



# Configuring Cisco IOS IP SLAs DNS Operations

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This module describes how to configure the Cisco IOS IP Service Level Agreements (SLAs) Domain Name System (DNS) operation to measure the difference between the time taken to send a DNS request and receive a reply. This module also demonstrates how the results of the DNS operation can be displayed and analyzed to determine the DNS lookup time which is a critical element for determining the performance of a DNS or web server.

## 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 for IP SLAs DNS Operations”](#) section on page 11.

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/cfn>. An account on Cisco.com is not required.

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# Information About IP SLAs DNS Operations

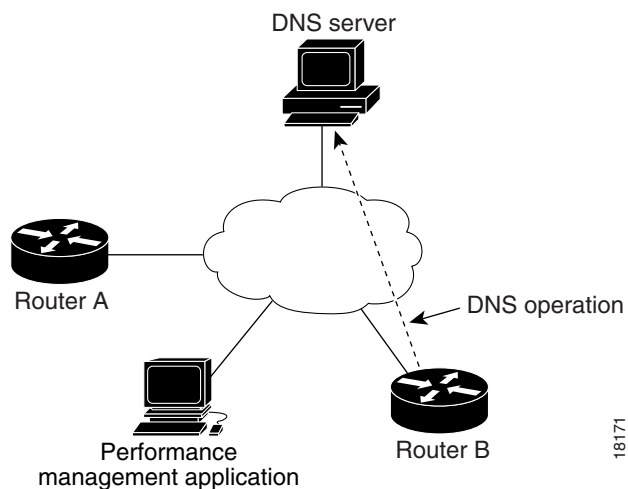
- [DNS Operation, page 2](#)

## DNS Operation

The DNS operation measures the difference between the time taken to send a DNS request and receive a reply. DNS is used in the Internet for translating names of network nodes into addresses. The IP SLAs DNS operation queries for an IP address if you specify a host name, or queries for a host name if you specify an IP address.

In [Figure 1](#) Router B is configured as the source IP SLAs device and a DNS operation is configured with the DNS server as the destination device.

**Figure 1**      **DNS Operation**



Connection response time is computed by measuring the difference between the time taken to send a request to the DNS server and the time a reply is received by Router B. The resulting DNS lookup time can help you analyze your DNS performance. Faster DNS lookup times translate to a faster web server access experience.

## How to Configure IP SLAs DNS Operations

- [Configuring an IP SLAs DNS Operation on the Source Device, page 2](#) (required)
- [Scheduling IP SLAs Operations, page 6](#) (required)

## Configuring an IP SLAs DNS Operation on the 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 DNS Operation on the Source Device, page 3](#)
- [Configuring a DNS Operation with Optional Parameters on the Source Device, page 4](#)

## Configuring a Basic DNS Operation on the Source Device

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip sla operation-number**
4. **dns** {*destination-ip-address* | *destination-hostname*} **name-server** *ip-address* [**source-ip** {*ip-address* | *hostname*} **source-port** *port-number*]
5. **frequency** *seconds*
6. **end**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> 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> Router# configure terminal	Enters global configuration mode.
Step 3	<b>ip sla operation-number</b>  <b>Example:</b> Router(config)# ip sla 10	Begins configuration for an IP SLAs operation and enters IP SLA configuration mode.
Step 4	<b>dns</b> { <i>destination-ip-address</i>   <i>destination-hostname</i> } <b>name-server</b> <i>ip-address</i> [ <b>source-ip</b> { <i>ip-address</i>   <i>hostname</i> } <b>source-port</b> <i>port-number</i> ]  <b>Example:</b> Router(config-ip-sla)# dns host1 name-server 172.20.2.132	Defines a DNS operation and enters IP SLA DNS configuration mode.
Step 5	<b>frequency seconds</b>  <b>Example:</b> Router(config-ip-sla-dns)# frequency 60	(Optional) Sets the rate at which a specified IP SLAs operation repeats.
Step 6	<b>end</b>  <b>Example:</b> Router(config-ip-sla-dns)# end	Exits to privileged EXEC mode.

## Configuring a DNS Operation with Optional Parameters on the Source Device

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip sla operation-number**
4. **dns** {*destination-ip-address* | *destination-hostname*} **name-server** *ip-address* [**source-ip** {*ip-address* | *hostname*} **source-port** *port-number*]
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> Router> 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> Router# configure terminal	Enters global configuration mode.
Step 3	<b>ip sla operation-number</b>  <b>Example:</b> Router(config)# ip sla 10	Begins configuration for an IP SLAs operation and enters IP SLA configuration mode.

	Command or Action	Purpose
Step 4	<p><b>dns</b> {<i>destination-ip-address</i>   <i>destination-hostname</i>} <b>name-server</b> <i>ip-address</i> [<b>source-ip</b> {<i>ip-address</i>   <i>hostname</i>} <b>source-port</b> <i>port-number</i>]</p> <p><b>Example:</b> Router(config-ip-sla)# dns host1 name-server 172.20.2.132</p>	Defines a DNS operation and enters IP SLA DNS configuration mode.
Step 5	<p><b>history buckets-kept</b> <i>size</i></p> <p><b>Example:</b> Router(config-ip-sla-dns)# history buckets-kept 25</p>	(Optional) Sets the number of history buckets that are kept during the lifetime of an IP SLAs operation.
Step 6	<p><b>history distributions-of-statistics-kept</b> <i>size</i></p> <p><b>Example:</b> Router(config-ip-sla-dns)# history distributions-of-statistics-kept 5</p>	(Optional) Sets the number of statistics distributions kept per hop during an IP SLAs operation.
Step 7	<p><b>history enhanced</b> [<b>interval</b> <i>seconds</i>] [<b>buckets</b> <i>number-of-buckets</i>]</p> <p><b>Example:</b> Router(config-ip-sla-dns)# history enhanced interval 900 buckets 100</p>	(Optional) Enables enhanced history gathering for an IP SLAs operation.
Step 8	<p><b>history filter</b> {<b>none</b>   <b>all</b>   <b>overThreshold</b>   <b>failures</b>}</p> <p><b>Example:</b> Router(config-ip-sla-dns)# history filter failures</p>	(Optional) Defines the type of information kept in the history table for an IP SLAs operation.
Step 9	<p><b>frequency</b> <i>seconds</i></p> <p><b>Example:</b> Router(config-ip-sla-dns)# frequency 30</p>	(Optional) Sets the rate at which a specified IP SLAs operation repeats.
Step 10	<p><b>history hours-of-statistics-kept</b> <i>hours</i></p> <p><b>Example:</b> Router(config-ip-sla-dns)# history hours-of-statistics-kept 4</p>	(Optional) Sets the number of hours for which statistics are maintained for an IP SLAs operation.
Step 11	<p><b>history lives-kept</b> <i>lives</i></p> <p><b>Example:</b> Router(config-ip-sla-dns)# history lives-kept 5</p>	(Optional) Sets the number of lives maintained in the history table for an IP SLAs operation.
Step 12	<p><b>owner</b> <i>owner-id</i></p> <p><b>Example:</b> Router(config-ip-sla-dns)# owner admin</p>	(Optional) Configures the Simple Network Management Protocol (SNMP) owner of an IP SLAs operation.

	Command or Action	Purpose
Step 13	<b>history statistics-distribution-interval</b> <i>milliseconds</i>  <b>Example:</b> Router(config-ip-sla-dns)# history statistics-distribution-interval 10	(Optional) Sets the time interval for each statistics distribution kept for an IP SLAs operation.
Step 14	<b>tag</b> <i>text</i>  <b>Example:</b> Router(config-ip-sla-dns)# tag TelnetPollServer1	(Optional) Creates a user-specified identifier for an IP SLAs operation.
Step 15	<b>threshold</b> <i>milliseconds</i>  <b>Example:</b> Router(config-ip-sla-dns)# threshold 10000	(Optional) Sets the upper threshold value for calculating network monitoring statistics created by an IP SLAs operation.
Step 16	<b>timeout</b> <i>milliseconds</i>  <b>Example:</b> Router(config-ip-sla-dns)# timeout 10000	(Optional) Sets the amount of time an IP SLAs operation waits for a response from its request packet.
Step 17	<b>end</b>  <b>Example:</b> Router(config-ip-sla-dns)# end	Exits to privileged EXEC mode.

## Scheduling IP SLAs Operations

### Restrictions

- The frequency of all operations scheduled in a multioperation group must be the same.
- Operation ID numbers are limited to a maximum of 125 characters. Do not give large integer values as operation ID numbers.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**

For individual IP SLAs operations only:

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**]

For multioperation scheduler only:

4. **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*}]

5. `exit`
6. `show ip sla group schedule`
7. `show ip sla configuration`

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<p><code>enable</code></p> <p><b>Example:</b> Router&gt; enable</p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<p><code>configure terminal</code></p> <p><b>Example:</b> Router# configure terminal</p>	<p>Enters global configuration mode.</p>
Step 3	<p><code>ip sla schedule operation-number</code> [<b>life</b> {<b>forever</b>   <b>seconds</b>}] [<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>]</p> <p><b>Example:</b> Router(config)# ip sla schedule 11 start-time now life forever</p>	<p>For individual IP SLAs operations only:</p> <p>Configures the scheduling parameters for an individual IP SLAs operation.</p>
Step 4	<p><code>ip sla group schedule group-operation-number operation-id-numbers</code> <b>schedule-period</b> <i>schedule-period-range</i> [<b>ageout</b> <i>seconds</i>] [<b>frequency</b> <i>group-operation-frequency</i>] [<b>life</b> {<b>forever</b>   <b>seconds</b>}] [<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>}]</p> <p><b>Example:</b> Router(config)# ip sla group schedule 1 3,4,6-9</p>	<p>For multioperation scheduler only:</p> <p>Specifies an IP SLAs operation group number and the range of operation numbers to be scheduled in global configuration mode.</p> <ul style="list-style-type: none"> <li>• The frequency of all operations scheduled in the operation group should be the same.</li> <li>• The operation ID numbers are limited to a maximum of 125 characters. Do not use large integer values as operation ID numbers.</li> </ul>
Step 5	<p><code>exit</code></p> <p><b>Example:</b> Router(config)# exit</p>	<p>Exits to privileged EXEC mode.</p>
Step 6	<p><code>show ip sla group schedule</code></p> <p><b>Example:</b> Router# show ip sla group schedule</p>	<p>(Optional) Displays the IP SLAs group schedule details.</p>
Step 7	<p><code>show ip sla configuration</code></p> <p><b>Example:</b> Router# show ip sla configuration</p>	<p>(Optional) Displays the IP SLAs configuration details.</p>

## Examples

The following sample output shows the configuration of all the IP SLAs parameters (including defaults) for the DNS operation number 11.

```
Router# show ip sla configuration 11

Complete Configuration Table (includes defaults)
Entry number: 11
Owner: DNS-Test
Tag: DNS-Test
Type of operation to perform: dns
Target address: www.cisco.com
Source address: 0.0.0.0
Source port: 0
Operation timeout (milliseconds): 9000
Operation frequency (seconds): 60
Next Scheduled Start Time: Start Time already passed
Group Scheduled: FALSE
Life (seconds): Forever
Entry Ageout (seconds): never
Recurring (Starting Everyday): FALSE
Status of entry (SNMP RowStatus): Active
Threshold (milliseconds): 5000
Number of statistic hours kept: 2
Number of statistic distribution buckets kept: 1
Statistic distribution interval (milliseconds): 20
Number of history Lives kept: 0
Number of history Buckets kept: 15
History Filter Type: None
```

## Troubleshooting Tips

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 SLAs operation, see [Configuring Proactive Threshold Monitoring](#).

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 IP SLAs DNS Operations

- [Example: Configuring a DNS Operation, page 9](#)

## Example: Configuring a DNS Operation

The following example shows how to configure a DNS operation as shown in [Figure 1](#) from Router B to the DNS server (IP address 172.20.2.132). The operation is scheduled to start immediately. In this example, the target address is a hostname and the DNS operation will query the DNS server for the IP address associated with the hostname host1. No configuration is required at the DNS server.

### Router B Configuration

```
ip sla 11
  dns host1 name-server 172.20.2.132
  frequency 50
  timeout 8000
  tag DNS-Test
ip sla schedule 11 start-time now
```

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<i>Cisco IOS Master Commands List, All Releases</i>
Cisco IOS IP SLAs commands	<i>Cisco IOS IP SLAs Command Reference</i>
Cisco IOS IP SLAs: general information	“Cisco IOS IP SLAs Overview” chapter of the <i>Cisco IP SLAs Configuration Guide</i> .

### 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: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

## 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.	<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 DNS Operations

Table 1 lists the features in this module and provides links to specific configuration information.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



**Note**

Table 1 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.

**Table 1** Feature Information for the IP SLAs DNS Operation

Feature Name	Releases	Feature Information
IP SLAs DNS 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 Domain Name System (DNS) operation allows you to measure the difference between the time taken to send a DNS request and receive a reply.

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