Configuring IP SLAs DNS Operations

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This module describes how to configure the 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 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.

Information About IP SLAs DNS Operations

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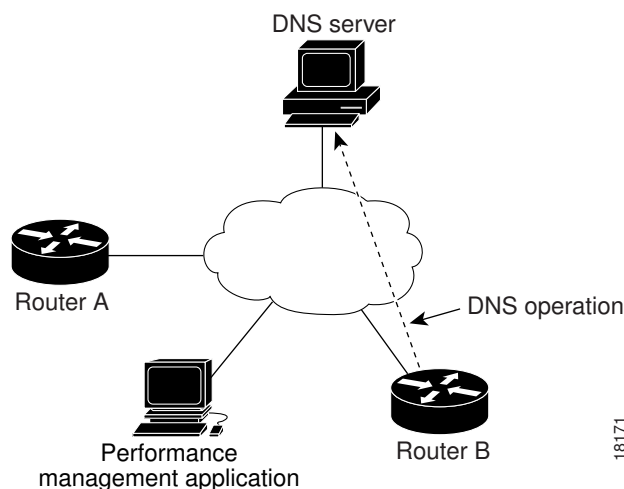
Connection response time is computed by measuring the difference between the time taken to send a request to the DNS server and the time a reply is received by Router B. The resulting DNS lookup time can help you analyze your DNS performance. Faster DNS lookup times translate to a faster web server access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

How to Configure IP SLAs DNS Operations

Configuring an IP SLAs DNS Operation on the Source Device

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

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	**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	**dns** {*destination-ip-address*	*destination-hostname*} **name-server** *ip-address* [**source-ip** {*ip-address*	*hostname*} **source-port** *port-number*] **Example:** 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	**frequency** *seconds* **Example:** Router(config-ip-sla-dns)# frequency 60	(Optional) Sets the rate at which a specified IP SLAs operation repeats.

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

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	**enable**	Enables privileged EXEC mode.
		• Enter your password if prompted.
	Example:	
	Router> enable	

	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	**dns** {*destination-ip-address* | *destination-hostname*} **name-server** *ip-address* [**source-ip** {*ip-address* | *hostname*} **source-port** *port-number*] **Example:** `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	**history buckets-kept** *size* **Example:** `Router(config-ip-sla-dns)# 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-dns)# 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-dns)# 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-dns)# 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-dns)# frequency 30	(Optional) Sets the rate at which a specified IP SLAs operation repeats.
Step 10	**history hours-of-statistics-kept** *hours* **Example:** Router(config-ip-sla-dns)# 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:** Router(config-ip-sla-dns)# history lives-kept 5	(Optional) Sets the number of lives maintained in the history table for an IP SLAs operation.
Step 12	**owner** *owner-id* **Example:** Router(config-ip-sla-dns)# owner admin	(Optional) Configures the Simple Network Management Protocol (SNMP) owner of an IP SLAs operation.
Step 13	**history statistics-distribution-interval** *milliseconds* **Example:** 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	**tag** *text* **Example:** Router(config-ip-sla-dns)# tag TelnetPollServer1	(Optional) Creates a user-specified identifier for an IP SLAs operation.

Command or Action	Purpose
Step 15 **threshold** *milliseconds* **Example:** 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 **timeout** *milliseconds* **Example:** 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 **end** **Example:** Router(config-ip-sla-dns)# end	Exits to privileged EXEC mode.

Scheduling IP SLAs Operations

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** **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	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*}] **Example:** Router(config)# ip sla schedule 10 start-time now life forever **Example:** Router(config)# ip sla group schedule 1 3,4,6-9	For individual IP SLAs operations only: Configures the scheduling parameters for an individual IP SLAs operation. or For multioperation scheduler only: Specifies an IP SLAs operation group number and the range of operation numbers to be scheduled in global configuration mode.
Step 4	**exit** **Example:** Router(config)# exit	Exits to privileged EXEC mode.
Step 5	**show ip sla group schedule** **Example:** Router# show ip sla group schedule	(Optional) Displays the IP SLAs group schedule details.

	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 DNS Operations

Example Configuring a DNS Operation

The following example shows how to configure a DNS operation from Router B to the DNS server (IP address 172.20.2.132) as shown in the "DNS Operation" figure in the "DNS peration" section. 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	Cisco IOS Master Commands List, All Releases
Cisco IOS IP SLAs commands	*Cisco IOS IP SLAs Command Reference*
Cisco IOS IP SLAs: general information	Configuring 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 DNS 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 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.