

IP SLAs DNS Operation

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Feature History for IP SLAs - DNS 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 26.2.1ea	IP SLAs - DNS Operation: IP SLAs - DNS Operation feature support has been introduced.	Cisco C9550 Series Smart Switches
Cisco IOS XE 17.18.1	IP SLAs - DNS Operation: This operation measures the time difference between sending a DNS request and receiving a reply.	Cisco C9350 Series Smart Switches Cisco C9610 Series Smart Switches

IP SLAs DNS

The IP SLAs DNS operation is designed to measure the time difference between sending a DNS request and receiving a reply. By analyzing the results of the DNS operation, network administrators can determine the DNS lookup time, which is a crucial factor in assessing the performance of DNS or web servers. Monitoring DNS response times helps identify potential issues and ensures optimal performance for applications that rely on fast and reliable domain name resolution.

How IP SLAs DNS works

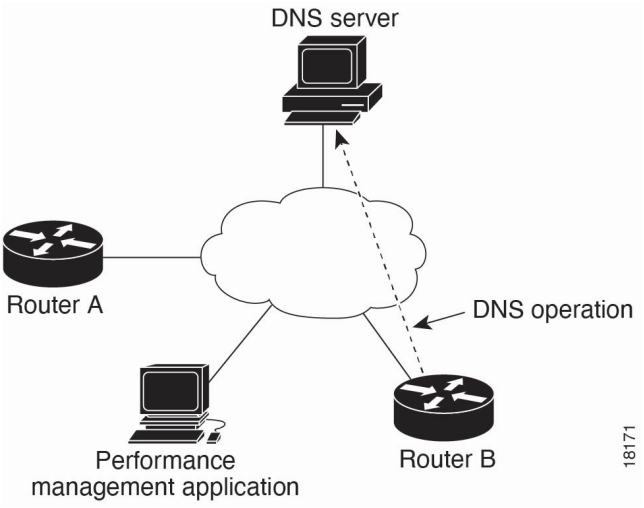
Summary

The DNS operation measures the time difference between sending a DNS request and receiving a reply, providing valuable insight into DNS server responsiveness. DNS plays a critical role on the Internet by translating network node names into IP addresses. With the IP SLAs DNS operation, a device can query for an IP address when a host name is provided, or query for a host name when an IP address is specified, allowing comprehensive monitoring of DNS resolution performance.

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

Workflow

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 Device 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.

Guidelines to to configure IP SLAs DNS

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

Configure an IP SLAs DNS operation on the source device

Follow the steps in each of these tasks to configure an IP SLAs DNS operation on the source device.

Before you begin

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

Procedure

Step 1 Perform any one of these tasks:

- Configure a basic DNS operation on the source device
- Configure a DNS operation with optional parameters on the source device

Step 2 Schedule IP SLAs operations

Configure a basic DNS operation on the source device

Perform this task to configure a basic DNS 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 **dns** {*destination-ip-address* | *destination-hostname*} **name-server** *ip-address* [**source-ip** {*ip-address* | *hostname*} **source-port** *port-number*]

Example:

```
Device(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:

```
Device(config-ip-sla-dns)# frequency 90
```

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

Step 6 **end**

Example:

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

Exits to privileged EXEC mode.

Configure a DNS operation with optional parameters on the source device

Perform this task to configure a DNS 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 **dns** {*destination-ip-address* | *destination-hostname*} **name-server** *ip-address* [**source-ip** {*ip-address* | *hostname*} **source-port** *port-number*]

Example:

```
Device(config-ip-sla)# dns host1 name-server 172.20.2.132
```

Defines a DNS operation and enters IP SLA DNS configuration mode.

- *destination-ip-address*: The IP address to query for its host name (reverse lookup).
- *destination-hostname*: The host name to query for its IP address (standard lookup).
- **name-server** *ip-address*: The IP address of the DNS server to be used for the query.
- **source-ip** {*ip-address* | *hostname*}: (Optional) Specifies the source IP address or hostname for the request.
- **source-port** *port-number*: (Optional) Specifies the source port number for the DNS request.

Step 5 **history buckets-kept** *size*

Example:

```
Device(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:

```
Device(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:

```
Device(config-ip-sla-dns)# history enhanced interval 900 buckets 100
```

(Optional) Enables enhanced history gathering for an IP SLAs operation.

- **interval** *seconds*: (Optional) The time interval, in seconds, between each statistics recording.
- **buckets** *number-of-buckets*: (Optional) The number of history data buckets (records) to store for the operation.

Step 8 **history filter** {**none** | **all** | **overThreshold** | **failures**}

Example:

```
Device(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:

```
Device(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:

```
Device(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:

```
Device(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:

```
Device(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:

```
Device(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:

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

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

Step 15 **threshold** *milliseconds*

Example:

```
Device(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:

```
Device(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:

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

Exits to privileged EXEC mode.

Schedule IP SLAs operations

Perform this task to schedule IP SLAs operations.

Before you begin

- 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.

- 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 (,).

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 schedule** *operation-number* [**life** {**forever** | *seconds*}] [**start-time** {[*hh:mm:ss*] [*month day* | *day month*] | **pending** | **now** | **after** *hh:mm:ss*}] [**ageout** *seconds*] [**recurring**]

Example:

```
Device(config)# ip sla schedule 10 life forever start-time
OR
Device(config)# ip sla schedule 1 3,4,6-9 schedule-period 50 frequency range 80-100
```

(Optional) Configures the scheduling parameters for an individual IP SLAs operation.

- *operation-number*: The IP SLA operation number to schedule (must match a previously created IP SLA operation).

  The range is from 1 to 2147483647.

- **life** {**forever** | *seconds*}: How long the operation will run.
  - **forever**: Runs the operation continuously until manually stopped.
  - *seconds*: Number of seconds the operation should run.

    The range is from 1 to 2147483647 seconds.

- **start-time** {[*hh:mm:ss*] [*month day* | *day month*] | **pending** | **now** | **after** *hh:mm:ss*}: Specifies when to start the operation.
  - *hh:mm:ss* [*month day* | *day month*]: Specific time and date.
  - **pending**: Waits for a manual start.
  - **now**: Starts immediately.
  - **after** *hh:mm:ss*: Starts after the specified amount of time.

- **ageout** *seconds*: Time (in seconds) after which the operation is automatically deleted.

The range is from 0 to 2147483647 seconds.

- **recurring**: Makes the operation run repeatedly according to its frequency settin

Step 4 **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*]}]

Example:

```
Device(config)# ip sla group schedule 10 schedule-period frequency
OR
Device(config)# ip sla group schedule 1 3,4,6-9 life forever start-time now
```

(Optional) Specifies an IP SLAs operation group number and the range of operation numbers for a multioperation scheduler.

- *group-operation-number*: The number assigned to the group operation (must be unique).

  The range is from 1 to 2147483647.

- *operation-id-numbers*: List of individual IP SLA operation numbers to be included in the group.

  The range is from 1 to 2147483647 (can be a series separated by spaces).

- **schedule-period** *schedule-period-range*: Schedules each operation in the group with a specified time period between them.

  The range is from 1 to 604800 (seconds; up to 7 days).

- **schedule-together**: Starts all operations in the group at the same time.

- **frequency** *group-operation-frequency*: How often (in seconds) the group operation runs.

  The range is from 1 to 604800 seconds.

Step 5 **end**

Example:

```
Device(config)# end
```

Exits global configuration mode and returns to privileged EXEC mode.

Configuration example for a DNS operation

The following example shows how to configure a DNS operation from Device B to the DNS server (IP address 172.20.2.132) as shown in the “DNS Operation” figure in the “DNS Operation” 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

Device B Configuration

```
Device> enable
Device# configure terminal
```

```
Device(config)# ip sla 11
Device(config-ip-sla)# dns host1 name-server 172.20.2.132
Device(config-ip-sla)# frequency 50
Device(config-ip-sla)# timeout 8000
Device(config-ip-sla)# tag DNS-Test
Device(config-ip-sla)# exit
Device(config-ip-sla)# ip sla schedule 11 start-time now
```

Verify IP SLA operations

Command	Description	
show ip sla group schedule	Displays IP SLAs group schedule details.	
show ip sla configuration	Displays IP SLAs configuration details.	