# IP SLAs—Multiple Operation Scheduling

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This document describes how to schedule multiple operations at once using the Cisco IOS IP Service Level Agreements (SLAs) group-scheduling feature.

Cisco IOS IP SLAs allows you to analyze IP service levels for IP applications and services, to increase productivity, to lower operational costs, and to reduce occurances of network congestion or outages. IP SLAs uses active traffic monitoring—the generation of traffic in a continuous, reliable, and predictable manner with proactive notification capabilities—for measuring network performance. IP SLAs can be used for network troubleshooting, network assessment, and health monitoring.

The ability to schedule hundreds of operations at once allows service providers with large networks to monitor service levels for mulitple environments.

In addition to allowing you to schedule multiple IP SLAs operations with a single command, IP SLAs can be used to schedule operations to run at equal intervals, automatically distributing the operations over a specified time frame. This distribution helps to minimize the CPU utilization, thereby enhancing the scalability of the IP SLAs monitoring solution.

### Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the "Feature Information for IP SLAs Multiple Operation Scheduling" section on page 14.

### Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.



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# Contents

# Prerequisites for IP SLAs Multiple Operations Scheduling

- Configure the IP SLAs operations before group scheduling those operations.
- Determine the IP SLAs operations you want to schedule as a single group.
- Identify the network traffic type and the location of your network management station.
- Identify the topology and the types of devices in your network.
- Decide on the frequency of testing for each operation.

# Information About Scheduling Multiple and Recurring IP SLAs Operations

To schedule IP SLAs as multiple or recurring operations, you should understand the following concept:

- Scheduling of Multiple IP SLAs Operations, page 2

## Scheduling of Multiple IP SLAs Operations

Normal scheduling of IP SLAs operations allows you to schedule one operation at a time. If you have large networks with thousands of IP SLAs operations to monitor network performance, normal scheduling (scheduling each operation individually) will be inefficient and time-consuming.

Multiple operations scheduling allows you to schedule multiple IP SLAs operations using a single command through the command line interface (CLI) or the CISCO-RTTMON-MIB. This feature allows you to control the amount of IP SLAs monitoring traffic by scheduling the operations to run at evenly distributed times. You must specify the operation ID numbers to be scheduled and the time range over which all the IP SLAs operations should start. This feature automatically distributes the IP SLAs operations at equal intervals over a specified time frame. The spacing between the operations (start interval) is calculated and the operations are started. This distribution of IP SLAs operations helps minimize the CPU utilization and thereby enhances the scalability of the network.

The IP SLAs multiple operations scheduling functionality allows you to schedule multiple IP SLAs operations as a group using the **ip sla monitor group schedule** command. The following parameters can be configured with this command:

- Group operation number—Group configuration or group schedule number of the IP SLAs operation to be scheduled.

- Operation ID numbers—A list of IP SLAs operation ID numbers in the scheduled operation group.

- Schedule period—Amount of time for which the IP SLAs operation group is scheduled.

- Ageout—Amount of time to keep the operation in memory when it is not actively collecting information. By default, the operation remains in memory indefinitely.

- Frequency—Amount of time after which each IP SLAs operation is restarted. When the frequency option is specified, it overwrites the operation frequency of all operations belonging to the group. Note that when the frequency option is not specified, the frequency for each operation is set to the value of the schedule period.

- Life—Amount of time the operation actively collects information. The operation can be configured to run indefinitely. By default, the lifetime of an operation is one hour.

- Start time—Time when the operation starts collecting information. You can specify an operation to start immediately or at an absolute start time using hours, minutes, seconds, day, and month.

The IP SLAs multiple operations scheduling functionality schedules the maximum number of operations possible without aborting. However, this functionality skips those IP SLAs operations that are already running or those that are not configured and hence do not exist. The total number of operations will be calculated based on the number of operations specified in the command, irrespective of the number of operations that are missing or already running. The IP SLAs multiple operations scheduling functionality displays a message showing the number of active and missing operations. However, these messages are displayed only if you schedule operations that are not configured or are already running.

A main benefit for scheduling multiple IP SLAs operations is that the load on the network is reduced by distributing the operations equally over a scheduled period. This distribution helps you to achieve more consistent monitoring coverage. To illustrate this scenario, consider configuring 60 operations to start during the same 1-second interval over a 60-second schedule period. If a network failure occurs 30 seconds after all 60 operations have started and the network is restored before the operations are due to start again (in another 30 seconds), then this failure would never be detected by any of the 60 operations. However, if the 60 operations are distributed equally at 1-second intervals over a 60-second schedule period, then some of the operations would detect the network failure. Conversely, if a network failure occurs when all 60 operations are active, then all 60 operations would fail, indicating that the failure is possibly more severe than it really is.

Operations of the same type and same frequency should be used for IP SLAs multiple operations scheduling. If you do not specify a frequency, the default frequency will be the same as that of the schedule period. The schedule period is the period of time in which all the specified operations should run. The following sections explain the IP SLAs multiple operations scheduling process:

**Note** The examples that follow focus on the interaction of the schedule period and frequency values, so the additional command syntax, such as start time and lifetime values, is not included in the illustrations.

## Default Behavior of IP SLAs Multiple Operations Scheduling

The IP SLAs Multiple Operations Scheduling feature allows you to schedule multiple IP SLAs operations as a group using the **ip sla monitor group schedule** command. In the example shown in Figure 1, the **ip sla monitor group schedule 1 1-10 schedule-period 20 [frequency 20]** command is configured. This example schedules operation 1 to operation 10 within operation group 1. Operation group 1 has a schedule period of 20 seconds, which means that all operations in the group will be started at equal intervals within a 20-second period. By default, the frequency is set to the same value as the configured schedule period. As shown in Figure 1, configuring the frequency is optional because 20 is the default.

*Figure 1       Schedule Period Equals Frequency—Default Behavior*

**ip sla monitor group schedule 1  1-10 schedule-period 20 [frequency 20]**
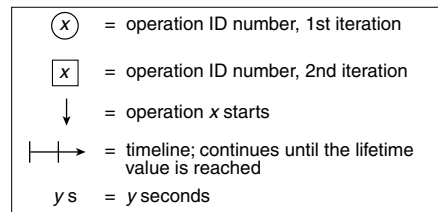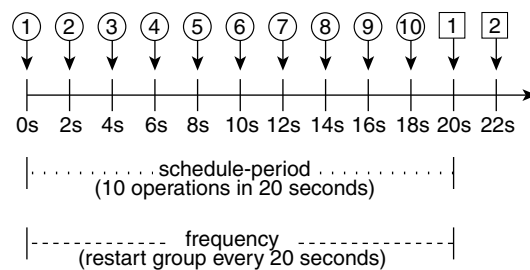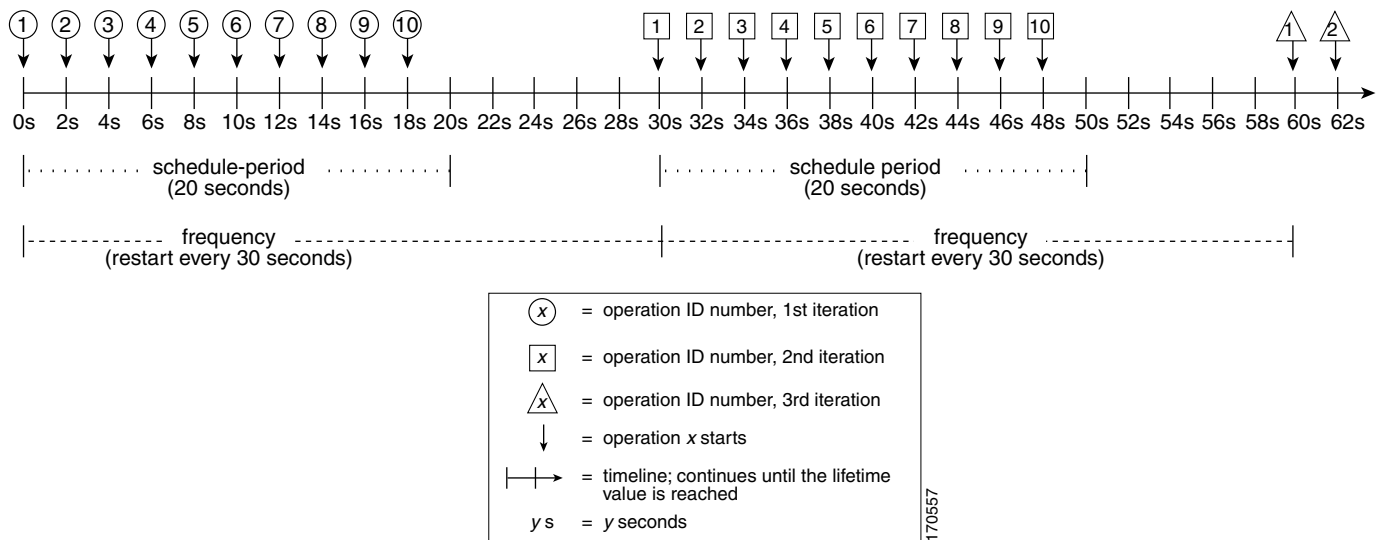


In this example, the first operation (operation 1) in operation group 1 will start at 0 seconds. All 10 operations in operation group 1 (operation 1 to operation 10) must be started in the schedule period of 20 seconds. The start time of each IP SLAs operation is evenly distributed over the schedule period by dividing the schedule period by the number of operations (20 seconds divided by 10 operations). Therefore, each operation will start 2 seconds after the previous operation.

The frequency is the period of time that passes before the operation group is started again (repeated). If the frequency is not specified, the frequency is set to the value of the schedule period. In the example shown in Figure 1, operation group 1 will start again every 20 seconds. This configuration provides optimal division (spacing) of operations over the specified schedule period.

## IP SLAs Multiple Operations Scheduling with Scheduling Period Less Than Frequency

As the frequency value in the **ip sla monitor group schedule** configuration is the amount of time that passes before the schedule group is restarted, if the schedule period is less than the frequency, there will be a period of time in which no operations are started.

In the example shown in Figure 2, the **ip sla monitor group schedule 1 1-10 schedule-period 20 frequency 30** command is configured. This example schedules operation 1 to operation 10 within operation group 2. Operation group 2 has a schedule period of 20 seconds and a frequency of 30 seconds.

***Figure 2        Schedule Period Is Less Than Frequency***

**ip sla monitor group schedule 2  1-10 schedule-period 20 frequency 30**



n this example, the first operation (operation 1) in operation group 2 will start at 0 seconds. All 10 operations in operation group 2 (operation 1 to operation 10) must be started in the schedule period of 20 seconds. The start time of each IP SLAs operation is evenly distributed over the schedule period by dividing the schedule period by the number of operations (20 seconds divided by 10 operations). Therefore, each operation will start 2 seconds after the previous operation.

In the first iteration of operation group 2, operation 1 starts at 0 seconds, and the last operation (operation 10) starts at 18 seconds. However, because the group frequency has been configured to 30 seconds each operation in the operation group is restarted every 30 seconds. So, after 18 seconds, there is a gap of 10 seconds as no operations are started in the time from 19 seconds to 29 seconds. Hence, at 30 seconds, the second iteration of operation group 2 starts. As all ten operations in the operation group 2 must start at an evenly distributed interval in the configured schedule period of 20 seconds, the last operation (operation 10) in the operation group 2 will always start 18 seconds after the first operation (operation 1).

As shown in Figure 2, the following events occur when the **ip sla monitor group schedule 1 1-10 schedule-period 20 frequency 30** command is configured:

- At 0 seconds, the first operation (operation 1) in operation group 2 is started.
- At 18 seconds, the last operation (operation 10) in operation group 2 is started. This means that the first iteration (schedule period) of operation group 1 ends here.
- From 19 to 29 seconds, no operations are started.
- At 30 seconds, the first operation (operation 1) in operation group 2 is started again. The second iteration of operation group 2 starts here.
- At 48 seconds (18 seconds after the second iteration started) the last operation (operation 10) in operation group 2 is started, and the second iteration of operation group 2 ends.
- At 60 seconds, the third iteration of operation group 2 starts.

This process continues until the lifetime of operation group 2 ends. The lifetime can be configured using the **ip sla monitor group schedule** command. The default lifetime for an operation group is forever.
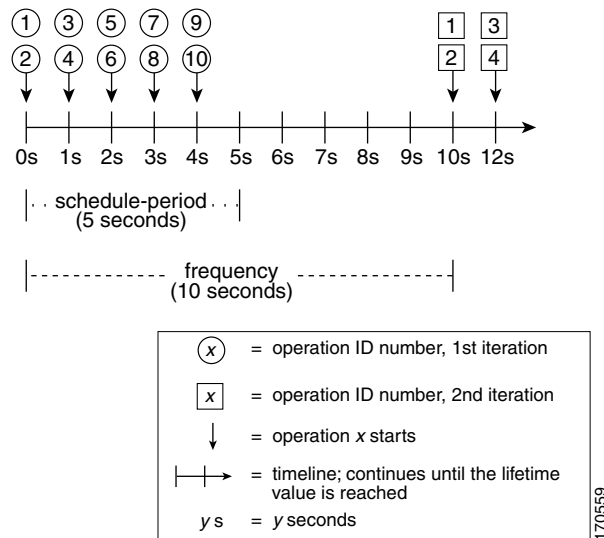
## Multiple Operations Scheduling When the Number of IP SLAs Operations Are Greater Than the Schedule Period

The minimum time interval between the start of IP SLAs operations in a group operation is 1 second. Therefore, if the number of operations to be multiple scheduled is greater than the schedule period, the IP SLAs multiple operations scheduling functionality will schedule more than one operation to start within the same 1-second interval. If the number of operations getting scheduled does not equally divide into 1-second intervals, then the operations are equally divided at the start of the schedule period with the remaining operations to start at the last 1-second interval.

In the example shown in Figure 3, the **ip sla monitor group schedule 3 1-10 schedule-period 5 frequency 10** command is configured. This example schedules operation 1 to operation 10 within operation group 3. Operation group 3 has a schedule period of 5 seconds and a frequency of 10 seconds.

*Figure 3        Number of IP SLAs Operations Is Greater Than the Schedule Period—Even Distribution*

**ip sla monitor group schedule 3  1-10 schedule-period 5 frequency 10**
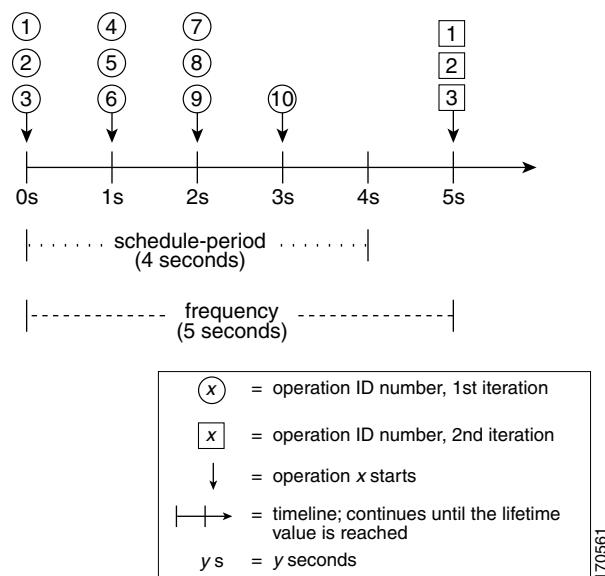


In this example, when dividing the schedule period by the number of operations (5 seconds divided by 10 operations, which equals one operation every 0.5 seconds) the start time of each IP SLAs operation is less than 1 second. Since the minimum time interval between the start of IP SLAs operations in a group operation is 1 second, the IP SLAs multiple operations scheduling functionality instead calculates how many operations it should start in each 1-second interval by dividing the number of operations by the schedule period (10 operations divided by 5 seconds). Therefore, as shown in Figure 3, two operations will be started every 1 second.

As the frequency is set to 10 in this example, each iteration of operation group 3 will start 10 seconds after the start of the previous iteration. However, this distribution is not optimal as there is a gap of 5 seconds (frequency minus schedule period) between the cycles.

If the number of operations getting scheduled does not equally divide into 1-second intervals, then the operations are equally divided at the start of the schedule period with the remaining operations to start at the last 1-second interval.

In the example shown in Figure 4, the **ip sla monitor group schedule 4 1-10 schedule-period 4 frequency 5** command is configured. This example schedules operation 1 to operation 10 within operation group 4. Operation group 4 has a schedule period of 4 seconds and a frequency of 5 seconds.

*Figure 4        Number of IP SLAs Operations Is Greater Than the Schedule Period—Uneven Distribution*

**ip sla monitor group schedule 4  1-10 schedule-period 4 frequency 5**



In this example, the IP SLAs multiple operations scheduling functionality calculates how many operations it should start in each 1-second interval by dividing the number of operations by the schedule period (10 operations divided by 4 seconds, which equals 2.5 operations every 1 second). Since the number of operations does not equally divide into 1-second intervals, this number will be rounded off to the next whole number (see Figure 4) with the remaining operations to start at the last 1-second interval.

## IP SLAs Multiple Operations Scheduling with Scheduling Period Greater Than Frequency

As the frequency value in the **ip sla monitor group schedule** configuration is the amount of time that passes before the schedule group is restarted, if the schedule period is greater than the frequency, there will be a period of time in which the operations in one iteration of an operation group overlap with the operations of the following iteration.

In the example shown in Figure 5, the **ip sla monitor group schedule 5 1-10 schedule-period 20 frequency 10** command is configured. This example schedules operation 1 to operation 10 within operation group 5. Operation group 5 has a schedule period of 20 seconds and a frequency of 10 seconds.

*Figure 5*     *IP SLAs Group Scheduling with Schedule Period Greater Than Frequency*

**ip sla monitor group schedule 5  1-10 schedule-period 20 frequency 10**
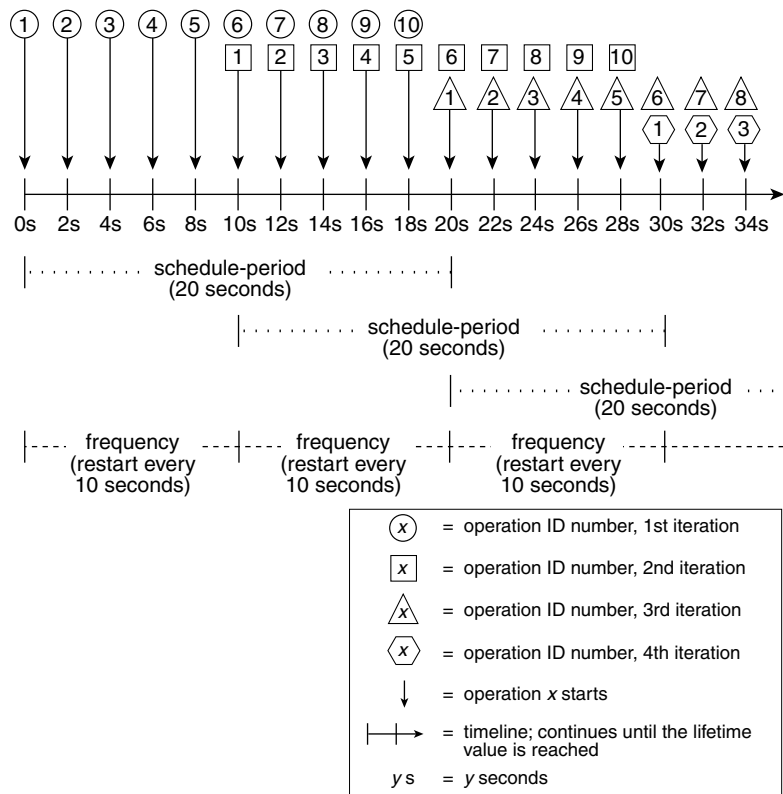


In this example, the first operation (operation 1) in operation group 5 will start at 0 seconds. All 10 operations in operation group 5 (operation 1 to operation 10) must be started in the schedule period of 20 seconds. The start time of each IP SLAs operation is evenly distributed over the schedule period by dividing the schedule period by the number of operations (20 seconds divided by 10 operations). Therefore, each operation will start 2 seconds after the previous operation.

In the first iteration of operation group 5, operation 1 starts at 0 seconds, and operation 10, the last operation in the operation group, starts at 18 seconds. Because the operation group is configured to restart every 10 seconds (**frequency 10**), the second iteration of operation group 5 starts again at 10 seconds, before the first iteration is completed. Therefore, an overlap of operations 6 to 10 of the first iteration occurs with operations 1 to 5 of the second iteration during the time period of 10 to 18 seconds (see Figure 5). Similarly, there is an overlap of operations 6 to 10 of the second iteration with operations 1 to 5 of the third iteration during the time period of 20 to 28 seconds.

In this example, the start time of operation 1 and operation 6 need not be at exactly the same time, but will be within the same 2-second interval.

The configuration described in this section is not recommended as you can configure multiple operations to start within the same 1-second interval by configuring the number of operations greater than the schedule period (see the Multiple Operations Scheduling When the Number of IP SLAs Operations Are Greater Than the Schedule Period, page 6).

# How to Schedule Multiple and Recurring IP SLAs Operations

This section contains the following tasks. Each task in the list is identified as either required or optional.

- Scheduling Multiple IP SLAs Operations, page 9 (required)
- Verifying IP SLAs Multiple Operations Scheduling, page 10 (optional)

# Scheduling Multiple IP SLAs Operations

Perform this task to schedule multiple IP SLAs operations using a single command.

## Prerequisites

Before scheduling a group of operations, you should configure all the IP SLAs operations that will be used in that group. For information on configuring IP SLAs operations, refer to the appropriate IP SLAs document at http://www.cisco.com/univercd/cc/td/doc/product/software/lib/netman/ipsla/index.htm

## Restrictions

- The frequency of all operations scheduled in the operation group should be the same.
- The 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**
3. **ip sla monitor 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 monitor group schedule**
6. **show ip sla monitor configuration**

**DETAILED STEPS**

|  | Command or Action | Purpose |
|---|---|---|
| Step 1 | **enable**<br><br>**Example:**<br>Router> enable | Enables privileged Exec mode.<br><br>• Enter your password if prompted. |
| Step 2 | **configure terminal**<br><br>**Example:**<br>Router# configure terminal | Enters global configuration mode. |
| Step 3 | **ip sla monitor 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*}]<br><br>**Example:**<br>Router# ip sla monitor group schedule 1 3,4,6-9 | Specifies an IP SLAs operation group number and the range of operation numbers to be scheduled in global configuration mode.<br><br>• The *group-operation-number* argument identifies the IP SLAs operation ID to be group scheduled.<br><br>• The *operation-id-numbers* argument specifies the number of operations that need to be group scheduled. |
| Step 4 | **end**<br><br>**Example:**<br>Router# end | Returns to the privileged Exec mode. |
| Step 5 | **show ip sla monitor group schedule**<br><br>**Example:**<br>Router# show ip sla monitor group schedule | (Optional) Displays the IP SLAs group schedule details. |
| Step 6 | **show ip sla monitor configuration**<br><br>**Example:**<br>Router# show ip sla monitor configuration | (Optional) Displays the IP SLAs configuration details. |

# Verifying IP SLAs Multiple Operations Scheduling

To verify and analyze the scheduled operation, use the **show ip sla monitor statistics**, **show ip sla monitor group schedule**, and **show ip sla monitor configuration** commands.

**SUMMARY STEPS**

1. **show ip sla monitor statistics**

2. **show ip sla monitor group schedule**

3. **show ip sla monitor configuration**

**DETAILED STEPS**

|  | Command or Action | Purpose |
|---|---|---|
| **Step 1** | `show ip sla monitor statistics`<br><br>**Example:**<br>`Router# show ip sla monitor statistics` | (Optional) Displays the IP SLAs operation details. |
| **Step 2** | `show ip sla monitor group schedule`<br><br>**Example:**<br>`Router# show ip sla monitor group schedule` | (Optional) Displays the IP SLAs group schedule details. |
| **Step 3** | `show ip sla monitor configuration`<br><br>**Example:**<br>`Router# show ip sla monitor configuration` | (Optional) Displays the IP SLAs configuration details. |

## Examples

After you have scheduled the multiple IP SLAs operations, you can verify the latest operation details using the above show commands.

The following example schedules IP SLAs operations 1 through 20 in the operation group 1 with a schedule period of 60 seconds and a life value of 1200 seconds. By default, the frequency is equivalent to the schedule period. In this example, the start interval is 3 seconds (schedule period divided by number of operations).

```
Router# ip sla monitor group schedule 1 1-20 schedule-period 60 life 1200
```

The following example shows the details of the scheduled multiple IP SLAs operation using the **show ip sla monitor group schedule** command.

```
Router# show ip sla monitor group schedule

Group Entry Number: 1
Probes to be scheduled: 1-20
Total number of probes: 20
Schedule period: 60
Group operation frequency: Equals schedule period
Status of entry (SNMP RowStatus): Active
Next Scheduled Start Time: Start Time already passed
Life (seconds): 1200
Entry Ageout (seconds): never
```

The following example shows the details of the scheduled multiple IP SLAs operation using the **show ip sla monitor configuration** command. The last line in the example indicates that the IP SLAs operations are multiple scheduled (TRUE).

```
Router# show ip sla monitor configuration 1

Entry number: 1
Owner:
Tag:
Type of operation to perform: udpEcho
Target address: 10.2.31.121
Source address: 0.0.0.0
Target port: 9001
Source port: 0
```

```
Request size (ARR data portion): 16
Operation timeout (milliseconds): 5000
Type Of Service parameters: 0x0
Verify data: No
Data pattern:
Vrf Name:
Control Packets: enabled
Operation frequency (seconds): 60
Next Scheduled Start Time: Start Time already passed
Life (seconds): 1200
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
Enhanced History:
Number of history Lives kept: 0
Number of history Buckets kept: 15
History Filter Type: None
Group Scheduled : TRUE
```

The following example shows the latest operation start time of the scheduled multiple IP SLAs operation, when the operations are scheduled at equal intervals, using the **show ip sla monitor statistics** command:

```
Router# show ip sla monitor statistics | include Latest operation start time

Latest operation start time: *03:06:21.760 UTC Tue Oct 21 2003
Latest operation start time: *03:06:24.754 UTC Tue Oct 21 2003
Latest operation start time: *03:06:27.751 UTC Tue Oct 21 2003
Latest operation start time: *03:06:30.752 UTC Tue Oct 21 2003
Latest operation start time: *03:06:33.754 UTC Tue Oct 21 2003
Latest operation start time: *03:06:36.755 UTC Tue Oct 21 2003
Latest operation start time: *03:06:39.752 UTC Tue Oct 21 2003
Latest operation start time: *03:06:42.753 UTC Tue Oct 21 2003
Latest operation start time: *03:06:45.755 UTC Tue Oct 21 2003
Latest operation start time: *03:06:48.752 UTC Tue Oct 21 2003
Latest operation start time: *03:06:51.753 UTC Tue Oct 21 2003
Latest operation start time: *03:06:54.755 UTC Tue Oct 21 2003
Latest operation start time: *03:06:57.752 UTC Tue Oct 21 2003
Latest operation start time: *03:07:00.753 UTC Tue Oct 21 2003
Latest operation start time: *03:07:03.754 UTC Tue Oct 21 2003
Latest operation start time: *03:07:06.752 UTC Tue Oct 21 2003
Latest operation start time: *03:07:09.752 UTC Tue Oct 21 2003
Latest operation start time: *03:07:12.753 UTC Tue Oct 21 2003
Latest operation start time: *03:07:15.755 UTC Tue Oct 21 2003
Latest operation start time: *03:07:18.752 UTC Tue Oct 21 2003
```

# Configuration Examples for Scheduling Multiple IP SLAs Operations

This section provides the following configuration examples:

## Scheduling Multiple IP SLAs Operations: Example

The following example schedules IP SLAs operations 1 to 10 in the operation group 1 with a schedule period of 20 seconds. By default, the frequency is equivalent to the schedule period.

```
Router# ip sla monitor group schedule 1 1-10 schedule-period 20
```

The following example shows the details of the scheduled multiple IP SLAs operation using the **show ip sla monitor group schedule** command. The last line in the example indicates that the IP SLAs operations are multiple scheduled (TRUE).

```
Router# show ip sla monitor group schedule

Multi-Scheduling Configuration:
Group Entry Number: 1
Probes to be scheduled: 1-10
Schedule period :20
Group operation frequency: 20
Multi-scheduled: TRUE
```

# Where to Go Next

- If you want to configure an IP SLAs operation, see the "Cisco IOS IP SLAs Overview" chapter of the *Cisco IOS IP SLAs Configuration Guide*, Release 12.4.
- If you want to configure threshold parameters for an IP SLAs operation, see the "IP SLAs—Proactive Threshold Monitoring" chapter of the *Cisco IOS IP SLAs Configuration Guide*, Release 12.4.

# Additional References

The following sections provide references related to IP SLAs group scheduling.

## Related Documents

| Related Topic | Document Title |
|---|---|
| Overview of Cisco IOS IP SLAs | "Cisco IOS IP SLAs Overview" chapter of the *Cisco IOS IP SLAs Configuration Guide*, Release 12.4 |
| Cisco IOS IP SLAs commands: complete command syntax, defaults, command mode, command history, usage guidelines, and examples | *Cisco IOS IP SLAs Command Reference*, Release 12.4 |

## Standards

| Standards | Title |
|---|---|
| No new or modified standards are supported 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. | — |

## Technical Assistance

| Description | Link |
|-------------|------|
| Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content. | http://www.cisco.com/public/support/tac/home.shtml |

# Feature Information for IP SLAs Multiple Operation Scheduling

Table 1 lists the features in this module and provides links to specific configuration information. Only features that were introduced or modified in Cisco IOS Release 12.3(14)T or a later release appear in the table. *Not all features may be supported in your Cisco IOS software release*.

For information on a feature in this technology that is not documented here, see the "Cisco IOS IP SLAs Features Roadmap."

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Cisco IOS software images are specific to a Cisco IOS software release, a feature set, and a platform. Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

**Note** Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

*Table 1*        ***Feature Information for IP SLAs Multiple Operation Scheduling***

| Feature Name | Releases | Feature Information |
|---|---|---|
| IP SLAs Multioperation Scheduler | 12.3(14)T | The IP SLAs Multioperation Scheduler feature provides a highly scalable infrastructure for Cisco IOS IP SLAs by allowing you to schedule multiple IP SLAs operations using a single command. |