



IP SLAs VoIP Call Setup (Post-Dial Delay) Monitoring

The Cisco IOS IP Service Level Agreements (SLAs) VoIP Call Setup (Post-Dial Delay) Monitoring feature provides the ability to measure your network's response time for setting up a Voice over IP (VoIP) call. This document describes how to use the IP SLAs VoIP call setup operation to monitor the call setup performance of your VoIP network.

When using either H.323 or Session Initiation Protocol (SIP), the IP SLAs VoIP call setup operation can measure the total time from when an originating gateway sends a call message (containing a call number) to when the originating gateway receives a message from the terminating gateway (destination) indicating that either the called number rang or the called party answered the call.

History for the IP SLAs VoIP Call Setup (Post-Dial Delay) Monitoring Feature

Release	Modification
12.3(14)T	This feature was introduced.

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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Prerequisites for the IP SLAs VoIP Call Setup Monitoring Operation

In order to use the IP SLAs VoIP call setup functionality, your Cisco IOS software image must support the IP SLAs VoIP test-call application and IP SLAs VoIP Responder application. To determine if your Cisco IOS software image is configured with these applications, use the **show call application voice** command in EXEC mode.

**Note**

The IP SLAs VoIP Responder application is different from the IP SLAs Responder (which is configured using the **ip sla monitor responder** command in global configuration mode).

Information About the IP SLAs VoIP Call Setup Monitoring Operation

To configure an IP SLAs VoIP call setup operation, you should understand the following concept:

- [IP SLAs VoIP Call Setup Monitoring Using H.323 or SIP, page 2](#)

IP SLAs VoIP Call Setup Monitoring Using H.323 or SIP

The Cisco IOS IP SLAs VoIP Call Setup Monitoring feature provides the ability to measure your network's response time for setting up a Voice over IP (VoIP) call. Prior to configuring the IP SLAs VoIP call setup operation, you must enable the IP SLAs VoIP test-call application on the originating gateway (source). With the IP SLAs VoIP test-call application enabled, H.323 or Session Initiation Protocol (SIP) call messages can be sent to and received by the originating and terminating gateways. The configuration for the IP SLAs VoIP call setup operation is essentially the same for both protocols.

When using either H.323 or SIP, the IP SLAs VoIP call setup operation can measure the total time from when an originating gateway sends a call message (containing a call number) to when the originating gateway receives a message from the terminating gateway (destination) indicating that either the called number rang or the called party answered the call. As with all Cisco IOS IP SLAs operations, you can configure the VoIP call setup operation to repeat at specified time intervals, for a specified number of repetitions, and over a specified duration of time.

**Note**

If a gatekeeper (GK) or directory gatekeeper (DGK) is involved in the H.323 call signaling, additional messages are sent and received between the originating and terminating gateways before the call message (containing a call number) is actually sent. The additional time required for these messages is included in the IP SLAs VoIP call setup response time measurement. Likewise, if a proxy server or redirection server is involved in the SIP call signaling, any additional time required for messages to be sent and received (prior to sending the call message) is included in the VoIP call setup response time measurement.

A plain old telephone service (POTS) IP phone can be set up at the terminating gateway to respond to an IP SLAs VoIP call setup test call. As a convenient alternative to an actual IP phone, you can enable the IP SLAs VoIP Responder application in the terminating gateway. The IP SLAs VoIP Responder application will respond to incoming call setup messages from the originating gateway using H.323 or SIP.

**Note**

The IP SLAs VoIP Responder application is different from the IP SLAs Responder (which is configured using the **ip sla monitor responder** command in global configuration mode).

How to Configure the IP SLAs VoIP Call Setup Monitoring Operation

This section contains the following tasks:

- [Configuring the Originating Gateway, page 3](#)
- [Configuring the Terminating Gateway Using the IP SLAs VoIP Responder Application, page 6](#)

Configuring the Originating Gateway

Perform this task on the originating gateway (source) in order to start the IP SLAs VoIP test-call application, set up the dial peer to route the test call, define the VoIP call setup operation, and schedule the VoIP call setup operation. The required configuration for setting up the dial peer will vary slightly depending on whether you are using H.323 or SIP.

Prerequisites

In order to use the IP SLAs VoIP call setup functionality, your Cisco IOS software image must support the IP SLAs VoIP test-call application and IP SLAs VoIP Responder application. To determine if your Cisco IOS software image is configured with these applications, use the **show call application voice** command in EXEC mode.

**Note**

The IP SLAs VoIP Responder application is different from the IP SLAs Responder (which is configured using the **ip sla monitor responder** command in global configuration mode).

SUMMARY STEPS

1. **enable**
2. **show call application voice** [*name* | **summary**]
3. **call application session start** *instance-name* [*application-name*]
4. **configure terminal**
5. **dial-peer voice** *tag* **voip**
6. **destination-pattern** [+] *string* [**T**]
7. **session target** {**ipv4:destination-address** | **dns:[*\$s\$*. | *\$d\$*. | *\$e\$*. | *\$u\$*.]** *host-name* | **enum:table-num** | **loopback:rtp** | **ras** | **sip-server**}

8. **session protocol sipv2**
9. **exit**
10. **ip sla monitor** *operation-number*
11. **type voip delay post-dial** [**detect-point** {**alert-ringing** | **connect-ok**}] **destination** *tag*
12. **exit**
13. **ip sla monitor schedule** *operation-number* [**life** {**forever** | *seconds*}] [**start-time** {*hh:mm[:ss]* [*month day* | *day month*]} | **pending** | **now** | **after** *hh:mm:ss*}] [**ageout** *seconds*] [**recurring**]
14. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p>enable</p> <p>Example: Router> enable</p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	<p>show call application voice [<i>name</i> summary]</p> <p>Example: Router# show call application voice summary NAME DESCRIPTION ... ipsla-testcall Basic app to place a simple call ipsla-responder Basic app to respond to a simple call ... TCL Script Version 2.0 supported. Call Treatment Action Application - Version 1.</p>	<p>(Optional) Displays information about configured voice applications.</p> <ul style="list-style-type: none"> If the summary keyword is entered, the command output displays a one-line summary about each configured voice application. If the Cisco IOS IP SLAs VoIP test-call application is configured on the currently loaded Cisco IOS software image, the ipsla-testcall name is displayed.
Step 3	<p>call application session start <i>instance-name</i> [<i>application-name</i>]</p> <p>Example: Router# call application session start ipsla-testcall ipsla-testcall</p>	<p>Starts a new session of the Cisco IOS IP SLAs VoIP test-call application.</p>
Step 4	<p>configure terminal</p> <p>Example: Router# configure terminal</p>	<p>Enters global configuration mode.</p>
Step 5	<p>dial-peer voice <i>tag</i> voip</p> <p>Example: Router(config)# dial-peer voice 6789 voip</p>	<p>Defines a particular dial peer, specifies the method of voice encapsulation, and enters dial-peer configuration mode.</p> <ul style="list-style-type: none"> The <i>tag</i> argument consists of one or more digits identifying the dial peer. Range is from 1 to 2147483647. The voip keyword indicates a VoIP dial peer using voice encapsulation on an IP network.

	Command or Action	Purpose
Step 6	<pre>destination-pattern [+] string [T]</pre> <p>Example: Router(config-dial-peer)# destination-pattern 6789</p>	Specifies either the prefix or the full E.164 telephone number to be used for a dial peer.
Step 7	<pre>session target {ipv4:destination-address dns:[\$\$\$. \$d\$. \$e\$. \$u\$.] host-name enum:table-num loopback:rtp ras sip-server}</pre> <p>Example: Router(config-dial-peer)# session target ipv4:172.29.129.123</p>	Designates a network-specific address to receive calls from a VoIP dial peer.
Step 8	<pre>session protocol sipv2</pre> <p>Example: Router(config-dial-peer)# session protocol sipv2</p>	<p>(Optional) Specifies SIP as the session protocol for the VoIP dial peer.</p> <p>Note Perform this step only if configuring a SIP call.</p>
Step 9	<pre>exit</pre> <p>Example: Router(config-dial-peer)# exit</p>	Exits dial-peer configuration mode and returns to global configuration mode.
Step 10	<pre>ip sla monitor operation-number</pre> <p>Example: Router(config)# ip sla monitor 1</p>	Specifies an ID number for the IP SLAs operation to be configured and enters IP SLA monitor configuration mode.
Step 11	<pre>type voip delay post-dial [detect-point {alert-ringing connect-ok}] destination tag</pre> <p>Example: Router(config-sla-monitor)# type voip delay post-dial detect-point alert-ringing destination 6789</p>	Enters IP SLA monitor VoIP configuration mode and configures the operation as a VoIP call setup (post-dial delay) operation that will generate VoIP call setup response time measurements.
Step 12	<pre>exit</pre> <p>Example: Router(config-sla-monitor-voip)# exit</p>	Exits IP SLAs VoIP configuration submode and returns to global configuration mode.

Command or Action	Purpose
<p>Step 13</p> <pre>ip sla monitor schedule operation-number [life {forever seconds}] [start-time {hh:mm[:ss] [month day day month] pending now after hh:mm:ss}] [ageout seconds] [recurring]</pre> <p>Example: Router(config)# ip sla monitor schedule 1 start-time now life forever</p>	<p>Schedules the IP SLAs operation by specifying when the operation should start and how long the operation should run.</p> <ul style="list-style-type: none"> Use the optional life and forever keywords to schedule the operation to run indefinitely. Use the optional life keyword and <i>seconds</i> argument to schedule the lifetime of the operation, in seconds. The default lifetime of an operation is 3600 seconds (one hour). Use the optional start-time keyword and associated options to specify a time for the operation to start. Use the optional start-time and pending keywords to configure the operation to remain in a pending (unstarted) state. The default state of this command is start-time pending. If the start-time keyword is not specified, no information is collected until the start time is configured or a trigger occurs that performs an immediate start. Use the optional start-time and now keywords to indicate that the operation should start immediately. Use the optional start-time and after keywords and associated arguments to specify the time after which the operation starts collecting information. Use the optional ageout keyword and <i>seconds</i> argument to specify the number of seconds to keep the operation in memory when it is not actively collecting information. The default value of 0 seconds means that the operation never times out.
<p>Step 14</p> <pre>exit</pre> <p>Example: Router(config)# exit</p>	<p>(Optional) Exits global configuration mode and returns to privileged EXEC mode.</p>

Configuring the Terminating Gateway Using the IP SLAs VoIP Responder Application

Perform this task on the terminating gateway (destination) in order to set up the dial peer and enable the IP SLAs VoIP Responder application to respond to the IP SLAs VoIP test call. The required configuration for setting up the dial peer will vary slightly depending on whether you are using H.323 or SIP.

Prerequisites

In order to use the IP SLAs VoIP call setup functionality, your Cisco IOS software image must support the IP SLAs VoIP test-call application and IP SLAs VoIP Responder application. To determine if your Cisco IOS software image is configured with these applications, use the **show call application voice** command in EXEC mode.

**Note**

The IP SLAs VoIP Responder application is different from the IP SLAs Responder (which is configured using the **ip sla monitor responder** command in global configuration mode).

SUMMARY STEPS

1. **enable**
2. **show call application voice** [*name* | **summary**]
3. **configure terminal**
4. **dial-peer voice** *tag* **voip**
5. **incoming called-number** *tag*
6. **application** *application-name*
7. **session protocol sipv2**
8. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p>enable</p> <p>Example: Router> enable</p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	<p>show call application voice [<i>name</i> summary]</p> <p>Example: Router# show call application voice summary NAME DESCRIPTION ... ipsla-testcall Basic app to place a simple call ipsla-responder Basic app to respond to a simple call ... TCL Script Version 2.0 supported. Call Treatment Action Application - Version 1.</p>	<p>(Optional) Displays information about configured voice applications.</p> <ul style="list-style-type: none"> • If the summary keyword is entered, the command output displays a one-line summary of each configured voice application. • If the Cisco IOS IP SLAs VoIP Responder application is configured on the currently loaded Cisco IOS software image, the ipsla-responder name is displayed.
Step 3	<p>configure terminal</p> <p>Example: Router# configure terminal</p>	<p>Enters global configuration mode.</p>
Step 4	<p>dial-peer voice <i>tag</i> voip</p> <p>Example: Router(config)# dial-peer voice 6789 voip</p>	<p>Defines a particular dial peer, specifies the method of voice encapsulation, and enters dial-peer configuration mode.</p> <ul style="list-style-type: none"> • The <i>tag</i> argument consists of one or more digits identifying the dial peer. Range is from 1 to 2147483647. • The voip keyword indicates a VoIP dial peer using voice encapsulation on an IP network.

	Command or Action	Purpose
Step 5	<code>incoming called-number tag</code> Example: Router(config-dial-peer)# incoming called-number 6789	Specifies a digit string that can be matched by an incoming call to associate the call with a dial peer.
Step 6	<code>application application-name</code> Example: Router(config-dial-peer)# application ipsla-responder	Enables a specific application on a dial peer. <ul style="list-style-type: none"> To enable the Cisco IOS IP SLAs VoIP Responder application, enter <code>ipsla-responder</code> as the <i>application-name</i> argument.
Step 7	<code>session protocol sipv2</code> Example: Router(config-dial-peer)# session protocol sipv2	(Optional) Specifies SIP as the session protocol for the VoIP dial peer. Note Perform this step only if configuring a SIP call.
Step 8	<code>exit</code> Example: Router(config-dial-peer)# exit	Exits dial-peer configuration mode and returns to global configuration mode.

Configuration Examples for the IP SLAs VoIP Call Setup Monitoring Operation

This section contains the following configuration examples:

- [Configuring the Originating Gateway: Example, page 8](#)
- [Configuring the Terminating Gateway: Example, page 9](#)

Configuring the Originating Gateway: Example

The following example shows how to configure an originating gateway to start the IP SLAs VoIP test-call application, set up the dial peer to route the test call, define the VoIP call setup operation, and schedule the VoIP call setup operation. In this example, test-call messages are generated using the Session Initiation Protocol (SIP).

```
call application session start ipsla-testcall ipsla-testcall
configure terminal
dial-peer voice 6789 voip
 destination-pattern 6789
 session target ipv4:172.29.129.123
 session protocol sipv2
 exit
ip sla monitor 1
 type voip delay post-dial detect-point alert-ringing destination 6789
 exit
ip sla schedule 1 start-time now life forever
```

Configuring the Terminating Gateway: Example

The following example shows how to configure a terminating gateway to set up the dial peer and enable the IP SLAs VoIP Responder application to respond to the IP SLAs VoIP call setup test call. In this example, test-call messages are generated using the Session Initiation Protocol (SIP).

```
configure terminal
dial-peer voice 6789 voip
incoming called-number 6789
application ipsla-responder
session protocol sipv2
exit
```

Additional References

The following sections provide references related to the IP SLAs VoIP Call Setup Monitoring feature.

Related Documents

Related Topic	Document Title
Cisco IOS IP SLAs configuration tasks	<i>Cisco IOS IP SLAs Configuration Guide</i> , Release 12.4
Cisco IOS IP SLAs commands	<i>Cisco IOS IP SLAs Command Reference</i> , Release 12.4

Standards

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

MIBs

MIB	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

RFC	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 Technical Support website contains thousands of 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/techsupport

Command Reference

This section documents the following new command:

- [type voip delay post-dial](#)

type voip delay post-dial

To configure an Cisco IOS IP Service Level Agreements (SLAs) VoIP call setup (post-dial delay) operation, use the **type voip delay post-dial** command in IP SLA monitor configuration mode. To remove or replace a previously configured IP SLAs operation, use the **no ip sla monitor operation-number** command in global configuration mode.

type voip delay post-dial [**detect-point** {**alert-ringing** | **connect-ok**}] **destination tag**

Syntax Description		
detect-point alert-ringing	Sets the Voice over IP (VoIP) call setup operation to measure the response time for the called number to ring. If the detect-point keyword is not specified, the response time for the called number to ring is measured by default.	
detect-point connect-ok	Sets the VoIP call setup operation to measure the response time for the called party to answer the call.	
destination tag	Specifies the E.164 number or URL of the destination dial-peer.	

Command Default No IP SLAs operation type is configured for the operation being configured.

Command Modes IP SLA monitor configuration

Command History	Release	Modification
	12.3(14)T	This command was introduced.

Usage Guidelines In order to use the IP SLAs VoIP call setup functionality, your Cisco IOS software image must support the IP SLAs VoIP test-call application and IP SLAs VoIP Responder application. To determine if your Cisco IOS software image is configured with these applications, use the **show call application voice** command in EXEC mode.



Note The IP SLAs VoIP Responder application is different from the IP SLAs Responder (which is configured using the **ip sla monitor responder** command in global configuration mode).

If the **detect-point** keyword is not specified, the response time for the called number to ring is measured by default.

You must configure the type of operation before you can configure any of the other characteristics of the operation.

Examples The following example shows how to configure an originating gateway to start the IP SLAs VoIP test-call application, set up the dial peer to route the test call, define the VoIP call setup operation, and schedule the VoIP call setup operation. In this example, test-call messages are generated using the Session Initiation Protocol (SIP).

■ type voip delay post-dial

```

call application session start ipsla-testcall ipsla-testcall
configure terminal
dial-peer voice 6789 voip
 destination-pattern 6789
 session target ipv4:172.29.129.123
 session protocol sipv2
 exit
ip sla monitor 1
 type voip delay post-dial detect-point alert-ringing destination 6789
 exit
ip sla schedule 1 start-time now life forever
 exit

```

The following example shows how to configure a terminating gateway to set up the dial peer and enable the IP SLAs VoIP Responder application to respond to the IP SLAs VoIP call setup test call. In this example, test-call messages are generated using the Session Initiation Protocol (SIP).

```

configure terminal
dial-peer voice 6789 voip
 incoming called-number 6789
 application ipsla-responder
 session protocol sipv2
 exit

```

Related Commands

Command	Description
ip sla monitor	Specifies an IP SLAs operation and enters IP SLA monitor configuration mode.
show call application voice	Displays information about configured voice applications.

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