



Analyze Call Signaling

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Analyze Call Signaling

The SIP Call Flow Analyzer enables you to determine the reason of call failure. SIP Call Flow Analyzer analyzes calls at a high level and then drills down to a lower level within the components themselves using the same tool.

The SIP Call Flow Analyzer helps you to:

- View the high-level view of the signaling path that includes originator, intermediate destination and final destination of calls to know the complete path of the call.
- View the signaling call ladder diagram to isolate any issues in the call.
- Drill down to individual components in that call to fix errors.
- View error messages, and possible root causes and recommendations.
- Automatically identify and highlight signaling errors and capability mismatches.
- Add any additional logs of Unified CCE to generate the Call Ladder Diagrams for Unified CCE deployments.

It analyzes call logs received from the following Unified Communications components:

Device Type	Supported Release in Advanced Mode	Components or Type Of Log
Cisco Unified Contact Center Enterprise (Unified CCE)	9.x and later	Router
Cisco Voice Portal (CVP)	9.x and later	All
Cisco Unified Communications Manager (Unified CM)	9.x and later	Call logs, and SDL logs

Device Type	Supported Release in Advanced Mode	Components or Type Of Log
IOS Gateways (TDM, CUBE (Enterprise Edition), VXML GWs)	15.1(4)M and later	Output of show logging command

Prerequisites

- You must add the Contact Center Assurance license to analyze call logs of Unified CCE and CVP devices. However, you can continue to use this feature for Unified CM.
- For more information on setting up devices and configure devices for Cisco Prime Collaboration Assurance, see the list at the following locations:
 - [Setting Up Devices for Cisco Prime Collaboration Assurance](#)
 - [Configure Devices for Cisco Prime Collaboration Assurance](#)
- Ensure that you complete the configuration mentioned in following sections:
 - Configure Debug Level 3 for Unified CCE - Section "Configure Debug Level 3 for UCCE Using System CLI"
 - Configure Debug Level 3 for CVP - Section "Configure Debug Level 3 for CVP Using System CLI"
 - Configure IOS Gateway - Section "Configure IOS Gateway"



Note

- The Advanced mode allows log analysis from any of supported devices (Unified CM, CVP, IOS Gateway, Unified CCE)
- Only SIP over TCP messages are parsed.
- For Unified CM - If both SDL/SDI and Call Logs are available then calls are parsed from SDL/SDI logs. If data is not available from the SDL/SDI logs, then call logs are used.
- Only logs collected from System CLI tool or another Cisco Prime Collaboration Assurance server 11.0 are supported.
- Time zone of the device is not collected from the System CLI tool.
- When Contact Center Assurance license expires, the SIP Call Flow Analyzer fails to analyze the logs received from Contact Center devices (UCCE and CVP). For more information on licensing, see the *Manage Licenses* chapter of [Cisco Prime Collaboration Assurance Guide-Advanced](#).
- The Operator and Helpdesk users cannot collect call logs from devices and do not have access to signaling call ladder diagram and **SIP Call Flow Analyzer** menu pages.

The following is required/supported by this feature:

Maximum disk size required for this feature.	18 GB for small, 35 GB for medium, and large profiles
Maximum file size that can be imported.	0.5 GB for small, and 1 GB for other profiles.
Maximum number of calls that can be selected for ladder generation at a time.	25

Maximum number of devices from which log collection to be done at a time.	100
Maximum size of a zipped log file that can be parsed at one instance.	0.5 GB for small, and 1 GB for other profiles. Note This size is inclusive of all devices and calls. If the zipped file size exceeds the size mentioned above, the log is divided into multiple zipped files of sizes 0.5 GB for small profiles, and 1GB for other profiles.
Maximum number of call records displayed on the user interface.	10,000
Maximum number of jobs supported concurrently.	Only one analysis job should be performed at a time.
Time to perform analysis of one log file.	It depends on the size of the file; however for a 1 GB file, the estimated time is 2 hours.

Supported Call Flows

The Call Trace feature enables you to analyze SIP-based calls.



Note The correlation of analysis of all the call legs of the same call (end-to-end call analysis) is only supported for Call Flow 1 and 2. To support end-to-end call analysis for these calls (Call Flow 1 and 2), the CISCO-GUID (SIP Message property) should be same across different products. End-to-end call analysis is not supported for the other call flows except Call Flow 1 and 2.

It supports the following call flows:

Figure 1: Call Flow 1

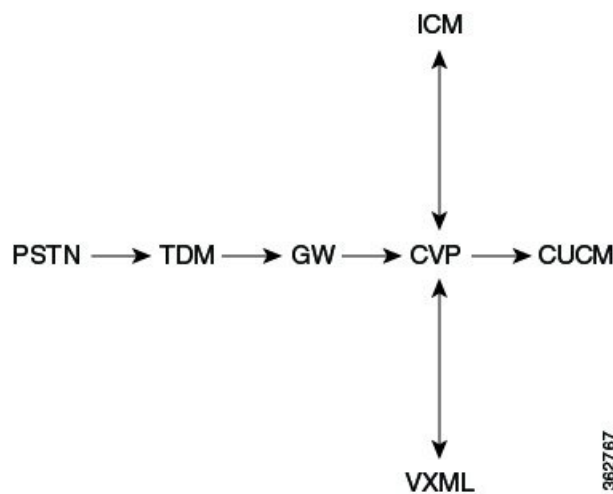


Figure 2: Call Flow 2

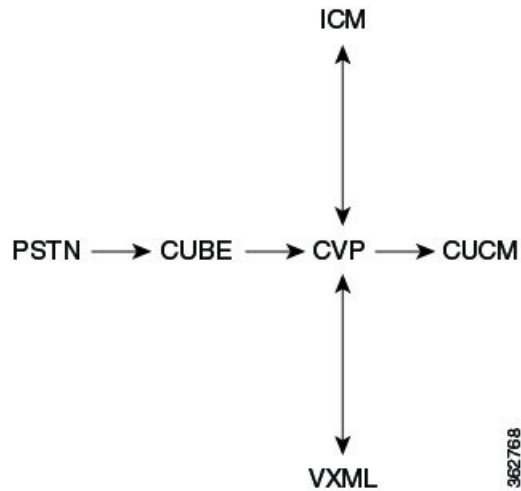


Figure 3: Call Flow 3

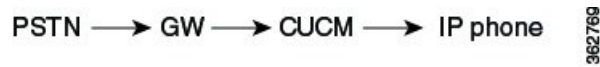


Figure 4: Call Flow 3 A

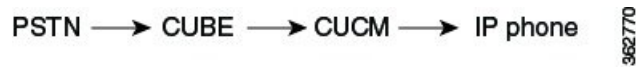


Figure 5: Call Flow 4



Figure 6: Call Flow 5

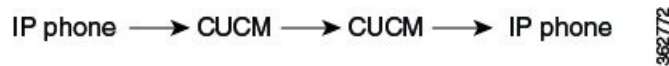


Figure 7: Call Flow 5 A



Figure 8: Call Flow 6



Create a Call Ladder Diagram

Step 1 Select a data source. Choose from the following options:

- Live Log Collection - The Group Type field is displayed. Click on the drop-down arrow, and select a device group from the Device Group dialog box. The devices available for the selected device group appear. Select a device from the options that are listed.

Note You can select a single or multiple devices.

- Local File System - You can select a log file from the options that appear. It includes log files collected from Device Log Collector and also from Live Log Collection. You can also click Import, to import the file(s) from your local file. Browse to the zipped log file through the Import dialog box. Based on the mode of deployment, you can associate a customer or a domain to the imported logs using domain/customer drop-down list in the Import dialog box. The imported file is updated in the options available under Log File System. For more information on Device Log Collector, see [Log Collection Center/Device Log Collector](#). You can also export the log files using the Export button.

The .gz, .gzo and .zip file formats are supported for import. The files are exported in .gz, .gzo and .zip file formats too. You can attach a single log file only. If the zipped log file size is more than 0.5 GB (for small profile) or 1 GB (for medium or large profiles), it is divided into multiple files of sizes 0.5 GB (for small profile) or 1 GB (for medium or large profiles) for import tasks.

You can delete a log file also if you have selected the log file system. It takes time to cleanup folders and processed records and thus there may be delay in completion of this task.

Step 2

(Optional) Filter Calls - You can search for a call from the files selected from the preceding data sources, using the following parameters:

For Cisco Prime Collaboration Release 12.1 SP3 and later

Note During live log collection, you can now filter the results by the Calling Number/URI field. This is applicable for the following fields - Calling Number/URI, Called Number/URI, Call ID, and GUID. Ensure the following guidelines are met before performing a search.

- Give one or more digits of the calling number.
- Special characters like '*' search is not allowed.

For Cisco Prime Collaboration Release 12.1 SP3 and earlier

Field	Description
Calling Number/URI	A SIP-URI is the SIP addressing schema to call another person through SIP. By default ALL listed.
Called Number/URI	By default ALL listed.
Disconnect Code	The error code for that call, for example - 200 OK.
Call ID	An ID that uniquely identifies calls in a Cisco UC product. Each Call Leg of a call has a different Call ID.
GUI ID	An ID that uniquely identifies calls across product.
Time Zone	By default it displays the Cisco Prime Collaboration Assurance server time zone.
Heartbeat Messages	This includes the heartbeat messages - OPTIONS, and NOTIFY. If you select this field, performance of this feature may be adversely affected.
Time Range	You can specify the time range. if you have selected the Local File System, the option of past time details will not be available to you. Ensure that you select a time range within which the calls had happened.

Device Type to Parse	The device types that are part of the selected logs are listed here. You can select a particular device type to filter the calls that involve that device type.
Maximum Number of Calls	By default this value is set to 500. If you set a higher value, it may take longer time to display the records. Thus we recommend that you set appropriate filters.
Initial Message	Initial Message is selected as INVITE (first message of a call for a particular call ID) by default. You can select a different Initial Message.
Comment	You can add your comments to show when, where, and why the logs are collected.

Step 3 Click the **Retrieve Calls** button. If you have selected the Live Log Collection option, Log Parsing In Progress status bar is displayed. After the log parsing process is completed, the Log Download In Progress status bar is displayed, indicating the process completeness. If you have selected the Local File System option, the Log Download In Progress status bar is displayed directly. If you try to parse an uploaded or existing log file, the Log Analysis In progress status bar does not appear as that file is already parsed.

The IOS Gateways and Unified CM call logs can have older data. You need to apply appropriate filters to get the specific time range call list.

In case of Local File System option, the file is first unzipped, parsed and then analyzed.

In case of Live Log Collection option, the file is first downloaded, unzipped, parsed, and then analyzed.

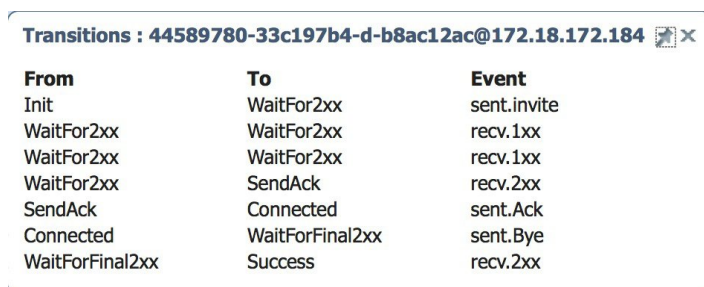
Step 4 The Call List is displayed. Select the calls from this list, and click on **Show Ladder Diagram** for those calls. The Call Ladder diagram page is displayed.

Call Ladder diagram opens in a new tab.

Note If you are using the call processor - Unified CM in your deployment, each call Leg of a call has a different Call ID. Thus to view the Call Ladder diagram of the complete call, select all the call legs from the Call List and then click the **Show Ladder Diagram** button.

You can also click on the **Show Transition Diagram** button when the call list is displayed to view the message transitions of the call. The Unknown errors are the same as Unexpected errors.

Figure 9: Transition Diagram



Transitions : 44589780-33c197b4-d-b8ac12ac@172.18.172.184

From	To	Event
Init	WaitFor2xx	sent.invite
WaitFor2xx	WaitFor2xx	recv.1xx
WaitFor2xx	WaitFor2xx	recv.1xx
WaitFor2xx	SendAck	recv.2xx
SendAck	Connected	sent.Ack
Connected	WaitForFinal2xx	sent.Bye
WaitForFinal2xx	Success	recv.2xx

If calls do not appear, check for the following:

- Filter is applied correctly.
- The selected time zone range matches the actual device time zone.
- Appropriate debug levels are set on the device before using the feature. See the list on setting up devices and configure devices for Cisco Prime Collaboration Assurance at the following locations:
 - [Setting Up Devices for Cisco Prime Collaboration Assurance](#)

- [Configure Devices for Cisco Prime Collaboration Assurance](#)

Filter a Message in the Call Ladder Diagram

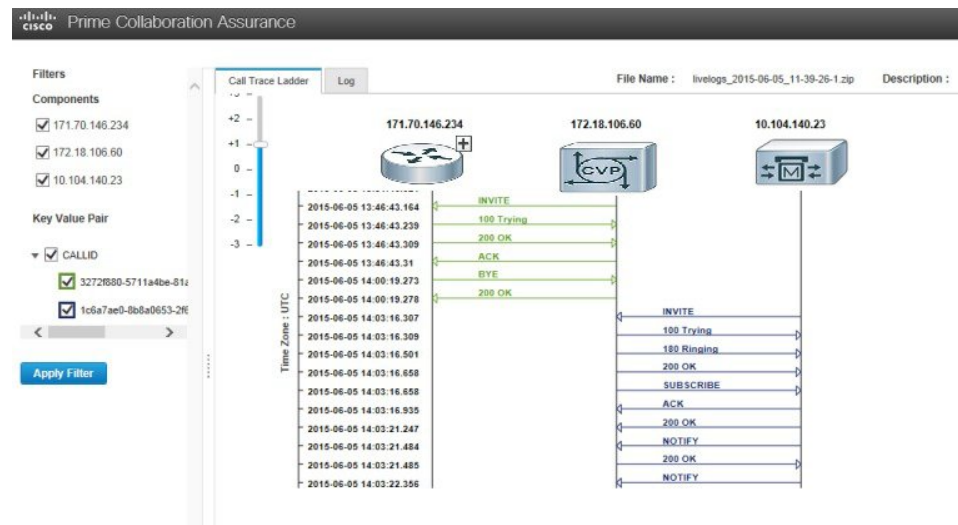
You can further create a call ladder diagram for a specific message.

- Step 1** You can also filter a message in the call ladder diagram on the following parameters:
- Components - The IP addresses of the devices (senders and receivers) in the call.
 - Key Value Pair - Attributes of the Call. This includes Call ID and GUID
- Step 2** Select the parameters and click **Apply**. The diagram is generated according to the filters you have applied.

Understand a Call Ladder Diagram

The Call Ladder diagram helps to visualize the SIP signaling for selected calls (both line and trunk side).

Figure 10: Call Ladder Diagram



You can see the following:

- Direction of the messages
- Sender and Receiver
- Time Stamp of the individual messages. The Call Ladder diagram shows UTC time zone only.
- Message and the Message Label. You can click on the message arrow to launch the Call Details popup window that displays the details of the call. You can do the following:
 - View details of the call.

- You can filter the on the Call ID through this window.
- You can view the device time stamp and time zone. This time stamp is converted into UTC and displayed too.
- You can click on **Click here for log** to see the log snippet of the message (highlighted in yellow) you had clicked on.

You can click on the **Logs** tab to view the log snippets of selected messages. When you click for the first time no logs are displayed.



Note By default, the log snippets of the last message selected by clicking on the **Click here for log** button on the Call Details popup window appear. To see the logs for a particular message, click on the message arrow on the Call Ladder diagram to launch the Call Details popup window. Now, click the **Click here for log** button.



Note If there are no details of the device type in the log, you see a plain grey device icon without any markings in the Call Ladder diagram. This shows that the device is unknown.

If you filter calls by selecting only certain devices in the Device Types to Parse field for creating a diagram, there may be components of the call (devices which have not been selected in the Device Types to Parse field) which can help in troubleshooting the call. Logs related to that device are also parsed and displayed to help you debug. These devices appear with a plus sign icon. Click the plus sign to expand the Call Ladder Diagram. The dotted line represents that a new component is added as part of the expansion. Based on time stamp order of the messages, rearrangement of the devices may happen.

Figure 11: Call Details Popup Window

The screenshot shows the Cisco Prime Collaboration Assurance interface. On the left, there's a 'Filters' panel with 'Components' and 'Key Value Pair' sections. The 'Call Trace Ladder' shows a vertical timeline of messages. The central 'Call Details' window is open, displaying the following information:

- Called Number:** 1919704080
- Calling Number:** 154033805711M2:0015804-67245443@64.100.36.183 filter
- Receiver:** 64.100.36.183
- Sender:** 172.18.106.00
- Time Stamp(UTC):** 2019-03-02 10:29:34.558
- Content Length:** 0
- C SEQ:** 104 SUBSCRIBE
- Call Type:** 70181
- Device IP Address:** 172.18.106.00
- Device Timezone:** US/Eastern
- From:** cisco.com
- Msg. ID:** 001 Subscrip[er]s[er]v[er] not word
- Msg. Type:** CUCM:SP:10
- Port:** 50177
- Received:** f50c
- Response Code:** 401
- Time Stamp(Message local time):** 11:59:39.558

Below the metadata, there's a 'Root Cause' and 'Recommendation' section:

- Root Cause:** 401 error code relates to a Server rejecting a request such as INVITE or CANCEL, but it cannot match the request to an existing transaction specified by the Call-ID field.
- Recommendation:** Correct match the request to an existing transaction specified by the Call-ID field.

At the bottom of the Call Details window, there's an 'Actions' section with a 'Click here for log' button. On the right, the 'Call Ladder' diagram shows a sequence of messages between devices, with a red arrow indicating an error in the call.

If there is any error in the call, that message arrow is shown in red color. You can click on the arrow to open the Call Details popup window to view the Root Cause of the error and also the Recommendation to help you troubleshoot the cause of the call failure.

Each Call Id is differently color coded and the schema is represented below the diagram.

You can zoom in and zoom out the diagram.