

Oracle® Enterprise Session Border Controller

Web GUI User Guide
Release E-CZ7.1.0

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Notices

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Contents

1 Overview.....	7
Getting Started.....	7
Browser Support.....	7
Internet Protocol Version Support.....	7
Log On and Log Off.....	7
User and Administrator Access.....	7
Simultaneous Logons.....	8
Radius Server in the Network.....	8
Log On to the Web GUI.....	9
Log Off the Web GUI.....	9
Web GUI Tools.....	9
Global Tools.....	9
2 Configuration.....	23
Introduction.....	23
Wizards Button.....	23
User and Administrator Access Rules.....	25
Workspace Tools.....	26
Basic Mode Configuration Tools.....	26
Expert Mode Configuration tools.....	28
Basic Mode.....	28
Accessing Basic Mode.....	29
Device Icon Connection Matrix.....	32
Typical Network Configuration.....	35
Basic Mode Configuration Functions.....	44
Settings Button.....	45
Additional Global Settings.....	45
Host Routes.....	53
Security Configuration.....	53
Management Settings.....	59
Configure Advanced Routing.....	63
Additional Features.....	66
Configuration Editing Methods.....	97
Copying a Configuration.....	99
Deleting a Configuration.....	100
Expert Mode.....	103
Accessing Expert Mode.....	103
Expert Mode Configuration Objects.....	105
Dynamic ACL for the HTTP-ALG.....	111
Enable Dynamic Access Control List (ACL) for the HTTP Application Layer Gateway (ALG).....	112
Dynamic Access Control List (ACL) Settings for the HTTP Application Layer Gateway (ALG).....	112
Session Manager Mapping.....	112
Map a Session Manager to a Session Border Controller.....	113
Upgrade Software - Web GUI System Tab.....	113
Upgrade Software - Wizard.....	114
Update the Configuration Schema.....	114
Configuring Remote Site Survivability using the Web GUI.....	115
Configure a Service Tag for an IP Interface.....	115
Configure Remote Site Survivability.....	115

Configure Service Health.....	116
Configure the Ping Method for a Session Agent.....	116

3 Monitor and Trace Tab..... 117

Monitor and Trace SIP Messages.....	117
Sessions Report.....	118
Display a Sessions Report.....	119
Registrations Report.....	127
Subscriptions Report.....	129
Notable Events Report.....	131
Search for a Record.....	133
Perform a Search.....	134
Specify Additional Identifiers.....	135
Specify Additional Search Options.....	135
Traceroute Command.....	136
Export Information to a Text File.....	137
Export Report Information to a Text File.....	138

4 System Tab..... 141

Upload a File.....	141
Download a File.....	143
Delete a File.....	144
Back up a File.....	145
Restore a File.....	145
System Reboot.....	145

5 Format of Exported Text Files..... 147

Introduction.....	147
Exporting Files.....	147
Session Summary Exported Text File.....	148
Example.....	148
Session Details Exported Text File.....	149
Example.....	149
Ladder Diagram Exported HTML File.....	154
Example.....	154

About This Guide

This guide provides information about configuring and administering the Enterprise Session Director from the Web GUI. The topics in this guide contain conceptual, procedural, and reference information.

Documentation Set

The following table describes the documents included in the Enterprise Session Director ECZ710 documentation set.

Document Name	Document Description
ACLI Configuration Guide	Contains information about the installation, configuration, and administration of the Enterprise Session Director.
Web GUI Users Guide	Contains information about using the tools and features of the Enterprise Session Director Web GUI.
Release Notes	Contains information about this release, including platform support, new features, caveats, known issues, and limitations.

Related Documentation

The following table describes related documentation for the Enterprise Session Director.

Document Name	Document Description
Acme Packet 3820 Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 3820 system.
Acme Packet 4500 Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 4500 system.
Release Notes	Contains information about the current documentation set release, including new features and management changes.
ACLI Configuration Guide	Contains information about the administration and software configuration of the Enterprise Session Director.
ACLI Reference Guide	Contains explanations of how to use the ACLI, with alphabetical listings and descriptions of all ACLI commands and configuration parameters.
Maintenance and Troubleshooting Guide	Contains information about logs, performance announcements, system management, inventory management, upgrades, working with configurations, and managing backups and archives.
MIB Reference Guide	Contains information about Management Information Base (MIBs), Acme Packet's enterprise MIBs, general trap information, including specific details about standard traps and enterprise traps, Simple Network Management Protocol (SNMP) GET query information (including standard and enterprise SNMP GET query names, object identifier names and numbers, and descriptions), examples of scalar and table objects.
Accounting Guide	Contains information about accounting support, including details about RADIUS accounting.
HDR Resource Guide	Contains information about the Historical Data Recording (HDR) feature. This guide includes HDR configuration and system-wide statistical information.

About This Guide

Document Name	Document Description
Administrative Security Essentials	Contains information about support for the Administrative Security license.
Security Guide	Contains information about security considerations and best practices from a network and application security perspective for the Enterprise Session Director family of products.

Revision History

Date	Revision	Description
April 2013	1.00	New document that represents the Net-Net Session Director Web GUI (Configuration, SIP Monitor and Trace, System File Management, and Configuration).
May 2013	1.01	Added the following Note: After upgrading your Net-Net ESD software, you should clear your browser cache before using the Net-Net ESD Web GUI.
June 2013	1.02	Incorporated EX[xz]6.4.0M1 information.
February 2014	1.03	Clarifies that the Monitor and Trace maximum message storage capacity is cumulative for all report types.
June 2014	1.04	Adds the ECZ710 features.
September 2015	1.05	Updates the note in "New Home Page in Web GUI" to clarify that the default widgets are also subject to the SIP configuration requirement for dashboard widget displays.

Overview


Getting Started

Oracle® recommends that you review the topics in this section before working with the system to ensure successful use of the tools and functions provided.

Browser Support

You can use the following Web browsers to access the Enterprise Session Director (E-SBC) Web GUI:

- Internet Explorer versions 9.0 and higher
- Mozilla Firefox versions 12.0 and higher
- Google Chrome versions 19.0.1084.46m and higher

 **Note:** After upgrading the software, clear the browser cache before using the E-SBC Web GUI.

Internet Protocol Version Support

The Web GUI supports only IPv4.

Log On and Log Off

This section provides the concepts and procedures for logging on to and logging off from the Web GUI.

User and Administrator Access

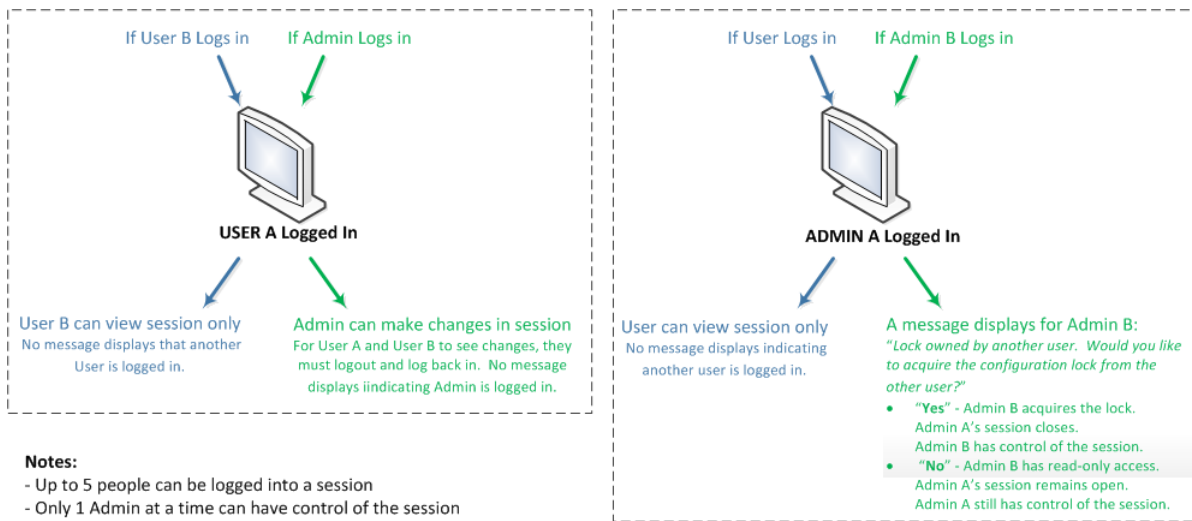
You can logon to the Web GUI using your Web browser. There are two types of user logons:

- User - Allows viewing (read-only) access to the Web GUI.
- Administrator - Allows Superuser access to the Web GUI.

For specific rules that apply to the User and Administrator when using the Web GUI tabs, see the respective topics.

Simultaneous Logons

The Web GUI allows simultaneous logons for both the User and Administrator. Session availability to the User and Admin depends on which type of user is logged onto the session. The following illustration shows a scenario of a User and an Administrator logged onto a Web GUI session.




Up to five users can log onto the same session at the same IP address at the same time. Only one Administrator at a time can have full control of a simultaneous session. If more than five users attempt to log on, the system displays the following error message:

User limit reached. Please try again later.

Radius Server in the Network

The Web GUI supports authentication functionality similar to a user logging on by way of TELNET, Secure Shell (SSH), and SSH File Transfer Protocol (SFTP).

The Web GUI supports RADIUS authentication. The following table describes the functions available to the Administrator and User levels.

If	Then
RADIUS server is configured as userclass=admin	Administrator has full access to all features and functions after logging onto the GUI.
RADIUS server is configured as userclass=user	<p>User has the following limited access to the features and functions after logging onto the GUI:</p> <p>Full access to all SIP Monitor and Trace features and functions</p> <p>Can download the following files in System File Management:</p> <ul style="list-style-type: none"> • Backup configuration • Configuration CSV • Local subscriber table (LST) • Log • Software image • SPL Plug-in (SPL) <p> Note: A user with User privilege cannot upload files in System File Management.</p>

Log On to the Web GUI

The default username for the User level is “user” and the default password is acme. The default username for an Administrator level is admin, and the default password is packet. If you changed a default password, use that one to log on. For more information about setting passwords, see the *Oracle Enterprise Session Border Controller ACLI Configuration Guide*. To change passwords, use the secret command from the ACLI to change the login password for user and the config password for admin.

To log on to the Web GUI:

1. On a PC, open an Internet Browser.
2. Start the GUI with either the HTTP or HTTPS logon.

```
http://<Server IP address>
https://<Server IP address>
```

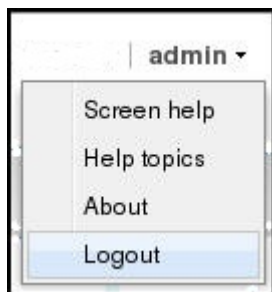


Note: Whether you log on using HTTP or HTTPS depends on the settings for your deployment. Contact your system Administrator for more information.

3. Enter your Web GUI username and password.
4. Click **Login**.

Log Off the Web GUI

To log off from the Web GUI, click **Logout** from the <logged-on-username> menu in the upper right corner of the Web GUI. In the following illustration, Admin is the name of the user who is logged on.



The system logs you off and displays the log on page.

Web GUI Tools

The Web GUI provides tools that apply to the entire GUI and to specific functions within each tab. For example, "Customizing the Page Display" applies to all pages and "Add widget" applies only to the Home page. Some tools are activated by icons and some are activated by links. The display of icons and links can depend on whether the system displays Expert mode or Basic mode.

Global Tools

The following paragraphs describe the tools you can use to enhance your Web GUI experience. These tools apply to the Configuration, Monitor and Trace, and System tabs.

About this Product

To view information about this product, select **About** from the Help menu.

Procedure

1. From the Web GUI, click **Help > About**.
2. Scroll to view the following information:
 - Platform type

Overview

- Software version number
- Legal notices
- Copyright information
- Open Source Mailing Address
- Trademark recognition
- Licensing information

Configuration Tab Tool Tips

A tool tip is a brief description of a specific field that the system displays when you roll the mouse over the field label on a dialog on the Configuration page. The system displays tool tips in both Expert and Basic modes.

To view a tool-tip:

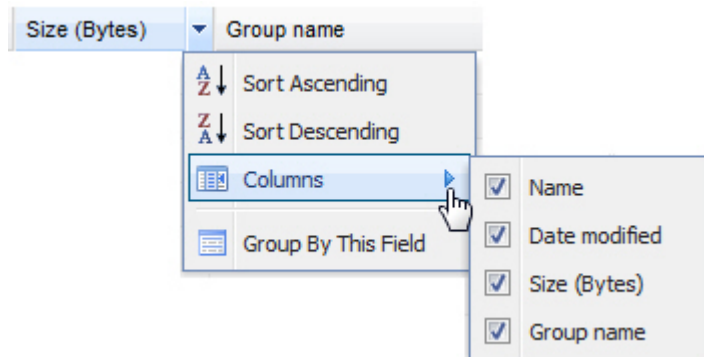
1. From the Web GUI, click the Configuration tab.
2. On any configuration dialog, roll the mouse over the label of a field that you want information about.

Customize the Page Display

You can customize the display of the data on the Web GUI pages by selecting which columns display and the sort order of the data in the columns.

To customize the page display:

1. Position the cursor over a column heading.
The system displays a down arrow in column the heading.
2. Click the down arrow to display the menu. For example:



3. Use the following options to customize the display.
 - Sort Ascending. Display the data in the table in ascending order.
 - Sort Descending. Display the data in the table in descending order.
 - Columns. Display a list of column names, where you can select items to display.
 - Group by This Field. Applies only to the System tab. See *Group by Field* for more information.

Group By Field

To customize the display of the File Management page on the System tab, you can group the elements by column head.

Procedure

1. From the Web GUI, click **System**.
2. On the System page, under File management, select a file type from the drop-down list to group by field.
3. On the File Management page, click the column title by which you want to group the items.
The system displays an arrow control to the right of the column title.
4. Click the arrow control, and click **Group By This Field** on the menu.
The system displays the data by the selected group.

Dashboard Operations

The Enterprise Session Director (E-SBC) provides a web-based dashboard that can display SIP data statistics to help you monitor and manage the system, for example, SIP Media Flows and Current Memory Usage. The system collects SIP statistics and stores the data in tables. Widgets are used to display the data on the dashboard and each widget represents one table. The E-SBC collects only SIP data for the dashboard widgets, including the default CPU and Memory widgets. For this reason, you must set up a valid SIP configuration before the E-SBC can display any data on a dashboard widget.

The Dashboard supports up to 18 widgets. Each widget can display up to 100 data samples in intervals of 1 hour, 1 minute, or 1 second. You can select a chart, a graph, a table, a web form, or text for the display. Customize the dashboard by adding, deleting, and moving the widgets. You can refresh the statistics displayed on the dashboard and you can reset the dashboard to its default display. The default display includes:

- Highest CPU Usage
- Current Memory Usage
- Historical Memory Usage

The following table describes the dashboard buttons that you can use to customize the display.

Button	Description
Refresh	Updates all of the widgets on the Dashboard.
Add Widget	Displays a list of widgets that you can add to the Dashboard.
Reset	Resets the Dashboard to display the default widgets. All other widgets are removed from the Dashboard.
Stats Portal	Displays the widget groups and subgroups. This portal allows you to display the statistics for a widget in either table or graph presentation.

Use the icons in the upper right corner of the widget to perform specific tasks.



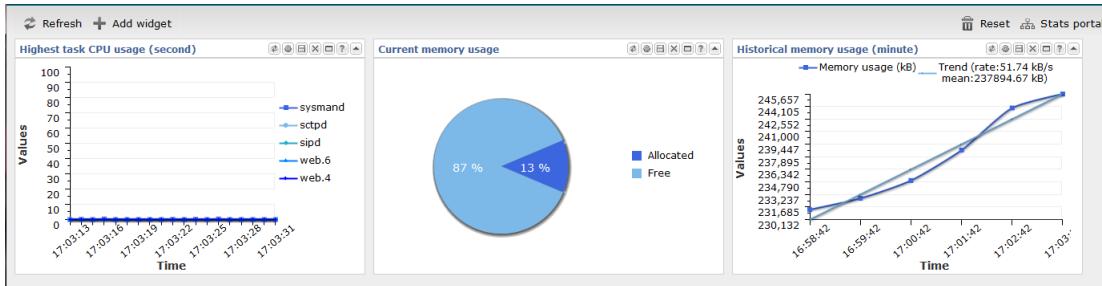
Note that the operation of widgets such as those that require the SIP.Session module may affect system performance. The system displays a warning when you add a widget that may affect performance. Oracle recommends adding such widgets at a time when the performance impact will not degrade service.

New Home Page in Web GUI

Release E-C[xz]6.4.0 M2 offers the ability to display Session Initiation Protocol (SIP) statistics on a new Home tab in the Enterprise Session Border Controller (E-SBC) Web GUI.

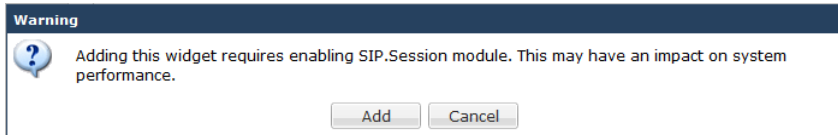
After logging into the E-SBC Web GUI, the Home page displays showing the following tables by default:

- Line graph of Highest CPU Usage
- Pie graph of Current Memory Usage
- Line graph of Historical Memory Usage



This page is called the “Dashboard” on the Web GUI. Each of the tables is called a widget, which contains specific statistics about the E-SBC. You can customize the Dashboard by adding, deleting, and moving the widgets. You can also refresh the statistics on the Dashboard, or return (reset) the Dashboard back to its default table display as shown above.

The operation of some widgets can degrade system performance. Examples of these widgets include those that require the SIP.Session module enabled. These widgets are not included on the default Dashboard. When you add one of these widgets to your home page, the system displays the following Warning dialog allowing you to add the widget or cancel the operation. Add these widgets only within a window in which the performance impact does not degrade service.




The system displays this dialog once per module that you enable. The performance impact of multiple widgets using that module is not additive. Be sure to monitor CPU usage when you enable modules that degrade system performance.

Note: The E-SBC collects only SIP data for the dashboard widgets, including the default CPU and Memory widgets. For this reason, you must set up a valid SIP configuration before the E-SBC can display any data on a dashboard widget.

The following table describes the buttons you can use on the Dashboard page to customize your display.

Buttons	Description
Refresh	Updates all of the statistics in the widgets that currently display on the Dashboard.
Add widget	Displays a list of all widgets from which you can select to add to the Dashboard.
Reset	Resets the Dashboard to display the default widgets of: SIP Media Flow line graph Current Memory Usage table list Current Memory Usage pie graph

Buttons	Description
	All other previous widgets are removed from the Dashboard.
 Stats portal	<p>Displays the widget groups and subgroups. This portal allows you to display the statistics for a widget in either table or graph presentation. After selecting a widget for display, you can also perform the following for that widget:</p> <ul style="list-style-type: none"> Refresh widget statistics Change widget settings Export widget statistics to a .csv file Add a widget to the Dashboard Display help for that widget <p>For more information about the functions you can perform when a widget is displayed in the Stats Portal, see Stats Portal Widget Tools .</p>

Types of Widgets

The following tables describe the types of widgets that you can add to the Dashboard to display Command, Session Initialization Protocol (SIP), and System, statistics.

Command Widget	Description
Show Configuration	Displays either the running configuration or the editing configuration for the selected configuration.

SIP Widget	Description
Message - Requests per second	Displays the number of requests per second.
Message - Response	Displays the number of responses per second.
Session - Answer Seizure Ratio (ASR)	Displays the percentage of answered calls with respect to the number of calls attempted during a period of time.
Session- Duration	Displays the total number of sessions and their durations.
Session - Established	Displays the number of sessions established during a period of time.

System Widget	Description
Alarms	Displays configured alarms and allows the user to clear the alarms.
Configuration Inventory	<p>Displays a list of changes made to configuration elements. The display shows the Running Count and counts for the following types of Changes Not Activated.</p> <ul style="list-style-type: none"> • Total • Added • Modified • Deleted <p>A selectable filter can change the display from Total count to the difference between the Running Count and the Changes Not Activated Count.</p>


Overview

System Widget	Description
Configuration Version	Displays the version number that is configured and the version number that is running.
CPU Usage	Displays 5 to 10 tasks with the highest percent of CPU usage during a period of time.
Current Disk	Displays the disk usage for the code directory on the Oracle Enterprise Session Border Controller. The system uploads data from the Web GUI to the code directory.
Current Memory	Displays the current percentage of free memory.
Historical Memory	Displays the number of kilobytes of free and allocated memory over a period of time.
System Health	Displays the synchronization health of the following components. <ul style="list-style-type: none">• Collect• Config• Media• Media Gateway Control• RADIUS Call Detail Record (CDR)• REC• Rotated Call Detail Record (CDR)• Service Health• SIP
User Management	Displays the user's remote IP address, duration, type, state, and user name.

Add a Dashboard Widget

Add a widget to the Web GUI Dashboard to display SIP and System statistics to help you monitor and manage the system.

You can add up to 18 widgets to the Dashboard with the **Add widget** control on the Web GUI Home page. The system does not require a reboot after adding a widget to the Dashboard.

 **Note:** If the system displays a warning that adding this widget requires the SIP.Message module to be enabled, the system enables the SIP.Message module when you add the widget.

Procedure

1. From the Home page, click **Add widget**.
2. From the list of **Widgets**, click the name of the widget to add.
3. Under the **Command** column header, click **Add** for the widget to add.
The system displays a success message.
4. Click **OK**.
5. Click **Close**.
The system displays the Dashboard with the newly added widget.

See "Configure Data Sampling Settings for a Dashboard Widget."

Configure Data Sampling Settings for a Dashboard Widget

To see SIP and System statistics displayed on a Dashboard widget, the system requires a setting for how often to refresh the display. You can use the default interval or select one from the Auto-refresh interval drop-down list on the widget. Some widgets also display the Table Name drop-down list, where you can set the data sampling frequency.

For example, you might configure the widget to refresh the display every 40 seconds and to display the data samples in one minute increments.






Before you begin, confirm that the widget that you want to configure is on the Dashboard. See *Add a Widget*.

1. On the Dashboard, click the **Home** tab.
2. On the widget, click the **Settings** icon.
3. Select a widget display refresh frequency from the **Auto-Refresh Interval (seconds)** drop down list.
4. If the widget displays the **Table Name** drop-down list, select a data sampling increment for the widget display.
5. Click **OK**.

Stats Portal

The Stats Portal is a link on the Web GUI that displays data about SIP traffic and System operations on the Enterprise Session Director.

The Enterprise Session Director captures data about SIP traffic and System operations. The system can display the data on the Web GUI in small Dashboard widgets and in full screen mode. Use the Stats Portal to view the data in full screen mode. From the Stats Portal page, you can use the controls to do the following.

Control	Description
 Refresh	Use to update the statistics in the widget.
 Settings	Use to configure the following display settings. <ul style="list-style-type: none"> • Table Name • Auto-Refresh Interval Note: Table Name is applicable to specific widgets only.
 Export	Use to export the data from the widget to a .csv file. The data in the .csv file displays in table format.
 Add	Use to add the widget to the Dashboard.
 Help	Use to view a short description of the widget.

From the Stats Portal page, you can return to the Dashboard and you can click another tab on the menu bar.

Web GUI Search

The Search function is added to the Web GUI for the Basic Configuration mode. You can search for a Basic Configuration object by name and attribute value. When you click Search, the system displays the Basic Configuration objects in a drop down list with a text box. You can select an object from the list or type an attribute in the text box. The system displays the search results in a list, where the object name is a link. Click the link to navigate to the object.

Shortcut Keys

The following tables list the shortcut key commands for the Home page and the Configuration page.

Home Page	Shortcut Key Command
Add a Widget	Ctrl+Shift+a
Refresh	Ctrl+Shift+r

Overview

Configuration Page	Shortcut Key Command
Discard	Ctrl+Shift+d
Save	Ctrl+Shift+s
Search	Ctrl+Shift+e

Help Tools

The Help menu on the Web GUI provides the following tools.

- **Screen Help.** Displays an overlay with pointers to tasks that you can perform on each page.
- **Help Topics.** Displays the online Help system.
- **About.** Displays platform, version, notices, disclaimers, terms, restrictions, and third-party notices about this product.

Certificate Management

You can perform the following certificate management tasks from the Web GUI in either Basic Mode or Expert Mode:

- Create a Certificate Record and add it to the system. See *Create a Certificate Record*.
- Generate a Certificate Request to send to a Certificate Authority. See *Generate a Certificate Request*.
- Import a Certificate into the system. See *Import a Certificate*.

Add a Certificate Record

Use the certificate-record element to add certificate records to the Enterprise Session Director (E-SBC).

Before You Begin

- Confirm that the system displays the Expert mode.

Procedure

A certificate record represents either the end-entity or the Certificate Authority (CA) certificate on the E-SBC. When you configure a certificate for the E-SBC, the name that you enter must be the same as the name that you use to generate a certificate request. If configuring for an end stations CA certificate for mutual authentication, the certificate name must be the same name used during the import procedure.

- If this certificate record is used to present an end-entity certificate, associate a private key with this certificate record by using a certificate request.
- If this certificate record is created to hold a CA certificate or certificate in pkcs12 format, a private key is not required.

1. From the Web GUI, click **Configuration > Security > Certificate record**.
2. On the Certificate record page, click **Add**.
3. On the Add certificate record page, click **Show advanced**, and do the following:

Attributes	Instructions
Name	Enter the name of the certificate record.
Country	Enter a two character country name abbreviation. For example, US for the United States.
State	Enter a two character state or province name abbreviation. For example, NE for Nebraska.
Locality	Enter the name of the locality in the state or province. For example, a city, a township, or a parish. Range: 1-128 characters.

Attributes	Instructions
Organization	Enter the name of the organization holding the certificate. For example, a company name. Range: 1-64 characters.
Unit	Name of the unit within the organization holding the certificate. For example, a business unit or a department. Range: 1-64 characters.
Common name	Common name for the certificate record. For example, your name. Range: 1-64 characters.
Key size	Size of the key for the certificate. Supported values: 512, 1024, 2048, and 4096.
Alternate name	Alternate name of the certificate holder.
Trusted	Select to trust this certificate record.
Key usage list	<p>Click Add and select a key that you want to use with this certificate record from the drop-down list, and do one of the following:</p> <ul style="list-style-type: none"> Click OK. Click Apply/Add Another, add another key , and click OK. Repeat as needed. <p>This parameter defaults to the combination of digitalSignature and keyEncipherment. For a list of other valid values and their descriptions, see the section “Key Usage Control” in the <i>ACLI Configuration Guide</i>.</p>
Extended key usage list	<p>Click Add, select an extended key that you want to use with this certificate record from the drop-down list, and do one of the following:</p> <ul style="list-style-type: none"> Click OK. Click Apply/Add Another, add another extended key, and click OK. Repeat as needed. <p>This parameter defaults to serverAuth. For a list of other valid values and their descriptions, see the section “Key Usage Control” in the <i>ACLI Configuration Guide</i>.</p>
Options	

- Click **OK**.
- Save and activate the configuration.

Next Steps

- Create TLS profiles, using the certificate records to further define the encryption behavior and to provide an entity that you can apply to a SIP interface.

Generate a Certificate Request from the GUI

Use the certificate-record element to select a certificate record and generate a certificate request.

Before You Begin

- Confirm that the certificate record exists.
- Confirm that the system displays the Expert mode.

Overview

To get a certificate authorized by a Certificate Authority (CA), you must generate a certificate request from the certificate record on the device and send it to the CA.

Procedure

1. From the Web GUI, click **Configuration > security > certificate-record**.
The system displays a list of certificate records.
2. Select the certificate record for the device.
3. Click **Generate**.
The system creates the request and displays it in a dialog.
4. Copy the information from the dialog and send it to your CA as a text file.

Next Steps

- When the CA replies with the certificate, import the certificate to the device with the corresponding certificate record.

Import a Certificate

Use the certificate-record element to import a certificate into the Enterprise Session Director (E-SBC).

Before You Begin

- Confirm that the system displays the Expert mode.

Use this procedure to import either a device certificate or an end-station CA certificate for a mutual authentication deployment. You must import the certificate to the corresponding certificate record for the E-SBC. End-station CA certificates may or may not need to be imported against a pre-configured certificate record.

Procedure

1. From the Web GUI, click **Configuration > security > certificate record**.
2. Select the certificate record for the device.
3. Click **Import**.
The system displays a dialog from which you can import the certificate.
4. Select one of the following format types from the **Format** drop down list:
 - pkcs7
 - x509
 - Try-all. The system tries all possible formats until it can to import the certificate.
5. Browse to the certificate file, and select the certificate to import.
6. Click **Import**.
The system imports the certificate.


Next Steps

- Apply the corresponding certificate record to the intended SIP interface.

Monitor and Trace Tools

The Web GUI provides specific tools on the Monitor and Trace tab that you can use to display data.

Refresh

Click the  at the bottom of any page to update the window with the latest data.

acme packet

Configuration Monitor and Trace System

Sessions
Registrations
Subscriptions
Notable Events

SIP Session Summary

Search Criteria: All

Search Show all Ladder Diagram Export Session Details Export Summary

Start Time	State	Call ID	Request URI
2012-06-14 15:46:34.915	TERMINATED-200	5-17902@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:46:33.914	TERMINATED-200	4-17902@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:46:32.914	TERMINATED-200	3-17902@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:46:31.914	TERMINATED-200	2-17902@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:46:30.914	TERMINATED-200	1-17902@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:45:35.557	FAILED-408	5-17609@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:45:34.557	FAILED-408	4-17609@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:45:33.558	FAILED-408	3-17609@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:45:32.559	FAILED-408	2-17609@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:45:31.559	TERMINATED-0	1-17609@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:45:14.210	TERMINATED-200	5-17548@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:45:13.211	TERMINATED-200	4-17548@192.168.200.226	sip:test@192.168.204.71:5060
2012-06-14 15:45:12.210	TERMINATED-200	3-17548@192.168.200.226	sip:test@192.168.204.71:5060

Page Size 50 Page 1 of 1 No data to display

Click here to refresh

Changing Number of Data Items on the Page

By default, 50 data items are shown per page. You can change the number of items that display on a page.

To change the number of data items displayed in Monitor and Trace:

1. At the bottom left corner of the window, click the down arrow next to Size. The drop down list of values appears.

acme packet Configuration Monitor and Trace System

Sessions
Registrations
Subscriptions
Notable Events

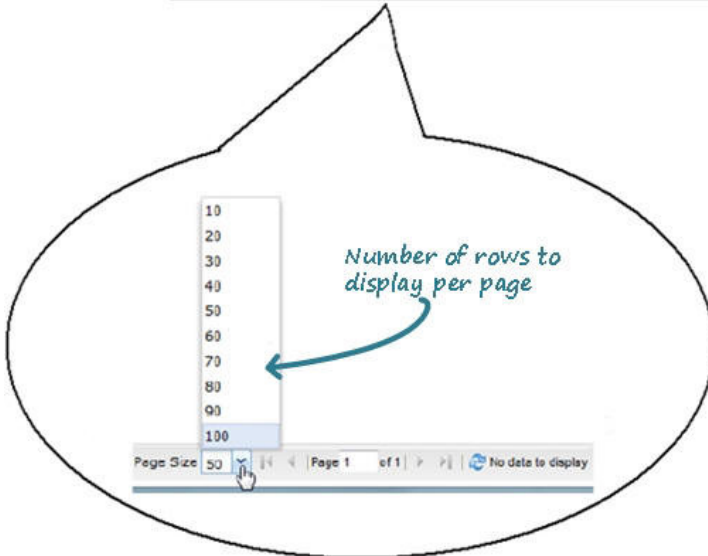
SIP Session Summary

Search Criteria: All

Search | Show all | Ladder Diagram | Export Session Details | Export Summary

Start Time	State	Call ID	Request URI	From URI	To URI
2012-06-14 15:48:34.915	TERMINATED-200	5-17902@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:33.914	TERMINATED-200	4-17902@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:32.914	TERMINATED-200	3-17902@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:30.914	TERMINATED-200	2-17902@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:28.957	FAILED-408	5-17609@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:28.957	FAILED-408	4-17609@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:28.956	FAILED-408	3-17609@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:28.958	FAILED-408	2-17609@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:31.959	TERMINATED-0	1-17609@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:14.210	TERMINATED-200	5-17548@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:13.211	TERMINATED-200	4-17548@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...
2012-06-14 15:48:12.210	TERMINATED-200	3-17548@192.168.200.228	sip:hw@192.168.204.71:5060	*2273636#*tel:781-414-23...	tel:*sip:kam@192.168.2...

Page Size: 50 | Page 1 of 1 | No data to display

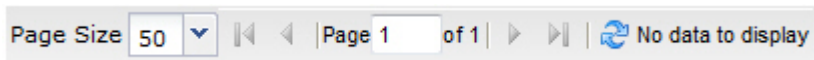


2. Click the number of data items you want to display per page. Default is 50. Valid values are 10 to 100 in increments of 10.

Navigating Pages

To navigate through multiple pages in Monitor and Trace:

1. Use the navigation arrows located at the bottom left corner of the window to navigate through the desired pages (first, previous, next, last). Or enter the page number you want to view in the page box



Pop-up Context Menu

All reports support a pop-up context menu that you can use to select a Ladder diagram, Export Session Details, and Export Session Summary.

To display the pop-up context menu in any report in Monitor and Trace:

1. Click a record on the page, and right-click to display the context menu.
2. Click an option on the menu.

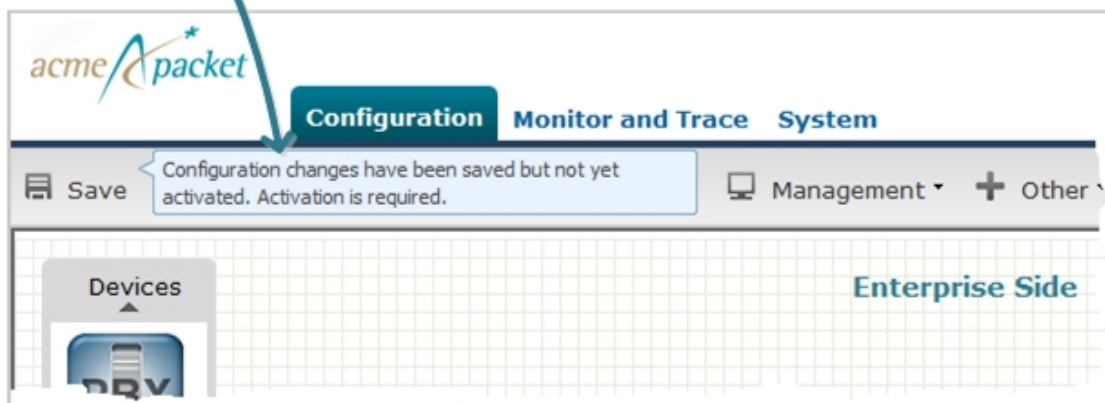
The applicable page displays or the export begins, depending on the option you selected..

Save Activate Notification Enhancement

The Save button in the Web GUI allows you to verify and save a current configuration in both the Basic and Expert Modes. A prompt also displays giving you a choice of whether or not to activate the configuration.

Previously, after performing configuration changes and then clicking <Save>, only a tool tip message displayed as shown in the following illustration to indicate an activation was still required.

Tool tip message displays when clicking <Save>.

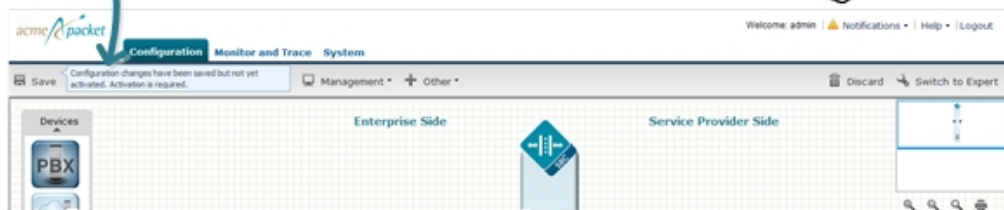


In this release after clicking <Save>, in addition to the tool tip display, a notification icon exists in the upper right corner of the screen.

After making configuration changes, you can click here to verify, save, and activate the configuration.



Tool tip message still displays after clicking <Save>.



This notification indicates a verify, save, and/or activate still needs to be performed on the changed configuration. You can continue to make changes to the configuration, and when you are ready to save, you can select Notifications->Save Changes, then click <Activate> at the prompt that displays.

Note: When the notification icon is grayed-out, a save and activate is not required.

View System Data Through the Stats Portal

Use the Stats Portal to display data from the SIP and System Dashboard widgets in full-screen mode.

Procedure

1. From the Home page, click **Stats Portal**.

Overview

2. In the navigation pane, click a Dashboard Widget name.
3. In the **Object** column, click an object to display.

Shortcut Keys

The following tables list the shortcut key commands for the Home page and the Configuration page.

Home Page	Shortcut Key Command
Add a Widget	Ctrl+Shift+a
Refresh	Ctrl+Shift+r

Configuration Page	Shortcut Key Command
Discard	Ctrl+Shift+d
Save	Ctrl+Shift+s
Search	Ctrl+Shift+e

Configuration

Introduction

You can configure the necessary basic and advanced parameters from the following modes:

- Basic Mode - Drag and drop icons. Recommended for most deployments.
- Expert Mode - Select objects and elements from a hierarchy. Recommended for complex deployments.

Wizards Button

The Wizards button displays a menu of configuration wizards from which you can perform, save, and activate selected configuration procedures for the Enterprise Session Director. Configuration wizards are available in the Basic mode and in the Expert mode.

The Wizards button provides access to the following configuration wizards.

Configuration Wizard	Purpose
Set boot parameters	Specify the boot file and the boot parameters.
Set entitlements	Set the number of sessions that a license entitles, and enable advanced features.
Set initial configuration	Configure a new system and reconfigure an existing system.
Set license	Enter the license number for a feature.
Set logon banner	Customize the text on the Web GUI logon banner.
Set time zone	Select the time zone for the deployment.
Upgrade Software	Upload a new version of the software.

Initial Configuration Wizard

Release E-C[xz]6.4.0M3 adds the Initial Configuration wizard to the Web GUI. The Initial Configuration wizard was accessible only from the command line in previous releases. You can use the Initial Configuration wizard to perform the initial configuration on an unconfigured system and to change the configuration on a configured system. During the configuration, you define the boot parameters, select the configuration mode, and select the session border controller mode. A valid license is required to run the Initial Configuration wizard.

Configuration

- Unconfigured system. The system displays the Web GUI Initial Configuration wizard upon the first logon. When the initial configuration is complete, the system saves the configuration, activates the configuration, and reboots the system. The system does not backup the initial configuration of an unconfigured system.
- Configured system. Launch the Initial Configuration wizard from the Web GUI. When the re-configuration is complete, the system saves a backup of the existing configuration, saves the new configuration, activates the new configuration, and reboots the system. The backup is stored in /code/bkups.

Next Steps

- Configure the system objects.
- Optional. Reconfigure the system.

Configure the System

The system requires an initial configuration of attributes, such as modes and IP addresses, before it can function in the network.

Use the Set initial configuration wizard to define the attributes for the system. The system displays the Set initial configuration wizard upon the first logon.

Procedure

1. Logon to the Enterprise Session Director.
The system displays the Set initial configuration wizard.
2. Run the Set initial configuration wizard, and click **Complete**.
The system saves the configuration, activates the configuration, and reboots.

Next Steps

- (Optional) Configure the system objects.

Reconfigure the System

You can reconfigure the system from the Web GUI.

Use the Set initial configuration wizard to change the initial configuration on a configured system, for example, change attributes such as IP addresses and modes.

Procedure

1. Logon to the system.
2. From the Web GUI, go to **Configuration > Wizards > Set initial configuration**.
3. Run the Set initial configuration wizard and change the attributes, as needed.
4. Click **Complete**.
The system saves a backup of the existing configuration, saves the new configuration, activates the new configuration, and automatically reboots.

Next Steps

- (Optional) Reconfigure the system objects.

Set the Boot Parameters

The Enterprise Session Director (E-SBC) requires you to enter the necessary parameters to boot the system in your deployment.

You can set the system boot parameters from the Set boot parameters wizard on the Web GUI in either Basic mode or Expert mode.

1. From the Web GUI, click **Configuration > Wizards > Set boot parameters**.
2. In the Set boot parameters dialog, enter the following information:
 - Boot File. Name of the image file.
 - IP Address.
 - VLAN.
 - Net Mask.

- Gateway. Internet address of the boot host. Leave blank if the host is on the same network.
- FTP Host IP.
- FTP Username.
- FTP Password. FTP password for the FTP user on the boot host.
- Flags. Hexadecimal. Always starts with 0x. See "Configurable Boot Loader Flags."
- Target Name. Name of the E-SBC, as displayed at the system prompt.
- Console Device.
- Console Baud Rate.

3. Click **Complete**.

The system displays a success message.

4. Click **OK**.

Configurable Boot Loader Flags

You may configure the following boot flags in the boot loader:

- 0x04 - disables autoboot timeout (ap3820 and ap4500 only)
- 0x08 - extend autoboot countdown timer to 15 seconds
- 0x40 - use DHCP for wancom0 (VM Edition only)
- 0x80 - network boot using TFTP instead of FTP

Set Time Zone

The system requires a setting for time zone.

You can set the system time from the Set time zone wizard on the Web GUI. You can select a time zone or Coordinated Universal Time (UTC). The wizard is available in Basic Mode and Expert Mode.

Procedure

1. From the Web GUI Home page, click **Configuration > Wizards > Set time zone**.

2. From the drop down list, select one of the following:

- Time zone by locale
- UTC

3. Click **Complete**.

The system displays a success message.

4. Click **OK**.

User and Administrator Access Rules

Users and Administrators can use the Enterprise Session Director Web GUI according to the rules for their role.

The following table describes the Web GUI access rules for the User and Administrator roles.

Role	Rule
User	<p>User</p> <ul style="list-style-type: none"> • Read-only access only • View basic and advanced configuration information • Cannot save and activate a configuration • Cannot add a configuration • Cannot edit a configuration
Administrator	<p>Administrator</p> <ul style="list-style-type: none"> • Add, edit, and view configurations • Add, edit, and view advanced configurations





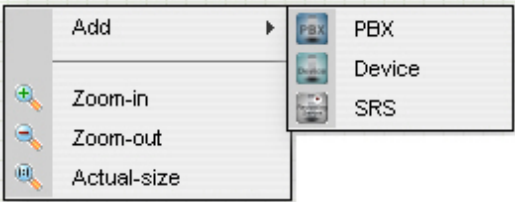
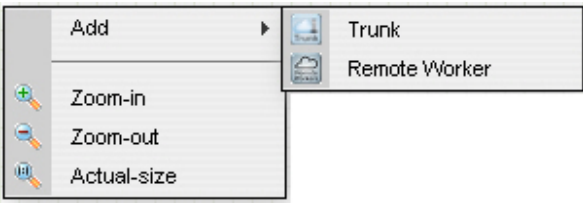
Configuration


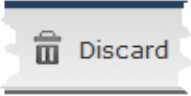
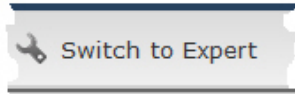
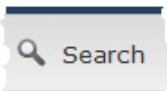
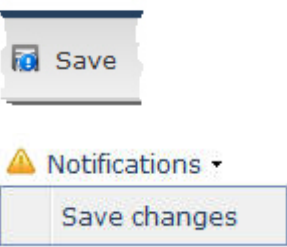
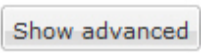
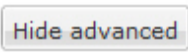
Role	Rule
	<ul style="list-style-type: none"> • Save and activate a configuration • Switch between Basic mode and Expert mode

Workspace Tools

The Configuration tab provides specific workspace tools that you can use within the Basic mode and Expert mode pages. These tools can help you manage the items in your workspace, save and activate the configuration, and allow you to search for elements in the configuration.

Basic Mode Configuration Tools

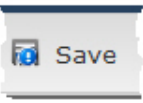
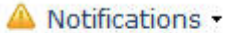

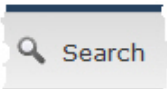
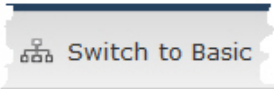
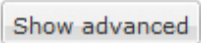
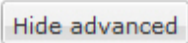
Tool	Description
	Zoom-in: Used to increase the viewing size of the current window and all its contents.
	Zoom-out: Used to decrease the viewing size of the current window and all its contents.
	Actual size: Used to display the current window and all its contents on a one-on-one ratio (actual size).
	Print: Provides a view of the image that you can print from your browser.
<p>Enterprise Add Menu</p> 	<p>Add Menus - These menus can be accessed by right-clicking the mouse on the Enterprise side or the Service Provider side.</p> <p>Add > PBX/Device/SRS- Allows you to add a PBX, a Device, or a Session Recording Server (SRS) to your Enterprise configuration. You can use this menu in lieu of dragging and dropping these elements from the Device tools.</p>
<p>Service Provider Add Menu</p> 	<p>Add > Trunk/Remote Worker Allows you to add a Trunk or a Remote Worker, to your Service Provider configuration. You can use this menu in lieu of dragging and dropping these elements from the Device tools.</p> <p>You can use the following tools from either menu instead of from the workspace tools in the upper right corner of the screen, if required:</p> <p>Zoom-in: Allows you to view a workspace and all of its elements in a closer proximity.</p> <p>Zoom-out: Allows you to view a workspace and all of its elements in a more distant proximity.</p> <p>Actual Size:: Allows you to view a workspace and all of its elements in its actual size.</p>

Tool	Description
	<p>Edit/Delete Menu - This menu can be accessed by selecting an element on the screen and then right-clicking the mouse.</p> <p>Edit: Allows you to edit the configuration of the element on which you right-clicked.</p> <p>Delete: Allows you to remove the element from the workspace AND the configuration.</p>
	<p>Discard - Allows you to discard all configuration changes made in the current session. Only the changes that have not yet been activated are discarded.</p>
	<p>Switch to Expert - Switches from Basic Mode to Expert Mode.</p> <p>Note: Before you can switch to Expert Mode, you must save and activate your configuration in Basic Mode.</p> <p>Caution: You can switch to Basic Mode from Expert Mode, if you do not save your changes. If you save your changes and you switch back to Basic Mode, you must run the Set Initial Configuration wizard again. You will lose all of the configuration changes you made in both modes.</p>
	<p>Search - Allows you to perform a search of any configuration element or sub-element on the Enterprise Session Director. You perform the search by entering a keyword which is not case sensitive. Special characters are allowed.</p>
	<p>Save - Allows you to verify and save the current configuration in Basic Mode. A prompt also displays giving you a choice of whether or not to activate the configuration.</p> <p>Note: After clicking <Save>, a notification icon in the upper right corner of the screen indicates the configuration still needs to be activated. You can continue to make changes to the configuration as required. When finished, you can select Notifications > Save changes to save and activate the configuration. The notification icon grays-out after saving and activating.</p>
	<p>Show advanced - This button displays in configuration dialog boxes that allow for more advanced parameters to be displayed. Oracle recommends that only Administrators configure these advanced parameters. When clicking this button, the advanced parameters display in italics, and the button toggles to a Hide advanced button.</p>
	<p>Hide advanced - This button displays in configuration dialog boxes that allow for more advanced parameters to be hidden. Oracle recommends that only Administrators configure these advanced parameters. When clicking this button, the advanced parameters are hidden from view, and the button toggles to a Show advanced button.</p>

Configuration

Expert Mode Configuration tools

Use the following tools to create the configuration in Expert Mode.


Button	Description
  	<p>Save - Allows you to verify and save the current configuration in Expert Mode. A prompt also displays giving you a choice of whether or not to activate the configuration.</p> <p>Note: After clicking <Save>, a notification icon in the upper right corner of the screen indicates the configuration still needs to be activated. You can continue to make changes to the configuration as required. When finished, you can select Notifications->Save changes to save and activate the configuration. The notification icon grays-out after saving and activating.</p>
	<p>Search - Allows you to perform a search of any configuration element or sub-element on the Enterprise Session Director. You perform the search by entering a keyword which is not case sensitive. Special characters are allowed.</p>
	<p>Switch to Basic - Switches from Expert Mode to Basic Mode.</p> <p>Note: If you save your configuration in Expert Mode, you cannot switch to Basic Mode.</p> <p>Caution: You can switch to Basic Mode from Expert Mode, if you do not save your changes. If you save your changes and you switch back to Basic Mode, you must run the Set Initial Configuration wizard again. You will lose all of the configuration changes you made in both modes.</p>
	<p>Show advanced - This button displays in configuration dialog boxes that allow for more advanced parameters to be displayed. Oracle recommends that only Administrators configure these advanced parameters. When clicking this button, the advanced parameters display in italics, and the button toggles to a Hide advanced button.</p>
	<p>Hide advanced - This button displays in configuration dialog boxes that allow for more advanced parameters to be hidden. Oracle recommends that only Administrators configure these advanced parameters. When clicking this button, the advanced parameters are hidden from view, and the button toggles to a Show advanced button.</p>

Basic Mode

Basic mode is a method for configuring your network for the Enterprise Session Director (ESBC) by way of a Web-based Graphical User Interface (GUI).

The Basic Mode Web GUI displays a workspace with drag-and-drop icons for the elements required to deploy the E-SBC between the Enterprise side and the Service Provider side of the network. When you drop an element icon into the workspace, the E-SBC displays the appropriate configuration dialog for the element. No other configuration


parameters are required, but advanced parameters are available in some Basic Mode dialogs. You can group like elements, create local policies between the elements in the workspace, and add new network interfaces to the E-SBC.

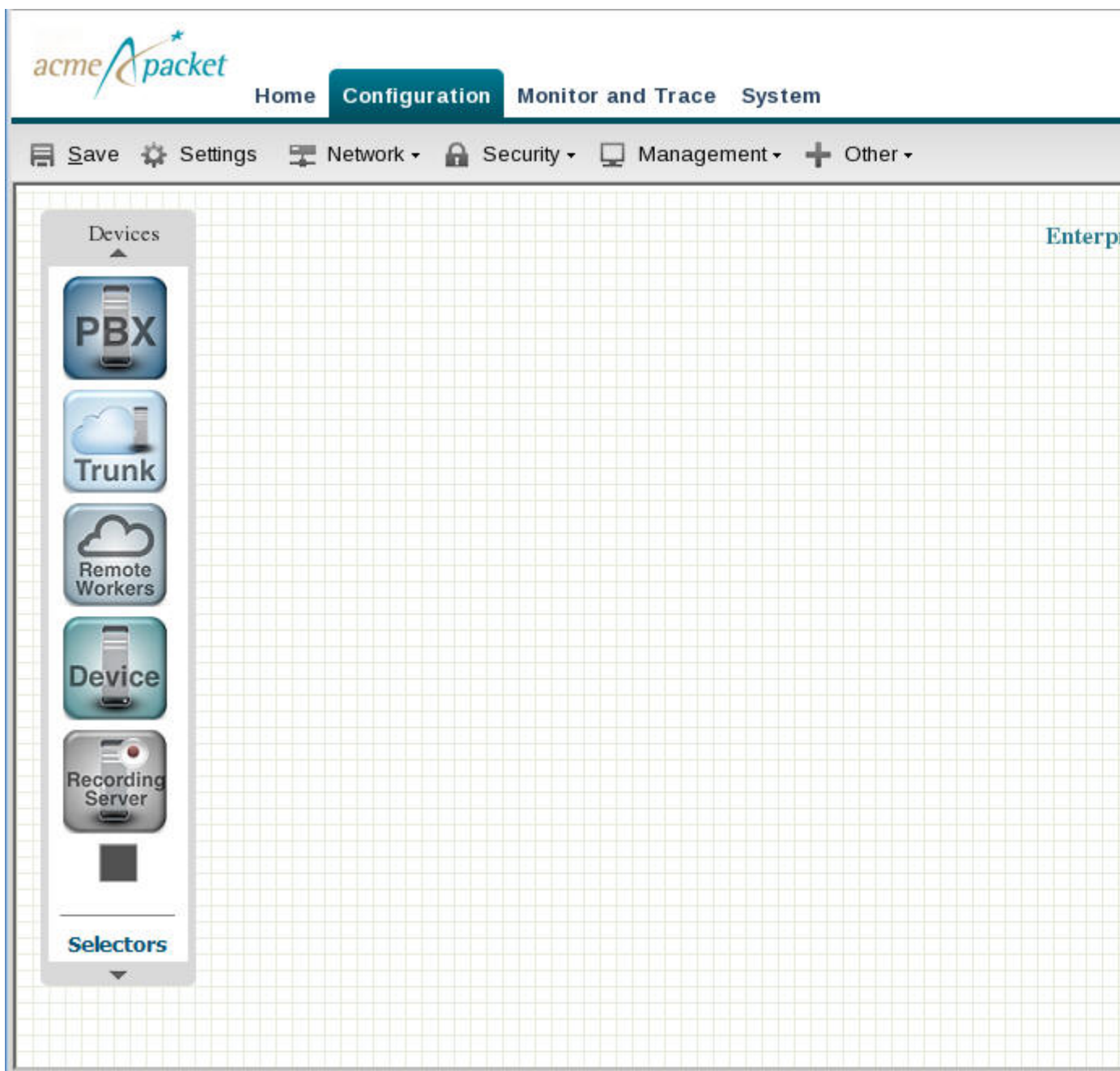
 **Note:** The Web GUI does not indicate required fields. You may be able to save the configuration without a required value because the E-SBC ignores the element in the configuration. The system does not display an error message for a missing required parameter.

Accessing Basic Mode

Access the Basic configuration mode on the Web GUI from the Configuration tab.

Log onto the Web GUI, and click on the Configuration tab.

 **Note:** If “Expert Mode” was set as the default during the Installation Setup Wizard in the ACLI, you cannot switch to Basic Mode. If you want to configure in Basic Mode, contact your Administrator.









Configuration










This page displays the Basic mode for configuring the Net-Net ESD on a workspace that you can use to configure the network. The ESD is centered in the middle between the Enterprise network on the left and the Service Provider network on the right.

To populate the network, use the Devices tool bar on the left of the page to drag and drop selected elements onto the workspace. Elements in the toolbar are associated specifically with Enterprise or Service Provider. If you drag and drop an element to an incorrect location in the workspace, the system displays the following error message:

"This icon cannot be placed here."

Device Toolbar


Element	Description
Elements for Enterprise	When adding any of the Enterprise elements below, a dialog box displays for you to configure the device.
	<p>PBX - Drag-and-drop icon</p> <p>Adds a Private Branch Exchange (PBX) to your Enterprise network.</p> <p>A PBX is a privately owned telephone switching system for handling multiple telephone lines. Users of the PBX share a certain number of outside lines for making telephone calls external to the PBX.</p>
	<p>Device - Drag-and-drop icon</p> <p>Adds a network device (router, media device, phone, etc.) to your Enterprise network.</p> <p>A device can be any network device used to setup the Enterprise Local Area Network (LAN).</p>
	<p>Recording Server - Drag-and-drop icon</p> <p>Adds a session recording server (SRS) to your Enterprise network.</p> <p>An SRS is a 3rd party call recorder or the Net-Net ISR's Record and Store Server (RSS)). It controls the recording of media transmitted in the context of a communications session between multiple user agents.</p>
	<p>SIP Network Interface - Drag-and-drop icon</p> <p>Adds a Session Initiation Protocol (SIP) network interface to the Enterprise side of the Enterprise Session Director. You can add up to five (5) SIP interfaces.</p> <p> Note: You can associate a SIP interface to any configured network interface.</p>
Elements for Service Provider	When adding any of the Service Provider elements below, a dialog box displays for you to configure the device.
	<p>Trunk - Drag-and-drop icon</p> <p>Adds a SIP Trunk to the Service Provider network.</p> <p>A SIP trunk is a service offered to Enterprises by a Service Provider that permits the Enterprises with PBXs installed, to use IP communications (including Voice over IP (VoIP)) outside of their Enterprise network on an Internet connection.</p>

Element	Description
	<p>Remote Worker - Drag-and-drop icon</p> <p>Adds a Remote Worker to the Service Provider network.</p> <p>A Remote Worker is a device that is setup outside the network but is still connected to the Enterprise Session Director from the remote location.</p>
	<p>SIP Network Interface - Drag-and-drop icon</p> <p>Adds a SIP network interface to the Service Provider side of the Enterprise Session Director. You can add up to five (5) SIP interfaces.</p> <p> Note: You can associate a SIP interface with any configured network interface.</p>
Elements for Both	
	<p>Selection Tool - Select this then click on any element in your workspace.</p> <p>This tool allows you to select any element in your network.</p>
	<p>Image Mover - Select this then click on the image in your workspace.</p> <p>This tool allows you to move the entire image of your network around within the workspace.</p>
	<p>Two-Way Local Policy - Select this first then click on the center of an icon in your network.</p> <p>This tool allows you to create a two-way route (local policy) between devices within your local network, or between the devices on the Enterprise side and the Service Provider side.</p> <p>When adding a two-way route, a dialog box displays for you to configure the route.</p>
	<p>One-Way Local Policy - Select this first then click on the center of an icon in your network.</p> <p>This tool allows you to create a one-way route between devices within your local network, or between the devices on the Enterprise side and the Service Provider side.</p> <p>When adding a one-way route, a dialog box displays for you to configure the route.</p>
	<p>Grouping Tool - Select the devices in your network that you want to group, then select the grouping tool.</p> <p>This tool allows you to create a grouping around like devices in your network (i.e., multiple PBXs, multiple routers, etc.).</p> <p>When creating a group, a dialog box displays for you to configure the group.</p>
	<p>Ungrouping Tool - Select the group you want to ungroup first, then select the ungrouping tool to ungroup the devices.</p> <p>This tool allows you to remove a grouping from around like devices in your network (i.e., multiple PBXs, multiple routers, etc.).</p> <p>When removing a group, the group configuration information is removed (not the device configurations within the group).</p>

Configuration

As you place an element in the workspace, the element connects to the SIP interface on the Enterprise Session Director automatically, and a configuration dialog box displays allowing you to configure the element for your network.

You can use the workspace tools on the upper right corner of the screen to zoom in, zoom out, display actual size, or print the current screen.

 **Note:** For more information about the workspace tools, see [Workspace Tools](#).


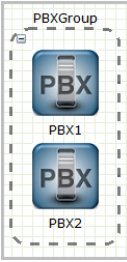

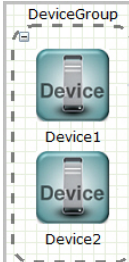

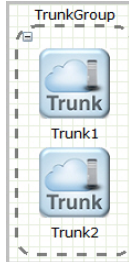



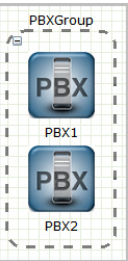

Device Icon Connection Matrix

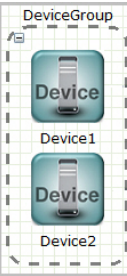

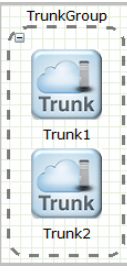


Before configuring the Enterprise Session Director (E-SBC) from the Web GUI workspace, you need to know the types of connections that the system supports between device icons.

The Web GUI Basic mode workspace supports connections between Enterprise and Service Provider device icons in two ways. You can configure a one-way route or a two-way route between devices. The configured route is called a local policy. You can also connect certain device icons by way of the Advanced Routing icon located on the E-SBC graphic.


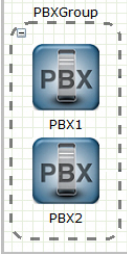

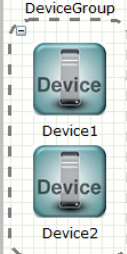

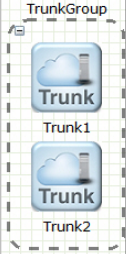



The following matrices show the device icons and their supported connections for a one-way policy, for a two-way policy, and for advanced routing. The Recording Server icon is not included here because you cannot route one by way of local policy.

One-Way Routing Local Policy

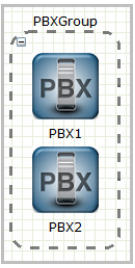

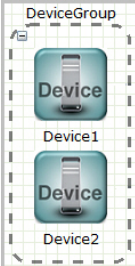

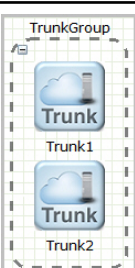


From	To							
								
	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	Yes	Yes	Yes	Yes	No	No	No	Yes
	Yes	Yes	Yes	Yes	No	No	No	Yes
	Yes	Yes	Yes	Yes	No	No	No	No
	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes


Two-Way Routing Local Policy


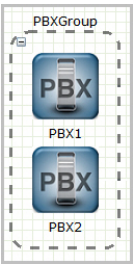

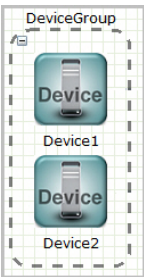

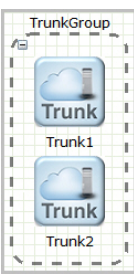


From	To							
								
	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Configuration

	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	Yes	Yes	Yes	Yes	No	No	No	Yes
	Yes	Yes	Yes	Yes	No	No	No	Yes
	No	No	No	No	No	No	No	No
	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Advanced Routing Local Policy

From	To
	

	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	No
	Yes

Typical Network Configuration


You can configure your network using the Basic Mode method to configure the devices.

The high-level process for a typical network configuration follows:

1. Add a PBX to the Enterprise Side.
2. Add a SIP Trunk to the Service Provider Side.

Configuration

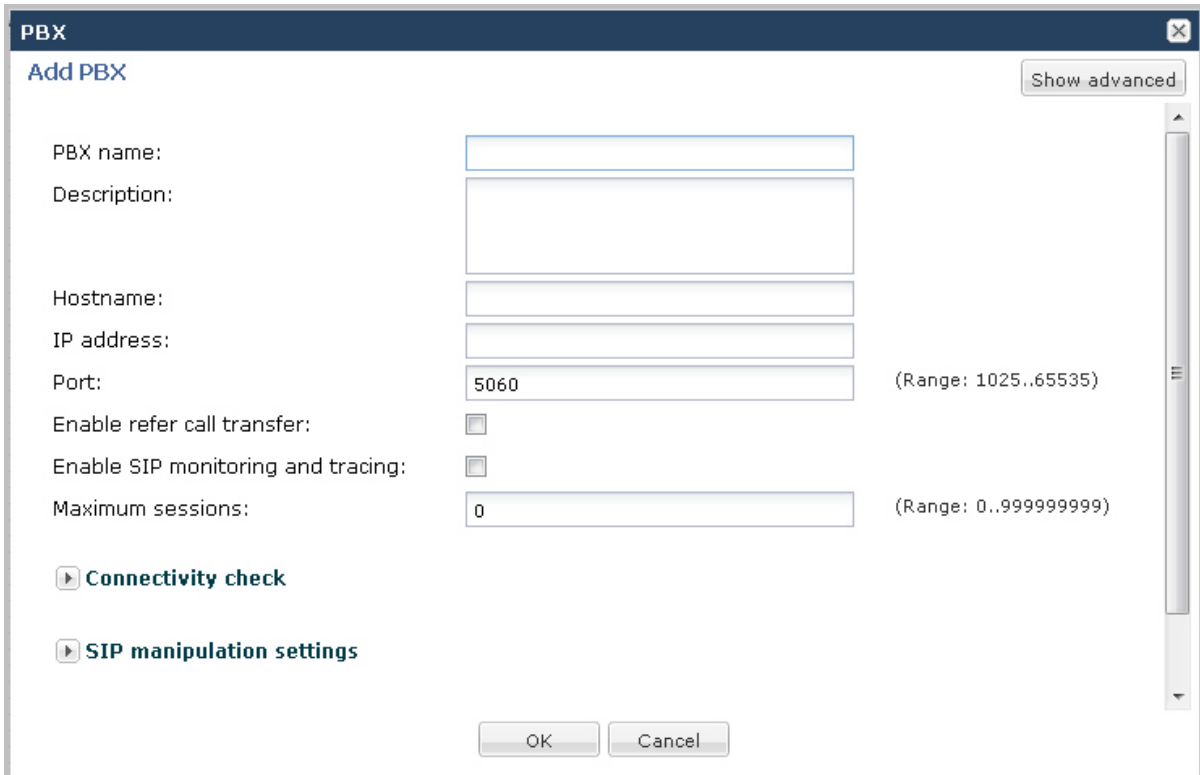
3. Add a Local Policy (2-way route) between the PBX and the SIP Trunk.
4. Verify the Network Interface on the Enterprise Session Director is correct on the Enterprise and Service Provider sides.

 **Note:** Drag-and-drop the icons from the Device tool bar onto the space below the titles of “Enterprise Side” and Service Provider Side. The workspace does not allow you to place icons above the titles.

Add a PBX

To add a PBX to the Enterprise side:

1. Click on the PBX icon in the device tool bar, and drag it to the Enterprise side in the workspace. The following dialog box displays.




The screenshot shows a dialog box titled "PBX" with a close button in the top right corner. The main heading is "Add PBX" with a "Show advanced" button to its right. The form contains the following fields and options:

- PBX name: [Text input field]
- Description: [Text input field]
- Hostname: [Text input field]
- IP address: [Text input field]
- Port: [Text input field with value 5060] (Range: 1025..65535)
- Enable refer call transfer:
- Enable SIP monitoring and tracing:
- Maximum sessions: [Text input field with value 0] (Range: 0..999999999)

Below the fields are two expandable sections: "Connectivity check" and "SIP manipulation settings", each with a right-pointing arrow. At the bottom are "OK" and "Cancel" buttons.

2. In the PBX name field, enter the name to assign to this PBX in the Enterprise network. For example, PBX1. Valid values are alpha-numeric characters.
3. (optional) In the Description field, enter a description for this PBX. For example, PBX for Enterprise. Valid values are alpha-numeric characters.
4. In the Hostname field, enter the hostname of the Enterprise Session Director to which this PBX is connected. For example, ESD1. Valid values are alpha-numeric characters.
5. (optional) In the IP address field, enter the IP address of this PBX. Enter the address in dotted decimal format. For example, 1.1.1.1. Default is 0.0.0.0.

 **Note:** By default, the Port on the PBX is 5060. Also, setting all other parameters in this dialog box is optional. If you want to modify the values of the remaining parameters, or if you want to set more advanced parameters, see the *Net-Net® Enterprise Session Director Configuration Guide* for more information. Oracle recommends that only Administrators add or modify advanced parameters.

6. Click <OK> to save your settings. The PBX displays in your Enterprise workspace with the name of the PBX displayed beneath the icon. You can edit the PBX configuration anytime if required, by double-clicking the icon and modifying the configuration in the dialog box.

Add a Trunk

To add a SIP Trunk to the Service Provider side:

1. Click on the Trunk icon in the device tool bar, and drag it to the Service Provider side in the workspace. The following dialog box displays.

The screenshot shows a dialog box titled "SIP Trunk" with a close button in the top right corner. Below the title bar, the text "Add SIP Trunk" is displayed, followed by a "Show advanced" button. The main area contains several input fields and checkboxes:


- Trunk name: [text input field]
- Description: [text input field]
- Hostname: [text input field]
- IP address: [text input field]
- IP port: [text input field with value 5060] (Range: 1025..65535)
- Enable SIP monitoring and tracing:
- Maximum sessions: [text input field with value 0] (Range: 0..999999999)

Below these fields are three expandable sections, each with a right-pointing arrow:

- ▶ Connectivity check
- ▶ SIP manipulation settings
- ▶ Denial of service settings

At the bottom of the dialog are "OK" and "Cancel" buttons.

2. In the Trunk name field, enter the name to assign to this SIP Trunk in the Service Provider network. For example, TrunkA. Valid values are alpha-numeric characters.
3. (optional) In the Description field, enter a description for this SIP Trunk. For example, Trunk between SP and Ent. Valid values are alpha-numeric characters.
4. In the Hostname field, enter the hostname of the Enterprise Session Director to which this Trunk is connected. For example, ESD1. Valid values are alpha-numeric characters.
5. (optional) In the IP address field, enter the IP address of this SIP Trunk. Enter the address in dotted decimal format. For example, 2.2.2.2. Default is 0.0.0.0.

 **Note:** By default, the IP Port on the SIP Trunk is 5060. Setting all other parameters in this dialog box is optional. If you want to modify the values of the remaining parameters, or if you want to set more advanced parameters, see the *Net-Net® Enterprise Session Director Configuration Guide* for more information. Oracle recommends that only Administrators add or modify advanced parameters.

6. Click <OK> to save your settings. The Trunk displays in your Enterprise workspace with the name of the Trunk displayed beneath the icon. You can edit the Trunk configuration anytime if required, by double-clicking the icon and modifying the configuration in the dialog box.

Add a Local Policy

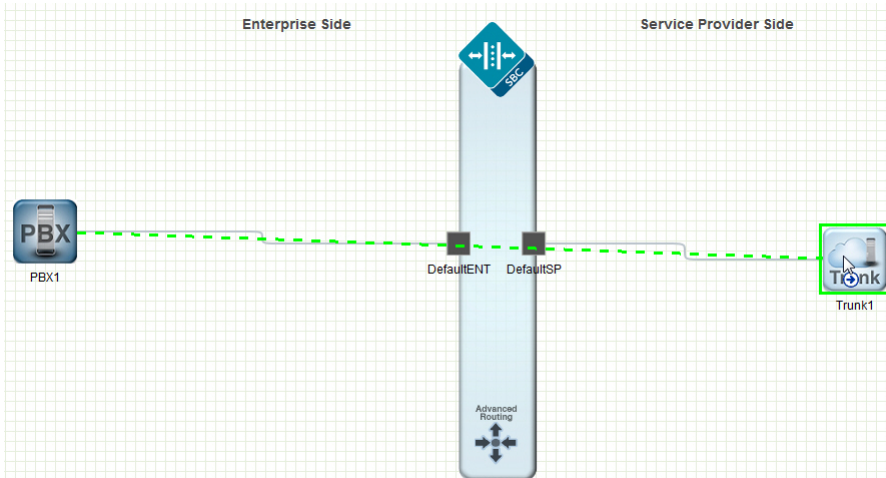
To add a Local Policy (2-way route) between the PBX and the SIP Trunk:

1. In the connectors section of the device tool bar, click on the 2-way arrow to select it.
2. Click in the center of the PBX icon in the Enterprise network. A small arrow displays.

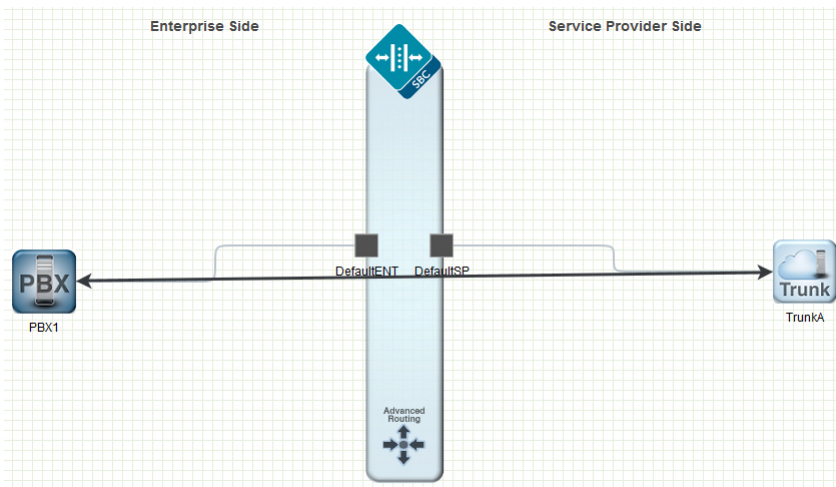
Configuration




3. Holding down the left mouse button, drag the mouse over to the Trunk icon, making sure a green border appears around the Trunk icon.



4. Release the left mouse button. This draws a 2-way arrow (local-policy) between the PBX and the Trunk. A dialog box displays.



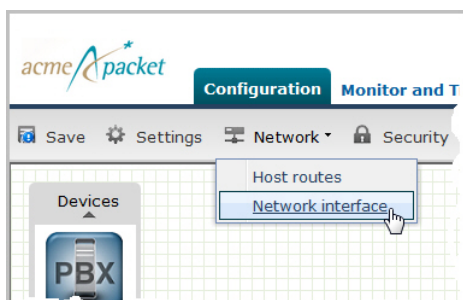
5. In the Route name field, enter a name for this route. For example, RouteA.
6. Click <OK>. You can edit the local policy configuration anytime if required, by double-clicking the 2-way arrow and modifying the configuration in the dialog box.

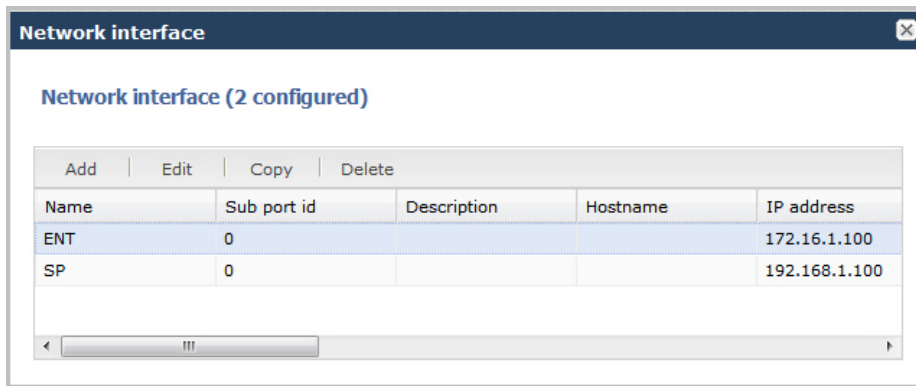
 **Note:** If you want to modify the values of the remaining parameters, or if you want to set more advanced parameters, see the ACLI Configuration Guide for more information.

Modify Enterprise Network Interface

To modify the Enterprise network interface:

1. From the Main Menu, select **Network > Network interface**. The following dialog box displays.





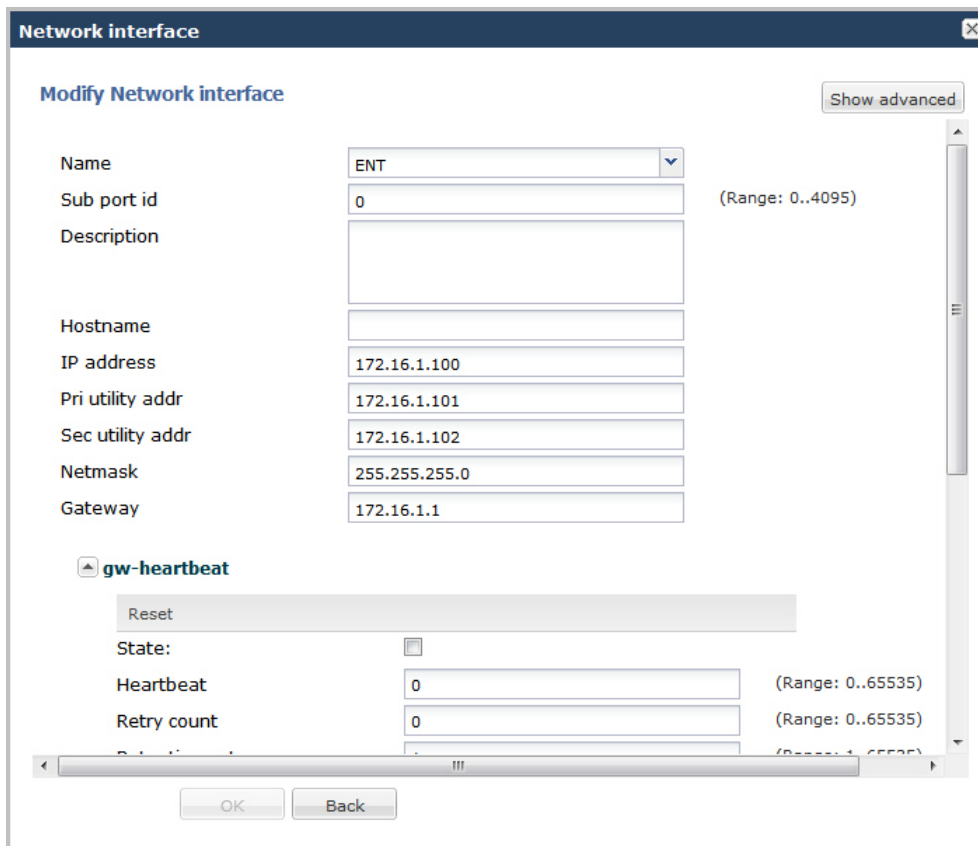
The screenshot shows a dialog box titled "Network interface" with a close button (X) in the top right corner. Below the title bar, it says "Network interface (2 configured)". There is a toolbar with "Add", "Edit", "Copy", and "Delete" buttons. Below the toolbar is a table with the following data:

Name	Sub port id	Description	Hostname	IP address
ENT	0			172.16.1.100
SP	0			192.168.1.100

At the bottom of the table is a scrollbar.

The list in the above dialog box shows the current default settings.

- From the list of network interfaces, select ENT (Enterprise) and click <Edit>. The following dialog box displays.



The screenshot shows a dialog box titled "Network interface" with a close button (X) in the top right corner. Below the title bar, it says "Modify Network interface" and a "Show advanced" button. The form contains the following fields:

- Name: ENT (dropdown menu)
- Sub port id: 0 (text field, with "(Range: 0..4095)" to the right)
- Description: (empty text field)
- Hostname: (empty text field)
- IP address: 172.16.1.100 (text field)
- Pri utility addr: 172.16.1.101 (text field)
- Sec utility addr: 172.16.1.102 (text field)
- Netmask: 255.255.255.0 (text field)
- Gateway: 172.16.1.1 (text field)

Below these fields is a section titled "gw-heartbeat" with a "Reset" button and a "State:" checkbox. Underneath are:


- Heartbeat: 0 (text field, with "(Range: 0..65535)" to the right)
- Retry count: 0 (text field, with "(Range: 0..65535)" to the right)

At the bottom of the dialog are "OK" and "Back" buttons.

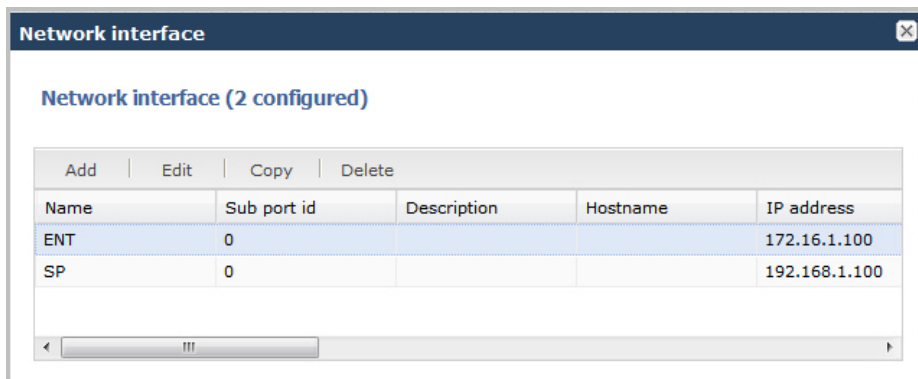
- In the IP address field, enter the IP address of the network interface on the Enterprise side. Enter the address in dotted decimal format. Default is 172.16.1.100.
- In the Netmask field, enter the netmask address of the network interface on the Enterprise side. Enter the address in dotted decimal format. Default is 255.255.255.0.
- In the Gateway field, enter the IP address of the gateway associated with the network interface on the Enterprise side. Enter the address in dotted decimal format. Default is 172.16.1.1.

For a High Availability (HA) environment:

- In the Pri utility address field, enter the IP address of the primary Enterprise Session Director. Enter the address in dotted decimal format. Default is 172.16.1.101.
- In the Sec utility address field, enter the IP address of the secondary (backup) Enterprise Session Director. Enter the address in dotted decimal format. Default is 172.16.1.102.

 **Note:** If you want to modify the values of the remaining parameters, or if you want to set more advanced parameters, see the *Net-Net® Enterprise Session Director Configuration Guide* for more information. Oracle recommends that only Administrators add or modify advanced parameters.

8. Click <OK> to save the changes. The following dialog box displays.

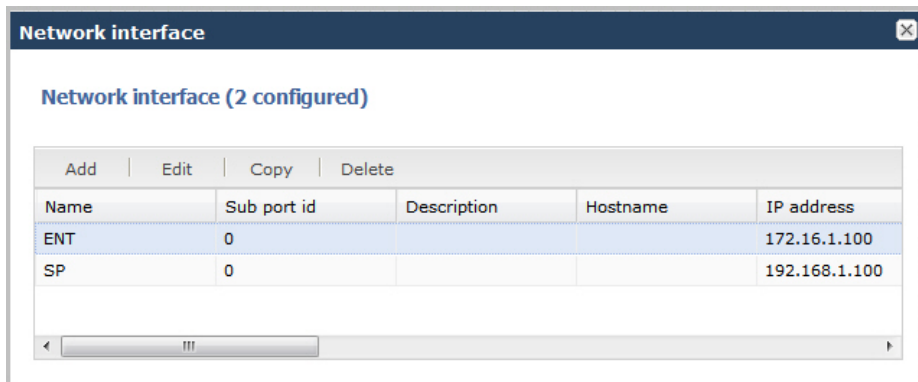
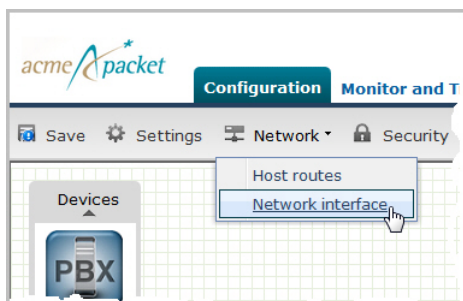


9. Modify the Service Provider network address using the procedure in Modify Service Provider Network Interface.

Modify Service Provider Network Interface

To modify the Service Provider network interface:

1. From the Main Menu, select **Network > Network interface**. The following dialog box displays.




The list in the dialog box shows the current default settings.

2. From the list of network interfaces, select SP (Service Provider) and click <Edit>. The following dialog box displays.

3. In the IP address field, enter the IP address of the network interface on the Service Provider side. Enter the address in dotted decimal format. Default is 192.168.1.100.
4. In the Netmask field, enter the netmask address of the network interface on the Service Provider side. Enter the address in dotted decimal format. Default is 255.255.255.0.
5. In the Gateway field, enter the IP address of the gateway associated with the network interface on the Service Provider side. Enter the address in dotted decimal format. Default is 192.168.1.1.

For a High Availability (HA) environment:

6. In the Pri utility address field, enter the IP address of the primary Enterprise Session Director. Enter the address in dotted decimal format. Default is 192.168.1.101.
7. In the Sec utility address field, enter the IP address of the secondary (backup) Enterprise Session Director. Enter the address in dotted decimal format. Default is 192.168.1.102.

 **Note:** If you want to modify the values of the remaining parameters, or if you want to set more advanced parameters, see the *Net-Net® Enterprise Session Director Configuration Guide* for more information. Oracle recommends that only Administrators add or modify advanced parameters.

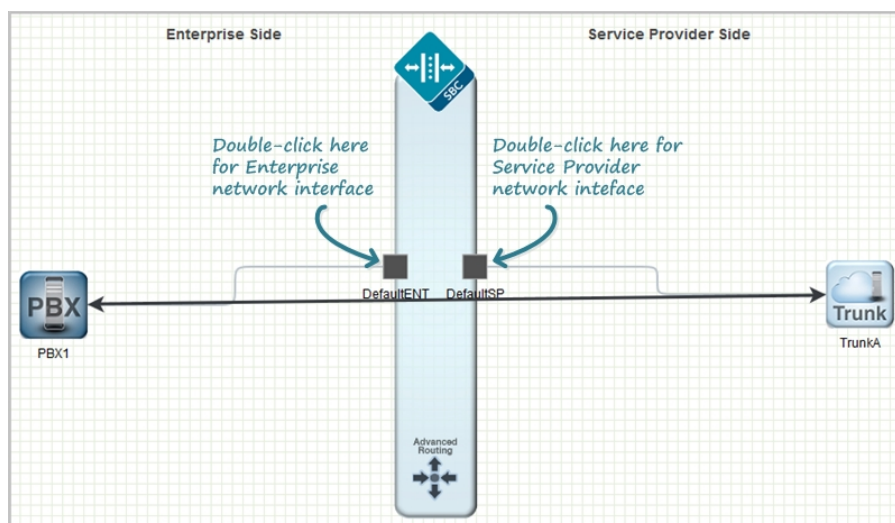
8. Click <OK> to save the changes. The following dialog box displays.

Name	Sub port id	Description	Hostname	IP address
ENT	0			172.16.1.100
SP	0			192.168.1.100

9. Click the x in the upper right corner to close this dialog box.



Note: You can modify additional parameters if required, for the Enterprise and Service Provider network interfaces by clicking on the network interface icons on the Enterprise Session Director. For more information on setting advanced parameters, see your *Net-Net® Enterprise Session Director Configuration Guide*.



Save and Activate Network Configuration

When you finish creating the network, you must save and activate the configuration on the Enterprise Session Director.

1. In any configuration dialog, click **OK**.
The system verifies and saves the current configuration to the last-saved configuration, which is stored in flash memory. This allows you to queue multiple changes during a configuration session before you set them all on the device.
2. Optional. Perform additional configuration, and click **OK** each time.
3. Click **Save**.
The system displays the Confirmation dialog, with the **Activate** button.
4. Click **Activate**.
The system displays the success dialog.
5. Click **OK**.
The system moves the changes from the flash memory to the running configuration.

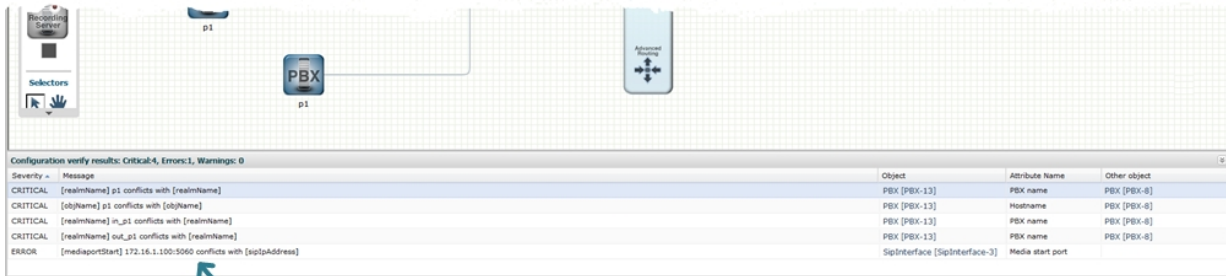
Configuration Error Messages

For both Basic and Expert Mode, if you save a configuration that contains errors, the errors display in a window at the bottom of the screen, and the following message displays:

There were errors! Are you sure you want to activate the configuration?

The following is an example of errors that display for a configuration in Basic Mode.

Configuration



Click on an error to go to the location in the configuration where you can fix it

Click the error link in the Object column to go to the exact location in the configuration where the error exists, and then edit the configuration as applicable.

The following table identifies the columns in the error list.

Column	Description
Severity	Identifies the level of severity that the Enterprise Session Director assigns to the error. Valid values are: ERROR - Indicates the issue identified in the "Message" column was not correctly configured or it does not exist. You can still verify, save, and activate the configuration if this severity exists. WARNING - Indicates the configuration contains invalid information for the element field identified in the "Message" column. You can still verify, save, and activate the configuration if this severity exists. CRITICAL - Indicates a critical error has occurred in the configuration and you cannot verify, save, or activate until the error is corrected. The "Message" column indicates the element field where the error has occurred.
Message	Identifies the element field(s) where the error, warning, or critical error has occurred, and identifies the reason for the error.
Object	Identifies the element and the field for that element where the error occurred.
Attribute	Identifies the attribute within the element where the error occurred.
Other Object	Identifies the other object when more than one object caused the error.

Basic Mode Configuration Functions

In Basic Mode, the Configuration tab displays the following function buttons that lead to configuration dialogs.

- Settings
- Network
 - Host routes
 - Network interface
- Security
- Management
- Other
 - Media profile
 - Translation rules
 - SIP features

- SIP manipulations
- SPL



Note: The Web GUI does not indicate which fields are required. You may be able to save the configuration even if you do not enter a value in a required field because the system ignores the element in the configuration. The system does not display an error message when you omit a required parameter.

Settings Button

In Basic mode, use the Settings button on the Web GUI to configure the following configuration elements.

- SBC hostname
- Description
- Location
- Default gateway IP address
- Network Time Protocol IP address
- Logging settings
- SNMP settings
- SIP settings
- Denial of service settings
- Communications monitoring probe settings
- High availability settings
- Packet capture settings
- Survivability

Advanced Settings

An Administrator can configure the following advanced parameters:

- Enable restart on critical failure

For more information on this setting, see Initiating Packet Capture in the *Oracle® Enterprise Session Border Controller ACLI Configuration Guide*.

Additional Global Settings

You can set the following additional global settings on the Enterprise Session Director if required:

- Logging
- SNMP
- SIP
- Denial of service (DoS)
- Communication Monitor Probe
- High Availability (HA)

Each of these global settings is described in the following paragraphs.

Logging Settings

The Enterprise Session Director (E-SBC) generates two types of logs - syslogs and process logs. Syslogs conform to the standard used for logging servers and processes as defined in RFC 3164.

Process logs are Oracle proprietary logs. Process logs are generated on a per-task basis and are used mainly for debugging purposes. Because process logs are more data inclusive than syslogs, their contents usually encompass syslog log data. A special application must be run on a remote server to receive process logs. Please contact your Oracle sales representative for more information about the process log application.

Syslog and process log servers are both identified by an IPv4 address and port pair.

1. From the Web GUI, click **Settings**.

Configuration

2. In the Settings dialog, do the following:
 - a) Click Logging Settings, to display the settings.
 - b) SysLog server IP address. Enter the IPv4 address of a syslog server.
 - c) Process log level. Select the starting log level of all processes running on the E-SBC.
3. Click **OK**.
4. Save and activate the configuration.

Simple Network Management Protocol (SNMP) Settings

SNMP is an Internet-standard protocol for managing devices on IP networks. It consists of a set of standards for network management, including an application layer protocol, a database schema, and a set of data objects.

SNMP is used to support monitoring of network-attached devices for conditions that warrant administrative attention. SNMP is comprised of three groups of settings on the Enterprise Session Director (E-SBC). These settings are system-wide configurations including MIB contact information, SNMP community settings, and trap receivers.

For more information, see the SNMP section in the *Enterprise Session Director ACLI Configuration Guide*.

1. From the Web GUI, click **Settings**.
2. In the **Settings** dialog, do the following:
 - a) Click **SNMP settings** to display the settings.
 - b) MIB system contact. Enter the contact information to use in the E-SBC MIB transactions.
 - c) MIB system name. Enter the identification of this E-SBC presented in MIB transactions.
 - d) MIB system location. Enter the physical location of this E-SBC that is reported within MIB transactions.
 - e) Enable event SNMP traps. Enable the E-SBC to report event SNMP traps.
3. Click **OK**.
4. Save and activate the configuration.

SIP Settings

Session Initiation Protocol (SIP) is an IETF-defined signaling protocol widely used for controlling communication sessions such as voice and video calls over Internet Protocol (IP). The protocol can be used for creating, modifying and terminating two-party (unicast) or multiparty (multicast) sessions. Sessions may consist of one or several media streams.

Dialog Transparency

Dialog transparency prevents the Enterprise Session Director (E-SBC) from generating a unique Call-ID and modifying dialog tags. With dialog transparency enabled, the E-SBC is prevented from generating a unique Call-ID and from modifying the dialog tags. The Enterprise Session Director passes what it receives. When a call made on one E-SBC is transferred to another UA and crosses a second E-SBC, the second E-SBC does not note the context of the original dialog, and the original call identifiers are preserved end to end. The signalling presented to each endpoint remains in the appropriate context regardless of how many times a call crosses through a E-SBC or how many E-SBCs a call crosses.

Without dialog transparency enabled, the E-SBC SIP B2BUA rewrites the Call-ID header and inserted dialog cookies into the From and To tags of all messages it processes. These dialog cookies are in the following format: SDxxxxxNN-. Using these cookies, the E-SBC can recognize the direction of a dialog. However, this behavior makes call transfers problematic because the Call-ID of one E-SBC might not be properly decoded by another E-SBC. The result is asymmetric header manipulation and unsuccessful call transfers.

IPv6 Reassembly and Fragmentation Support

As it does for IPv4, the E-SBC supports reassembly and fragmentation for large signaling packets when you enable IPV6 on the system.

The E-SBC takes incoming fragments and stores them until it receives the first fragment containing a Layer 4 header. With that header information, the E-SBC performs a look-up so it can forward the packets to its application layer.

Then the packets are re-assembled at the applications layer. Media fragments, however, are not reassembled and are instead forwarded to the egress interface.

On the egress side, the E-SBC takes large signaling messages and encodes it into fragment datagrams before it transmits them.

Note that large SIP INVITE messages should be sent over TCP. If you want to modify that behavior, you can use the SIP interface's option parameter `max-udplength=xx` for each SIP interface where you expect to receive large INVITE packets.

Other than enabling IPv6 on your E-SBC, there is no configuration for IPv6 reassembly and fragmentation support. It is enabled automatically.

Configure SIP Features on the (E-SBC)

To set SIP features on the Enterprise Session Director (E-SBC).

1. From the Web GUI, click **Settings**.
2. On the Settings page, click **SIP settings** > **Show advanced** to display the settings.
3. Under SIP Settings, do the following.
 - a) Select Enable dialog transparency.
 - b) Optional. Maximum SIP message length. Change the default 4096 to another value.
 - c) Select SIP UDP fragmentation.
 - d) Select Set INVITE expires at 100 responses.
 - e) Options. Optional. Add SIP options.
4. Click **OK**.
5. Save and activate the configuration.

Advanced Settings

An Administrator can configure the following more advanced parameters:

- Maximum SIP message length
- SIP options

For more information on these settings, see “Fraud Prevention” and SIP Options Tag Handling in the *Net-Net[®] Enterprise Session Director Configuration Guide*.

SNMP Settings

Simple Network Management Protocol (SNMP) is an Internet-standard protocol for managing devices on IP networks. It consists of a set of standards for network management, including an application layer protocol, a database schema, and a set of data objects.

SNMP is used to support monitoring of network-attached devices for conditions that warrant administrative attention. SNMP is comprised of three groups of settings on the Enterprise Session Director. These settings are system-wide configurations including MIB contact information, SNMP community settings, and trap receivers.

For more information about SNMP, see the section, SNMP in the *Net-Net[®] Enterprise Session Director Configuration Guide*.

To set SNMP on the Enterprise Session Director:

1. Click on Settings in the Main Menu. The following dialog box displays.

The screenshot shows a 'Settings' dialog box with a 'Modify Settings' section. The 'SBC hostname' field is filled with 'E-SBC'. Below it are empty fields for 'Description' and 'Location'. The 'Default gateway IP address' is '172.30.0.1' and the 'NTP IP address' is '0.0.0.0'. There are several expandable sections: 'Logging settings', 'SNMP settings', 'SIP settings', 'Denial of service settings', 'Communications monitoring probe settings', and 'High availability settings'. At the bottom are 'OK' and 'Cancel' buttons.

2. Click on SNMP settings to expand the dialog box. The following displays.

The screenshot shows the expanded 'SNMP settings' section. It contains four fields: 'MIB system contact', 'MIB system name', and 'MIB system location', all of which are empty. Below these is a checkbox labeled 'Enable event SNMP traps', which is currently unchecked.

3. In the MIB system contact field, enter the contact information used within the Enterprise Session Director's MIB transactions. The SNMP agent sends this information to a Network Management System (NMS) in response to an SNMP Get for the MIB-II sysContact MIB variable. This parameter's value can be a textual identification of your company's contact person for the Enterprise Session Director and/or information about how to contact that person. For example, John Doe. Valid values are alpha-numeric characters. Default is blank.
4. In the MIB system name field, enter the identification of this Enterprise Session Director presented within MIB transactions. This value, along with the target name of the Enterprise Session Director (identified in the boot parameters) are the values reported for MIB-II when an SNMP GET is issued by the NMS for the MIB-II sysName variable. For example, Test System: This parameter has no direct relation to the hostname parameter in the system configuration element. By convention, this is the node's FQDN. For SNMP MIB-II sysName GETs, the Enterprise Session Director returns SNMP communications in the following format:

```
<targetName>[.<mib-system-name>]"
```

The "targetName" is the value configured in the target name (tn) boot parameter and mib-system-name is the value configured in this field.

Valid values are alpha-numeric characters. Default is blank.

5. In the MIB system location field, enter the physical location of this Enterprise Session Director that is reported within MIB transactions. This parameter is reported when an SNMP GET is issued by the NMS for the MIB-II sysLocation variable. This parameter has no direct relation to the location field in the system configuration element. For example, Oracle. Valid values are alpha-numeric characters. Default is blank.
6. In the Enable event SNMP traps field, place a checkmark in the box to enable the Enterprise Session Director to report event SNMP traps. Uncheck to the box to disable this feature. Default is disabled.
7. Click <OK>.

Denial of Service Settings (DoS)

The Enterprise Session Director (E-SBC) Denial of Service (DoS) protection functionality protects softswitches and gateways with overload protection, dynamic and static access control, and trusted device classification and separation

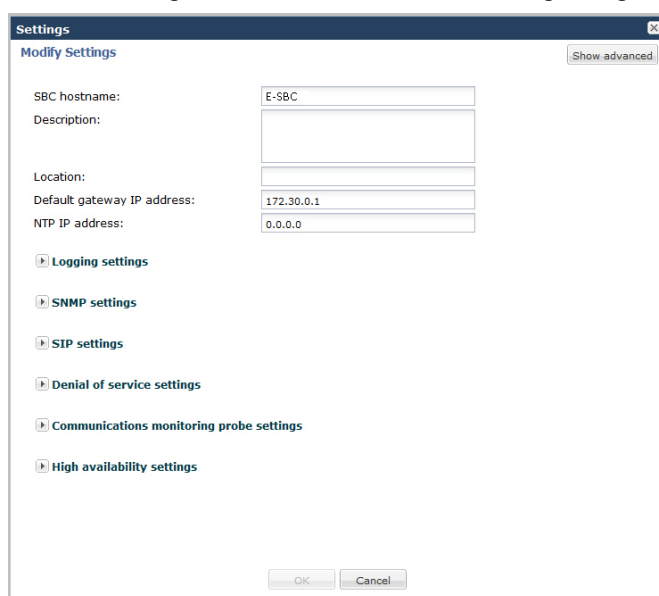
at Layers 3-5. The E-SBC itself is protected from signaling and media overload, but more importantly the feature allows legitimate, trusted devices to continue receiving service even during an attack. DoS protection prevents the Net-Net ESD host processor from being overwhelmed by a targeted DoS attack from the following:

- IP packets from an untrusted source as defined by provisioned or dynamic ACLs
- IP packets for unsupported or disabled protocols
- Nonconforming/malformed (garbage) packets to signaling ports
- Volume-based attack (flood) of valid or invalid call requests, signaling messages, and so on.

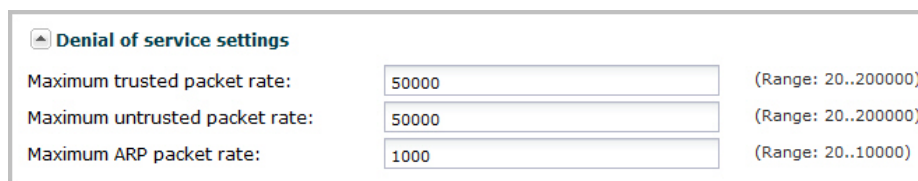
The Server Edition and VM Edition support of Denial of Service (DoS) protection differs from the Oracle Hardware Platforms Edition because of the absence of Oracle network interface hardware. Consequently DoS protection is implemented in software and consumes CPU cycles when responding to attacks.

In addition, the Server Edition and VM Edition handle media packet fragments differently, processing them in the datapath rather than in the host application code. Protection against fragment attacks is still present by ensuring fragments are never kept more than 5 ms.

1. Click on Settings in the Main Menu. The following dialog box displays.



2. Click on Denial of service settings to expand the dialog box. The following displays.



3. In the Maximum trusted packet rate field, enter the maximum trusted packet rate, in packets per seconds. Valid values are 20 to 200,000. Default is 50,000.
4. In the Maximum untrusted packet rate field, enter the maximum untrusted packet rate, in packets per seconds. Valid values are 20 to 200,000. Default is 50,000.
5. In the Maximum ARP packet rate field, enter the maximum ARP packet rate, in packets per seconds. Valid values are 20 to 10,000. Default is 1000.
6. Click <OK>.


Communication Monitoring Probe Settings

Palladion is Oracle’s Communication Experience Manager. The manager is powered by the Palladion Mediation Engine, a platform that collects SIP, DNS, ENUM, and protocol message traffic received from Palladion Probes. The

Configuration

mediation engine stores the traffic in an internal database, and analyzes aggregated data to provide comprehensive multi-level monitoring, troubleshooting, and interoperability information.

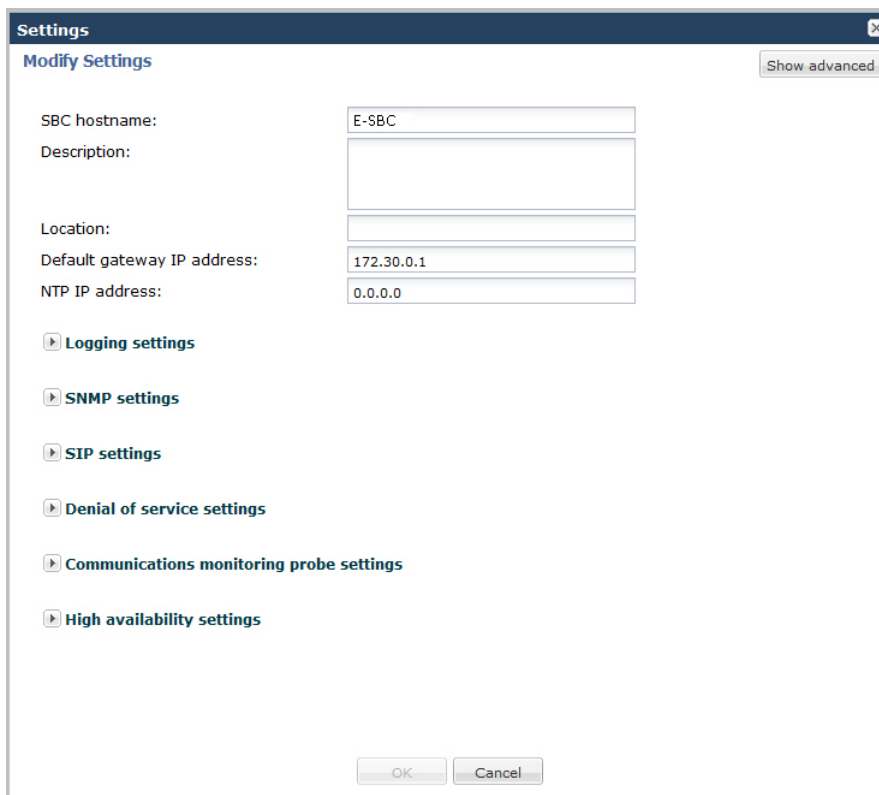
Palladion simplifies the operation of software-based Palladion probes by enabling the transmission of Internet Protocol Flow Information Export (IPFIX) data to one or more Palladion Mediation Engines, possibly on different sub-nets. This enhancement requires a slight change in the ACLI hierarchy -- specifically, the removal of the network-interface parameter from the comm-monitor configuration object, and its transfer to the monitor-collector configuration object.

 **Note:** The Palladion Communications Monitor Probe communicates over the media interface for signaling and Quality of Service (QoS) statistics using IPFIX. QoS reporting is done via Call Detail Records (CDR) (accounting).

For more information about the Communications Monitoring Probe, see the Communications Monitoring Probe chapter in the Net-Net[®] Enterprise Session Director Configuration Guide.

To set Communication Monitoring Probe features on the Enterprise Session Director:


1. Click on Settings in the Main Menu. The following dialog box displays.



2. Click on Communications monitoring probe settings to expand the dialog box. The following displays.



3. In the Enable Monitoring field, place a check mark in the box to enable the Communication Monitor Probe to monitor the network. Uncheck the box to disable monitoring. Default is disabled.

 **Note:** After checking the Enable monitoring box, all remaining fields are enabled for you to edit.

4. In the SBC group id field, enter an integer value to assign to the Net-Net ESD, that indicates its role as an information exporter. Valid values are 0 to 999999999. Default is zero (0).
5. In the Collector network interface field, enter the network interface and port whose traffic is exported to the Palladion Mediation Engine. Valid values are alpha-numeric characters. Default is the Enterprise network interface and port (ENT:0).
6. In the Collector IP address field, enter the IP address monitored by a Palladion Mediation Engine for incoming IPFIX traffic. Enter the address in dotted decimal format (0.0.0.0). Default is 1.1.1.1.
7. In the Collector port field, enter the port monitored by a Palladion Mediation Engine for incoming IPFIX traffic. Valid values are 1025 to 65535. Default is 4739.
8. Click <OK>.

High Availability (HA) Settings

You can deploy the Enterprise Session Director (E-SBC) in pairs to deliver high availability (HA). Two E-SBCs operating in this way are called an HA node. Over the HA node, call state is shared, keeping sessions and calls from dropping in the event of a service disruption.

Two E-SBCs work together in an HA node, one in active mode and one in standby mode.

- The active E-SBC checks itself for internal process and IP connectivity issues. If it detects that it is experiencing certain faults, it hands over its role as the active system to the standby E-SBC in the node.
- The standby E-SBC is the backup system, fully synchronized with the active E-SBC session status. The standby E-SBC monitors the status of the active system so that, if needed, it can assume the active role without the active system having to instruct it to do so. If the standby system takes over the active role, it notifies network management using an SNMP trap.

To produce seamless switchovers from one E-SBC to the other, the HA node uses shared virtual MAC and virtual IP addresses for the media interfaces in a way that is similar to VRRP (virtual router redundancy protocol). Sharing addresses eliminates the possibility that the MAC and IPv4 address set on one E-SBC in an HA node will be a single point of failure. The standby E-SBC sends ARP requests using a utility IPv4 address and its hard-coded MAC addresses to obtain Layer 2 bindings.

When there is a switchover, the standby E-SBC issues gratuitous ARP messages using the virtual MAC address, establishing that MAC on another physical port within the Ethernet switch. To the upstream router, the MAC and IP are still alive, meaning that existing sessions continue uninterrupted.

Within the HA node, the E-SBCs advertise their current state and health to one another in checkpointing messages; each system is apprised of the other's status. Using Oracle's HA protocol, the E-SBCs communicate with UDP messages sent out and received on the interfaces carrying "heartbeat" traffic between the active and standby devices.

The standby E-SBC assumes the active role when:

- It has not received a checkpoint message from the active E-SBC for a certain period of time.
- It determines that the active E-SBC's health score has decreased to an unacceptable level.
- The active E-SBC relinquishes the active role.

To set HA features on the E-SBC:

1. Click Settings in the Main Menu. The following dialog box displays.

Settings
Modify Settings Show advanced

SBC hostname: E-SBC
Description:
Location:
Default gateway IP address: 172.30.0.1
NTP IP address: 0.0.0.0

Logging settings
SNMP settings
SIP settings
Denial of service settings
Communications monitoring probe settings
High availability settings





OK Cancel

2. Click High availability settings to expand the dialog box. The following displays.

High availability settings

Enable high availability:

Name of primary peer: jyangsd51
Name of secondary peer:
ENT phy interface virtual MAC: 02:50:56:a6:07:af
SP phy interface virtual MAC: 22:50:56:a6:07:af

3. In the Enable high availability field, place a check mark in the box to enable HA on the E-SBC.
 **Note:** After checking the Enable high availability box, all remaining fields are enabled for you to edit.
4. In the Name of primary peer field, enter the name of the primary E-SBC peer. Valid values are alpha-numeric characters. Default is <primary peer name>.
 **Note:** This field is automatically populated with the primary peer name that you entered when you ran the Installation Wizard.
5. In the Name of secondary peer field, enter the name of the secondary system you are using for HA purposes to peer with the primary system. Valid values are alpha-numeric characters. Default is blank.
6. In the ENT phy interface virtual MAC field, enter the MAC address of the Enterprise's physical interface on the E-SBC.
 **Note:** This field is automatically populated with the Enterprise's MAC address that was entered when you ran the Installation Wizard.
7. In the SP phy interface virtual MAC field, enter the MAC address of the Service Provider's physical interface on the E-SBC.
 **Note:** This field is automatically populated with the Service Provider's MAC address that was entered when you ran the Installation Wizard.
8. Click OK.

Packet Capture Settings (Advance Configuration only)

The Server and VM Edition support of packet tracing differs from the other Oracle platforms. When enabled, packets are captured that meet specific criteria. The packets are logged into a file in the /opt/traces directory in a PCAP-formatted format as well as being displayed to the ACLI session from which the capture was executed.

You can enable or disable packet capture on the Enterprise Session Director. The default filter uses port 5060 on the specified interface to capture both ingress and egress ICMP traffic. This does not support sending the captured packets off the box in RFC2003 IP in IP format. Therefore the capture-receiver element supported by the other platforms has been removed.

Advanced Settings

An Administrator can configure the following more advanced parameters:

- Enable packet capture
- Capture receiver network interface
- Capture receiver IP address

For more information on these settings, see Initiating Packet Capture in the *Net-Net® Enterprise Session Director Configuration Guide*.

Host Routes

Host routes let you insert entries into the Enterprise Session Director (E-SBC) routing table. These routes affect traffic that originates at the E-SBC host process. Host routes are used primarily for steering management traffic to the correct network.

When traffic is destined for a network that is not explicitly defined on an E-SBC, the default gateway is used. If you try to route traffic to a specific destination that is not accessible through the default gateway, you need to add a host route. Host routes can be thought of as a default gateway override.

Certain SIP configurations require that the default gateway is located on a front media interface. In this scenario, if management applications are located on a network connected to a rear-interface network, you need to add a host route for management connectivity.

When source-based routing is used, the default gateway must exist on a front media interface. Host routes might be needed to reach management applications connected to a wancom port in this kind of situation.

Add a Host Route

Use the following procedure to add a host route to the configuration.

1. From the Main Menu, click **Network > Host routes**.
2. On the Host Route page, click **Add**.
3. In the Add Host Route dialog, do the following.
 - a) **Dest network.** Enter the IPv4 address of the destination network that this host route points toward. Enter the address in dotted decimal format. For example, 192.30.1.104.
 - b) **Netmask.** Select the netmask from the drop-down list associated with the destination network you entered for the Dest network parameter. For example, 255.255.128.0.
 - c) **Gateway.** Enter the gateway for which traffic destined for the address defined in the Dest network parameter, should use as its first hop. Enter the address in dotted decimal format. For example, 192.30.1.1.
 - d) **Description.** Enter a description for this host route. Valid values are alpha-numeric characters. For example, Host Route A.
4. Click **OK** to save the host route.
The host route you created displays in the Host Routes table.
5. Click **Close**.

Security Configuration

Enterprise Session Director (E-SBC) security is designed to provide security for VoIP and other multi-media services. E-SBC security includes access control, DoS attack, and overload protection, which help secure service and protect the network infrastructure. E-SBC security lets legitimate users place a call during attack conditions, protecting the service itself.

Configuration

E-SBC security includes the Net-SAFE framework's numerous features and architecture designs. Net-SAFE is a requirements framework for the components required to provide protection for the E-SBC, the service provider's infrastructure equipment (proxies, gateways, call agents, application servers, and so on), and the service itself.

To configure security in your network, you can configure:

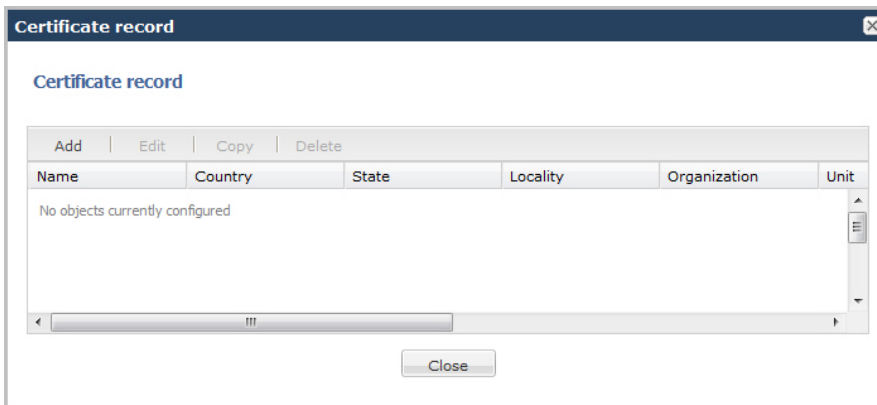
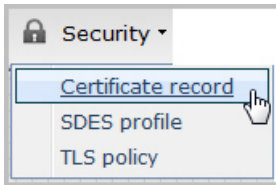
- Certificate record
- SDES Profile (for advanced Administrators only)
- TLS Policy

Adding a Certificate Record

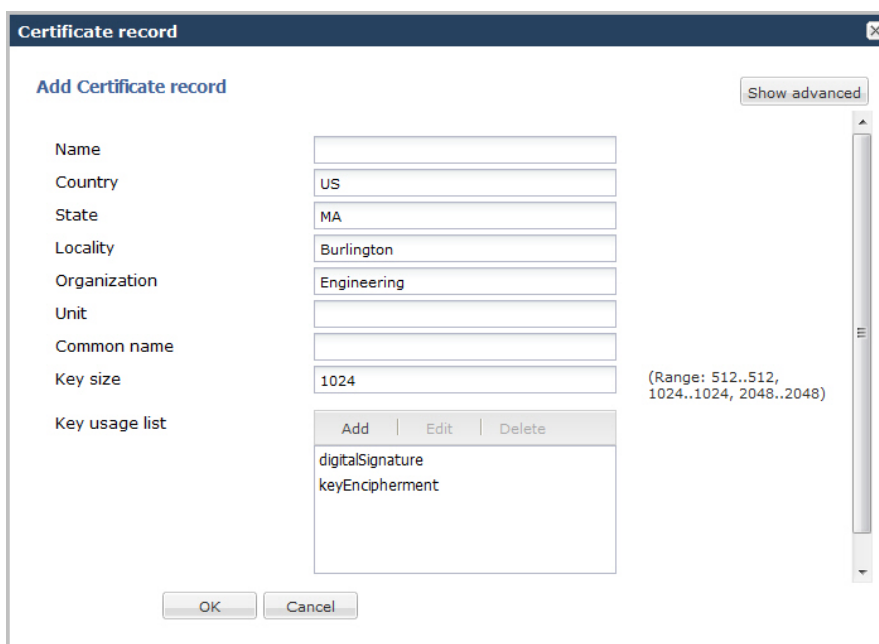
Use the following procedure to add a certificate record to your configuration.

To add a certificate record:

1. From the Main Menu, click **Security > Certificate record**. The following displays.

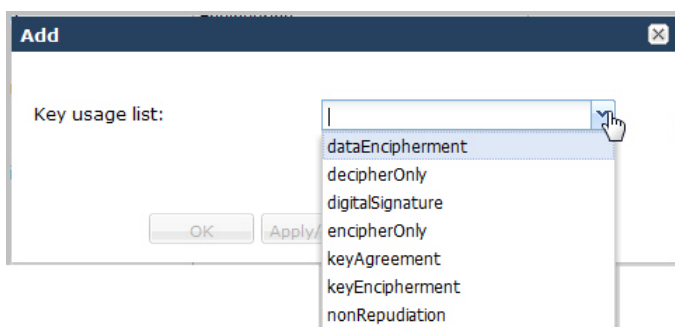


2. Click <Add>. The following dialog box displays.



3. In the Name field, enter a name for the certificate record. For example, acmepacket. Valid values are alpha-numeric characters. Default is blank.
4. In the Country field, enter the name of the country where the certificate is being used. The default is US.
5. In the State field, enter the name of the state where the certificate is being used. The default is MA.
6. In the Locality field, enter the name of the locality within the state where the certificate is being used. Default is Burlington.
7. In the Organization field, enter the name of the organization holding the certificate. The default is Engineering.
8. In the Unit field, enter the name of the unit that is holding the certificate within the organization. Valid values are alpha-numeric characters. Default is blank.
9. In the Common name field, enter a common name for the certificate record. Valid values are alpha-numeric characters. Default is blank.
10. In the Key size field, enter the size of the encrypted key for the certificate. The default is 1024. Valid values are:
 - 512
 - 1024
 - 2048
11. In the Key usage list field, select the usage extensions you want to use with this certificate record. This parameter can be configured with multiple values. Default is a combination of digitalSignature and keyEncipherment.

To add additional usage extensions to the list, click <Add>. The following dialog box displays.



In the Key usage list field, select an additional usage extension(s) to add the key usage list. Valid values are:

- dataEncipherment

Configuration

- decipherOnly
- digitalSignature
- encipherOnly
- keyAgreement
- keyEncipherment
- nonRepudiation

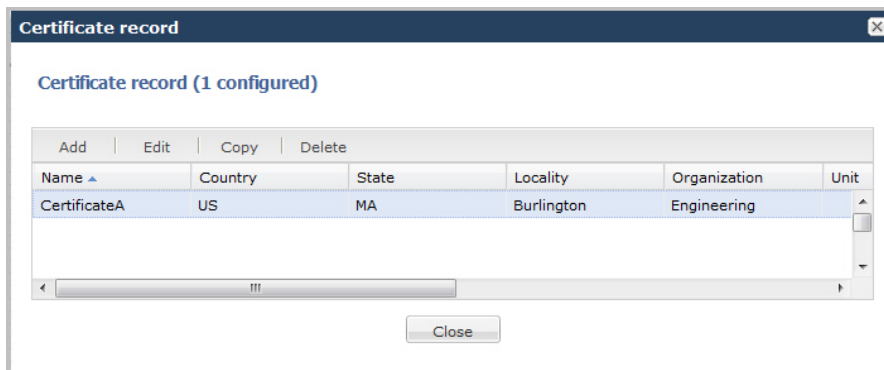


Note: For more information on these usage extensions, see Chapter 18, the section, Key Usage Control, of the *Net-Net® Enterprise Session Director Configuration Guide*.

To add the usage extension to the list and apply another one, click <Apply/Add Another>.

When you have completed adding usage extensions, click <OK>.

12. Click <OK> to save the certificate record. The certificate record you created displays in the Certificate Record table.



13. Click <Close>.

Advanced Settings

An Administrator can configure the following more advanced parameters:

- Alternate name
- Trusted state
- Extended key usage list
- Options

For more information about these settings, see Chapter 18, the section, “Configuring Certificates, in the *Net-Net® Enterprise Session Director Configuration Guide*.

SDES Profile

Session Description Protocol Security Descriptions (SDES) for Media Streams is a way to negotiate the key for Secure Real-time Transport Protocol (SRTP). It provides confidentiality, message authentication, and replay protection for RTP media and control traffic.

Adding a TLS Policy

Transport Layer Security (TLS) is a cryptographic protocol that provides communication security over the Internet. TLS encrypts the segments of network connections at the Application Layer for the Transport Layer, using asymmetric cryptography for key exchange, symmetric encryption for confidentiality and message authentication codes for message integrity.

The TLS policy configuration holds the information required to run SIP over TLS. You can configure an end entity certificate and a trusted certification authority (CA) certificate(s) for a TLS policy. CA certificates are certificates that are issued by a CA to itself or to a second CA for the purpose of creating a defined relationship between the two CAs. A certificate that is issued by a CA to itself is referred to as a trusted root certificate, because it is intended to establish

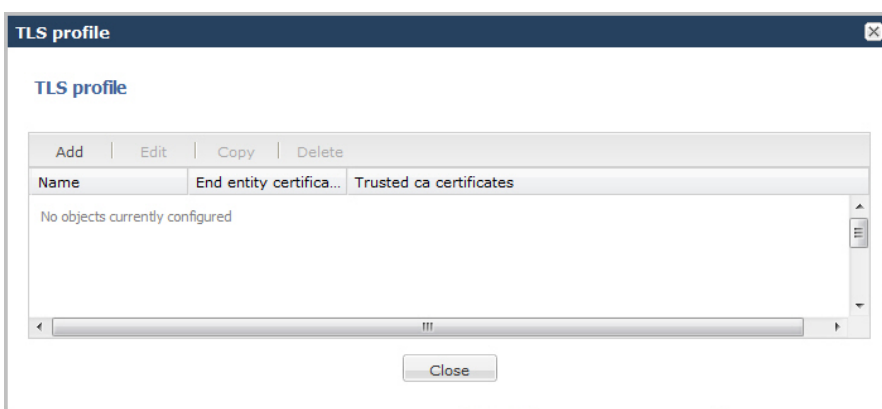
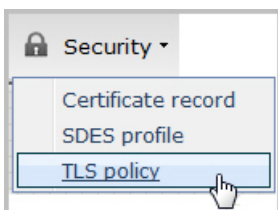
a point of ultimate trust for a CA hierarchy. Once the trusted root has been established, it can be used to authorize subordinate CAs to issue certificates on its behalf.

For more information about TLS, see Chapter 18, the section, Transport Layer Security, in the Net-Net® Enterprise Session Director Configuration Guide.

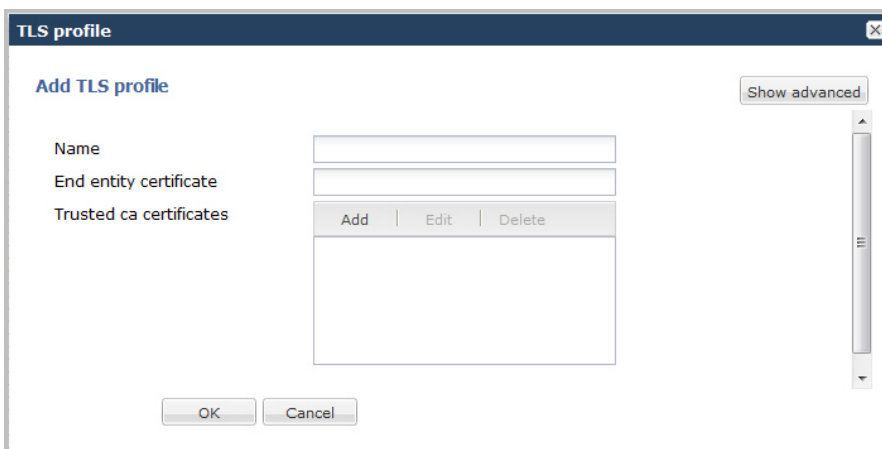
Use the following procedure to add a TLS policy to your configuration.

To add a TLS policy:

1. From the Main Menu, click **Security > TLS policy**. The following displays.



2. Click <Add>. The following dialog box displays.

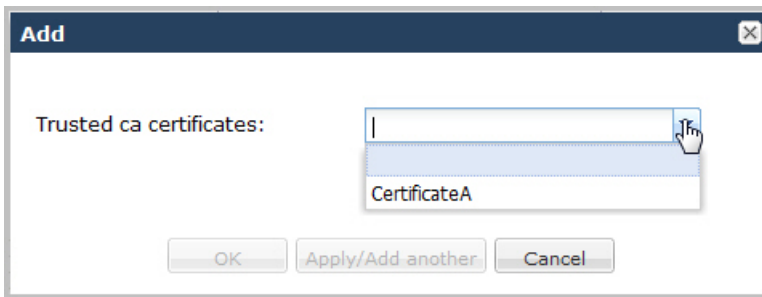


3. In the Name field, enter a name for the TLS profile. For example, TLS1. Valid values are alpha-numeric characters. Default is blank.
4. In the End entity certificate field, enter the name of the entity certification record. Valid values are alpha-numeric characters. Default is blank.
5. In the Trusted ca certificates field, select the names of the trusted CA certificate records.

To add a trusted CA certificate, click <Add>.

The following dialog box displays.

Configuration

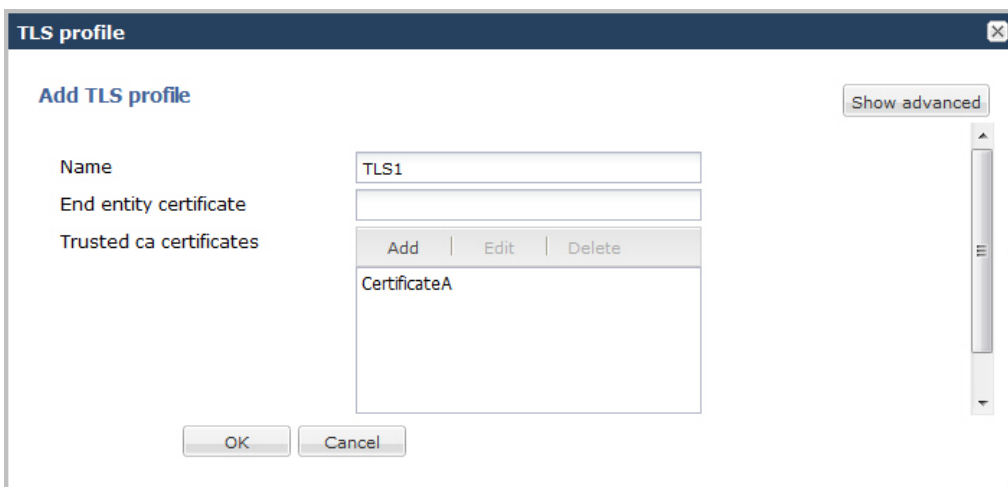


In the Trusted ca certificates field, select the certificate to trust for this TLS profile.

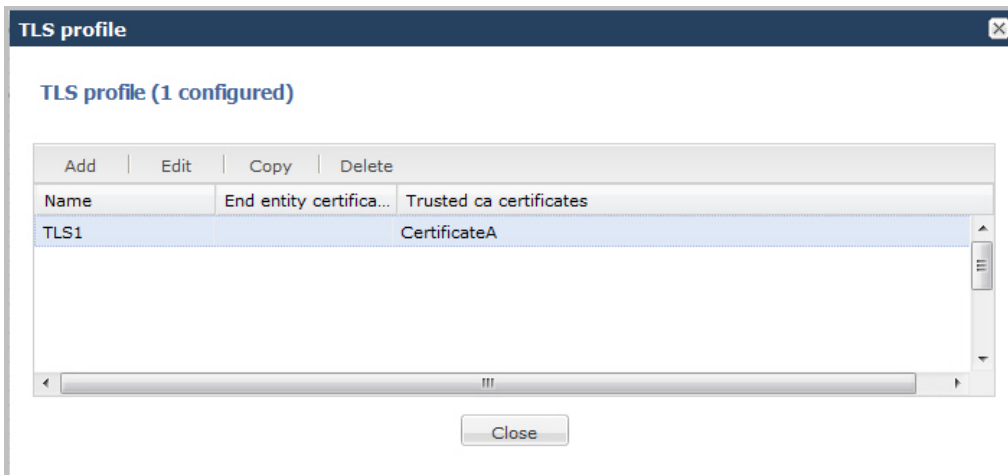
 **Note:** You must add a certificate record to the Net-Net ESD configuration in order to select a value for this field. To add a certificate record, see Adding a Certificate Record.

To add the certificate to the list and apply another one, click <Apply/Add Another>.

When you have completed adding certificates, click <OK>. The following displays.



6. Click <OK>. The profile you created displays in the TLS Profile table.



7. Click <Close>.

Advanced Settings

An Administrator can configure the following more advanced parameters:

- Cipher list
- Verify depth

- Mutual authenticate
- TLS version
- Options
- Certificate status check
- Certificate status profile list
- Enable/disable ignore dead responder

For more information about these settings, see Chapter 18, the section, Transport Layer Security, in the *Net-Net® Enterprise Session Director Configuration Guide*.

Management Settings

Management settings in Basic Mode allow you to configure the following features on the Enterprise Session Director:

- Accounting
- SNMP Community
- Trap Receiver
- Web Server

Accounting Configuration

The Enterprise Session Director (E-SBC) supports RADIUS, an accounting, authentication, and authorization (AAA) system. RADIUS servers are responsible for receiving user connection requests, authenticating users, and returning all configuration information necessary for the client to deliver service to the user.


You can configure the E-SBC to send call accounting information to one or more RADIUS servers. This information can help you to see usage and Quality of Service (QoS) metrics, monitor traffic, and even troubleshoot your system.

For information about how to configure the E-SBC for RADIUS accounting, refer to the *Oracle Communications Session Border Controller Accounting Guide*. The Accounting Guide contains all RADIUS information, as well as information about:

- Accounting for SIP and H.323
- Local CDR storage on the E-SBC, including CSV file format settings
- Ability to send CDRs via FTP to a RADIUS sever (the FTP push feature)
- Per-realm accounting control
- Configurable intermediate period
- RADIUS CDR redundancy
- RADIUS CDR content control

Configuring SNMP Community

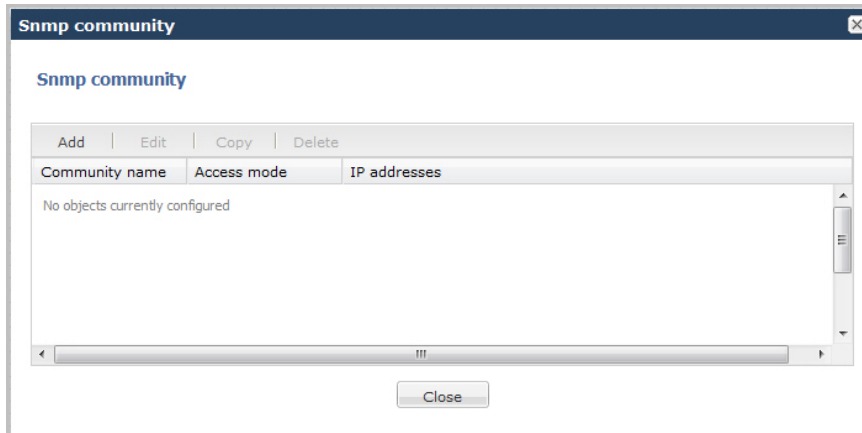
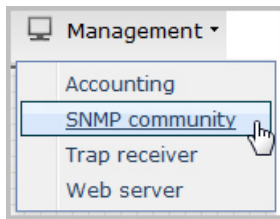
A Simple Network Management Protocol (SNMP) community is a name (string) used as a password by the SNMP manager to communicate with the SNMP agent. The SNMP community string allows access to other devices' statistics. It is used to support monitoring of network-attached devices for conditions that warrant administrative attention. If an SNMP community is configured, the Enterprise Session Director sends the community string along with all SNMP requests.

 **Note:** SNMP community strings are used only by devices which support SNMPv1 and SNMPv2c protocol. SNMPv3 uses username/password authentication, along with an encryption key.

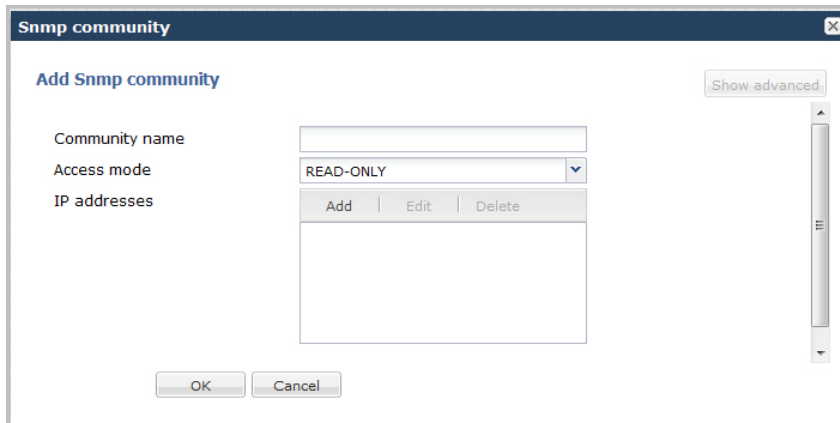
For more information about configuring an SNMP community, see Configuring SNMP, in the *Net-Net® Enterprise Session Director Configuration Guide*.

To configure an SNMP community:

1. From the Main Menu, click **Management > SNMP community**. The following displays.

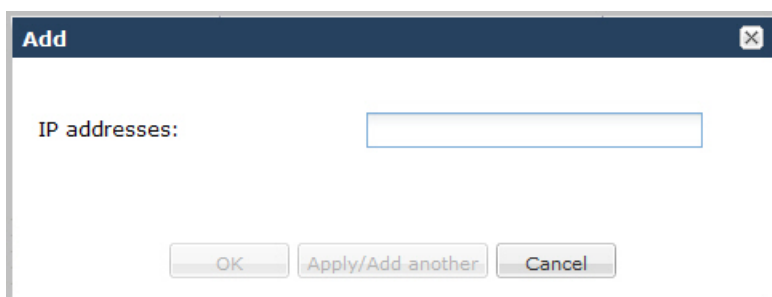


2. Click <Add>. The following dialog box displays.



3. In the Community name field, enter an SNMP community name of an active community where this Enterprise Session Director can send or receive SNMP information. A community name value can also be used as a password to provide authentication, thereby limiting the NMSs that have access to this Net-Net system. With this field, the SNMP agent provides trivial authentication based on the community name that is exchanged in plain text SNMP messages. For example, public. Valid values are alpha-numeric characters. Default is blank.
4. In the Access mode field, enter the access level for all Network Management Systems (NMSs) defined within this SNMP community. The access level determines the permissions that other NMS hosts can wield over this Enterprise Session Director. Default is READ-ONLY. Valid values are:
 - READ-ONLY—allows GET requests.
 - READ-WRITE—allows both GET and SET requests.
5. In the IP addresses field, select one or multiple IPv4 addresses that are valid within this SNMP community. These IPv4 addresses correspond with the IPv4 address of NMS applications that monitor or configure this Enterprise Session Director. Include the IPv4 addresses of all servers where NMSs are installed.

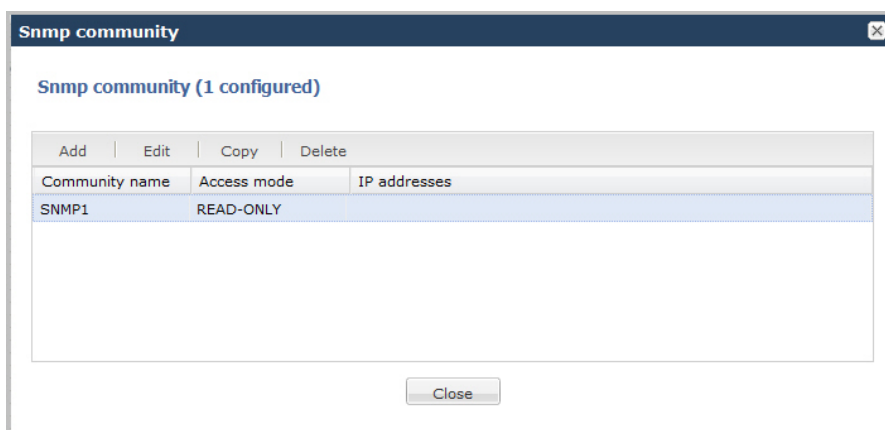
To add an IP address, click <Add>. The following dialog box displays.



In the IP addresses field, enter an IPv4 address that is valid within this SNMP community.

To add the address to the list and apply another one, click <Apply/Add Another>.

When you have completed adding IP addresses, click <OK>. The following displays.



6. Click <Close>.

Configure an SNMP Trap Receiver

You can define one or more SNMP trap receivers on an Enterprise Session Director (E-SBC) for redundancy or to segregate alarms with different severity levels to individual trap receivers.

Before You Begin

- Confirm that SNMP is configured.
- Note the names of users who are allowed to receive secure traps.
- Confirm that the system displays Expert mode.


Oracle recommends that you configure each server with an NMS installed as a trap receiver on each E-SBC managed by an NMS. When configuring the trap-receiver element for use with Network Management Systems, Oracle recommends setting the filter-level parameter to All.

Procedure

1. From the Web GUI, click **Configuration > System > Show advanced > trap-receiver**.
2. On the trap receiver page, click **Add**.
3. On the Add trap receiver page, do the following:

Attributes	Instructions
IP address	Enter the IPv4 address and port number of an authorized NMS in dotted decimal format. Default: 0.0.0.0:162.
Filter level	Select the filter level threshold for the severity level at which a trap is sent to the trap receiver.

Configuration

Attributes	Instructions
Community name	Enter the SNMP community name to which this trap receiver belongs.
User list	Create a list of users allowed to receive secure traps. Click Add , enter the name of a user, and do one of the following: <ul style="list-style-type: none">• Click OK.• Click Apply/Add another, add another user, and click OK. Repeat, as needed. <p> Note: If SNMPv3 is enabled on the E-SBC, but no users are listed for this field, a warning message is sent during the verify-config execution.</p>

4. Click **OK**.
5. Save and activate the configuration.

Configuring a Web Server

The Release E-C[xz]6.4.0 Web server is a software application that helps to deliver Web content that you can access through the Internet. The Web server runs the Enterprise application called the Web GUI.

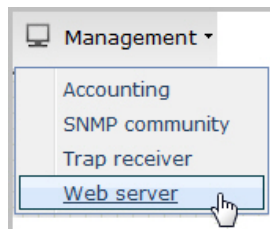
Every Web server has an IP address and sometimes a domain name. For example, if you enter the URL `http://www.acmepacket.com/index.html` in your browser, this sends a request to the Web server whose domain name is `acmepacket.com`. The server then fetches the page named `index.html` and sends it to your browser.

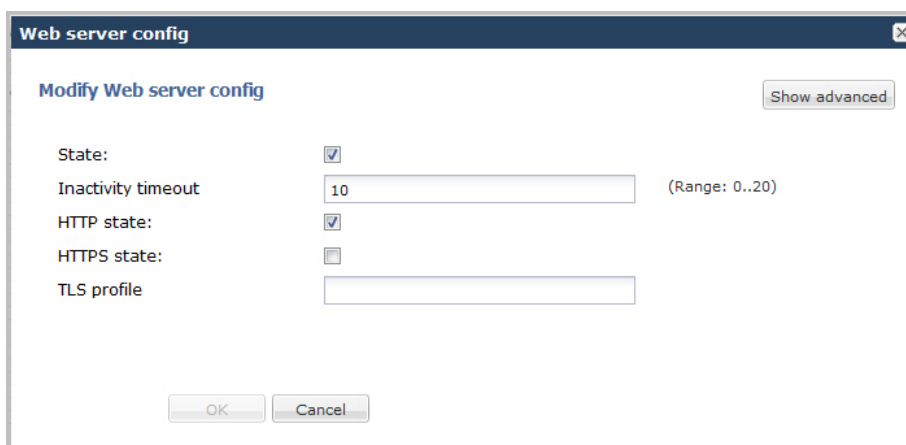
If you enter `http://132.45.6.5`, and this address has been configured by your Administrator to access the Web GUI, the server fetches the page and displays the Web GUI login to your browser.

This section provides a procedure for configuring the Web server in your network. For information about configuring the Web server using TLS, see Chapter 22 of the *Net-Net® Enterprise Session Director Configuration Guide*.


To configure the Web server:

1. From the Main Menu, click **Management > Web server**. The following displays.






2. In the State field, specify whether or not to enable the Web GUI. Default is enabled. A check mark indicates enabled, and a blank box indicates disabled.
3. In the Inactivity timeout field, enter the amount of time, in minutes, that the Web GUI must have remained inactive before it ends the Web session. For example, if this timeout value is set as 5, after 5 minutes of no activity, the Web session disconnects. Default is 10. Valid values are 0 to 20. Zero (0) disables this parameter.

 **Note:** The following HTTP state and HTTPS state parameters may have already been set via the GUI installation wizard on your Enterprise Session Director. You can edit these parameters if required.

4. In the HTTP state field, specify whether or not to enable HTTP for accessing the Web server. Default is enabled. A check mark indicates enabled, and a blank box indicates disabled.
5. In the HTTPS state field, specify whether or not to enable HTTPS (secure connection) for accessing the Web server. Default is disabled. A check mark indicates enabled, and a blank box indicates disabled.
6. In the TLS profile field, enter the Transport Layer Security (TLS) Protocol profile name to use with HTTPS. Valid values are alpha-numeric characters. Default is blank.

 **Note:** To create a TLS profile, see Adding a TLS Policy. If you specify a TLS profile, and HTTP is enabled, the Enterprise Session Director checks against the TLS profile table for a match. If there is no match, the applicable errors display during the verification of the configuration.

7. Click <OK>.

Advanced Settings

An Administrator can configure the following more advanced parameters:

- HTTP Port
- HTTPS Port

For more information about these settings, see Appendix D, Manual Web Server Configuration in the *Net-Net® Enterprise Session Director Configuration Guide*.

Configure Advanced Routing

After adding a one-way or two-way local policy route, you can configure the routes with more advanced parameters from the Web GUI.

In the Advanced Routing dialog, configure the advanced routing parameters that you want and add the corresponding LDAP configuration.

1. Click the Advanced Routing icon on the Enterprise Session Director.
2. In the local-routing-config dialog, click **Add** and **Show Advanced**.
3. In the Add local routing config dialog, do the following:
 - Name. Enter a unique name for the local route table. No spaces.

Configuration

- File name. Enter or select the name for the file from which the database corresponding to this local route table will be created. You should use the .gz format, and the file should be placed in the /code/lrt/ directory.
- Prefix length. Enter a number from 0-999999999.
- String lookup. Optional. Selection.
- Re-target requests. Optional selection.
- Match mode. Select a mode from the drop down list.

4. Click **OK**.

5. Click **Close**.

Configure LDAP.

Ldap-config Tab

1. In the Name field, enter a name to assign to this LDAP configuration. This is a unique identifier. Valid values are alpha-numeric characters. Default is blank.
2. In the State field, specify whether or not to enable the operational state of the LDAP configuration. When the state is disabled, ESD does not attempt to establish any connection with the corresponding LDAP Server(s). Default is enabled.
3. In the ldap-servers field, click <Add> and enter the IP address(es) and optionally the port number(s) for each LDAP Server(s) you want to add to the LDAP configuration. When more than one server is specified, each server address should be separated by a space and the list enclosed within parentheses. The first server listed is considered the primary LDAP Server, and the remaining servers are considered the secondary LDAP Servers. The HUNT strategy is used to determine the active LDAP Server (where the ESD selects the first LDAP Server; if unreachable, it selects the second LDAP Server; if that is unreachable, it selects the third LDAP Server, etc.). Default ports used are 389 (for LDAP over TCP) and 636 (LDAP over TLS). IP Address must be entered in dotted decimal format (0.0.0.0). Default is blank.
4. In the SIP Interface field, select the SIP interface from the list that issues an LDAP query. This list contains all of the current SIP interfaces configured on the Enterprise Session Director. Default values are:

- Default ENT - Default Enterprise SIP interface
- Default SP - Default Service Provider SIP interface

5. In the Authentication mode field, select the authentication mode to use in the LDAP bind request. Default is Simple. Valid value is:

- Simple (default) - No specific password encryption is done when sending the bind request. You can use an LDAPS connection with the LDAP Server to maintain security (see ldap-sec-type).

6. In the Username field, enter the username that the LDAP bind request uses for authentication before access is granted to the LDAP Server. Valid values are alpha-numeric characters. Default is blank.
7. In the Password field, click <Set>. Then enter the password to be paired with the username attribute, that the LDAP bind request uses for authentication before access is granted to the LDAP Server. Valid values are alpha-numeric characters. Default is blank.
8. In the Confirm password field, re-enter the password you specified in Step 7, and click <OK>.
9. In the Ldap search base field, enter the base Directory Number you can use for LDAP search requests. Valid values are alpha-numeric characters. Default is blank. For example, cn=users, dc=englab, dc=acmepacket, dc=com.

Configure LDAP-transactions

You use the LDAP transactions to configure the application transaction type for LDAP, determine route priority in the route list, and configure the LDAP configuration attributes. You configure this object for LDAP search queries in call routing.

To configure LDAP transactions:

1. In the ldap-transactions sections, click <Add>.

2. In the App trans type field, select the application transaction type to use for LDAP. This value allows the Enterprise Session Director (E-SBC) to add call routing updates to the Active Directory. Default is ad-call-routing. Valid value is:
 - ad-call-routing (default)
3. In the Route mode field, select the route priority that the E-SBC uses in the route list. This parameter determines which routes are created, and the priority of those routes within the route list. Default is exact-match-only. Valid values are:
 - exact-match-only (default) - If there is an exact match between the dialed telephone number and an LDAP attribute value in the search response entry, a route is created corresponding to that LDAP attribute. If there is an exact match on multiple attributes, the ordering of LDAP attributes in the LDAP configuration determines the priority for each route. For example, an enterprise that uses the same phone number for both Lync and IP-PBX phones, if the msRTCSIP-Line attribute is configured first, the corresponding next hop (Lync Server) would be used to create the first route in the route list.
 - attribute-order-only - The ordering of LDAP attributes in the LDAP configuration determines the priority for each route. So if the msRTCSIP-Line attribute is configured first, the corresponding next hop (Lync Server) would be used to create the first route in the route list. If there is a valid value present in the search response entry for a LDAP attribute, a route is created corresponding to that LDAP attribute. Note: The LDAP attribute must have a valid value in the response; a match is not necessary for that attribute. If an entry is returned in the search response, there must be a match on at least one other attribute. For example, the dialed telephone number could be +17813284392 (IP-PBX Phone#), and the msRTCSIP-Line in the response could be +17814307069 (Lync phone#). A route is created for the Lync phone#, even though the dialed telephone number is the PBX Phone#.
 - exact-match-first - If there is an exact match between the dialed telephone number and an LDAP attribute value in the search response entry, the corresponding route gets the highest priority in the route list. For the rest of the routes, the ordering of LDAP attributes in the LDAP configuration determines the priority for each route. So if the msRTCSIP-Line attribute is configured first, the corresponding next hop (Lync Server) would be used to create the second highest priority route in the route list. If there is a valid value present in the search response entry for an LDAP attribute, a route is created corresponding to that LDAP attribute. Note: The LDAP attribute must have a valid value in the response; a match is not necessary for that attribute. If an entry is returned in the search response, there must be a match on at least one other attribute. For example, the dialed telephone number could be +17813284392 (IP-PBX Phone#), and the msRTCSIP-Line in the response could be +17814307069 (Lync phone#). A route is created for the Lync phone#, even though the dialed telephone number is the PBX Phone#.

Configure LDAP-config Attributes

You use the LDAP config attributes object to configure the Active Directory attribute name, next hop for routing SIP requests, the realm for the next hop, a regular expression pattern, and a format for the attribute value. You configure this object for LDAP search queries in the Active Directory.

To configure LDAP config attributes:

1. In the ldap-cfg-attributes section, click <Add>.
2. In the Name field, enter the Active Directory attribute name. Default is blank. Valid values are alpha-numeric characters. Some examples of Active Directory attribute names are:
 - ipPhone and msRTCSIP-Line for Lync phone number
 - telephoneNumber for IP PBX phone number
 - mobile for Mobile phone number
3. In the Next hop field, enter the Active Directory's next hop when routing SIP requests. Default is blank. Valid values are alpha-numeric characters. Some examples of the Active Directory's next hop are:
 - SAG (Session Agent Group) name, specified by entering an sag: prefix
 - SA (Session Agent) name
 - IP Address

Configuration

4. In the SIP interface field, select the name of the SIP interface associated with the next hop. This value determines the network interface to which to route the SIP request. This list contains all of the current SIP interfaces configured on the Enterprise Session Director. Default values are:
 - Default ENT - Default Enterprise SIP interface
 - Default SP - Default Service Provider SIP interface
5. In the Extraction regex field, enter the regular expression pattern used to break down the string of digits in the phone number extracted from the request URI of the SIP request. The variables extracted from the phone number can be used in the attribute-value-format parameter. The default regex is "`^\+?1?(\d{2})(\d{3})(\d{4})$`". This value assumes that the phone number is a North American phone number specified in the E.164 format. It extracts three variables from the phone number:
 - \$1 is the area code
 - \$2 and \$3 are the next 3 and 4 digits in the phone numberValid values are alpha-numeric characters.
6. In the Value format field, enter the format for the attribute value. These format values are extracted from the phone number using the extraction-regex parameter. The default parameter is "`tel:+1$1$2$3`". This value assumes that the phone number is a North American phone number specified in the E.164 format, and it recreates the phone number in E.164 format.

In addition to the E.164 format, Oracle's Active Directory uses other formats as well to store the phone numbers. You can customize the value specified for this parameter to enable successful queries for phone numbers in other formats.

Valid values are alpha-numeric characters.
7. Click <OK>.
8. Save and activate the configuration.

Additional Features

Using the Web GUI, an Administrator can perform configuration on other features on the Enterprise Session Director. These features include:

- Configuring Media Profile
- Configuring Translation Rules
- Configuring SIP Features
- Configuring SIP Manipulations (including Multipurpose Internet Mail Extensions (MIME), ISDN User Part (ISUP) and Session Description Protocol (SDP) rules)
- Adding an SPL

This section provides procedures for configuring each of these features.


Configure Media Profile

A Media Profile is a group of parameters that the Enterprise Session Director uses as a rule when sending/receiving media over the network. You can configure the following parameters for a Media Profile:

- Name
- Subname
- Payload type
- Transport

1. From the Main Menu, click **Other > Media profile**
2. Click <Add>.
3. In the Name field, enter the name for this media profile. For example, you might set the name of the media profile as PCMU. Valid values are alpha-numeric characters. Default is blank.
4. In the Subname field, enter the subname for this media profile. Valid values are alpha-numeric characters. You must use a combination of alpha and numeric characters. Default is blank.

- In the Payload type field, enter the payload type number that corresponds to the encoding name you entered in Step 3. This value identifies the format in the SDP media lines. Valid values are alpha-numeric characters. Default is blank.

 **Note:** The Payload type value must be numeric if you use the RTP/AVP transport method.

The following is a table of standard audio and visual payload encodings defined in H. Schulzrinne, GND Fokus, RTP Profile for Audio and Visual Conferences with Minimal Control, RFC 1890, and in the RTP Parameters document in IANA's Directory of Generally Assigned Numbers.

Payload Type	Encoding Name	Audio (A)/Visual (V)	Clock Rate (Hz)
0	PCMU	A	8000
1	1016	A	8000
2	G721	A	8000
3	GSM	A	8000
4	G723	A	8000
5	DVI4	A	8000
6	DVI4	A	16000
7	LPC	A	8000
8	PCMA	A	8000
9	G722	A	8000
10	L16	A	44100
11	L16	A	44100
12	QCELP	A	8000
13	reserved	A	
14	MPA	A	90000
15	G728	A	8000
16	DVI4	A	11025
17	DVI4	A	22050
18	G729	A	8000
19	reserved	A	
20	unassigned	A	
21	unassigned	A	
22	unassigned	A	
23	unassigned	A	
dyn	GSM-HR	A	8000
dyn	GSM-EFR	A	8000
dyn	L8	A	var.
dyn	RED	A	

Configuration

Payload Type	Encoding Name	Audio (A)/Visual (V)	Clock Rate (Hz)
dyn	VDVI	A	var.
24	unassigned	V	
25	CeIB	V	90000
26	JPEG	V	90000
27	unassigned	V	
28	nv	V	90000
29	unassigned	V	
30	unassigned	V	
31	H261	V	90000
32	MPV	V	90000
33	MP2T	AV	90000
34	H263	V	90000
35-71	unassigned	?	
72-76	reserved for RTCP conflict avoidance	N/A	N/A
77-95	unassigned	?	
96-127	dynamic	?	
dyn	BT656	V	90000
dyn	H263-1998	V	90000
dyn	MP1S	V	90000
dyn	MP2P	V	90000
dyn	BMPEG	V	90000

6. In the Transport field, enter the type of transport protocol to specify in the Media Profile. Default is RTP/AVP. Valid values are:

- RTP/AVP
- UDP

7. Click <OK>.

8. Click <Close>.

Advanced Settings

An Administrator can configure the following more advanced parameters:

- Media type
- Required bandwidth
- Frames per packet
- Parameters

Configure Translation Rules

Enterprise Session Director number translation is used to change a layer-5 endpoint name according to prescribed rules. Number translations can be performed on both the inbound and the outbound call legs independently, before and after routing occurs.

Number translation is used for SIP, H.323, and SIP/H.323 interworking configurations. Number translation takes place twice for both H.323 and SIP calls. The first number translation is applied to the incoming leg of the call, before the outgoing route is selected. The second number translation is applied to the outgoing leg of the call after the outgoing route is selected.

Number translation can be used to strip address prefixes added by external gateways. It can also be used to add a string tag to an address in order to implement a local policy routing scheme, and then remove the tag upon egress from the Net- Net ESD. The most common use of number translation is to add or remove a “1” or a + from a phone number sent from or addressed to a device.

To configure a Translation Rules:

1. From the Main Menu, click **Other** > **Translation** rules.
The Translation rules table displays the default translation rules for the Enterprise Session Director. You can select a rule to edit or add a new rule as required.
2. To add new rules, click <Add>.
3. In the Id field, enter a descriptive ID name for this translation rule. Valid values are alpha-numeric characters. Default is blank.
4. In the Type field, select the type of translation rule you want to configure. Default is none. Valid values are:
 - add—Adds a character or string of characters to the address
 - delete—Deletes a character or string of characters from the address
 - none—Translation rule is disabled
 - replace—Replaces a character or string of characters within the address
5. In the Add string field, enter the string to be added during address translation to the original address. The value in this field should always be a real value; i.e., this field should not be populated with at-signs (@) or dollar-signs (\$). Valid values are alpha-numeric characters. Default is blank.
6. In the Delete string field, enter the string to be deleted from the original address during address translation. Unspecified characters are denoted by the at-sign symbol (@). Valid values are alpha-numeric characters. Default is blank.



Note: The @ character only works if the type parameter is set to delete. This parameter supports wildcard characters or digits only. For example, valid entries are: delete-string=@@@@, or delete-string=123456. An invalid entry is delete-string=123@@@.

When the type is set to replace, this value is used in conjunction with the add-string value. The value specified in the delete-string field is deleted and the value specified in the add-string field is inserted. If no value is specified in the delete-string parameter and the type field is set to replace, then nothing is inserted into the address.

7. Click <OK>.
8. Click <Close>.

Advanced Settings

An Administrator can configure the following more advanced parameters:

- Add Index
- Delete Index

Configure SIP Features

SIP extensions that require specific behavior by UAs or proxies are identified by option tags. Option tags are unique identifiers used to designate new options (for example, extensions) in SIP. These option tags appear in the Require, Proxy-Require, and Supported headers of SIP messages.

Configuration

Option tags are compatibility mechanisms for extensions and are used in header fields such as Require, Supported, Proxy-Require, and Unsupported in support of SIP.

The option tag itself is a string that is associated with a particular SIP option (i.e., an extension). It identifies this option to SIP endpoints.

You configure the SIP feature element to define option tag names and their treatment by the Enterprise Session Director when the option tag appears in a Supported header, a Require header, and a Proxy-Require header. If an option tag is encountered that is not configured as a SIP feature, the default treatments apply. You only need to configure option tag handling in the SIP feature element when non-default treatment is required.

For more information about configuring a SIP Options Tag, see the section, SIP Options Tag Handling in the Net-Net[®] Enterprise Session Director Configuration Guide.

To configure a SIP Options Tag:

1. From the Main Menu, click **Other** > **SIP features**.
2. Click <Add>.
3. In the Name field, enter a name for the option tag that appears in the Require, Supported, or Proxy-Require headers of inbound and outbound SIP messages. You must enter a unique value. Valid values are alpha-numeric characters. Default is blank.



Note: Valid option tags are registered with the IANA Protocol Number Assignment Services under Session Initiation Protocol Parameters. Because option tags are not registered until the SIP extension is published as a RFC, there might be implementations based on Internet-Drafts or proprietary implementations that use unregistered option tags.

4. In the SIP interface field, select the SIP interface for which to apply this SIP feature. Default is blank. Valid values are:

- DefaultENT—Default Enterprise SIP interface.
- DefaultSP—Default Service Provider SIP interface.



Note: The drop-down list for the SIP interface field may contain other SIP interfaces if they have been configured in your network.

5. In the Require mode inbound field, select the require proxy mode to define how the option tag is treated when encountered in an incoming SIP message's Proxy-Require header. Default is reject. Valid values are:
 - pass—Indicates the Back-to-Back User Agent (B2BUA) should include the tag in the corresponding outgoing message.
 - reject—Indicates the B2BUA should reject the request with a 420 (Bad Extension) response. The option tag is included in an Unsupported header in the reject response.
6. In the Require mode outbound field, select the require mode to define how the option tag is treated when it is encountered in an outbound SIP message's Require header. The default value is reject. Valid values are:
 - pass—Indicates the B2BUA should include the tag.
 - reject—Indicates the B2BUA should reject the request with a 420 (Bad Extension) response. The option tag is included in an Unsupported header in the reject response.
7. Click <OK>.
8. Click <Close>.

Advanced Settings

An Administrator can configure the following more advanced parameters:

- Support mode inbound
- Proxy require mode inbound
- Support mode outbound
- Proxy required mode outbound

Configure SIP Manipulations

SIP Header Manipulation provides the flexibility to add, remove, or modify any attribute in a SIP message on the Enterprise Session Director (E-SBC). The most common reason for doing this is to fix an incompatibility problem between two SIP endpoints. This could range from anything such as Softswitch/PSTN incompatibility or an issue between two different IP PBX platforms in a multi-site Enterprise where calls between them fail due to issues in the SIP messaging.

The SIP header and parameter manipulation feature allows you to add, modify, and delete SIP headers and parts of SIP headers called SIP header elements. SIP header elements are the different subparts of the header, such as the header value, header parameter, URI parameter and so on (excluding the header name).

To enable the SIP header and parameter manipulation functionality, you create header manipulation rule sets in which you specify header manipulation rules, as well as optional header element rules that operate on specified header elements. You then apply the header manipulation ruleset as inbound or outbound for a session agent or SIP interface.

Header manipulation rules operate on the header you specify when you configure the rule. A header manipulation rule can also be configured with a list of element rules, each of which would specify the actions you want performed for a given element of this header.

Header element rules perform operations on the elements of a header. Header elements include all subparts of a header; excluding the header name. For example, header value, header parameter, URI parameter, and so on.

1. From the Main Menu, click **Other > SIP manipulation**.

The SIP manipulation table displays the default header manipulation rules for the E-SBC. You can select a rule to edit or add a new rule as required.

2. To add a new rule, click <Add>. The following dialog box displays.
3. In the Name field, enter the name of the header to which this rule applies. The name you enter here must match a header name. This is a case-insensitive string that is compared to the header name for matching. You need to create a rule using the long form of the header name and a rule using the compact form of the header name. Valid values are alpha-numeric characters. Default is blank.



Note: The Request-URI header is identified as request-uri.

4. In the Description field, enter a description for this header manipulation rule. Valid values are alpha-numeric characters. Default is blank.

Specify Split Headers

In the Split headers field, enter the elements of the message header that you want the Enterprise Session Director to split.

Click <Add>.

In the Split headers field, enter the header element you want to split. For example, \$LOCAL_IP.

To add the element to the list and apply another one, click <Apply/Add Another>.

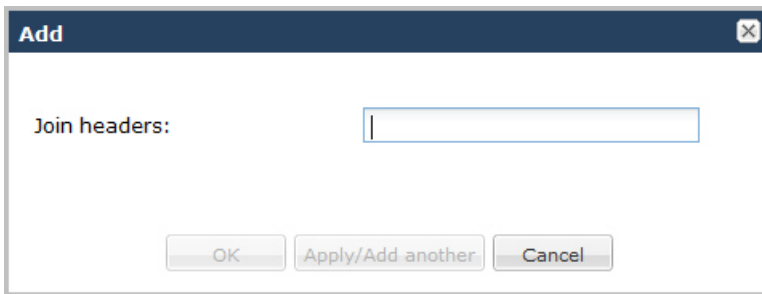
When you have completed adding header elements to the Split header list, click <OK>.

Specify Join Headers

In the Join headers field, enter the header element you want the Enterprise Session Director to join.

Click <Add>. The following displays.

Configuration

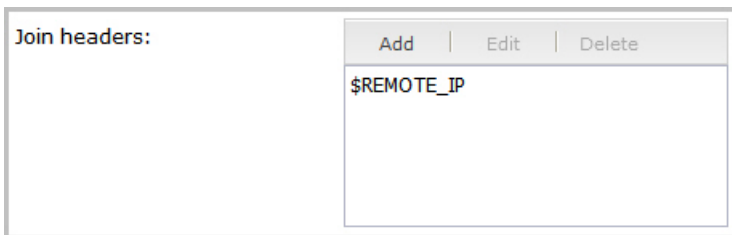


The 'Add' dialog box features a title bar with a close button. Below the title bar is a label 'Join headers:' followed by an empty text input field. At the bottom of the dialog are three buttons: 'OK', 'Apply/Add another', and 'Cancel'.

In the Join headers field, enter the header element you want to join. For example, \$REMOTE_IP.

To add the element to the list and apply another one, click <Apply/Add Another>.

When you have completed adding header elements to the Join header list, click <OK>. The following displays.



The 'Join headers' configuration window shows a list of headers. The list contains one entry: '\$REMOTE_IP'. Above the list is a toolbar with three buttons: 'Add', 'Edit', and 'Delete'.


Specify Configuration Rule

1. In the cfgRules field, enter the rule to use in the Enterprise Session Director configuration. These rules use the “Split” and Join headers you specified above.
2. Click <Add>, and select header-rule from the drop-down list. The following displays.



The 'cfgRules' field has an 'Add' dropdown menu open. The menu items are: 'header-rule', 'mime-rule', 'mime-isup-rule', and 'mime-sdp-rule'. A mouse cursor is pointing at the 'header-rule' option.

3. In the Name field, enter a name you want to use for this rule set. Valid values are alpha-numeric characters. Default is blank.
4. In the Header name field, enter the name of the header to which this rule applies. The name you enter here must match a header name. This is a case-insensitive string that is compared to the header name for matching. You need to create a rule using the long form of the header name and a rule using the compact form of the header name. Valid values are alpha-numeric characters. Default is blank.

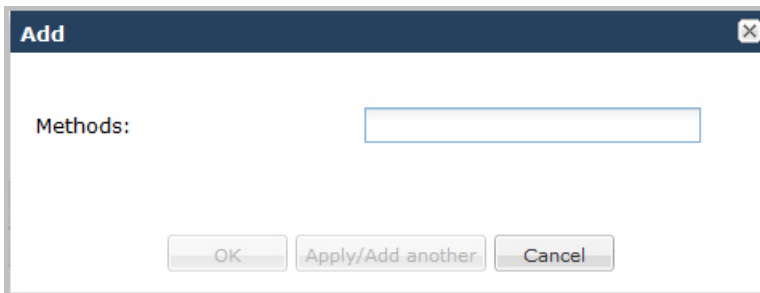
 **Note:** The Request-URI header is identified as request-uri.

5. In the Action field, select an action you want applied to the header specified in the Name parameter. Default is none. Valid values are:
 - add—Adds a new header, if that header does not already exist.
 - delete—Deletes the header, if it exists.
 - find-replace-all—Finds all matching headers and replaces it with the header you specified for “Split” and Join.
 - log—Logs the header.
 - manipulate—Manipulates the elements of this header to the element rules configured.
 - monitor—Monitors the header.
 - store—Stores the header.
 - none—(default) No action is taken.
 - reject—Rejects the header.
 - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
 - store—Stores the header.
6. In the Comparison type field, select the way that you want SIP headers to be compared. This choice dictates how the Enterprise Session Director processes the match rules against the SIP header. Default is case-sensitive. Valid values are:
 - boolean—Header is compared to header rule and must match exactly or it is rejected.
 - case-insensitive—Header is compared to header rule regardless of the case of the header.


Configuration

- case-sensitive—(default) Header is compared to the header rule and case must be exactly the same or it is rejected.
 - pattern-rule—Header is compared to the header rule and the pattern must be exactly the same or it is rejected.
 - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
 - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
7. In the Msg type field, select the message type to which this header rule applies. Default is any. Valid values are:
- any—(default) Requests, replies, and out-of-dialog messages
 - out-of-dialog—Out of dialog messages only.
 - reply—Reply messages only
 - request—Request messages only
8. In the Methods field, specify the SIP method names to which you want to apply this header rule.

Click <Add>. The following displays.

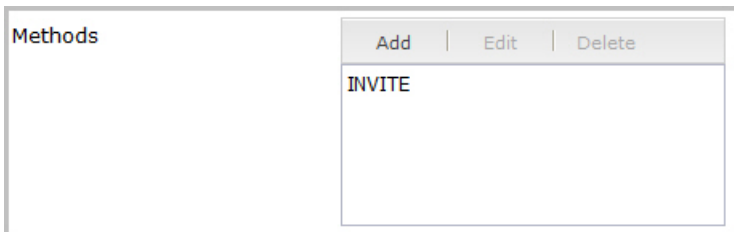


In the Methods field, enter SIP method names to which you want to apply this header rule. For example, INVITE, ACK, BYE.

 **Note:** This field is empty by default. If you leave the method field empty, the header rule applies to all methods.

To add the method to the list and apply another one, click <Apply/Add Another>.

When you have completed adding methods, click <OK>. The following displays.



9. In the Match value field, enter the value you want to match against the element value for an action to be performed.
10. In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
- Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.
- For example:
- ```
sip:?"+$STRUNK_GROUP+?".STRUNK_GROUP_CONTEXT
```
- Pre-defined parameters always start with a \$. The following table describes the pre-defined parameters.

Pre-defined Parameters Table

| Parameter             | Description                                                                                                                       |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| \$ORIGINAL            | Original value of the element is used.                                                                                            |
| \$LOCAL_IP            | IP address of the SIP interface on which the message was received for inbound manipulation; or sent on for outbound manipulation. |
| \$REMOTE_IP           | IP address the message was received from for inbound manipulation; or being sent to for outbound manipulation.                    |
| \$REMOTE_VIA_HOST     | Host from the top Via header of the message is used.                                                                              |
| \$TRUNK_GROUP         | Trunk group is used.                                                                                                              |
| \$TRUNK_GROUP_CONTEXT | Trunk group context is used.                                                                                                      |

The following table describes the Operators.

Operators Table

| Operator | Description                                                                        |
|----------|------------------------------------------------------------------------------------|
| +        | Append the value to the end. For example:<br>acme"+"packet<br>generates acmepacket |
| +^       | Prepends the value. For example:<br>acme"+"^"packet<br>generates packetacme        |
| -        | Subtract at the end. For example:<br>112311"-11<br>generates 1123                  |
| _ ^      | Subtract at the beginning. For example:<br>112311"-^"11<br>generates 2311          |

Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```

### Specify Element Rule

Header element rules perform operations on the elements of a header. Header elements include all subparts of a header; excluding the header name. For example, header value, header parameter, URI parameter, and so on.

1. In the cfgRules field, click <Add>, and then select element-rule from the drop-down list. This allows you to define the element rules you want to use to be performed on the elements of the header specified by the header rule. The following dialog box displays.



2. In the Name field, enter the name of the element to which this rule applies. Valid values are alpha-numeric characters. Default is blank.
3. In the Parameter name field, enter the parameter name to which this rule applies. The parameter name depends on the element name you entered in step 2. For uri-param, uri-user-param, and header-param it is the parameter name to be added, replaced, or deleted. For all other types, it serves to identify the element rule and any name can be used. Valid values are alpha-numeric characters. Default is blank.
4. In the Type field, select the type of element on which to perform the action. Default is blank. Valid values are:
  - header-param—Perform the action on the parameter portion of the header.
  - header-param-name—Perform the action on the header parameter name.
  - header-value—Perform the action on the header value.
  - mime—Perform the action on Multipurpose Internet Mail Extensions (MIME).
  - reason-phrase—Perform the action on reason phrases.
  - status-code—Perform the action on status codes.
  - teluri-param—Perform the action on a SIP telephone Uniform Resource Identifier (URI).
  - uri-display—Perform the action on the display of the SIP URI.
  - uri-header—Perform the action on a header included in a request constructed from the URI.
  - uri-header-name—Perform the action on a SIP URI header name.
  - uri-host—Perform the action on a Host portion of the SIP URI.
  - uri-param—Perform the action on the parameter included in the SIP URI.
  - uri-param-name—Perform the action on the name parameter of the SIP URI.
  - uri-phone-number-only—Perform the action on a SIP URI phone number only.
  - uri-port—Perform the action on the port number portion of the SIP URI.
  - uri-user—Perform the action on the user portion of the SIP URI.
  - uri-user-only—Perform the action on the user portion only of the SIP URI.
  - uri-user-param—Perform the action on the user parameter of the SIP URI.
5. In the Action field, enter the action you want applied to the element specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.
  - delete-element—Deletes the element, if it exists.
  - delete-header—Delete the header where this element exists.

- find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - replace—Replaces the element
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.
6. In the Match val type field, select the type of value that needs to be matched to the match-field entry for the action to be performed. Default is any. Valid values are:
- any—(default) Element value in the SIP message is compared with the match-value field entry. If the match-value field is empty, all values are considered a match.
  - fqdn—Element value in the SIP message must be a valid FQDN to be compared to the match-value field entry. If the match-value field is empty, any valid FQDN is considered a match. If the element value is not a valid FQDN, it is not considered a match.
  - ip—Element value in the SIP message must be a valid IP address to be compared to the match-value field entry. If the match-value field is empty, any valid IP address is considered a match. If the element value is not a valid IP address, it is not considered a match.
7. In the Comparison type field, select the way that you want SIP elements to be compared. This choice dictates how the Enterprise Session Director processes the match rules against the SIP header. Default is case-sensitive. Valid values are:
- boolean—Header is compared to header rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to header rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the header rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the header rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
8. In the Match value field, enter the value you want to match against the element value for an action to be performed.
9. In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
- Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.

For example:

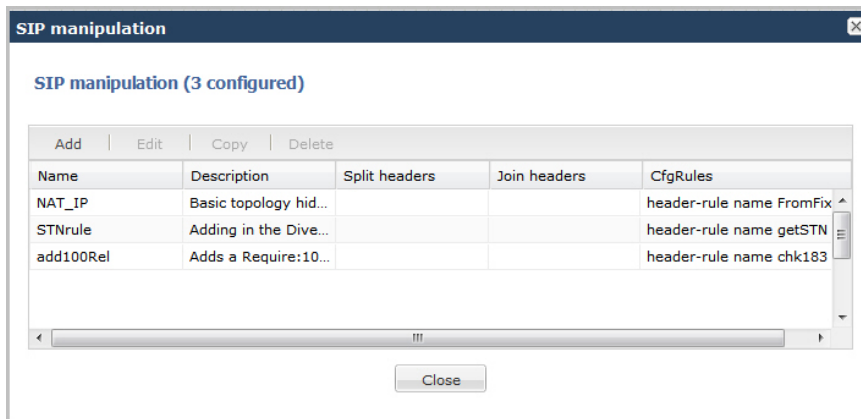
```
sip:~+$STRUNK_GROUP+~$.STRUNK_GROUP_CONTEXT
```

- Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
- Operators parameters - For valid values, see the Operators Table.

Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```

10. Click <OK>. The Header Rule dialog box displays.



11. Click <Close>.

### Configuring MIME Rules

Using the SIP Head Manipulation Rule (HMR) feature set, you can manipulate Multipurpose Internet Mail Extensions (MIME) types in SIP message bodies. While you can manipulate the body of SIP messages or a specific content type using other iterations of SIP HMR, this version gives you the power to change the MIME attachment of a specific type within the body by using regular expressions.

To achieve this, you use the find-replace-all action type, which enables the search for a particular string and the replacement of all matches for that type. Although you use find-replace-all to manipulate MIME attachments, it can also be used to achieve other goals in SIP HMR. Note that using find-replace-all might consume more system resources than other HMR types. Therefore this powerful action type should only be used when another type cannot perform the type of manipulation you require.

For more information about configuring MIME rules, see the section, MIME Support in the *Net-Ner® Enterprise Session Director Configuration Guide*.

To configure MIME rules:

1. After adding a new SIP manipulation rule, go to the SIP Manipulation dialog box.

**SIP manipulation** [X]

**Modify SIP manipulation** Show advanced

Name:

Description:

Split headers: Add | Edit | Delete

Join headers: Add | Edit | Delete

**cfgRules**

| Name        | Element type |
|-------------|--------------|
| FromFix     | header-rule  |
| ToFix       | header-rule  |
| PAIFix      | header-rule  |
| HeaderRule1 | header-rule  |

OK Cancel

- In the cfgrules field, click <Add> and select mime-rules from the drop-down list. This allows you to specify mime rules for the header rules you configured. The following dialog box displays.

**cfgRules**


Add ▾

- header-rule
- mime-rule**
- mime-isup-rule
- mime-sdp-rule

3. In the Name field, enter a name you want to use for this MIME rule. Valid values are alpha-numeric characters. Default is blank.
4. In the Content type field, enter the content type of the MIME. For example, application/sipfrag or application/sdp. This value is the content type that the Enterprise Session Director looks for in the MIME. Valid values are alpha-numeric characters. Default is blank.
5. In the Msg type field, specify the type of message to which this MIME rule applies. Default is any. Valid values are:
  - any—Both Requests and Reply messages
  - out-of-dialog—Out of dialog messages only.
  - reply—Reply messages only
  - request—Request messages only
6. In the Methods field, specify the SIP method names to which you want to apply this MIME rule.

Click <Add>. The following displays.

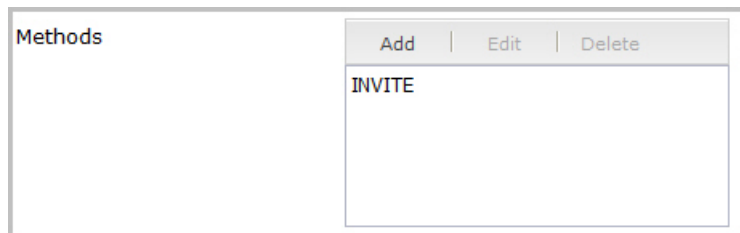
In the Methods field, enter SIP method names to which you want to apply this MIME rule. For example, INVITE, ACK, BYE.

 **Note:** This field is empty by default. If you leave the method field empty, the MIME rule applies to all methods.

To add the method to the list and apply another one, click <Apply/Add Another>.



When you have completed adding methods, click <OK>. The following displays.



7. In the Format field, select the format to apply to this MIME rule. Default is ascii-string. Valid values are:
  - ascii-string - a character-encoding scheme that represents text (128 ASCII codes, 7 bits)
  - binary-ascii - encoding scheme where each byte of an ASCII character is used; can use up to 256 bit patterns
  - hex-ascii - encoding scheme that uses a string of numbers (no spaces) to represent each ASCII character.
8. In the Action field, enter the action you want applied to the MIME rule specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.
  - delete—Deletes the element, if it exists.
  - find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - manipulate—Manipulates the elements of this header to the element rules configured.
  - monitor—Monitors the header for this element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.
9. In the Comparison type field, select the way that you want the MIME to be compared with this MIME rule. This choice dictates how the Enterprise Session Director processes the match rules against the MIME. Default is case-sensitive. Valid values are:
  - boolean—Header is compared to MIME rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to MIME rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the MIME rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the MIME rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
10. In the Match value field, enter the value you want to match against the element value for an action to be performed.
11. In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
  - Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.

For example:

```
sip:~+$STRUNK_GROUP+~.$STRUNK_GROUP_CONTEXT
```

- Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
- Operators parameters - For valid values, see the Operators Table.

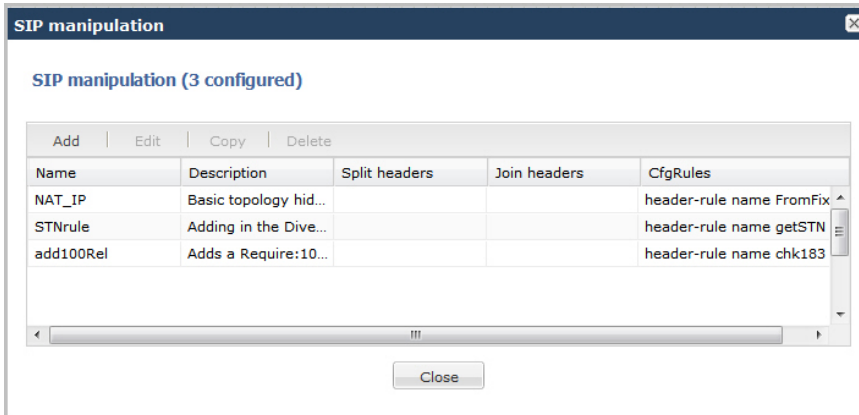
Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
```

## Configuration

```
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```

12. Click <OK>. The MIME Rule dialog box displays.
13. Click <OK>. The SIP Manipulation dialog box displays.



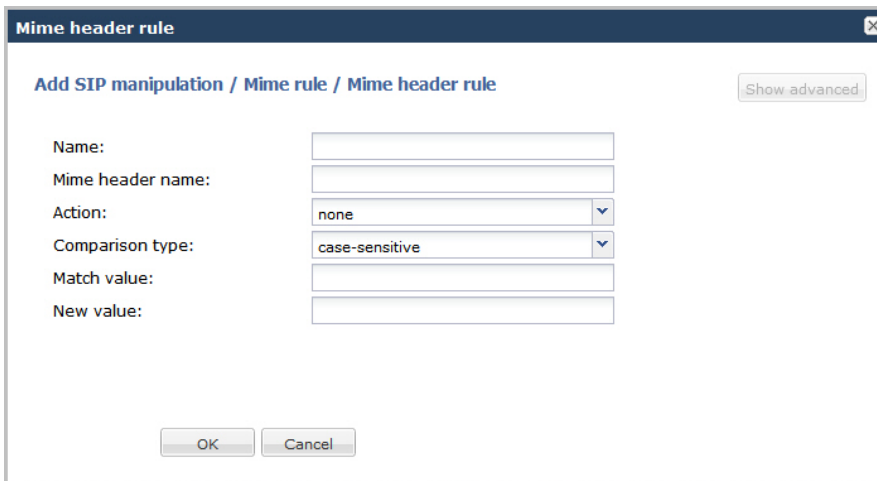
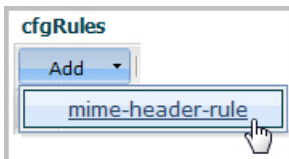
14. Click <Close>.

### Configuring MIME Header Rule

You can configure MIME header rules within a MIME rule. Use the following procedure to configure a MIME header rule.

To configure a MIME header rule:

1. In the MIME rules dialog box, in the cfgRules field, click <Add>, and then select mime-header-rule from the drop-down list. This allows you to define the MIME rules you want to use to be performed on the elements of the header specified by the MIME rule. The following dialog box displays.



2. In the Name field, enter the name of the element to which this rule applies. Valid values are alpha-numeric characters. Default is blank.
3. In the Mime header name field, enter the parameter name to which this rule applies. The parameter name depends on the element name you entered in step 2. For uri-param, uri-user-param, and header-param it is the parameter

name to be added, replaced, or deleted. For all other types, it serves to identify the element rule and any name can be used. Valid values are alpha-numeric characters. Default is blank.

4. In the Action field, enter the action you want applied to the MIME rule specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.
  - delete—Deletes the element, if it exists.
  - find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - monitor—Monitors the header for this element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - replace—Replaces the element.
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.
5. In the Comparison type field, select the way that you want the MIME to be compared with this MIME rule. This choice dictates how the Enterprise Session Director processes the match rules against the MIME. Default is case-sensitive. Valid values are:
  - boolean—Header is compared to MIME rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to MIME rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the MIME rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the MIME rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
6. In the Match value field, enter the value you want to match against the element value for an action to be performed.
7. In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
  - Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.

For example:

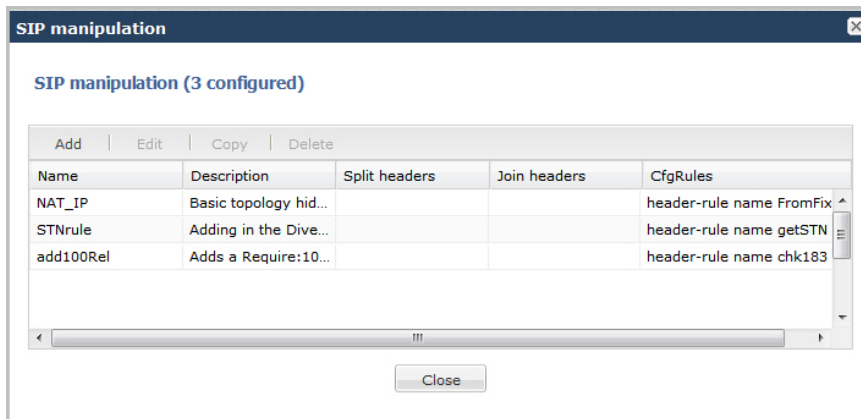
```
sip:~+$STRUNK_GROUP+~.$STRUNK_GROUP_CONTEXT
```

- Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
- Operators parameters - For valid values, see the Operators Table.

Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```

8. Click <OK>. The MIME Rule dialog box displays.
9. Click <OK>. The SIP Manipulation dialog box displays.



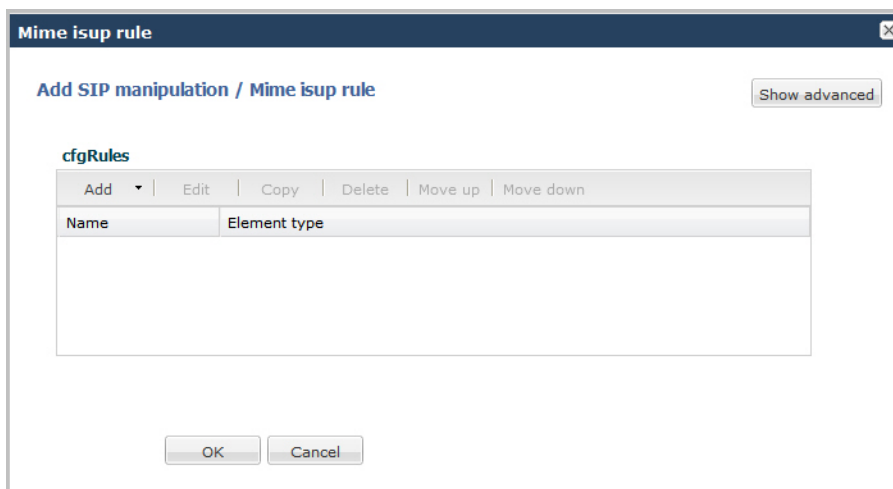
10. Click <Close>.

### Configuring MIME ISUP Rule

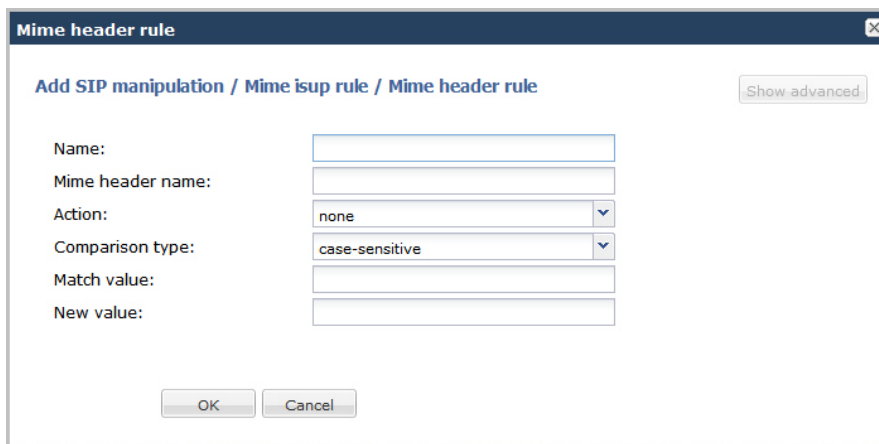
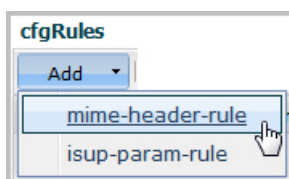
You can configure a MIME ISDN User Part (ISUP) rule for a SIP manipulation rule. Use the following procedure to configure a MIME ISUP rule.

To configure a MIME ISUP rule:

1. In the SIP Manipulation dialog box, in the `cfgRules` field, click <Add>, and then select `mime-isup-rule` from the drop-down list. This allows you to define the MIME ISUP rules you want to use to be performed on the elements of the header specified by the MIME rule. The following dialog box displays.



2. In the `cfgRules` field, click <Add>, and then select `mime-header-rule` from the drop-down list. The following dialog box displays.



3. In the Name field, enter the name of the element to which this rule applies. Valid values are alpha-numeric characters. Default is blank.
4. In the Mime header name field, enter the parameter name to which this rule applies. The parameter name depends on the element name you entered in step 3. For uri-param, uri-user-param, and header-param it is the parameter name to be added, replaced, or deleted. For all other types, it serves to identify the element rule and any name can be used. Valid values are alpha-numeric characters. Default is blank.
5. In the Action field, enter the action you want applied to the MIME rule specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.
  - delete—Deletes the element, if it exists.
  - find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - monitor—Monitors the header for this element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - replace—Replaces the element.
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.
6. In the Comparison type field, select the way that you want the MIME to be compared with this MIME rule. This choice dictates how the Enterprise Session Director processes the match rules against the MIME. Default is case-sensitive. Valid values are:
  - boolean—Header is compared to MIME rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to MIME rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the MIME rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the MIME rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
7. In the Match value field, enter the value you want to match against the element value for an action to be performed.

## Configuration

8. In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.

- Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.

For example:

```
sip:~+$STRUNK_GROUP+~.$STRUNK_GROUP_CONTEXT
```

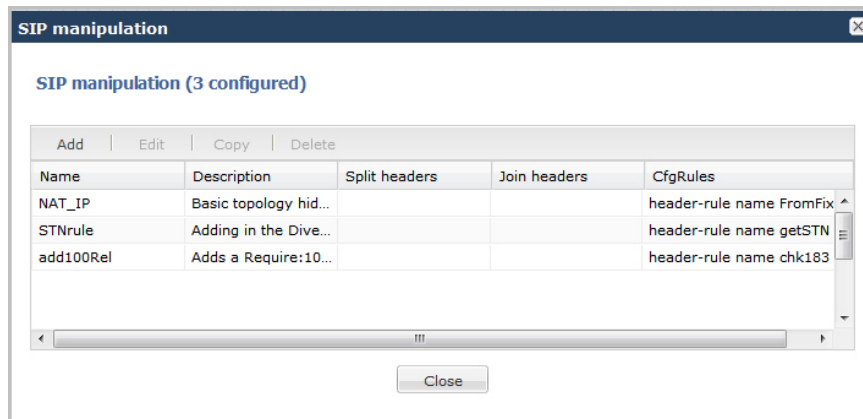
- Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
- Operators parameters - For valid values, see the Operators Table.

Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```

9. Click <OK>. The MIME ISUP Rule dialog box displays.

10. Click <OK>. The SIP Manipulation dialog box displays.



11. Click <Close>.

### Configuring ISUP Param Rules

The ISUP param rules are for advanced users only. This feature configures the following for the ISUP param rules:

- Name
- Type
- Format
- Action
- Comparison Type
- Match Value
- New Value

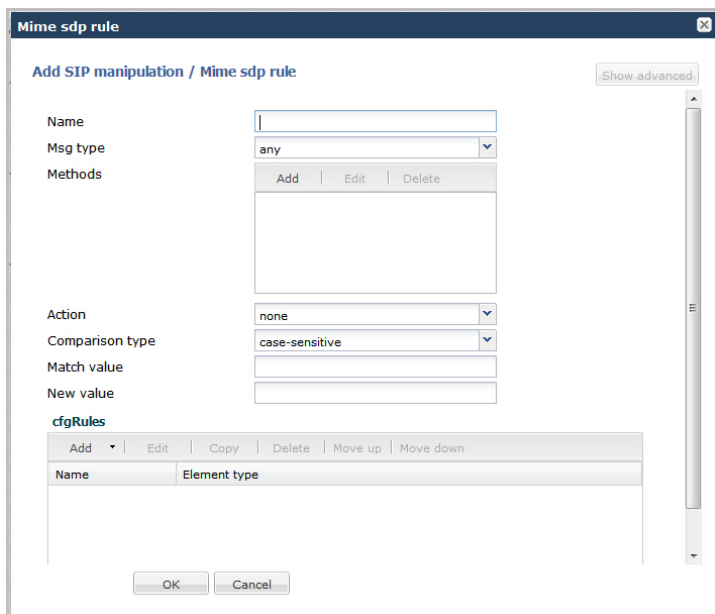
For more information about configuring ISUP Param Rules, see the section, Regular Expressions and Boolean Expressions in the *Net-Net® Enterprise Session Director Configuration Guide*.

### Configuring MIME SDP Rules

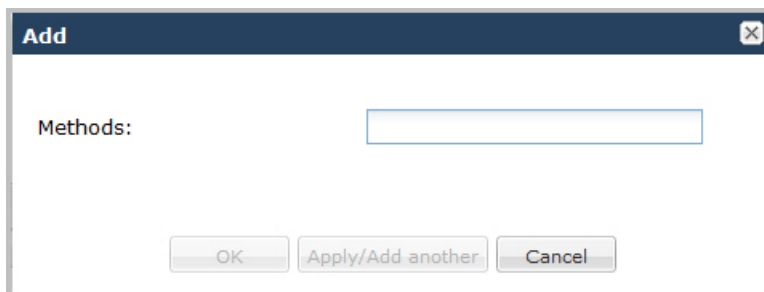
You can configure MIME Session Description Protocol (SDP) rules for SIP Manipulation on the Enterprise Session Director if required. Use the following procedure to configure MIME SDP rules.

To configuration MIME SDP rules:


1. From the SIP Manipulation dialog box, in the cfgRules field, click <Add>, and then select mime-sdp-rule from the drop-down list. The following dialog box displays.



2. In the Name field, enter a name you want to use for this MIME SDP rule. Valid values are alpha-numeric characters. Default is blank.
3. In the Msg type field, specify the type of message to which this MIME SDP rule applies. Default is any. Valid values are:
  - any—Both Requests and Reply messages
  - out-of-dialog—Out of dialog messages only.
  - reply—Reply messages only
  - request—Request messages only
4. In the Methods field, specify the SIP method names to which you want to apply this MIME SDP rule. Click <Add>. The following displays.



In the Methods field, enter SIP method names to which you want to apply this MIME SDP rule. For example, INVITE, ACK, BYE.

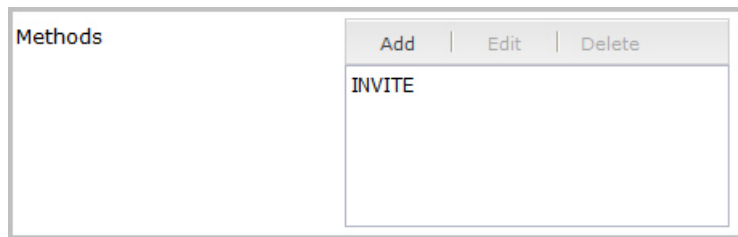
 **Note:** This field is empty by default. If you leave the method field empty, the MIME rule applies to all methods.

## Configuration

---

To add the method to the list and apply another one, click <Apply/Add Another>.

When you have completed adding methods, click <OK>. The following displays.



| Methods |
|---------|
| INVITE  |

- In the Action field, enter the action you want applied to the MIME SDP rule specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.
  - delete—Deletes the element, if it exists.
  - find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - manipulate—Manipulates the elements of this header to the element rules configured.
  - monitor—Monitors the header for this element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.
- In the Comparison type field, select the way that you want the MIME to be compared with this MIME SDP rule. This choice dictates how the Enterprise Session Director processes the match rules against the MIME. Default is case-sensitive. Valid values are:
  - boolean—Header is compared to MIME rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to MIME rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the MIME rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the MIME rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
- In the Match value field, enter the value you want to match against the element value for an action to be performed.
- In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
  - Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.

For example:

```
sip:~+$STRUNK_GROUP+~.$STRUNK_GROUP_CONTEXT
```

- Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
- Operators parameters - For valid values, see the Operators Table.

Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```



## Configuring MIME Header Rule for SDP

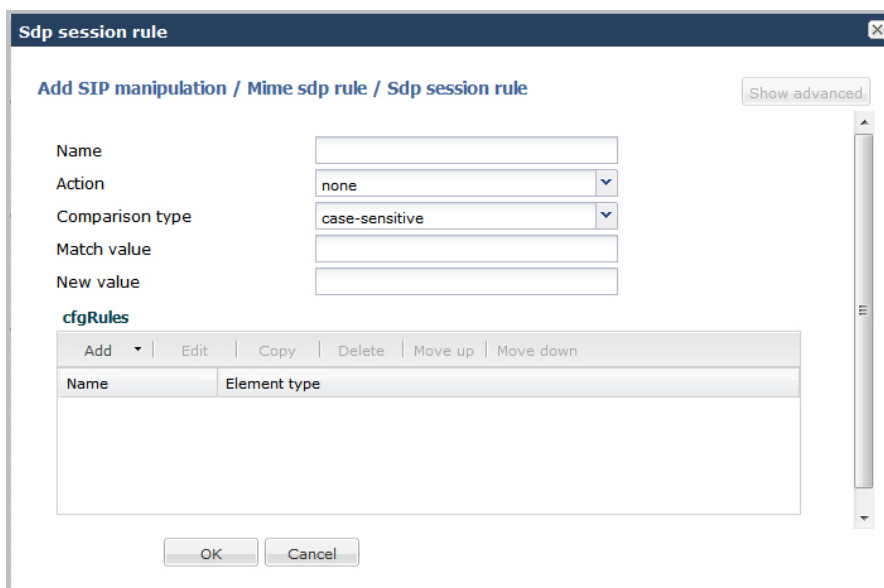
You can configure the MIME header rule for the MIME SDP rule if required. Use the procedures in Configuring MIME Header Rule to configure the MIME header rule fo SDP.

## Configuring SDP Session Rule

You can configure the SDP session rules for the MIME SDP rules if required. Use the following procedure to configure SDP Session rules.

To configure SDP session rules:

1. In the MIME SDP Rules dialog box, in the `cfgRules` field, click <Add>, and then select `sdp-session-rule` from the drop-down list. This allows you to define the SDP session rules you want to use to be performed on the elements of the header specified by the MIME rule. The following dialog box displays.



2. In the Name field, enter the name of the element to which this rule applies. Valid values are alpha-numeric characters. Default is blank.
3. In the Action field, enter the action you want applied to the SDP session rule specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.
  - delete—Deletes the element, if it exists.
  - find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - monitor—Monitors the header for this element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - replace—Replaces the element.
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.

## Configuration

- In the Comparison type field, select the way that you want the MIME to be compared with this SDP session rule. This choice dictates how the Enterprise Session Director processes the match rules against the MIME. Default is case-sensitive. Valid values are:
  - boolean—Header is compared to MIME rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to MIME rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the MIME rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the MIME rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
- In the Match value field, enter the value you want to match against the element value for an action to be performed.
- In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
  - Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.

For example:

```
sip:~+$STRUNK_GROUP+~$.STRUNK_GROUP_CONTEXT
```

- Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
- Operators parameters - For valid values, see the Operators Table.

Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```

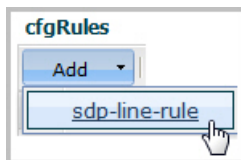
## Configuring SDP Line Rules for Sessions

When configuring the SDP session rules, you can also configure the SDP line rules. For more information about configuring SDP line rules, see the section, `sdp-line-rule` in the *Net-Net® Enterprise Session Director Configuration Guide*.

Use the following procedure to configure the SDP line rules.

To configure SDP line rules:

- From the SDP Session Rule dialog box, in the `cfgRules` field, click <Add>, and then select `sdp-line-rules` from the drop-down list. This allows you to define the SDP line rules you want to use to be performed on the elements of the header specified by the SDP session rule. The following dialog box displays.



2. In the Name field, enter the name of the element to which this rule applies. Valid values are alpha-numeric characters. Default is blank.
3. In the Type field, enter the applicable SDP descriptor for the SDP line rule. SDP descriptors are added to the SDP, adhering to the definitions in RFC 4566. Default is blank. Valid values are:

| Session Description |                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------|
| v                   | Protocol version                                                                                       |
| o                   | Originator and session identifier                                                                      |
| s                   | Session name                                                                                           |
| i                   | Session information*                                                                                   |
| u                   | URI of description*                                                                                    |
| e                   | Email address*                                                                                         |
| p                   | Phone number*                                                                                          |
| c                   | Connection information - not required if included in all media*                                        |
| b                   | Zero or more bandwidth information lines* One or more time descriptions (“t=” and r= lines; see below) |
| z                   | Time zone adjustments*                                                                                 |
| k                   | Encryption key*                                                                                        |
| a                   | Zero or more session attribute lines* Zero or more media descriptions (see below)                      |
| Time Description    |                                                                                                        |
| t                   | Time the session is active                                                                             |
| r                   | Zero or more repeat times*                                                                             |

\*Indicates an optional descriptor

4. In the Action field, enter the action you want applied to the SDP line rule specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.

## Configuration

- delete—Deletes the element, if it exists.
  - find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - monitor—Monitors the header for this element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - replace—Replaces the element.
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.
5. In the Comparison type field, select the way that you want the MIME to be compared with this SDP line rule. This choice dictates how the Enterprise Session Director processes the match rules against the MIME. Default is case-sensitive. Valid values are:
- boolean—Header is compared to MIME rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to MIME rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the MIME rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the MIME rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
6. In the Match value field, enter the value you want to match against the element value for an action to be performed.
7. In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
- Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.

For example:

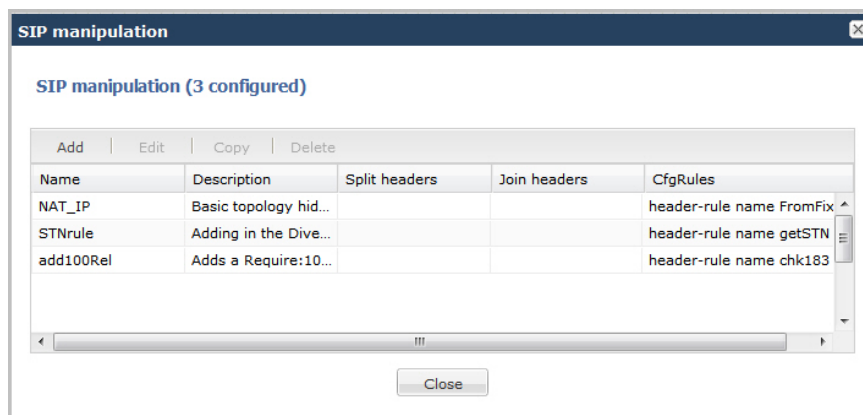
```
sip:~+$STRUNK_GROUP+~.$STRUNK_GROUP_CONTEXT
```

- Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
- Operators parameters - For valid values, see the Operators Table.

Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```

8. Click <OK>. The SDP Session Rule dialog box displays.
9. Click <OK>. The SIP Manipulation dialog box displays.



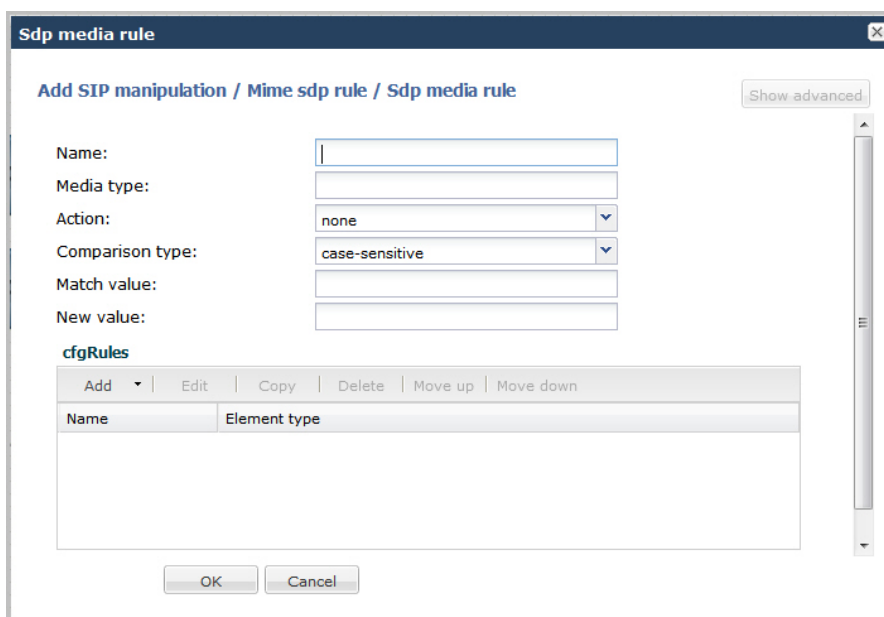
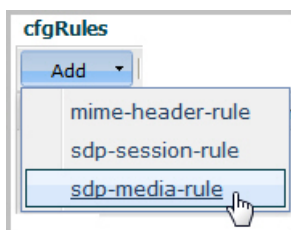
10. Click <Close>.

### Configuring SDP Media Rules

When configuring the SDP session rules, you can also configure the SDP media rules. Use the following procedure to configure the SDP media rules.

To configure SDP media rules:

1. From the SDP Session Rule dialog box, in the `cfgRules` field, click <Add>, and then select `sdp-media-rules` from the drop-down list. This allows you to define the SDP media rules you want to use to be performed on the elements of the header specified by the SDP session rule. The following dialog box displays.



2. In the Name field, enter the name of the element to which this rule applies. Valid values are alpha-numeric characters. Default is blank.
3. In the Media Type field, enter the applicable SDP descriptor for the SDP media rule. SDP descriptors are added to the SDP, adhering to the definitions in RFC 4566. Default is blank. Valid values are:

|                                |                                                                 |
|--------------------------------|-----------------------------------------------------------------|
| Media Description (if present) |                                                                 |
| m                              | Media name and transport address                                |
| i                              | Media title*                                                    |
| c                              | Connection information - optional if included at session level* |
| b                              | Zero or more bandwidth information lines*                       |
| k                              | Encryption key*                                                 |
| a                              | Zero or more media attribute lines*                             |
| Time Description               |                                                                 |

## Configuration

|   |                            |
|---|----------------------------|
| t | Time the session is active |
| r | Zero or more repeat times* |

\*Indicates an optional descriptor

- In the Action field, enter the action you want applied to the SDP media rule specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.
  - delete—Deletes the element, if it exists.
  - find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - monitor—Monitors the header for this element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - replace—Replaces the element.
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.
- In the Comparison type field, select the way that you want the MIME to be compared with this SDP media rule. This choice dictates how the Enterprise Session Director processes the match rules against the MIME. Default is case-sensitive. Valid values are:
  - boolean—Header is compared to MIME rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to MIME rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the MIME rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the MIME rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
- In the Match value field, enter the value you want to match against the element value for an action to be performed.
- In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
  - Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.

For example:

```
sip:?"$STRUNK_GROUP+?".STRUNK_GROUP_CONTEXT
```

- Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
- Operators parameters - For valid values, see the Operators Table.

Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```

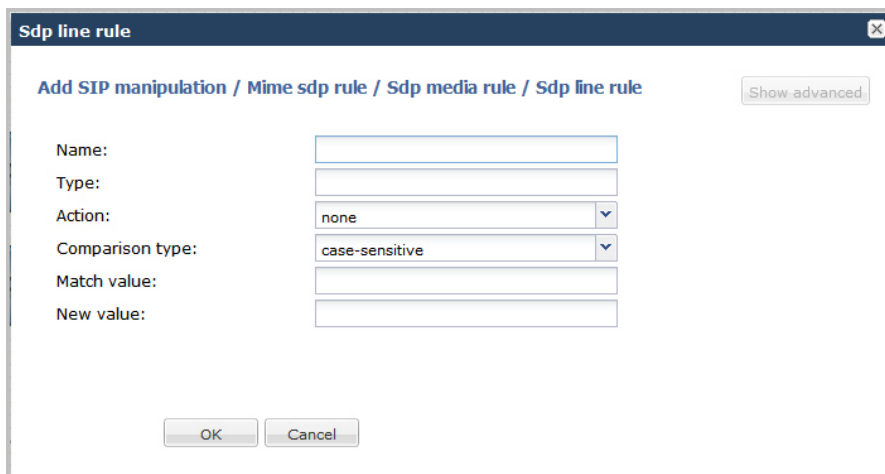
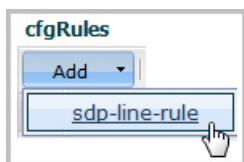
### Configuring SDP Line Rules for Media

You can configure SDP Line Rules for Media if required. For more information about configuring SDP line rules, see the section, `sdp-line-rule` in the *Net-Net® Enterprise Session Director Configuration Guide*.

Use the following procedure to configure SDP line rules for media.

To configure SDP line rules for media:

1. From the SDP Media Rule dialog box, in the `cfgRules` field, click <Add>, and then select `sdp-line-rule` from the drop-down list. This allows you to define the SDP line rules you want to use to be performed on the elements of the header specified by the SDP media rule. The following dialog box displays.



2. In the Name field, enter the name of the element to which this rule applies. Valid values are alpha-numeric characters. Default is blank.
3. In the Type field, enter the applicable SDP descriptor for the SDP line rule. SDP descriptors are added to the SDP, adhering to the definitions in RFC 4566. Default is blank. Valid values are:

| Session Description |                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------|
| v                   | Protocol version                                                                                       |
| o                   | Originator and session identifier                                                                      |
| s                   | Session name                                                                                           |
| i                   | Session information*                                                                                   |
| u                   | URI of description*                                                                                    |
| e                   | Email address*                                                                                         |
| p                   | Phone number*                                                                                          |
| c                   | Connection information - not required if included in all media*                                        |
| b                   | Zero or more bandwidth information lines* One or more time descriptions (“t=” and r= lines; see below) |
| z                   | Time zone adjustments*                                                                                 |
| k                   | Encryption key*                                                                                        |
| a                   | Zero or more session attribute lines* Zero or more media descriptions (see below)                      |
| Time Description    |                                                                                                        |
| t                   | Time the session is active                                                                             |
| r                   | Zero or more repeat times*                                                                             |

## Configuration

---

\*Indicates an optional descriptor

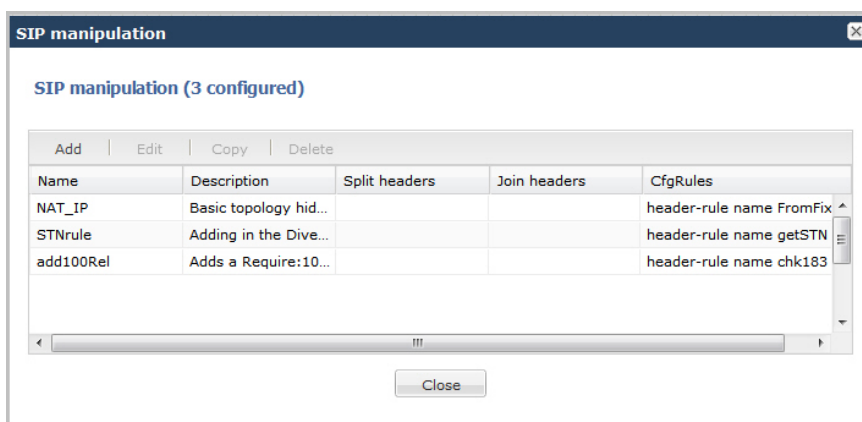
4. In the Action field, enter the action you want applied to the SDP line rule specified in the Name parameter, if there is a match value. Default is none. Valid values are:
  - add—Adds a new element, if that element does not already exist.
  - delete—Deletes the element, if it exists.
  - find-replace-all—Finds all matching elements and replaces it with the element you specified in this procedure.
  - log—Logs the element.
  - monitor—Monitors the header for this element.
  - none—(default) No action is taken.
  - reject—Rejects the element.
  - replace—Replaces the element.
  - sip-manip—Manipulates the SIP elements of this header to the element rules configured.
  - store—Stores the element.
5. In the Comparison type field, select the way that you want the MIME to be compared with this SDP line rule. This choice dictates how the Enterprise Session Director processes the match rules against the MIME. Default is case-sensitive. Valid values are:
  - boolean—Header is compared to MIME rule and must match exactly or it is rejected.
  - case-insensitive—Header is compared to MIME rule regardless of the case of the header.
  - case-sensitive—(default) Header is compared to the MIME rule and case must be exactly the same or it is rejected.
  - pattern-rule—Header is compared to the MIME rule and the pattern must be exactly the same or it is rejected.
  - refer-case-insensitive—Header is compared to the header rule regardless of the case in a REFER message.
  - refer-case-sensitive—Header is compared to the header rule and the case must be exactly the same as in the REFER message or it is rejected.
6. In the Match value field, enter the value you want to match against the element value for an action to be performed.
7. In the New value field, enter the value for a new element or to replace a value for an existing element. You can enter an expression that includes a combination of absolute values, pre-defined parameters, and operators.
  - Absolute values - use double quotes for clarity. You must escape all double quotes and back slashes that are part of an absolute value, and enclose the absolute value in double quotes.For example:

```
sip:?"$STRUNK_GROUP+"$.STRUNK_GROUP_CONTEXT
```

  - Pre-defined parameters always start with a \$. For valid values, see the Pre-defined Parameters Table.
  - Operators parameters - For valid values, see the Operators Table.Examples of entries for the new-value field.

```
$ORIGINAL+acme
$ORIGINAL+"my name is john"
$ORIGINAL+"my name is \"john\""
$ORIGINAL-^781+^617
```
8. Click <OK>. The SDP Media Rule dialog box displays.
9. Click <OK>. The MIME SDP Rule dialog box displays.
10. Click <OK>. The Modify SIP manipulation dialog box displays.
11. Click <OK>. The SIP Manipulation dialog box displays.





12. Click <Close>.

### Add an SPL

Add an SPL plugin, which is a customized script, to quickly implement a feature on the Enterprise Session Director (E-SBC). The SPL plugin augments running the software image on the E-SBC, and provides new features when you need them without having to upgrade the software.

#### Before You Begin

- Confirm the name and location of the SPL plugin that you want to add.

Use the following procedure to integrate an Oracle-signed plug-in with the E-SBC operating system. Note that the E-SBC does not load an unsigned SPL or one with invalid signatures.

#### Procedure

1. From the Web GUI, click **Other > SPL**.
2. In the **Spl config** dialog, do the following:

| Attributes  | Instructions                                                                                                                                                                                                                                                   |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Spl options | Enter the name of SPL option.                                                                                                                                                                                                                                  |
| Plugins     | <p>Click <b>Add</b>, and do the following:</p> <ul style="list-style-type: none"> <li>• Select State to enable the plugin.</li> <li>• Enter the name of plugin to load.</li> <li>• Click <b>OK</b>.</li> </ul> <p>The system displays the SPL config page.</p> |

3. Click **OK**.
4. Save and activate the configuration.

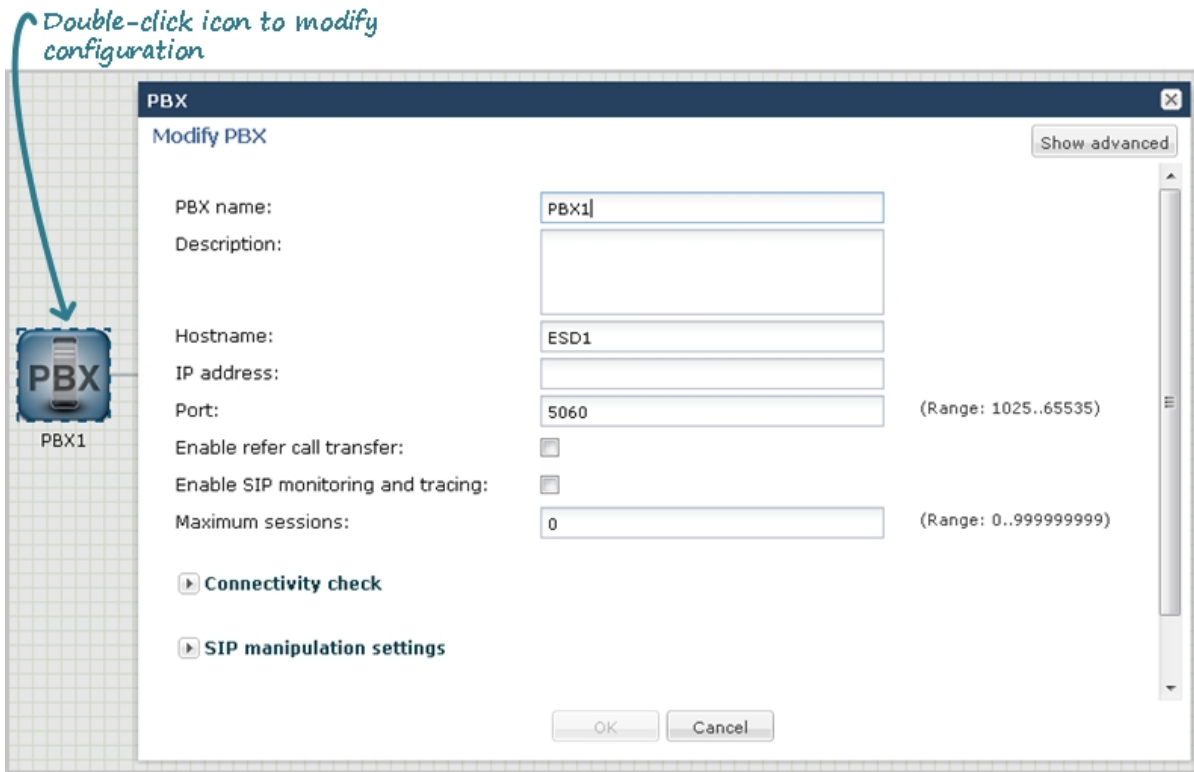
## Configuration Editing Methods

In Basic mode, you can edit a configuration. After editing a configuration, you must save and activate the configuration for the changes to take affect.

### Editing Icon Configuration

For any device or interface that currently exists in your workspace, you can double-click the icon and edit the configuration, or right-click on the icon and select Edit from the drop-down menu. The following shows an example of editing the PBX configuration.

## Configuration

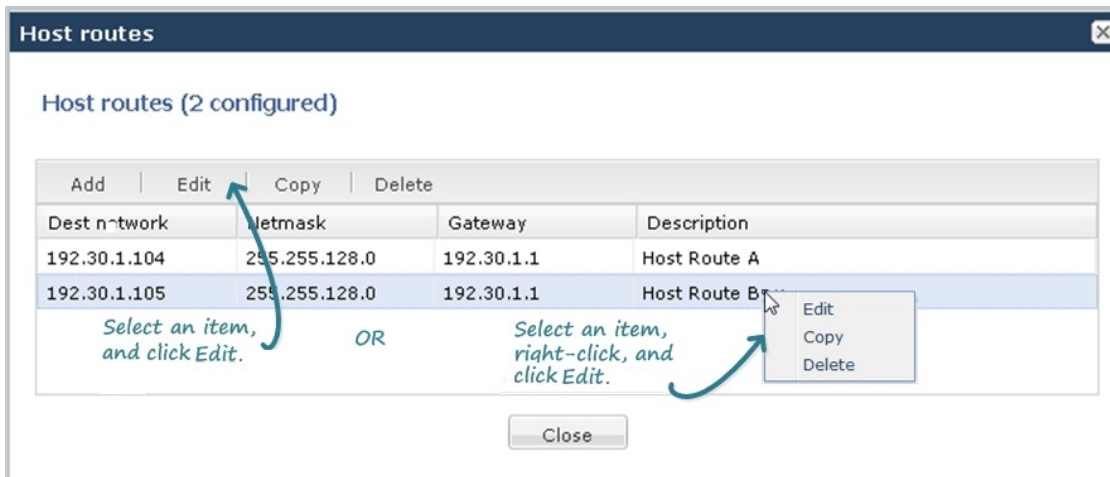
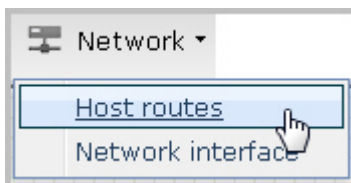


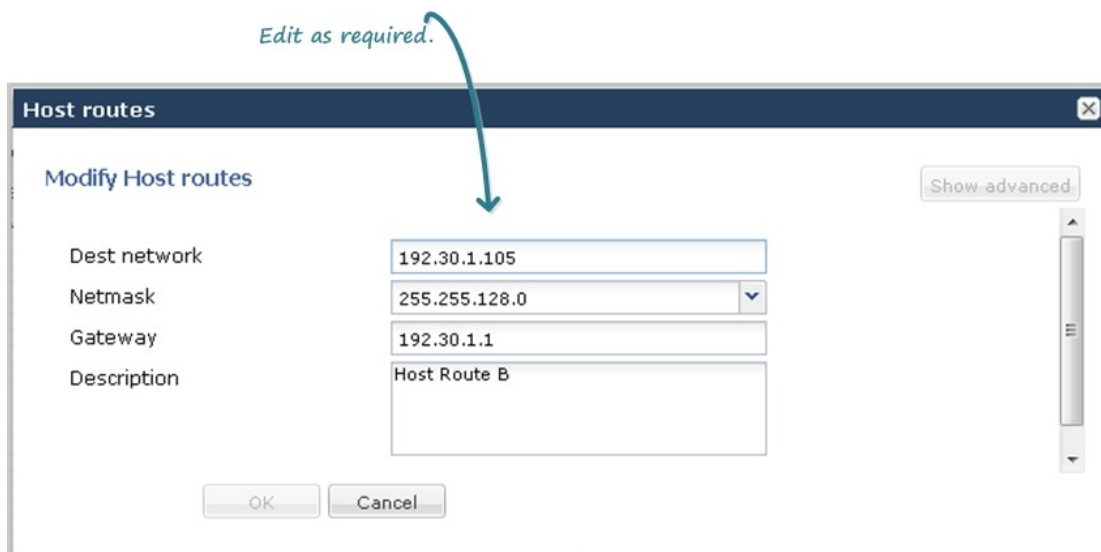
## Editing Advanced Configuration

To edit more advanced configurations in your network, you can select the required configuration from the Main Menu, and edit the configuration item from the list that displays. You can edit an item using either of two methods:

- Selecting the item from the list and clicking the <Edit> button
- Selecting the item from the list, right clicking the mouse, and selecting Edit from the drop-down menu.

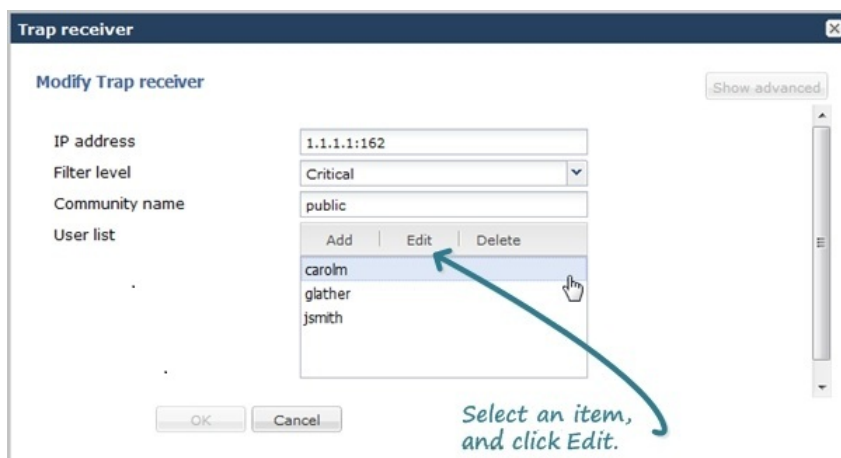
The following shows an example of editing a host route configuration.





### Editing Parameter Fields

Some dialog boxes in a configuration provide the ability to edit within a parameter field. In the following example, a user list within the trap-receiver configuration is selected for editing.



### Copying a Configuration

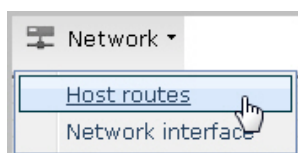
You can copy configurations, when configuring your network.

#### Copying Advanced Configuration

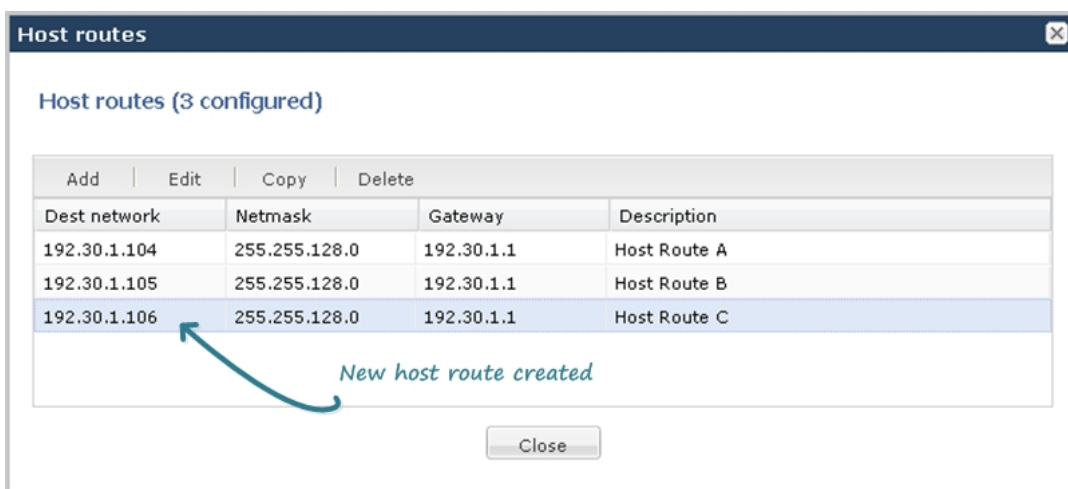
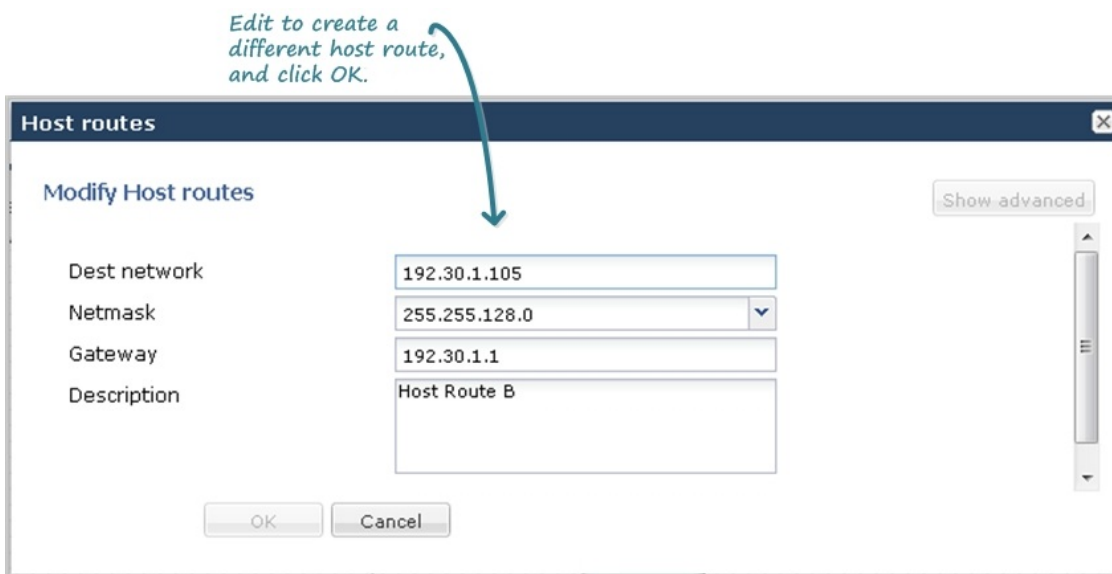
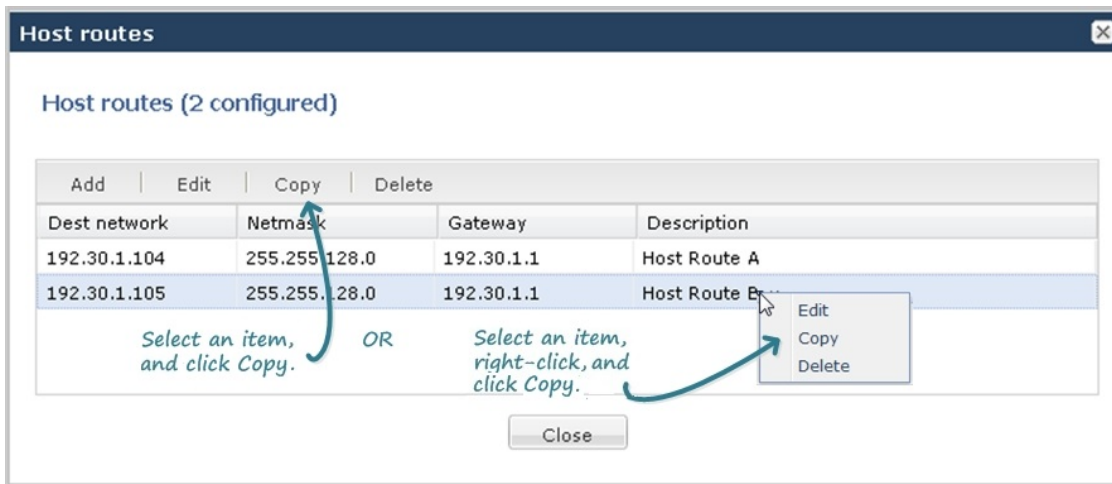
To copy more advanced configurations in your network, you can select the required configuration from a list that displays using either of two methods:

- Selecting the item from the list and clicking the <Copy> button
- Selecting the item from the list, right clicking the mouse, and selecting Copy from the drop-down menu.

The following shows host route 192.30.1.105 copied and edited as a new host route of 192.30.1.106.



## Configuration



## Deleting a Configuration

In Basic Mode, you can delete configurations as required.

## Deleting Icon Configuration

For any device or interface that currently exists in your workspace, you can right-click on the icon and select Delete from the drop-down menu. The following shows an example of deleting a PBX configuration.



The configuration deletes from the workspace and from the Enterprise Session Director.

## Deleting Advanced Configuration

To delete more advanced configurations in your network, you can select the required configuration from the Main Menu, and delete the configuration item from the list that displays. You can delete an item using either of two methods:

- Selecting the item from the list and clicking the <Delete> button  
or
- Selecting the item from the list, right clicking the mouse, and selecting Delete from the drop-down menu.

The following shows host route 192.30.1.106 being deleted from the Host route table.

## Configuration

Host routes (3 configured)

| Add          | Edit          | Copy       | Delete       |                        |
|--------------|---------------|------------|--------------|------------------------|
| Dest network | Netmask       | Gateway    | Description  |                        |
| 192.30.1.104 | 255.255.128.0 | 192.30.1.1 | Host Route A |                        |
| 192.30.1.105 | 255.255.128.0 | 192.30.1.1 | Host Route B |                        |
| 192.30.1.106 | 255.255.128.0 | 192.30.1.1 | Host Route C | Edit<br>Copy<br>Delete |

Select an item, and click Delete. OR Select an item, right-click, and click Delete.

Close

Confirmation

Are you sure you want to delete the selected item?

Yes No

Click Yes to delete the item.  
Click No to cancel the delete function.

Host routes (2 configured)

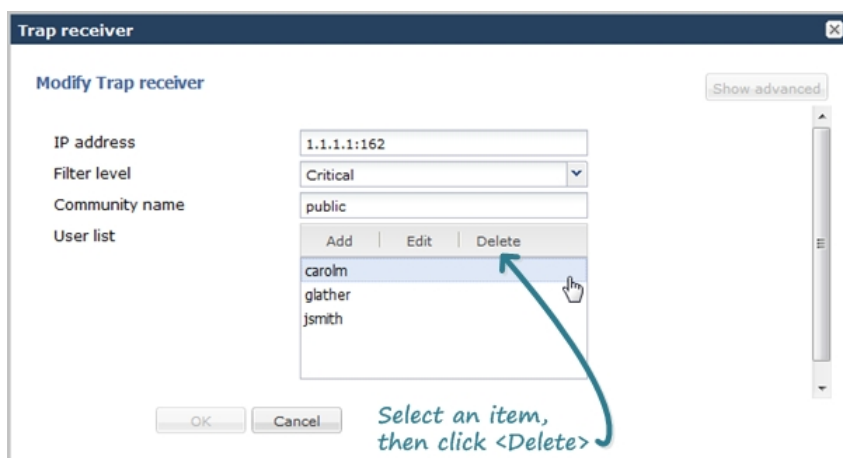
| Add          | Edit          | Copy       | Delete       |  |
|--------------|---------------|------------|--------------|--|
| Dest network | Netmask       | Gateway    | Description  |  |
| 192.30.1.104 | 255.255.128.0 | 192.30.1.1 | Host Route A |  |
| 192.30.1.105 | 255.255.128.0 | 192.30.1.1 | Host Route B |  |

Item is deleted

Close


### Deleting Parameter Fields

Some dialog boxes in a configuration provide the ability to delete within a parameter field. In the following example, a user list within the trap-receiver configuration is selected for deleting.



## Expert Mode

The Expert mode of configuring the Enterprise Session Director (E-SBC) allows you to set parameters by navigating through a tree structure of objects and attributes. This tree structure matches the Oracle Command Line Interface (ACLI) view of the E-SBC.


-  **Note:** The Web GUI does not indicate required fields. You may be able to save the configuration without a required value because the E-SBC ignores the element in the configuration. The system does not display an error message for a missing required parameter.

## Accessing Expert Mode

You can access the Expert mode of configuration by clicking the Configuration tab in the Web GUI.

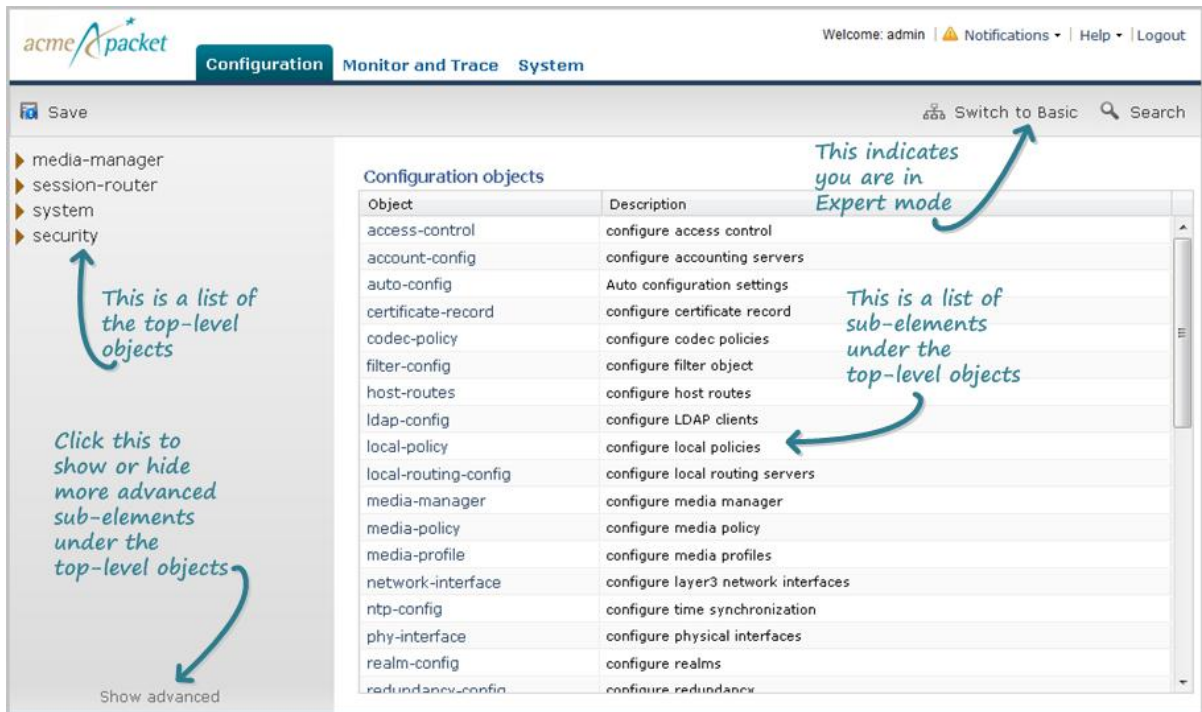
To access Expert mode:

1. After logging into the Web GUI, click on the Configuration tab. The following displays.

-  **Note:** The “Expert Mode” displays only if your Administrator set this interface as default during the Installation Wizard setup. If “Basic Mode” is set as the default, click Switch to Expert in the upper right corner of the screen.

The page displays the minimum objects you can set to configure the Enterprise Session Director. You can display additional objects to configure by clicking the Show Advanced link at the bottom of the left column.

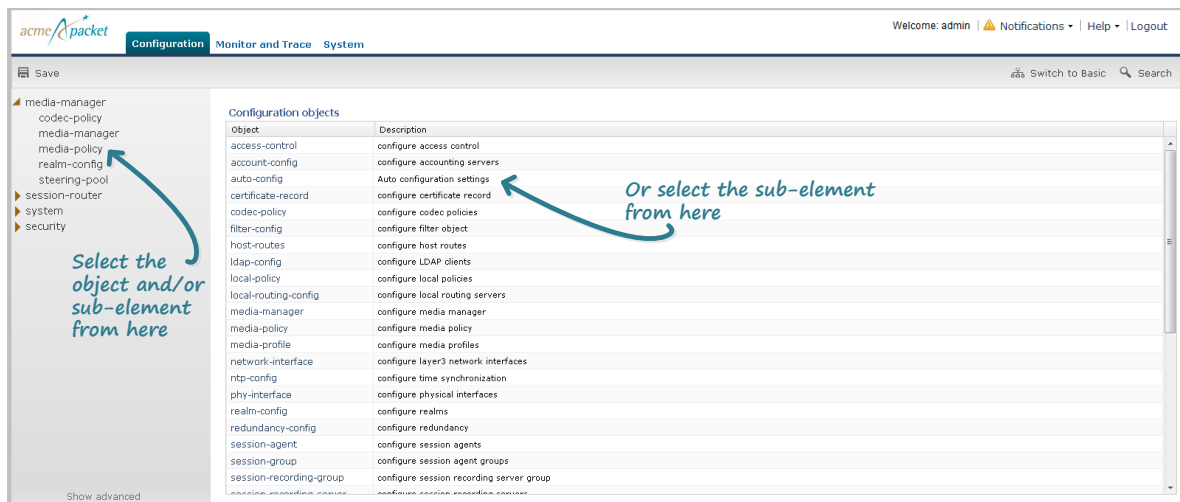
Oracle recommends advanced parameters be configured by experienced administrators only.



The list of sub-elements in the right column are all the sub-elements associated with the top-level element selected from the left column.

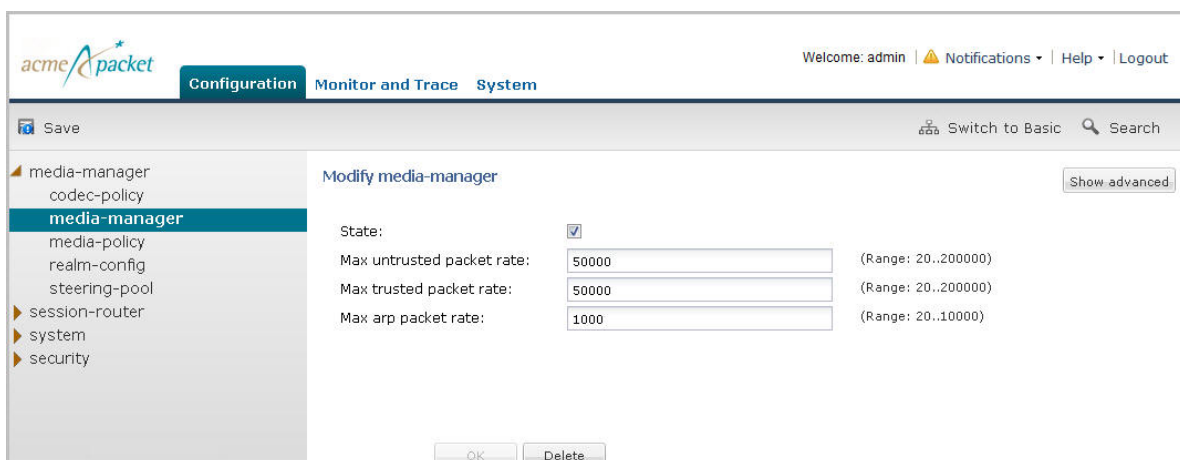
You can select the sub-element you want to configure from the right column if required; or you can expand a top-level object to show the sub-element of that object.

- Expand a top-level object in the left column, and then click on a sub-element. Or click on the sub-element in the right column.



The page associated with the sub-element you select displays. The following illustration is an example of the media-manager page.





Some fields in the configuration windows of Expert Mode identify valid values for a field. For example, in the Modify media-manager window above, a range of values for each text box is provided.

## Expert Mode Configuration Objects

In Expert Mode, you can add, modify, and delete configuration objects and attributes as required.

The system displays the following configuration objects in Expert Mode:

- media-manager
- session-router
- system
- security

The following table lists the sub-elements of each top element in the Enterprise Session Director.

| Media Manager       | Session Router            | System              | Security             |
|---------------------|---------------------------|---------------------|----------------------|
| codec-policy        | access-control            | auto-config         | auth-params*         |
| dns-alg-constraints | account-config            | capture-receiver**  | authentication*      |
| dns-config          | allowed-elements-profile* | host-route          | ike**                |
| media-manager       | class-profile             | network-interface   | dpd-params           |
| media-policy        | class-policy              | network-parameters* | ipsec**              |
| msrp-config         | enforcement-profile*      | ntp-config          | ipsec-global-config  |
| playback-config     | enum-config*              | phy-interface       | security-association |
| realm-config        | filter-config             | redundancy-config   | security-association |
| realm-group*        | h323                      | snmp-community      | security-policy      |
| rtp-policy          | h323-config               | spl-config          | password-policy*     |
| static-flow*        | h323-stack                | system-access-list* |                      |
| steering-pool       | home-subscriber-server    | system-config       |                      |
|                     | http-alg*                 | tdm-config          |                      |
|                     | iwg-config                | trap-receiver       |                      |
|                     | ladp-config               | web-server-config   |                      |
|                     | local-policy              |                     |                      |

## Configuration

| Media Manager | Session Router           | System | Security |
|---------------|--------------------------|--------|----------|
|               | local-response-map       |        |          |
|               | local-routing-config     |        |          |
|               | media-profile            |        |          |
|               | net-management-control   |        |          |
|               | qos-constraints          |        |          |
|               | response-map             |        |          |
|               | service-health           |        |          |
|               | session-agent            |        |          |
|               | session-constraints      |        |          |
|               | session-group            |        |          |
|               | session-recording group  |        |          |
|               | session-recording-server |        |          |
|               | session-timer-profile    |        |          |
|               | session-translation      |        |          |
|               | sip-advanced-logging     |        |          |
|               | sip-config               |        |          |
|               | sip-feature              |        |          |
|               | sip-interface            |        |          |
|               | sip-manipulation         |        |          |
|               | sip-monitoring           |        |          |
|               | surrogate-agent          |        |          |
|               | survivability            |        |          |
|               | translation-rules        |        |          |

\*These advanced parameters are applicable to Virtual Machines (VMs) and Session Director hardware.

\*\*These parameters are applicable to Session Director hardware only.

### Function Buttons

Expert Mode displays function buttons on each configuration page to perform tasks such as add, edit, copy, and delete. The system activates the buttons depending on your selection on a page. Some sub-element tables also display these buttons. The following table describes each button.


| Button | Description                                                                                                  |
|--------|--------------------------------------------------------------------------------------------------------------|
| Add    | Use to add configuration information to the Enterprise Session Director.                                     |
| Edit   | Use to edit existing configuration information.<br>Note: Select an item in a list to enable the Edit button. |
| Copy   | Use to copy existing configuration information, and edit the information to create a new configuration.      |

| Button | Description                                                                                                      |
|--------|------------------------------------------------------------------------------------------------------------------|
|        | Note: Select an item in a list to enable the Copy button.                                                        |
| Delete | Use to delete existing configuration information.<br>Note: Select an item in a list to enable the Delete button. |
| Search | Use to search for configured objects.                                                                            |
| Clear  | Use to clear the Search field.                                                                                   |

### Add a Configuration

The following is an example procedure for adding a configuration to the Enterprise Session Director.

To add a configuration:

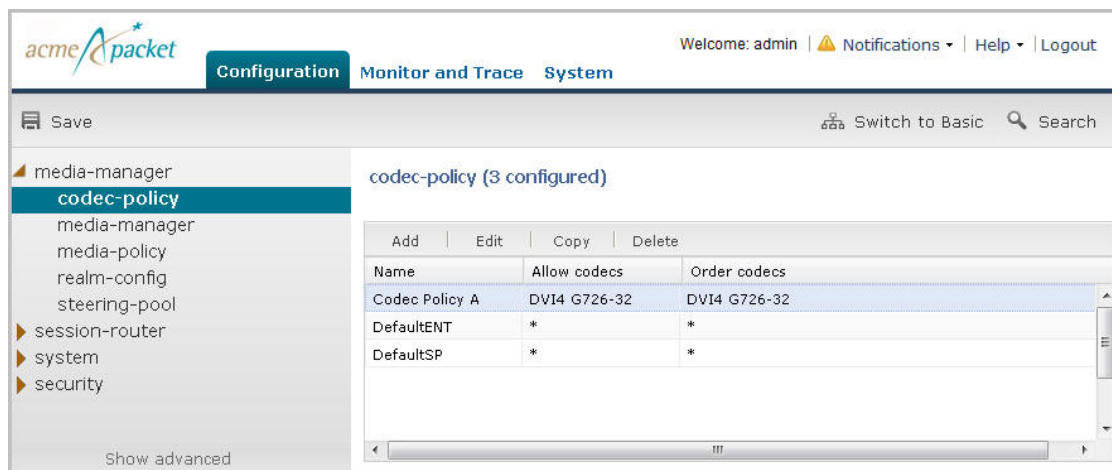
- Under media-manager, click codec-policy.
  -  **Note:** In some tables, default information displays if applicable. In the example below, DefaultENT and DefaultSP are the default codec policies in the Enterprise Session Director.
- Click <Add>. The following displays.
- Enter information in the text box and add information to the list boxes as required. Refer to the *Net-Net® Enterprise Session Director Configuration Guide* for valid values for each field.
- Click <OK> to save the changes.

### Editing a Configuration

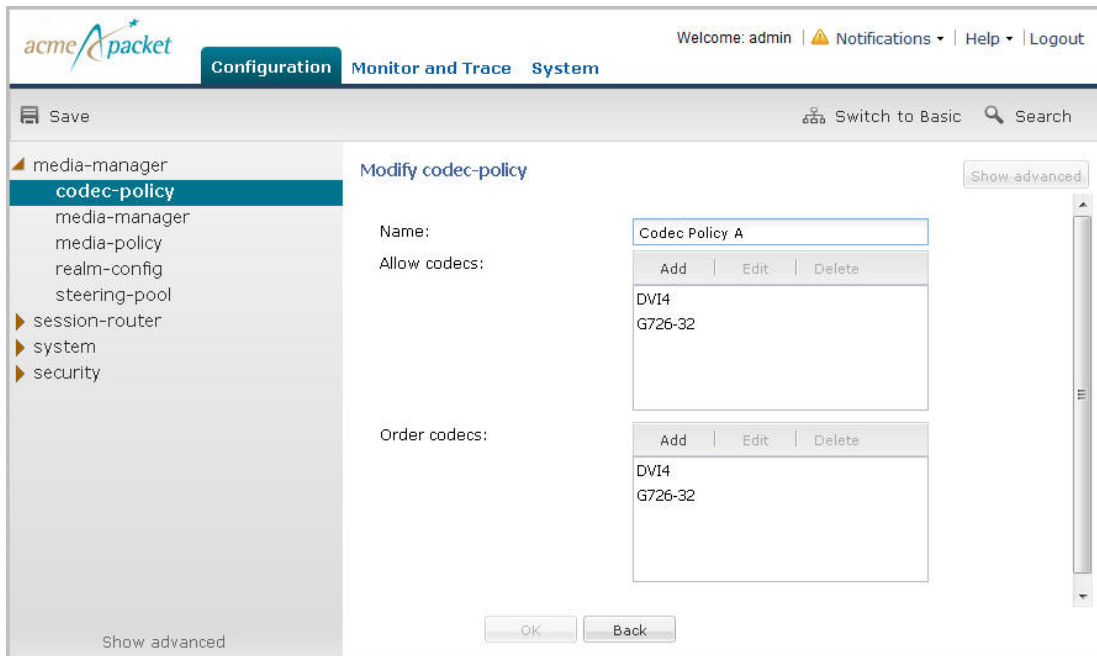
The following is an example procedure for editing a configuration in the Enterprise Session Director.

To edit a configuration:

- Under media-manager, click on codec-policy. The following displays.



- In the list box, select the item you want to edit and click <Edit>. The configuration you selected displays.



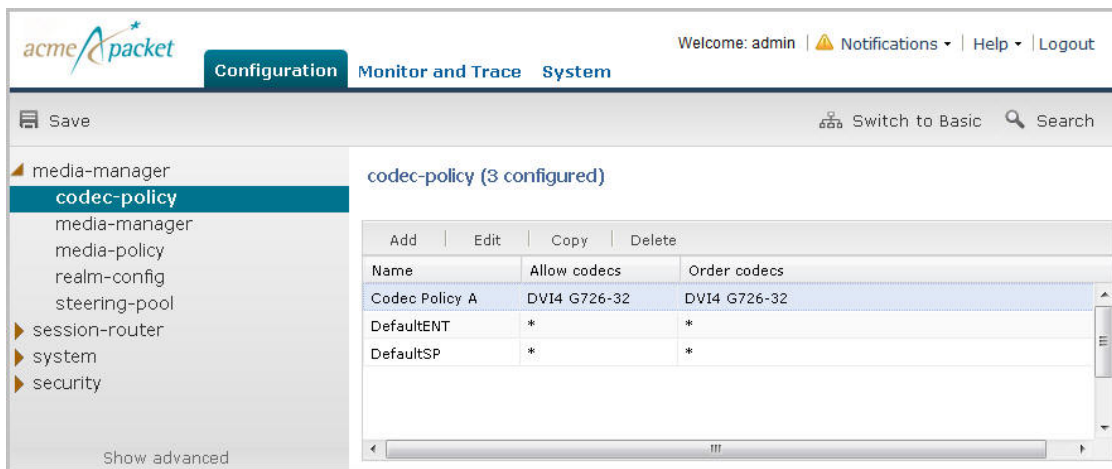
3. Edit the configuration as applicable and then click <OK>.

## Deleting a Configuration

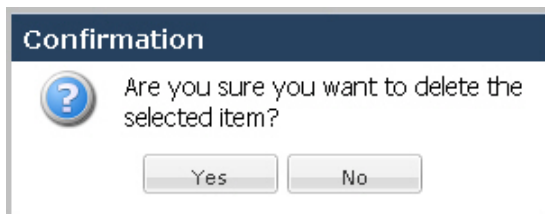
The following is an example procedure for deleting a configuration in the Enterprise Session Director.

To delete a configuration:

1. Under media-manager, click on codec-policy. The following displays.



2. In the list box, select the item you want to delete and click <Delete>. The following prompt displays.



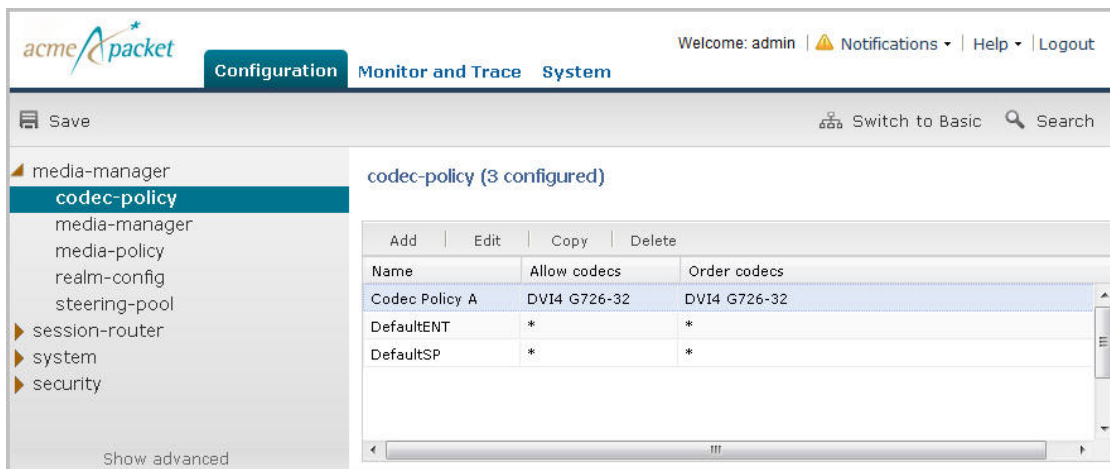
3. Click <Yes> to delete the item from the configuration. Or click <No> to cancel the delete function. If you delete the item, it no longer displays in the list box. You must save and activate the configuration for the change to take affect.

## Copying a Configuration

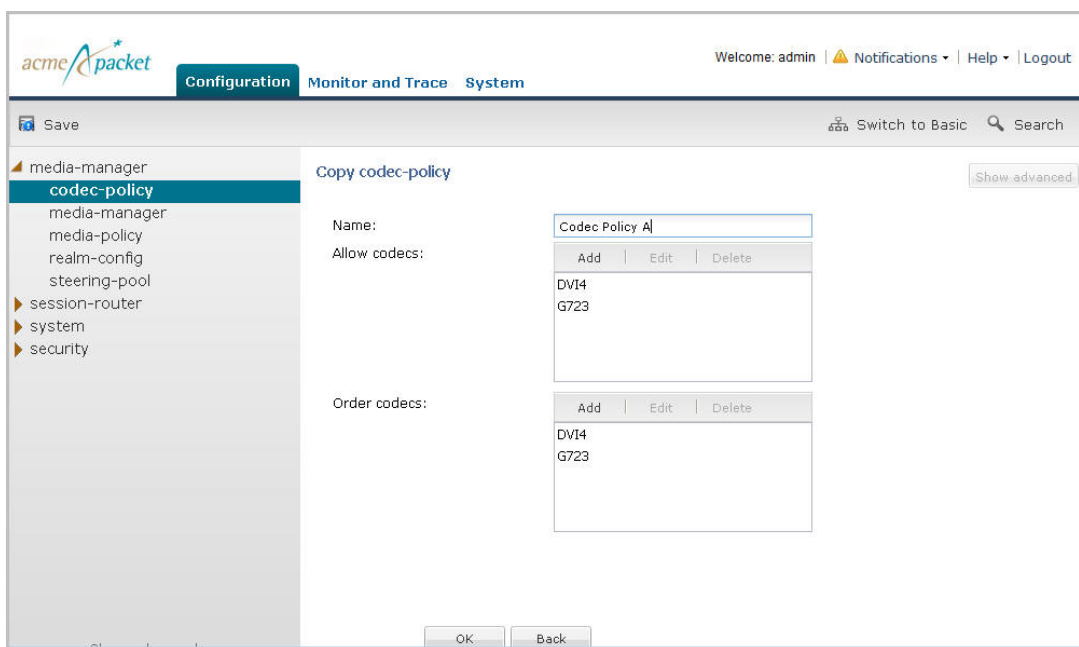
The following is an example procedure for copying a configuration in the Enterprise Session Director.

To copy a configuration:

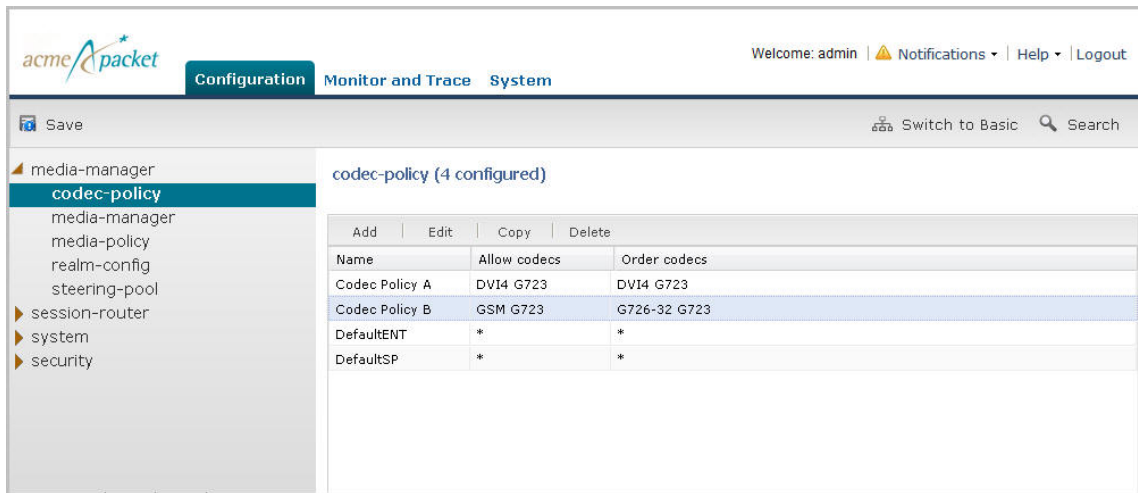
1. Under media-manager, click on codec-policy. The following displays.



2. In the list box, select the item you want to copy and click <Copy>. The configuration you selected displays.



3. Edit the configuration as applicable and then click <OK>. The new configuration displays in the list box, and the old configuration is retained. In the example, below, Codec Policy A is retained, and Codec Policy B is a new item in the list.



## Save and Activate Network Configuration

When you have completed creating your network, the <Save> button allows you to verify, save, and activate the configuration on the Enterprise Session Director. Clicking <Save> verifies and saves the current configuration to the Enterprise Session Director's last-saved configuration, stored in flash memory. It also displays a prompt that allows you to activate the configurations the running configuration if required.

A notification icon displays grayed-out in the upper right corner of the screen. After clicking <Save>, the Notifications menu becomes active. This menu will remain active allowing you to continue making changes to the configuration, and when you are ready to save and activate the configuration, you can select **Notifications > Save Changes** and then choose to activate the configuration.

To save your Enterprise Session Director configuration:

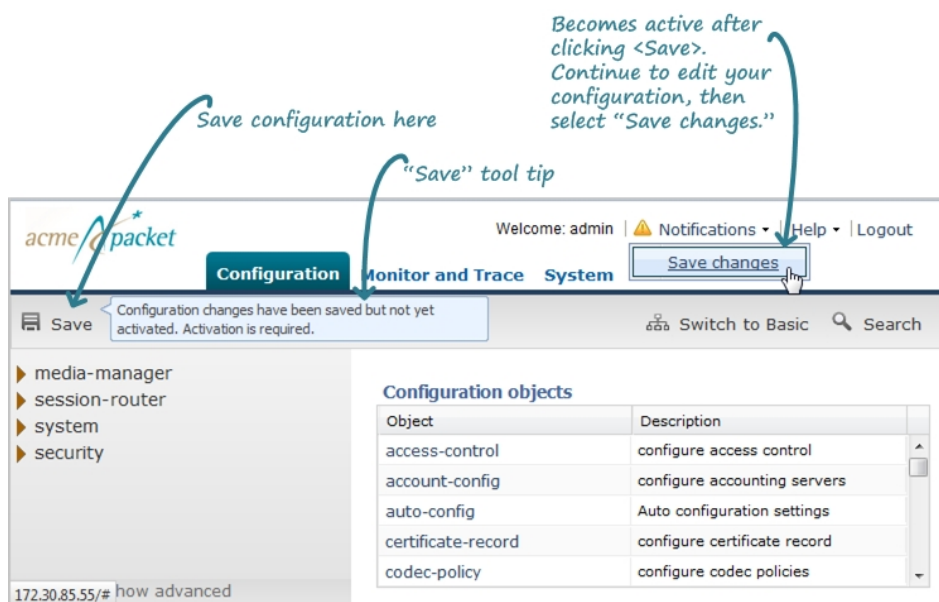
1. Click Save to verify and save your configuration. This saves the current configuration to the Enterprise Session Director's last-saved configuration, stored in flash memory.



**Note:** Placing the pointer over the <Save> button displays the following tool tip: Configuration changes have been made but not yet activated. Activation is required.

The following prompt displays: Do you want to activate the configuration?

2. Click <Activate> to activate the current configuration and make it the running configuration. Or click <Cancel> to cancel the activate function. The configuration is still saved in memory. If you click <Cancel>, you can continue to make changes to the configuration. After you clicked <Save> in Step 1, a notification icon became active in the upper right corner of the screen. When you complete your changes, you can then select **Notifications > Save changes** from this notification menu and then activate your configuration.



**Note:** Once you save the configuration in Expert Mode, you cannot switch back to Basic Mode.

## Dynamic ACL for the HTTP-ALG

The dynamic Access Control List (ACL) option for HTTP-Application Layer Gateway (ALG) provides Distributed Denial of Service (DDoS) attack protection for the HTTP port.

When the dynamic ACL option is enabled, the static flow for the public listening socket defined in `http-alg > public` is created with a trust level set to **untrusted**. Each listening socket creates and manages its ACL list, which allows the listening socket to keep track of the number of received and invalid messages, the number of connections per endpoint, and so on. You can configure a different setting for each `http-alg` object.

Dynamic ACL for each endpoint is triggered by Session Initialization Protocol (SIP) registration messages. Upon receiving a SIP registration message, the SIP agent creates a dynamic ACL entry for the endpoint. If the 200 OK response is received, the ACL is promoted, allowing the HTTP message to go through the security domain. If SIP registration is unsuccessful, the ACL entry is removed and HTTP ingress messages are blocked from the endpoint. The ACL entry is removed upon incomplete registration renewal or telephone disconnect.

The following example describes the criteria and associated configuration item that result in a denied or allowed connection for both low and medium control levels.

| Criteria                                       | Associated Configuration Item                            | Action                                |
|------------------------------------------------|----------------------------------------------------------|---------------------------------------|
| Exceed total number of connections for allowed | <code>http-alg &gt; max-incoming-conns</code>            | Connection denied                     |
| Exceed total connections per peer              | <code>http-alg &gt; per-src-ip-mas-incoming-conns</code> | Connection denied                     |
| ACL not promoted                               | Dynamically set on SIP registration                      | Connection denied                     |
| Exceed maximum number of packets/sec           | <code>realm-config &gt; maximum-signal-threshold</code>  | Connection denied and peer is demoted |
| Exceed maximum number of error packets         | <code>Realm-config &gt; invalid-signal-threshold</code>  | Connection denied and peer is demoted |

Oracle recommends setting `realm-config > access-control-level` to medium.

## Configuration

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If a peer is promoted to **trusted**, the system performs DDoS checks on **max number of packets/sec** and **max number of error packets** allowed.

Demotions depend on the realm's **realm-config > access-control-trust-level** setting. For more information on **realm-config** settings, see the ACLI Configuration Guide.


If you want to configure different ACL settings for SIP traffic and for HTTP-ALG traffic, you must configure a realm for each type of traffic.

### Enable Dynamic Access Control List (ACL) for the HTTP Application Layer Gateway (ALG)

Dynamic ACL option, which provides Distributed Denial of Service (DDoS) attack protection for the HTTP port, is an option that you must enable.

Confirm that the session manager is mapped to the Enterprise Session Director.

Two ACL entries are required for each registered telephone, where one entry is used for SIP traffic and one is used for HTTP-ALG traffic.

 **Note:** Enabling dynamic access control for HTTP-ALG traffic reduces the number of available dynamic ACL entries on the session border controller, which may reduce the number of concurrent trusted endpoints that the system can support.

1. From the command line, type `configure terminal`, and press ENTER.
2. Type `session-router`, and press ENTER.
3. Type `http-alg`, and press ENTER.  
The system displays a list of configured HTTP-ALG objects.
4. Type the number of the HTTP-ALG object that you want to edit, and press ENTER.  
The system displays the configuration values for the selected object.
5. Type `dynamic-acl enabled`, and press ENTER.
6. Optional. Type `max-incoming-conns <value>`, and press ENTER to set the maximum number of connections per peer IP address.
7. Optional. Type `per-src-ip-max-incoming-conns <value>`, and press ENTER to set the maximum number of HTTP connections per peer IP address.
8. Type `Done`, and press ENTER to save the HTTP-ALG values.  
The system displays the HTTP-ALG configuration.
9. Exit, Save, and Activate the configuration.

### Dynamic Access Control List (ACL) Settings for the HTTP Application Layer Gateway (ALG)

You can set the following parameters for the realm specified in `http-alg > public > realm-id`.

- `access-control-trust-level`
- `invalid-signal-threshold`
- `maximum-signal-threshold`
- `untrusted-signal-threshold`
- `deny-period`

For more information on **realm-config** settings, see the ACLI Configuration Guide.

## Session Manager Mapping

---

The Enterprise Session Director (SBC) supports mapping between multiple session managers and multiple SBCs. Such mapping allows the SBC to work in a redundant network configuration where you can map:

- The primary session manager to the primary SBC IP address



- One or more redundant session managers to one or more redundant SBCs

To map a redundant session manager to a redundant SBC, map the private IP address of the redundant session manager to the public SIP IP address configured in HTTP-ALG > Public on the SBC. For instructions, see "Map a Session Manager to a Session Border Controller."

## Map a Session Manager to a Session Border Controller

You can map one or more session managers to an Enterprise Session Director (E-SBC) to provide redundancy and load balancing.

### Before You Begin

- Note the private IP address of the session manager and the public SIP interface IP address of the session border controller that you want to map.
- Confirm that the system displays the Expert mode.

Map the private IP address of the session manager to the public SIP interface IP address of the E-SBC.

### Procedure

1. From the Web GUI, go to **Configuration > session-router > http-alg**.
2. On the http-alg page, click **Show advanced > Add**.
3. In the Add http-alg dialog, enter the information in the fields and make the selections for the deployment.
4. Click **OK**.  
The system lists the new map on the http-alg page.
5. Save and activate the configuration.

## Upgrade Software - Web GUI System Tab

You can upgrade the system software from the System tab on the Web GUI. The system requires a reboot after the upgrade.

1. From the Web GUI, click the System tab.
2. Click Upgrade Software.
3. Click Verification.
4. Verify that system health, synchronization health, current configuration version, and disk usage are appropriate and adequate for the upgrade.
5. From the drop-down list, select Upload method , and select one of the following methods.
  - Local. Use to select a file from your system for transfer.
  - Flash. Use to select a file already on the device.
  - Network. Use to specify parameters for network boot by way of file transfer.

The system displays the Upgrade Software dialog with the fields required for your upgrade.

6. Complete the required fields.
  - Software file to upload. (Local) Use Browse to locate the file on your local system.
  - Software file. (Flash) The location and name of the file on the device.
  - Boot file. (Network) The complete name of the boot file.
  - Host IP. (Network) The IP address of the FTP server.
  - FTP username. (Network) The user name to log onto the FTP server.
  - FTP password. (Network) The password to log onto the FTP server.
7. Optional. Select Reboot after upload.
8. Click Complete.
  - If you did not select Reboot after upload, the system displays a message stating that a reboot is required for the changes to take effect.

## Configuration

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- If you selected Reboot after upload, the system displays a message stating that it is about to reboot.
9. Click OK.  
If you selected Reboot after upload, the system reboots.

## Upgrade Software - Wizard

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You can upgrade the system software with the Upgrade software wizard on the Web GUI.

Use the Software Upgrade wizard to perform the following tasks:

- Check the system health before the upgrade
- Download new software
- Change boot parameters
- Reboot the system

The system requires a reboot after the upgrade for the changes to take effect.

1. From the Web GUI tool bar, click **Wizards**.
2. On the Wizards drop down list, click **Upgrade software**.
3. Optional. In the Software Upgrade dialog, click **Verification**, and do the following:
  - Click **View Synchronization Health**, and confirm that the system components are synchronized.
  - Click **View Configuration Version**, and note the Current Version and Running Version.
  - Click **View Disk Usage**, and confirm that the system has enough free space.
4. In the Software Upgrade dialog, do the following:
  - Select an **Upload Method**.
  - Select a **Software File to Upload**, if you chose the Local or Flash method.
  - Confirm or edit the boot parameters, if you chose the Network method.
  - Optional. Select **Reboot After Upload**.
5. Click **Complete**.
  - If you did not select **Reboot After Upload**, the system displays a message stating that a reboot is required for the changes to take effect.
  - If you selected **Reboot After Upload**, the system displays a message stating that it is about to reboot.
6. Click **OK**.  
The system performs the file transfer and any boot parameter changes. If you selected **Reboot After Update**, the system reboots.

## Update the Configuration Schema

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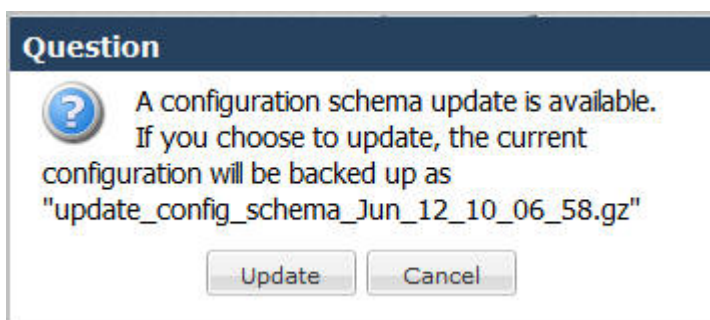
You can update the configuration parameters in your software with any new parameters included in a subsequent release by updating the schema.

Updating the schema adds any new parameters to each configuration screen in Basic Mode.


After updating your Web GUI software to a subsequent release, the system displays a schema update prompt after first log on to the GUI. If you click Cancel, the update is bypassed and no new parameters are added. The update prompt displays each time you log on to the Web GUI, until you choose to update the configuration schema.

### Procedure

1. Log into the Web GUI. The system displays the following prompt.



2. Click **Update**. The system backs up the current configuration and updates the configuration schema.

 **Note:** If needed, you can reinstall the backed up configuration at a later time from the System tab in the Web GUI.

3. Click **OK**.

4. On the Configuration page toolbar, click **Save**.

## Configuring Remote Site Survivability using the Web GUI

The Enterprise Session Director Web GUI supports the configuration of Survivability.

Use the following procedure to configure Survivability.

### Configure a Service Tag for an IP Interface

Configure a service tag to enable the Enterprise Session Director to monitor the health of a group of session agents, when survivability is enabled.

- Confirm that survivability is enabled.
- Confirm that the system displays the Expert mode.

To configure a service-tag for an IP interface:

1. From the Web GUI, click **Configuration > session-router > sip-interface**.
2. On the Modify SIP Interface page, in the Service tag field, enter a character string that identifies a group of session-agents for the current SIP interface.
3. Click **OK**.
4. Save and activate the configuration.

### Configure Remote Site Survivability

You must enable remote site survivability on the Enterprise Session Director (E-SBC) and set the parameters before the system can enter and exit survival mode.

#### Before You Begin

- Confirm that at least one session agent is configured.
- Confirm that the system displays the Expert mode.

#### Procedure

1. From the Web GUI, click **Configuration > session-router > survivability**.
2. At the bottom of the left pane, click **Show advanced**.
3. On the Add survivability page, do the following:

| Attributes | Instructions                    |
|------------|---------------------------------|
| State      | Select to enable Survivability. |

## Configuration

| Attributes             | Instructions                                                                                                                                             |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reg expires            | Enter the number of seconds that the Enterprise Session Director waits before entering the remote site survivability mode when the registration expires. |
| Prefix length          | Enter the maximum number of digits allowed for a phone extension. Range: 0-10.                                                                           |
| Session agent hostname | Select the agent hostname or the session agent group name from the drop down list.                                                                       |

4. Click **OK**.
5. Save and activate the configuration.

### Next Steps

- Configure a ping method on the session agent. See "Configure a Session Agent."

## Configure Service Health

To configure the service health for a list of service tags:

1. Select **session-router > service-health**.
2. In the service-tag-list window, click <Add>.
3. In the service-tag-string field, enter a list of service tags (associated with IP interfaces) on which the Enterprise Session Director (E-SBC) checks the service health. Default is blank. For example, intf1, intf2, intf3.
4. In the sa-health-profile box, click <Add>.
5. In the session-agent-hostname field, enter the hostname of the session agent on which the E-SBC monitors the service health.
6. In the session-agent-health field, enter the health score that the E-SBC uses to determine whether or not the health of the session-agent has decremented and gone out of service or incremented and came back into service. Valid values are 0 to 100 percent. Default is 100. For example, if this parameter is set to 100, and if the health score of the session-agent falls beneath 100 percent, Survivability mode begins (if enabled). If the health of the session-agent comes back up to 100 percent, Survivability mode ends and the system returns to Normal mode.



**Note:** For cases where there are two session agents, each session agent could have a service health of 50.

7. Click <OK>.
8. Save and activate the configuration.

## Configure the Ping Method for a Session Agent

Configure a ping method to confirm that the session agent is in service.

Use the session-agent object to configure the ping-method for a session-agent.

1. Click **Configuration > session-router > session-agent**.
2. On the Modify Session Agent page, select the session-agent for which you want to configure the ping-method, and click **OK**.
3. In the **Ping method** field, enter the SIP message/method to use to ping a session agent. Oracle recommends setting this value to OPTIONS.
4. In the **Ping interval** field, enter the number of seconds between pings.
5. Click **OK**.
6. Save and activate the configuration.

---

## Monitor and Trace Tab

The Monitor and Trace tab displays the results of filtered SIP session data from the Enterprise Session Director. The page displays the results in a common log format for local viewing.

Monitor and Trace supports the following summary reports that you can export to a PC.

- Sessions
- Registrations
- Subscriptions
- Notable events

Each report provides sorting, searching, and paging functionality. You can customize the columns in each report and use the buttons on the page to display additional information or to perform a task.

The SIP Monitor and Trace function can store messages per session and it can store cumulative sessions across all report types. Once the sessions maximum is reached, the system removes the oldest call and adds the newest call.

- On systems with less than 4GB of RAM, the system can store:
  - 50 messages
  - 2,000 sessions
- On systems with more than 4GB of RAM, the system can store:
  - 50 messages
  - 4,000 sessions

The call database is not persistent across reboots

The system can perform live paging from Monitor and Trace tables.

The system displays the Realm Configuration when you click a cell in the RealmID column in a table in Expert mode.

---

## Monitor and Trace SIP Messages

The Monitor and Trace page on the Web GUI displays the results of filtered SIP session data from a Enterprise Session Director (E-SBC). The page displays the results in a common log format for local viewing.

When the E-SBC filters the data from a SIP message, it captures the message, applies the Header Manipulation Rules (HMR), and applies the Session Plug-in Language (SPL) to that message. When the message is sent from the E-SBC, it applies the SPL, applies the HMR, and sends the captured SIP message.

Monitor and Trace supports the following summary reports that you can export to a PC.

## Monitor and Trace Tab

- Hairpin call data
- Notable events
- Registrations
- Sessions
- Siprec call data
- Subscriptions

Each type of report provides sorting, searching, and paging functionality. You can customize the columns in each report and use the buttons on the page to display additional information or perform a task.

The SIP Monitor and Trace function can store up to 100 messages per session and it can store up to 2000 cumulative sessions across all report types. Once the 2000 sessions maximum is reached, the system removes the oldest call and adds the newest call. The call database is not persistent across reboots.

## Sessions Report

The Sessions Report is a SIP session summary of all logged call sessions on the Enterprise Session Director (E-SBC). When Lightweight Directory Access Protocol (LDAP) is enabled on the Active Directory, LDAP session messages may also display.

The columns that display on the Sessions Report page depend on the columns that you specified in the "Customizing the Page Display" procedure.

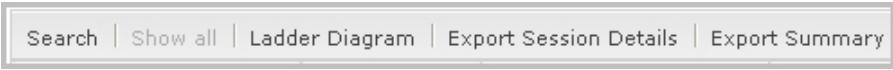
| Start Time              | State       | Call ID               | Request URI               | From URI              |
|-------------------------|-------------|-----------------------|---------------------------|-----------------------|
| 2013-10-17 13:56:41.083 | FAILED-408  | 5-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:40.984 | FAILED-408  | 4-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:40.884 | FAILED-408  | 3-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:40.784 | FAILED-408  | 2-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:40.683 | FAILED-408  | 1-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:21.338 | TERMINATED- | 5-15665@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:21.238 | TERMINATED- | 4-15665@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:21.136 | TERMINATED- | 3-15665@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |

The following table describes the columns on the SIP Session Summary page.

| Heading     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start Time  | Timestamp of the first SIP message in the call session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| State       | Status of the call or media session. Valid values are:<br>INITIAL—Session for which an INVITE or SUBSCRIBE was forwarded.<br>EARLY—Session that received the first provisional response (1xx other than 100).<br>ESTABLISHED—Session for which a success (2xx) response was received.<br>TERMINATED—Session that ended by receiving or sending a BYE for an “Established” session or forwarding an error response for an “Initial” or “Early” session. The session remains in the terminated state until all the resources for the session are freed up.<br>FAILED—Session that failed due to a 4xx or 5xx error code. |
| Call ID     | Identification of the call source. Includes the phone number and source IP address.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Request URI | Uniform Resource Identifier (URI) formatted string that identifies a resource by way of a protocol, name, location, and any other applicable characteristic that is sent by the E-SBC in REQUEST headers.                                                                                                                                                                                                                                                                                                                                                                                                              |

| Heading          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| From URI         | URI formatted string that identifies the call source information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| To URI           | URI formatted string that identifies the call destination information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Duration         | Amount of time, in seconds, that the call or media event was active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Notable Event    | Indicates if a notable event has occurred on the call session. Valid values are:<br><br>short session—Sessions that do not meet a minimum configurable duration threshold. Session dialogue, captured media information, and termination signalling. Any event flagged as a short session interesting event.<br><br>local rejection—Sessions locally rejected at the E-SBC for any reason, for example, Session Agent (SA) unavailable, no route found, SIP signalling error, and so on. Session dialogue, capture media information, and termination signalling. Any event flagged as a local rejection interesting event. |
| Session ID       | Identification assigned to the call session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ingress Src Addr | Source IP address of the incoming call or media event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Egress Dest Addr | Destination IP address of the outgoing call or media event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

The following table describes the buttons on the SIP Session Summary page.

| Button                                                                              | Description                                                                                                                                              |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                                                          |
| Search                                                                              | Use to specify parameters for performing a search for specific session summary records within the current report.                                        |
| Show all                                                                            | Use to display all of the session summary records in the Sessions Report.                                                                                |
| Ladder Diagram                                                                      | Use to display a Ladder Diagram of a specific record in the table. The Ladder Diagram displays detailed information about a call session or media event. |
| Export Session Details                                                              | Use to export the SIP messages and media events associated with the selected session to a file in text format on the local machine.                      |
| Export Summary                                                                      | Use to export all logged session summary records to a file in text format on the local machine.                                                          |

## Display a Sessions Report

### Procedure

1. From the Web GUI, click **Monitor and Trace > Sessions**.  
The system displays the SIP Session Summary page.
2. Use the buttons on the top of the page to find, view, and export information about the records in the report.

### Ladder Diagram

Ladder diagrams in the GUI are logical schematics that show the call and media flow of packets on ingress and egress routes via the Enterprise Session Director.

Ladder diagrams for the Session Report display the following session summary information:

- Quality of Service (QoS) statistics for call sessions
- SIP messages and media events in time sequence

## Monitor and Trace Tab

To display a ladder diagram for a specific record in the Session Report, you can double-click a record in the summary table OR click <Ladder Diagram> on the Session Report page.

Click here to display the ladder diagram for a session

or

Double-click an entry to display the session's ladder diagram

acme packet Configuration Monitor and Trace System Welcome: admin Notifications Help Logout

Sessions Registrations Subscriptions Notable Events

SIP Session Summary

Search Criteria: All

Search Show all Ladder Diagram Export Session Details Export Summary


| Start Time              | State          | Call ID                 | Request URI                 | From URI                      | To URI                      | Ingress Realm | Egress Realm | Duration | Notable Event |
|-------------------------|----------------|-------------------------|-----------------------------|-------------------------------|-----------------------------|---------------|--------------|----------|---------------|
| 2012-06-14 15:46:34.915 | TERMINATED-200 | 5-17902@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:46:33.914 | TERMINATED-200 | 4-17902@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:46:32.914 | TERMINATED-200 | 3-17902@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:46:31.914 | TERMINATED-200 | 2-17902@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:46:30.914 | TERMINATED-200 | 1-17902@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:45:35.557 | FAILED-400     | 5-17909@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:45:34.557 | FAILED-400     | 4-17909@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:45:33.558 | FAILED-400     | 3-17909@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:45:32.559 | FAILED-400     | 2-17909@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:45:31.559 | TERMINATED-200 | 1-17909@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:45:14.219 | TERMINATED-200 | 5-17544@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:45:13.219 | TERMINATED-200 | 4-17544@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |
| 2012-06-14 15:45:12.219 | TERMINATED-200 | 3-17544@192.168.200.226 | sip:trn@192.168.204.71:5060 | *:2273630@192.168.204.71:5060 | sip:trn@192.168.204.71:5060 | access        | core         |          |               |

Page Size: 50 Page 1 of 1 No data to display

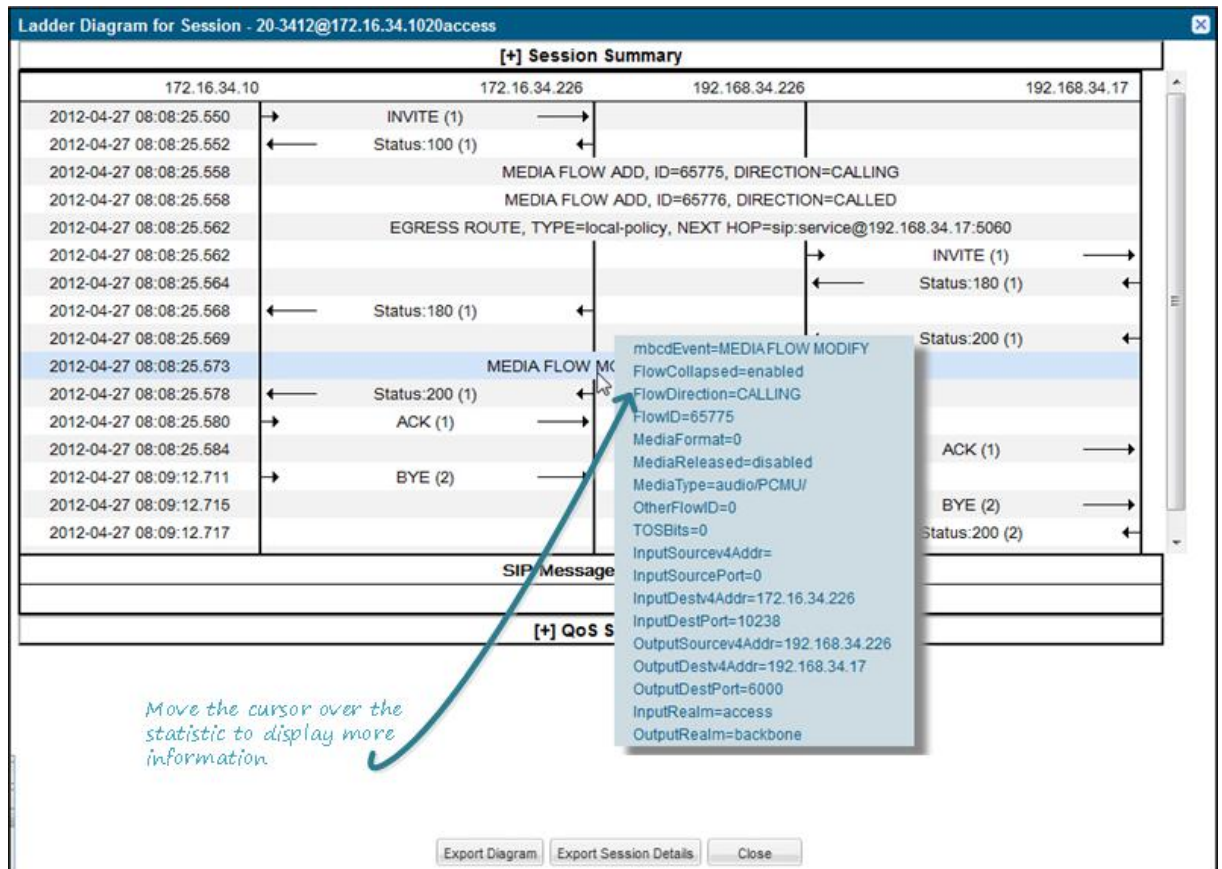
## Display a Ladder Diagram

To display a ladder diagram:

On the Sessions Report page, click **Ladder diagram**, or select a record in the table and double-click on that record. The following is an example of the ladder diagram that displays.

 **Note:** The Enterprise Session Director (E-SBC) captures SIP messages, applies the Header Manipulation Rules (HMR) configured on the E-SBC, and then applies the Session Plug-in Language (SPL) to that message. When the message is sent out from the E-SBC, it applies the SPL, the HMR, and then sends out the captured SIP message. Therefore, when viewing the session detail on a Ladder Diagram, the HMR and SPL information may be present.





The Session Record Ladder Diagram consists of the following information:

- Session Summary - summary information about the call or media session in focus.
- SIP Message Details - SIP message and call flow information about the call or media session in focus.
- QoS Statistics - Quality of Service (QoS) statistic information about the call or media session in focus.

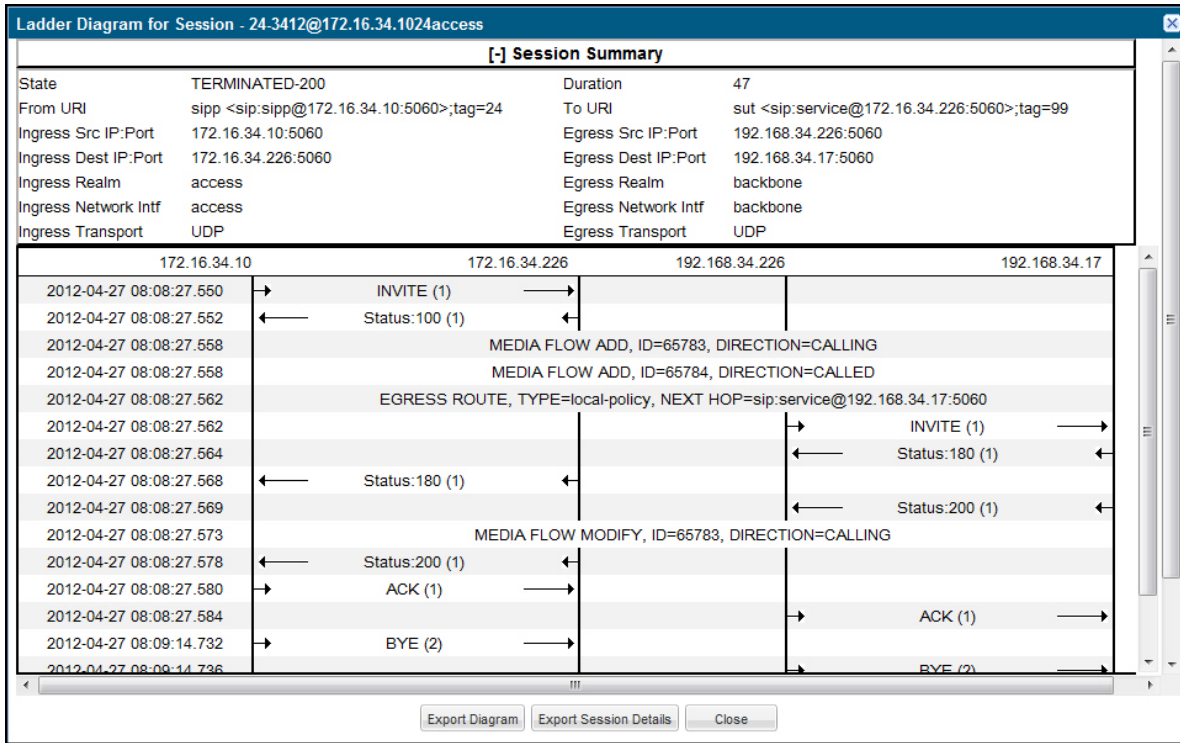
You can move your mouse over any statistic in the Ladder Diagram to view additional parameters and associated values for the statistic in a pop-up window.

The following table describes the buttons in this Ladder Diagram window.

| Button | Description                                                                                                                                                     |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | Exports all of the information in the Ladder Diagram (Session Summary, SIP Message Details, and QoS statistics), to a file in text format on the local machine. |
|        | Exports detailed information about the SIP messages and media events associated with the session in focus, to a file in text format on the local machine.       |
|        | Closes the Ladder Diagram window.                                                                                                                               |

### Session Summary

The Session Summary window in the Ladder Diagram displays an overall summary of the call or media session in focus.



**Display the Session Summary**

To display the Session Summary:

1. In the Ladder Diagram, click the [+] next to Session Summary at the top of the Ladder Diagram window. The Session Summary window expands. This window displays a summary of information about the call or media session in focus. The following table describes each field in the Session Summary window.

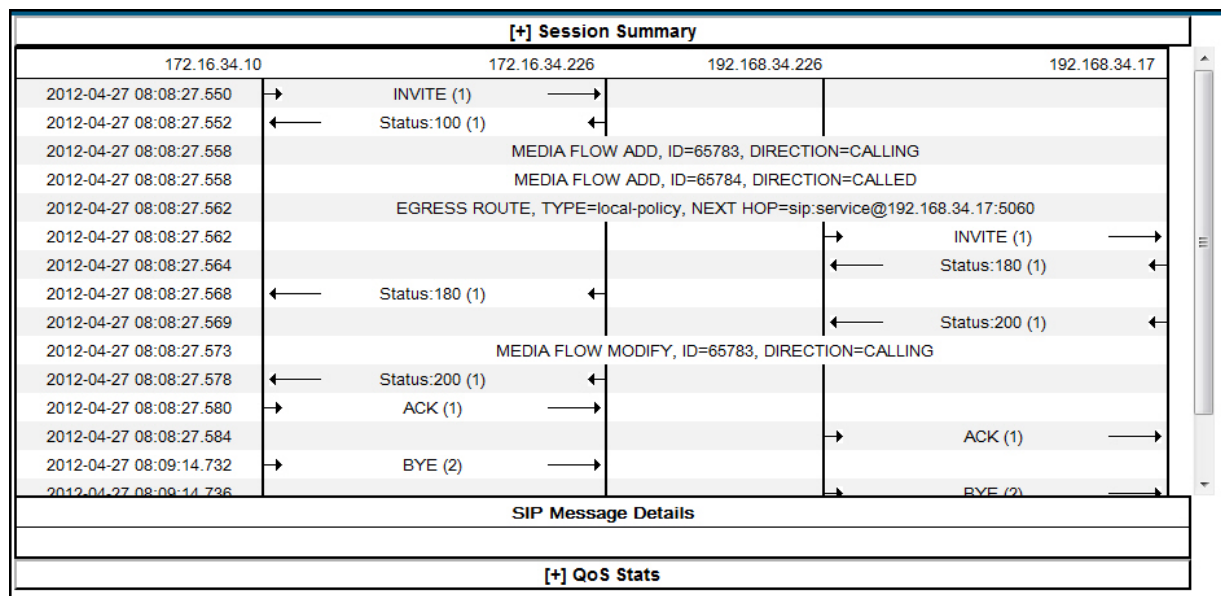
| Heading              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State                | Status of the call or media session. Valid values are:<br>INITIAL Session for which an INVITE or SUBSCRIBE was forwarded.<br>EARLY Session received the first provisional response (1xx other than 100).<br>ESTABLISHED Session for which a success (2xx) response was received.<br>TERMINATED Session that has ended by receiving or sending a BYE for an “Established” session or forwarding an error response for an “Initial” or Early session. The session remains in the terminated state until all the resources for the session are freed up.<br>FAILED Session that has failed due to a 4xx or 5xx error code. |
| Duration             | Amount of time, in seconds, that the call or media session was active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| From URI             | URI formatted string that identifies the call source information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| To URI               | URI formatted string that identifies the call destination information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Ingress Src IP:Port  | Source IP address and port number of the incoming call or media session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Egress Src IP: Port  | Source IP address and port number of the outgoing call or media session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ingress Dest IP:Port | Destination IP address and port number of the incoming call or media session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Egress Dest IP: Port | Destination IP address and port number of the outgoing call or media session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Heading              | Description                                                                                                                                  |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Ingress Realm        | Incoming realm name.                                                                                                                         |
| Egress Realm         | Outgoing realm name.                                                                                                                         |
| Ingress Network Intf | Name of the incoming network interface on the Enterprise Session Director (E-SBC).                                                           |
| Egress Network Intf  | Name of the outgoing network interface on the E-SBC.                                                                                         |
| Ingress Transport    | Protocol type used on the incoming call or media session. Valid values are User Datagram Protocol (UDP) or Transport Control Protocol (TCP). |
| Egress Transport     | Protocol type used on the outgoing call or media session. Valid values are User Datagram Protocol (UDP) or Transport Control Protocol (TCP). |

2. Click [-] to close the Session Summary window.

### SIP Message Details

The SIP Message Detail window displays detailed information and data flow (ingress and egress) about the call or media event.



When a session is routed using the a Lightweight Directory Access Protocol (LDAP) configuration (Active Directory) for the local policy, the LDAP information displays in the Session Summary window. The next hop value containing "enum:..." or "dns:..." displays. Similarly, the next hop value "ldap:..." displays for LDAP queries.

## Monitor and Trace Tab

| [+] Session Summary     |                                                       |                    |               |
|-------------------------|-------------------------------------------------------|--------------------|---------------|
| 192.168.204.64          | 192.168.204.71                                        | 172.16.204.67      | 172.16.204.64 |
| 2012-07-09 15:30:58.328 | → INVITE (1) →                                        |                    |               |
| 2012-07-09 15:30:58.334 | ← Status:100 (1) ←                                    |                    |               |
| 2012-07-09 15:30:58.354 | MEDIA FLOW ADD, ID=65536, DIRECTION=CALLING           |                    |               |
| 2012-07-09 15:30:58.356 | MEDIA FLOW ADD, ID=65537, DIRECTION=CALLED            |                    |               |
| 2012-07-09 15:30:58.371 | EGRESS ROUTE, TYPE=local-policy, NEXT HOP=ldap:lookup |                    |               |
| 2012-07-09 15:30:58.371 |                                                       | → INVITE (1) →     |               |
| 2012-07-09 15:30:58.625 |                                                       | ← Status:180 (1) ← |               |
| 2012-07-09 15:30:58.633 | ← Status:180 (1) ←                                    |                    |               |
| 2012-07-09 15:30:58.729 |                                                       | ← Status:200 (1) ← |               |
| 2012-07-09 15:30:58.738 | MEDIA FLOW MODIFY, ID=65536, DIRECTION=CALLING        |                    |               |
| 2012-07-09 15:30:58.754 | ← Status:200 (1) ←                                    |                    |               |
| 2012-07-09 15:30:59.020 | → ACK (1) →                                           |                    |               |
| 2012-07-09 15:30:59.028 |                                                       | → ACK (1) →        |               |
| 2012-07-09 15:31:01.754 | → BYE (2) →                                           |                    |               |
| 2012-07-09 15:31:01.763 |                                                       | → BYE (2) →        |               |
| 2012-07-09 15:31:01.889 |                                                       | ← Status:200 (2) ← |               |
| 2012-07-09 15:31:01.900 | ← Status:200 (2) ←                                    |                    |               |
| 2012-07-09 15:31:01.893 | MEDIA FLOW DELETE, ID=65536, DIRECTION=CALLING        |                    |               |
| 2012-07-09 15:31:01.895 | MEDIA FLOW DELETE, ID=65537, DIRECTION=CALLED         |                    |               |
| SIP Message Details     |                                                       |                    |               |
| [+] QoS Stats           |                                                       |                    |               |

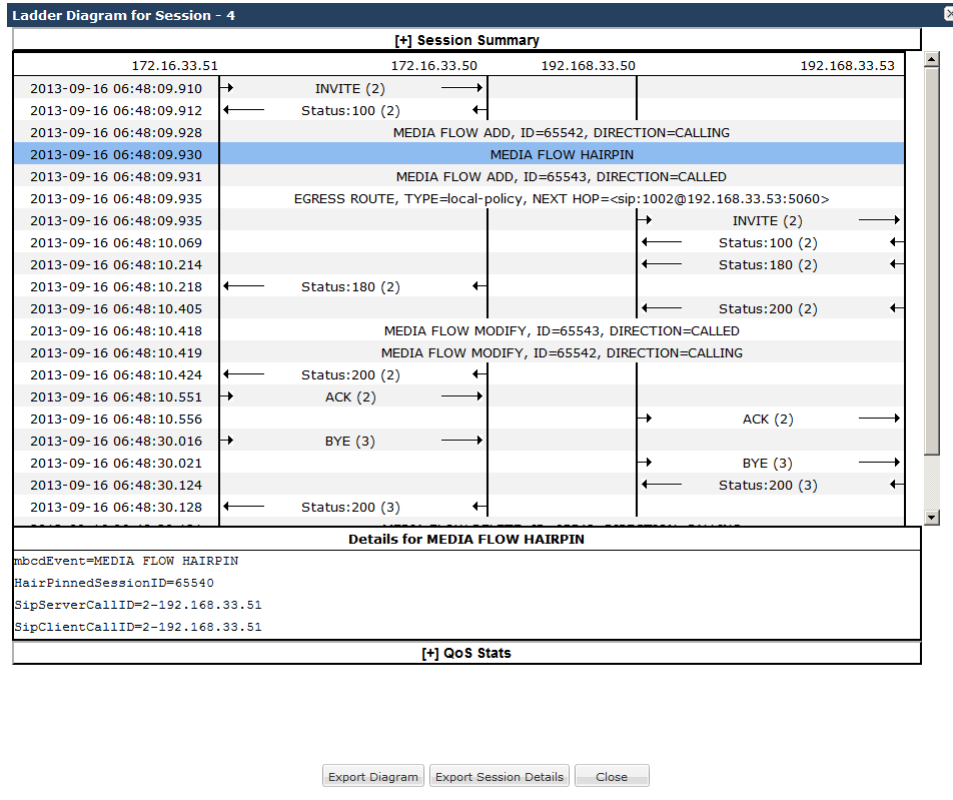
## SIPREC Call Data

The following diagram shows SIP Monitor and Trace output for a call with media forwarded by way of SIPREC.

| [+] Session Summary                                                                                                                                                                       |                                                                        |                    |                         |              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|-------------------------|--------------|
| 192.168.33.1                                                                                                                                                                              | 192.168.33.100                                                         | 172.16.33.100      | 172.16.33.1             | 192.168.33.2 |
| 2013-09-16 12:42:47.101                                                                                                                                                                   | → INVITE (1) →                                                         |                    |                         |              |
| 2013-09-16 12:42:47.104                                                                                                                                                                   | ← Status:100 (1) ←                                                     |                    |                         |              |
| 2013-09-16 12:42:47.128                                                                                                                                                                   | MEDIA FLOW ADD, ID=65562, DIRECTION=CALLING                            |                    |                         |              |
| 2013-09-16 12:42:47.130                                                                                                                                                                   | MEDIA FLOW ADD, ID=65563, DIRECTION=CALLED                             |                    |                         |              |
| 2013-09-16 12:42:47.170                                                                                                                                                                   | → INVITE (100021) →                                                    |                    |                         |              |
| 2013-09-16 12:42:47.190                                                                                                                                                                   |                                                                        |                    | ← Status:100 (100021) ← |              |
| 2013-09-16 12:42:47.200                                                                                                                                                                   |                                                                        |                    | ← Status:200 (100021) ← |              |
| 2013-09-16 12:42:47.226                                                                                                                                                                   | EGRESS ROUTE, TYPE=local-policy, NEXT HOP=sip:service@172.16.33.1:5060 |                    |                         |              |
| 2013-09-16 12:42:47.226                                                                                                                                                                   |                                                                        | → INVITE (1) →     |                         |              |
| 2013-09-16 12:42:47.255                                                                                                                                                                   | → ACK (100021) →                                                       |                    |                         |              |
| 2013-09-16 12:42:47.278                                                                                                                                                                   |                                                                        | ← Status:180 (1) ← |                         |              |
| 2013-09-16 12:42:47.285                                                                                                                                                                   | ← Status:180 (1) ←                                                     |                    |                         |              |
| 2013-09-16 12:42:47.287                                                                                                                                                                   |                                                                        | ← Status:200 (1) ← |                         |              |
| 2013-09-16 12:42:47.299                                                                                                                                                                   | MEDIA FLOW MODIFY, ID=65563, DIRECTION=CALLED                          |                    |                         |              |
| 2013-09-16 12:42:47.301                                                                                                                                                                   | MEDIA FLOW MODIFY, ID=65562, DIRECTION=CALLING                         |                    |                         |              |
| 2013-09-16 12:42:47.307                                                                                                                                                                   | ← Status:200 (1) ←                                                     |                    |                         |              |
| 2013-09-16 12:42:47.312                                                                                                                                                                   | → ACK (1) →                                                            |                    |                         |              |
| 2013-09-16 12:42:47.333                                                                                                                                                                   |                                                                        | → ACK (1) →        |                         |              |
| 2013-09-16 12:42:47.346                                                                                                                                                                   | → INVITE (100022) →                                                    |                    |                         |              |
| 2013-09-16 12:42:47.360                                                                                                                                                                   |                                                                        |                    | ← Status:200 (100022) ← |              |
| 2013-09-16 12:42:47.377                                                                                                                                                                   | → ACK (100022) →                                                       |                    |                         |              |
| 2013-09-16 12:43:19.323                                                                                                                                                                   | → BYE (2) →                                                            |                    |                         |              |
| 2013-09-16 12:43:19.334                                                                                                                                                                   |                                                                        | → BYE (2) →        |                         |              |
| 2013-09-16 12:43:19.356                                                                                                                                                                   |                                                                        | ← Status:200 (2) ← |                         |              |
| 2013-09-16 12:43:19.371                                                                                                                                                                   | → BYE (100023) →                                                       |                    |                         |              |
| 2013-09-16 12:43:19.395                                                                                                                                                                   | ← Status:200 (2) ←                                                     |                    |                         |              |
| 2013-09-16 12:43:19.409                                                                                                                                                                   |                                                                        |                    | ← Status:200 (100023) ← |              |
| Details for INVITE (1)                                                                                                                                                                    |                                                                        |                    |                         |              |
| 2013-09-16 12:42:47.101<br>INVITE sip:service@192.168.33.100:5060 SIP/2.0<br>Via: SIP/2.0/UDP 192.168.33.1:5060;branch=z9hG4bK-27311-1-0<br>From: sipp <sip:sipp@192.168.33.1:5060>;tag=1 |                                                                        |                    |                         |              |

### Hairpin Call Data

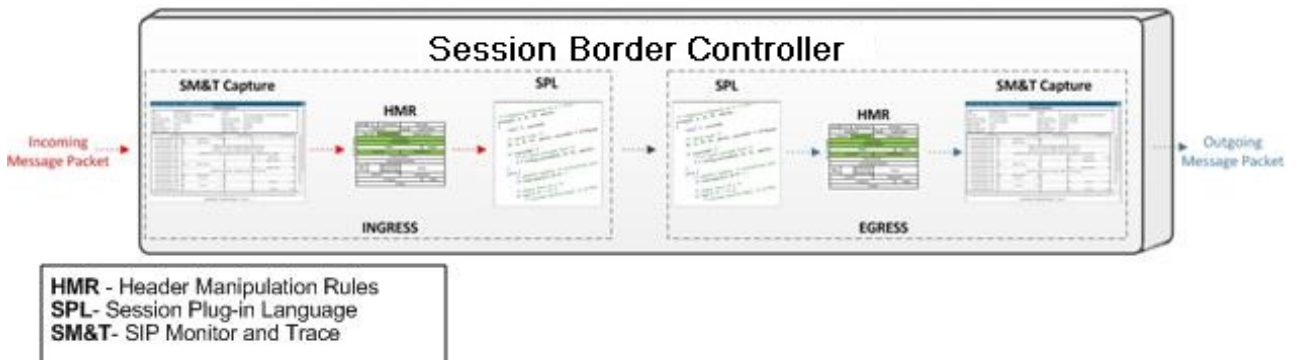
The following diagram shows SIP Monitor and Trace output for a hairpin call. Note the Media Flow Hairpin indication within the display.



### SIP Monitor & Trace Ingress Egress Messages

The SM&T feature allows SIP sessions on the Enterprise Session Director in your network to be monitored. Release E-C[xz]6.4.0 M2 includes a change to the way the Enterprise Session Director handles SM&T data in ingress and egress messages. It processes SM&T data first on incoming messages and sends the data out last on outgoing messages. This allows the Enterprise Session Director to capture SIP Monitor and Trace data over the wire for display in the Web GUI.

The Enterprise Session Director captures SIP messages, applies the Header Manipulation Rules (HMR) configured on the Enterprise Session Director, and then applies the Session Plug-in Language (SPL) to that message. When the message is sent out from the Net-Net ESD, it applies the SPL, then applies the HMR, and then sends out the captured SIP message.



## Monitor and Trace Tab

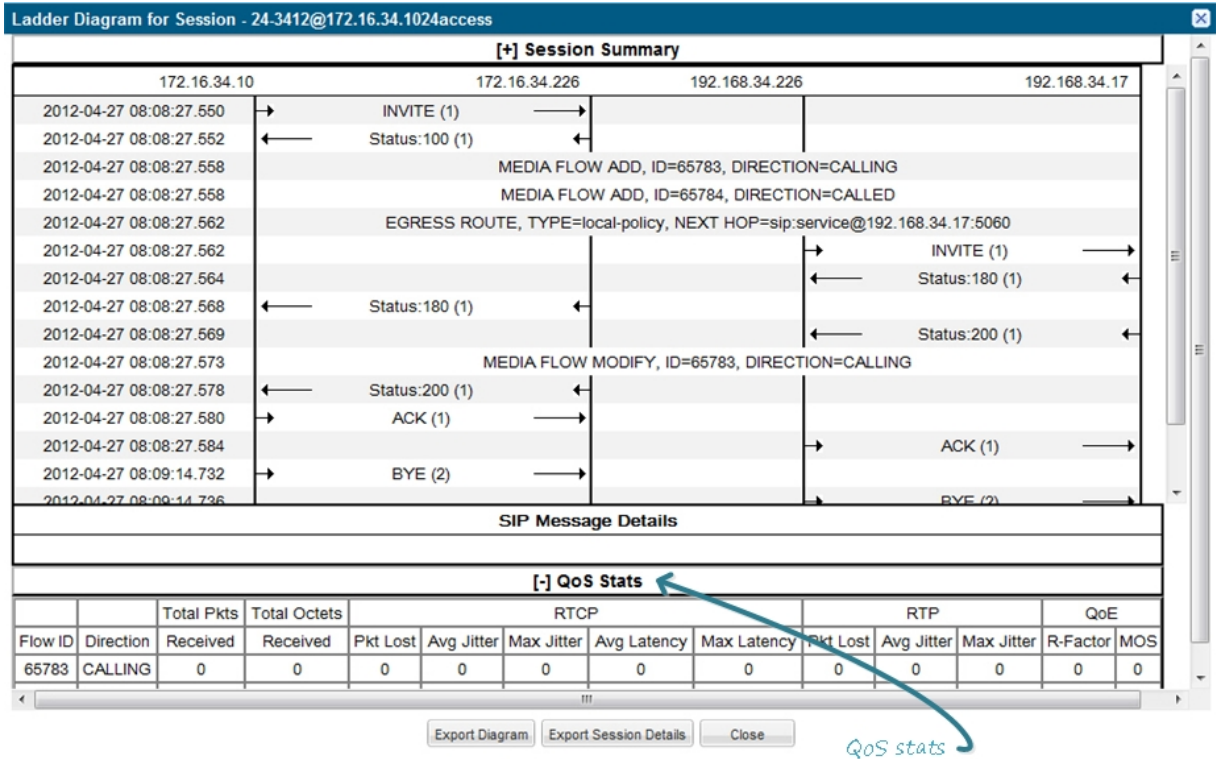
### Display SIP Message Details

To display SIP Message Details:

On the Sessions Report page, click **Ladder diagram**, or select a record in the table and double-click on that record. The SIP Message Details window displays. This window displays the messages and status codes that occurred during the active call session or media event. You can use the information to troubleshoot calls and media events that failed or timed out when trying to connect.

### QoS Statistics

The Quality of Service (QoS) window displays information about the quality of the service used on the call session or media event when the call or event was active.



### Display QoS Statistics

To display QoS Statistics:

1. In the Ladder Diagram, click the [+] next to QoS Stats at the bottom of the Ladder Diagram window. The QoS window expands. This window displays the QoS statistics for the call session or media event in focus. The following table describes each field in the QoS Statistics window.

| Heading               | Description                                                                                                                                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flow ID               | ID number assigned to the call session or media event flow of data.                                                                                                    |
| Direction             | The direction of the call or media event flow. Valid values are:<br>CALLING (egress direction)<br>CALLED (ingress direction)                                           |
| Total Pkts Received   | Total number of data packets received on the interface during the active call session or media event.                                                                  |
| Total Octets Received | Total number of octets received on the interface during the active call session or media event. An octet is a unit of digital information that consists of eight bits. |

| Heading     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RTCP        | Real-time Transport Control Protocol - used to send control packets to participants in a call.                                                                                                                                                                                                                                                                                                                                                                                            |
| Pkts Lost   | Number of RTCP data packets lost on the interface during the active call session or media event.                                                                                                                                                                                                                                                                                                                                                                                          |
| Avg Jitter  | Average measure of the variability over time of the RTCP packet latency across a network. A network with constant latency has no variation (or jitter). Jitter is referred to as Packet Delay Variation (PDV). It is the difference in the one-way end-to-end delay values for packets of a flow. Jitter is measured in terms of a time deviation from the nominal packet interarrival times for successive packets.                                                                      |
| Max Jitter  | Maximum measure of the variability over time of the RTCP packet latency across a network. A network with constant latency has no variation (or jitter).                                                                                                                                                                                                                                                                                                                                   |
| Avg Latency | Average observed one-way signaling latency during the active window period. This is the average amount of time the signaling travels in one direction.                                                                                                                                                                                                                                                                                                                                    |
| Max Latency | Maximum observed one-way signaling latency during the sliding window period. This is the maximum amount of time the signaling travels in one direction.                                                                                                                                                                                                                                                                                                                                   |
| RTP         | Real-Time Transport Protocol - a standard packet format for delivering audio and video over the internet.                                                                                                                                                                                                                                                                                                                                                                                 |
| Pkts Lost   | Number of RTP data packets lost on the interface during the active call session or media event.                                                                                                                                                                                                                                                                                                                                                                                           |
| Avg Jitter  | Average measure of the variability over time of the RTP packet latency across a network. A network with constant latency has no variation (or jitter). Jitter is referred to as Packet Delay Variation (PDV). It is the difference in the one-way end-to-end delay values for packets of a flow. Jitter is measured in terms of a time deviation from the nominal packet interarrival times for successive packets.                                                                       |
| Max Jitter  | Maximum measure of the variability over time of the RTP packet latency across a network. A network with constant latency has no variation (or jitter).                                                                                                                                                                                                                                                                                                                                    |
| QoE         | Quality of Experience - measurement used to determine how well the network is satisfying the end user's requirements.                                                                                                                                                                                                                                                                                                                                                                     |
| R-Factor    | Average Quality of Service (QoS) factor observed during the active window period. Quality of service shapes traffic to provide different priority and level of performance to different data flows. R-factors are metrics in VoIP, that use a formula to take into account both user perceptions and the cumulative effect of equipment impairments to arrive at a numeric expression of voice quality. This statistic defines the call or transmission quality expressed as an R factor. |
| MOS         | Mean Opinion Score (MOS) score. MOS is a measure of voice quality. MOS gives a numerical indication of the perceived quality of the media received after being transmitted and eventually compressed using Codecs.                                                                                                                                                                                                                                                                        |

- Click [-] to close the QoS Stats window.

## Registrations Report

The Registrations Report is a summary of all logged SIP registrations sessions on the Enterprise Session Director.

The columns that display on the Registration Report page are dependent on the columns you selected in the "Customizing the Page Display" procedure.

## Monitor and Trace Tab

The following table describes the columns on this page.

| Heading          | Description                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start Time       | Timestamp of the first SIP message in the call session.                                                                                                                                                                                                                                                                                                                                  |
| Call ID          | Identification of the call source. Includes the phone number and source IP address.                                                                                                                                                                                                                                                                                                      |
| To URI           | URI formatted string that identifies the call destination information.                                                                                                                                                                                                                                                                                                                   |
| From URI         | URI formatted string that identifies the call source information.                                                                                                                                                                                                                                                                                                                        |
| Local Expires    | The current setting for the expiration of a registration request sent from the Integrated Media Gateway (IMG) to a Remote SIP User Agent. The default is 3600 sec.                                                                                                                                                                                                                       |
| Remote Expires   | The current setting for the expiration of a registration request sent from the Remote SIP User Agent to the Integrated Media Gateway (IMG). The default is 3600 sec.                                                                                                                                                                                                                     |
| Ingress Realm    | Incoming realm name.                                                                                                                                                                                                                                                                                                                                                                     |
| Egress Realm     | Outgoing realm name.                                                                                                                                                                                                                                                                                                                                                                     |
| Notable Event    | Indicates if a notable event has occurred on the call session. Valid value is:<br>local rejection - Sessions locally rejected at the E-SBC for any reason (for example, Session Agent (SA) unavailable, no route found, SIP signalling error, etc.); Session dialogue, capture media information and termination signalling; Any event flagged as a local rejection<br>interesting event |
| Session ID       | Identification assigned to the call session.                                                                                                                                                                                                                                                                                                                                             |
| Ingress Src Addr | Source IP address of the incoming call or media event.                                                                                                                                                                                                                                                                                                                                   |
| Egress Dest Addr | Destination IP address of the outgoing call or media event.                                                                                                                                                                                                                                                                                                                              |
| Request URI      | Uniform Resource Identifier (URI) formatted string that identifies a resource via a protocol, name, location, and any other applicable characteristic, and is sent by the E-SBC in REQUEST headers.                                                                                                                                                                                      |

The following table describes the buttons on this page.

| Button | Description                                                                                                              |
|--------|--------------------------------------------------------------------------------------------------------------------------|
|        |                                                                                                                          |
| Search | Allows you to specify parameters for performing a search for specific session summary records within the current report. |



| Button                 | Description                                                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Show all               | Displays all of the session summary records in the Session Report.                                                                                 |
| Ladder Diagram         | Displays a Ladder Diagram of a specific record in the table. The Ladder Diagram displays detailed information about a call session or media event. |
| Export Session Details | Exports the SIP messages and media events associated with the selected session, to a file in text format on the local machine.                     |
| Export Summary         | Exports all logged session summary records to a file in text format on the local machine.                                                          |

### Display a Registrations Report

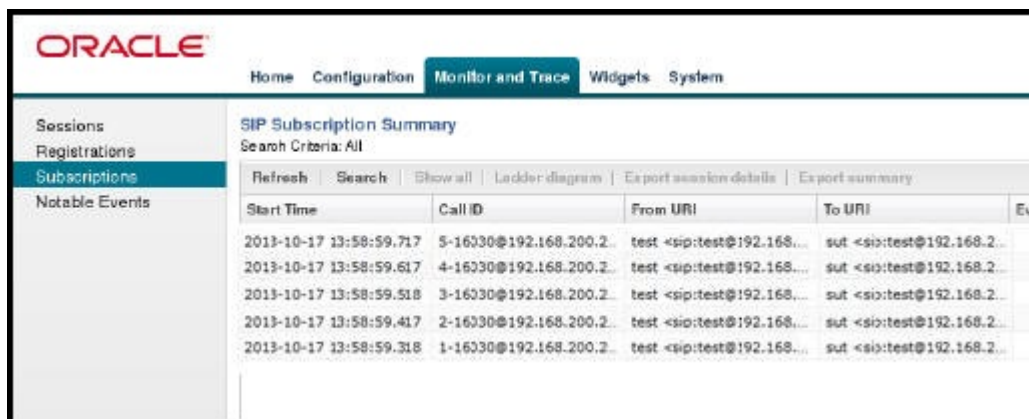
#### Procedure

1. From the Web GUI, click **Monitor and Trace > Registrations**.
2. Use the buttons on the top of the page to view information about the records in this report.

### Subscriptions Report

The Subscriptions Report is a summary of all logged SIP subscription sessions on the Enterprise Session Director (E-SBC).

The columns that display on the Subscription Report page are dependent on the columns you selected in the procedure, Customizing the Page Display (11).



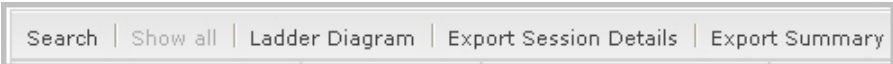
The following table describes the columns on this page.

| Heading    | Description                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start Time | Timestamp of the first SIP message in the call session.                                                                                                                                                                                                                                                                                                                                                              |
| Call ID    | Identification of the call source. Includes the phone number and source IP address.                                                                                                                                                                                                                                                                                                                                  |
| From URI   | URI formatted string that identifies the call source information.                                                                                                                                                                                                                                                                                                                                                    |
| To URI     | URI formatted string that identifies the call destination information.                                                                                                                                                                                                                                                                                                                                               |
| Events     | Specific subscribe event package that was sent from an endpoint to the destination endpoint. Applicable event packages can be:<br>conference - Event package that allows users to subscribe to a conference Uniform Resource Identifier (URI).<br>consent-pending additions - Event package used by SIP relays to inform user agents about the consent-related status of the entries to be added to a resource list. |

## Monitor and Trace Tab

| Heading          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <p>dialog - Event package that allows users to subscribe to another user, and receive notifications about the changes in the state of the INVITE-initiated dialogs in which the user is involved.</p> <p>message-summary - Event package that carries message-waiting status and message summaries from a messaging system to an interested User Agent (UA).</p> <p>presence - Event package that conveys the ability and willingness of a user to communicate across a set of devices. A presence protocol is a protocol for providing a presence service over the Internet or any IP network.</p> <p>reg - Event package that provides a way to monitor the status of *all* the registrations for a particular Address of Record (AoR).</p> <p>refer - Event package that provides a mechanism to allow the party sending the REFER to be notified of the outcome of a referenced request.</p> <p>winfo - Event package for watcher information. It tracks the state of subscriptions to a resource in another package.</p> <p>vq-rtcpX - Event package that collects and reports the metrics that measure quality for RTP sessions.</p> |
| Local Expires    | The current setting for the expiration of a registration request sent from the Integrated Media Gateway (IMG) to a Remote SIP User Agent. The default is 3600 sec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Remote Expires   | The current setting for the expiration of a registration request sent from the Remote SIP User Agent to the Integrated Media Gateway (IMG). The default is 3600 sec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Ingress Realm    | Incoming realm name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Egress Realm     | Outgoing realm name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Notable Event    | Indicates if a notable event has occurred on the call session. Valid value is:<br><br>local rejection - Sessions locally rejected at the E-SBC for any reason (for example, Session Agent (SA) unavailable, no route found, SIP signalling error, etc.); Session dialogue, capture media information and termination signalling; Any event flagged as a local rejection interesting event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Session ID       | Identification assigned to the call session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Ingress Src Addr | Source IP address of the incoming call or media event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Egress Dest Addr | Destination IP address of the outgoing call or media event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Request URI      | Uniform Resource Identifier (URI) formatted string that identifies a resource via a protocol, name, location, and any other applicable characteristic, and is sent by the E-SBC in REQUEST headers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

The following table describes the buttons on this page.

| Button                                                                               | Description                                                                                                              |
|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                          |
| Search                                                                               | Allows you to specify parameters for performing a search for specific session summary records within the current report. |
| Show all                                                                             | Displays all of the session summary records in the Session Report.                                                       |

| Button                 | Description                                                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Ladder Diagram         | Displays a Ladder Diagram of a specific record in the table. The Ladder Diagram displays detailed information about a call session or media event. |
| Export Session Details | Exports the SIP messages and media events associated with the selected session, to a file in text format on the local machine.                     |
| Export Summary         | Exports all logged session summary records to a file in text format on the local machine.                                                          |

### Display a Subscriptions Report

#### Procedure

1. From the Web GUI, click **Monitor and Trace > Subscriptions**.
2. Use the buttons on the top of the page to view information about the records in this report.

### Notable Events Report

The Notable Events Report contains all logged sessions that have a notable event associated with the session on the Enterprise Session Director (E-SBC).

The columns that display on the Notable Events Report page are dependent on the columns you selected in the procedure, Customizing the Page Display.

| Start Time              | State       | Call ID               | Request URI               | From URI   |
|-------------------------|-------------|-----------------------|---------------------------|------------|
| 2013-10-17 13:56:41.083 | FAILED-408  | 5-15779@192.168.200.2 | sip:service@192.168.20... | 9788482942 |
| 2013-10-17 13:56:40.984 | FAILED-408  | 4-15779@192.168.200.2 | sip:service@192.168.20... | 9788482942 |
| 2013-10-17 13:56:40.884 | FAILED-408  | 3-15779@192.168.200.2 | sip:service@192.168.20... | 9788482942 |
| 2013-10-17 13:56:40.784 | FAILED-408  | 2-15779@192.168.200.2 | sip:service@192.168.20... | 9788482942 |
| 2013-10-17 13:56:40.683 | FAILED-408  | 1-15779@192.168.200.2 | sip:service@192.168.20... | 9788482942 |
| 2013-10-17 13:56:21.338 | TERMINATED- | 5-15665@192.168.200.2 | sip:service@192.168.20... | 9788482942 |
| 2013-10-17 13:56:21.238 | TERMINATED- | 4-15665@192.168.200.2 | sip:service@192.168.20... | 9788482942 |

The following table describes the columns on this page.

| Heading    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start Time | Timestamp of the first SIP message in the call session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| State      | Status of the call or media event session. Valid values are:<br>INITIAL Session for which an INVITE or SUBSCRIBE was forwarded.<br>EARLY Session received the first provisional response (1xx other than 100).<br>ESTABLISHED Session for which a success (2xx) response was received.<br>TERMINATED Session that has ended by receiving or sending a BYE for an “Established” session or forwarding an error response for an “Initial” or Early session. The session remains in the terminated state until all the resources for the session are freed up.<br>FAILED Session that has failed due to a 4xx or 5xx error code. |
| Call ID    | Identification of the call source. Includes the phone number and source IP address.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Monitor and Trace Tab

| Heading          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Request URI      | Uniform Resource Identifier (URI) formatted string that identifies a resource via a protocol, name, location, and any other applicable characteristic, and is sent by the E-SBC in REQUEST headers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| To URI           | URI formatted string that identifies the call destination information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| From URI         | URI formatted string that identifies the call source information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Notable Event    | <p>Specific subscribe event package that was sent from an endpoint to the destination endpoint. Applicable event packages can be:</p> <p>conference - Event package that allows users to subscribe to a conference Uniform Resource Identifier (URI).</p> <p>consent-pending additions - Event package used by SIP relays to inform user agents about the consent-related status of the entries to be added to a resource list.</p> <p>dialog - Event package that allows users to subscribe to another user, and receive notifications about the changes in the state of the INVITE-initiated dialogs in which the user is involved.</p> <p>message-summary - Event package that carries message-waiting status and message summaries from a messaging system to an interested User Agent (UA).</p> <p>presence - Event package that conveys the ability and willingness of a user to communicate across a set of devices. A presence protocol is a protocol for providing a presence service over the Internet or any IP network.</p> <p>reg - Event package that provides a way to monitor the status of *all* the registrations for a particular Address of Record (AoR).</p> <p>refer - Event package that provides a mechanism to allow the party sending the REFER to be notified of the outcome of a referenced request.</p> <p>winfo - Event package for watcher information. It tracks the state of subscriptions to a resource in another package.</p> <p>vq-rtcpX - Event package that collects and reports the metrics that measure quality for RTP sessions.</p> |
| Ingress Realm    | Incoming realm name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Egress Realm     | Outgoing realm name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Notable Event    | <p>Indicates if a notable event has occurred on the call session. Valid values are:</p> <p>short session - Sessions that don't meet a minimum configurable duration threshold; Session dialogue, captured media information and termination signalling; Any event flagged as a short session interesting event.</p> <p>local rejection - Sessions locally rejected at the E-SBC for any reason (for example, Session Agent (SA) unavailable, no route found, SIP signalling error, etc.); Session dialogue, capture media information and termination signalling; Any event flagged as a local rejection interesting event.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Session ID       | Identification assigned to the call session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Ingress Src Addr | Source IP address of the incoming call or media event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Egress Dest Addr | Destination IP address of the outgoing call or media event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

The following table describes the buttons on this page.

| Button                                                                                                                                                                                                                             | Description                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <div style="border: 1px solid gray; padding: 5px; display: flex; gap: 10px;"> <span>Search</span>   <span>Show all</span>   <span>Ladder Diagram</span>   <span>Export Session Details</span>   <span>Export Summary</span> </div> |                                                                                                                                                    |
| Search                                                                                                                                                                                                                             | Allows you to specify parameters for performing a search for specific session summary records within the current report.                           |
| Show all                                                                                                                                                                                                                           | Displays all of the session summary records in the Session Report.                                                                                 |
| Ladder Diagram                                                                                                                                                                                                                     | Displays a Ladder Diagram of a specific record in the table. The Ladder Diagram displays detailed information about a call session or media event. |
| Export Session Details                                                                                                                                                                                                             | Exports the SIP messages and media events associated with the selected session, to a file in text format on the local machine.                     |
| Export Summary                                                                                                                                                                                                                     | Exports all logged session summary records to a file in text format on the local machine.                                                          |

### Display a Notable Events Report

#### Procedure

1. From the Web GUI, click **Monitor and Trace > Notable Events**.
2. Use the buttons on the top of the page to view information about the records in this report.

## Search for a Record

The <Search> button at the top of the report page allows you to perform a search to find a specific record(s) within a report (Sessions, Registrations, Subscriptions, Notable Events). It also allows you to specify criteria on which to perform the search.

After defining a search criteria in the Search Filter dialog box, clicking <Search>, automatically populates the report page with the records that match the criteria you specified. The search performs the filtering process of criteria dependent on the report page from which you are running the search.

For example, performing a search from the Sessions report page displays only the reports pertaining to call sessions. If you performed a search on the Registration report page, only the reports pertaining to call registrations displays on the report page. The search string containing the criteria on which you performed the search, displays in the top left corner of the page.

The screenshot shows the Oracle Enterprise Session Border Controller GUI. The top navigation bar includes 'Configuration', 'Monitor and Trace', and 'System'. A sidebar on the left lists 'Sessions', 'Registrations', 'Subscriptions', and 'Notable Events'. The main content area displays a 'SIP Session Summary' report. At the top of the report, the search criteria are shown: 'Search Criteria: toURI=172.16.34.226; startDateTime=2012-04-26 08:08:28; endDateTime=2012-04-27 08:08:27'. Below this, a table lists session records with columns for Start Time, State, Call ID, and Request URI. Hand-drawn blue arrows point from the text 'Click here to perform a search' to the 'Search' button in the report's toolbar, and from 'Search string displays here' to the search criteria text.

| Start Time              | State          | Call ID              | Request URI                 |
|-------------------------|----------------|----------------------|-----------------------------|
| 2012-04-27 08:08:28.051 | TERMINATED-200 | 25-3412@172.16.34.10 | sip.service@172.16.34.226.. |
| 2012-04-27 08:08:27.550 | TERMINATED-200 | 24-3412@172.16.34.10 | sip.service@172.16.34.226.. |
| 2012-04-27 08:08:27.050 | TERMINATED-200 | 23-3412@172.16.34.10 | sip.service@172.16.34.226.. |

## Monitor and Trace Tab



**Note:** A SIP Monitor and Trace global search can find items in the SIP headers as well.

The search criteria is saved until you click <Reset> in the dialog box, or until you log out of the HTTP session.

### Perform a Search

To perform a search:

You can specify a value for any or all of the fields in the Search box. The search process searches for records with all of the values you specify and displays only the records with these values. If you perform a “Global Search”, AND specify values in other fields, the search process searches the other specified fields first and then filters on the “Global Search” field.

If you specify a “\*” in a search string, the search is performed on that exact string. For example, if you search for “123\*45”, the search shows results for all strings containing “123\*45”.

You can use quotes (“”) to specify a search. For example, you can enter Smith and the search finds all of the records that match Smith, such as: John Smithfield<sip:sipp@192.168.1.70:5070>;tag=12260SIPpTag001.

If you enter a space before or after a quotation mark, (for example, “Smith “), the search returns no data.

1. In any reports page, click **Search**.
2. In the Global Search field, specify a string to search all parameters in all records. Valid values are alpha-numeric characters.

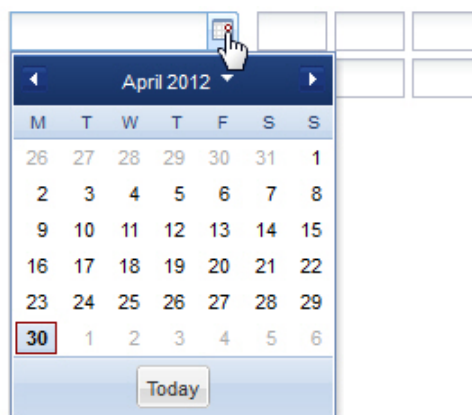


**Note:** The Global Search option searches all parameters in all the session records stored in memory. All values you specify in other fields are searched before the value specified in the Global Search field is used.

3. In the From URI field, enter the URI formatted string of the call source information you are searching. Valid values are alpha-numeric characters. For example, sipp<sip:sipp@172.16.34.10:5060;tag=24.
4. In the Requested URI field, enter the URI formatted string that contains a protocol, name, location, or any other applicable characteristic, that is sent by the Net-Net ECB in the REQUEST header. Valid values are alpha-numeric characters. For example, sip:service@172.16.34.226:5060.
5. In the To URI field, enter URI formatted string of the call destination information you are searching. Valid values are alpha-numeric characters. For example, sut<sip:service@172.16.34.226:5060;tag=99.
6. In the Start Date/Time (HH mm ss) field, enter a starting date to search on in the first text box in the format YYYY-MM-DD (where Y =year, M=month, and D=day). or Click on the calendar icon in this field to display a calendar from which you can select a date. Navigate the calendar to find the date you want and click on it to enter it into this field, or click <Today> to enter today’s date. For example, 2012-04-15 would search for all records starting on April 15, 2012. Valid values are numeric characters only. Enter a start time to search on in the last three text boxes in the format HH mm ss (where H=hour, m=minutes, and s=seconds). For example, 01 30 45 would search for all records starting at 1:30 and 45 seconds. Valid value are numeric characters only.

Start Date/Time(HH mm ss)

End Date/Time(HH mm ss)



7. In the End Date/Time (HH mm ss) field, repeat the process of entering a date and time as provided in Step 7.

8. To search on additional parameters, click on the Additional Identifiers down arrow to expand the dialog box.

## Specify Additional Identifiers

To specify additional identifiers:

1. In the Session Id field, enter the ID of the call session you want to search. Valid values are alpha-numeric characters. For example, 22-3412@172.16.34.1.
2. In the In Call ID field, enter the ID of the incoming call (phone number and source IP address). Valid values are alpha-numeric characters. For example, 25-3412@172.16.34.10.
3. In the Out Call ID field, enter the ID of the outgoing call (phone number and IP address). Valid values are alpha-numeric characters. For example, 14-3412@172.14.54.6.
4. In the State (with result code) field, enter the status of the call session with the result code for which you want to search. Valid values are (case-sensitive):
  - INITIAL-<result code>
  - EARLY-<result code>
  - ESTABLISHED-<result code>
  - TERMINATED-<result code>
  - FAILED-<result code>

Result codes can range from 1xx to 5xx. For example, terminated-200, or failed-400.

5. In the Notable Event field, select the notable event for which you want to search. Valid values are:
  - any-event - search displays any notable event that was stored in memory.
  - short-session - search displays only records that indicate a short-session duration has occurred.
  - local-rejection - search displays only records that indicate a local-rejection has occurred.
6. To search on additional parameters, click on the Additional Search Options down arrow to expand the dialog box.

## Specify Additional Search Options

To specify additional search options:

1. In the “In Realm” field, enter the name of the realm for which the incoming call belongs. Valid values are alpha-numeric characters. For example, access.
2. In the “Out Realm” field, enter the name of the realm for which the outgoing call belongs. Valid values are alpha-numeric characters. For example, backbone.
3. In the “In SA” field, enter the name of the session agent (SA) on the incoming call session. Valid values are alpha-numeric characters. For example, SA1.
4. In the “Out SA” field, enter the name of the session agent (SA) on the outgoing call session. Valid values are alpha-numeric characters. For example, SA2.
5. In the “In Source Addr” field, enter the source IP address of the SA that accepted the incoming call session. IP Address must be entered in dotted decimal format (0.0.0.0). For example, 172.45.6.7.
6. In the “Out Dest Addr” field, enter the destination IP address of the SA that accepted the outgoing call session. IP Address must be entered in dotted decimal format (0.0.0.0). For example, 172.64.56.7.
7. In the In Network Interface field, enter the incoming core network interface that connects the Net-Net ECB to your network. IP Address must be entered in dotted decimal format (0.0.0.0). For example, 192.45.6.7.
8. In the Out Network Interface field, enter the outgoing network interface that connects your Net-Net ECB to the outside network. IP Address must be entered in dotted decimal format (0.0.0.0). For example, 192.45.6.8.
9. Click <Search> to perform the search with the values you specified. A list of the records that the search process filtered, display in the window. The GUI saves the search specifications until you click <Reset> in the search dialog box, OR until you log out of the GUI.

### Traceroute Command

---

The system can trace the route of an IP packet to an Internet host by sending probe packets and listening to responses from gateways along the route. Use the traceroute command to see each host route and the round trip time of packets received from each host in a route for diagnostic purposes.

The traceroute command sends probe packets that start with a maximum time-to-live (TTL) value of one. The system listens for an Internet Control Message Protocol (ICMP) error message in response to the TTL expiry, and records the source that sent the ICMP error message. The system repeats this process and increments the TTL value by 1 for each hop in the route to the final destination.

The traceroute command returns the following information, which allows tracing the packet route to its destination.

- TTL value
- IP address of each host along the route
- Amount of time that it takes for each probe packet to travel to each host in the route

Notes:

- Unless otherwise specified, the system sends three probe packets to each host.
- The traceroute command is only available in software versions of the Enterprise Session Director, for example, Server Edition (SE) and Virtual Machine Edition (VME). For more information on supported platforms, see "Platform Support."

For traceroute command syntax and arguments, see "Traceroute Command Specifications."

#### Examples

The following example traces the route to IP address 172.30.0.167, identifying each host in the route and the amount of time that it takes for each of three probe packets to travel to each host. The first three probe packets reach the host at 172.44.0.1 in times ranging from less than one to a little over two milliseconds. The next three probe packets reach the route destination at IP address 172.30.0.167 all in less than one millisecond.

```
ACMEPACKET# traceroute 172.30.0.167
traceroute to 172.30.0.167
1 172.44.0.1 (0.669003 ms) (2.140045 ms) (2.290964 ms)
2 172.30.0.167 (0.25602 ms) (0.219822 ms) (0.604868 ms)
```

The following example traces the route to IP address 172.30.0.167 but specifies the use of 4 probe packets instead of the default of 3.

```
ACMEPACKET traceroute 172.30.0.167 probes 4
traceroute to 172.30.0.167
1 172.44.0.1 (0.549003 ms) (1.180045 ms) (2.920584 ms) (2.48541 ms)
2 172.30.0.167 (0.25802 ms) (0.220822 ms) (0.454868 ms) (0.387574)
```

The following example specifies that the traceroute command is issued to the IP address over the user-specified network interface private and VLAN 123.

```
ACMEPACKET traceroute 10.1.2.6 intf-name:vlan private:123
traceroute to 10.1.2.6
1 10.1.2.6 (0.265121 ms) (0.599080 ms) (0.0184195 ms)
```

The following example specifies that the wait for a response timeout is 4 seconds. The default value is three seconds.

```
ACMEPACKET traceroute 10.1.2.6 timeout 4
traceroute to 10.1.2.6
1 10.1.2.6 (0.265121 ms) (0.199080 ms) (0.0284195 ms)
```

The following example specifies that the traceroute starts at a user-specified source IP address of 172.20.22.31 to a destination IP address of 10.25.2.10.

```
ACMEPACKET traceroute 172.20.22.31 source-ip 10.25.2.10
traceroute to 172.20.22.31
172.20.22.31 (0.284121 ms) (0.499770 ms) (0.084595 ms)
```



## Export Information to a Text File

Monitor and Trace allows you to export information to a text file from the Sessions, Registrations, Subscriptions and Notable Events Reports, as well as from a specific ladder diagram, or from a page containing the results of a search. The data exports to a file that you can open and view as required.

You can export any of the following:

- All information from each report
- Information from a specific record only
- Information from a search result
- Information from a Ladder Diagram

From the Sessions, Registrations, Subscriptions, and Notable Events Reports Page

Select a session and click here to export the session's details

Click here to export a summary of all the sessions

| Start Time              | State          | Call ID                 | Request URI                 | From URI                     | To URI                       | Ingress Realm | Egress Realm | Duration | Notable Event |
|-------------------------|----------------|-------------------------|-----------------------------|------------------------------|------------------------------|---------------|--------------|----------|---------------|
| 2012-06-14 15:46:34.915 | TERMINATED-200 | 5-17902@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:46:33.914 | TERMINATED-200 | 4-17902@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:46:32.914 | TERMINATED-200 | 3-17902@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:46:31.914 | TERMINATED-200 | 2-17902@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:46:30.914 | TERMINATED-200 | 1-17902@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:45:35.957 | FAILED-400     | 5-17609@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:45:34.957 | FAILED-400     | 4-17609@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:45:33.958 | FAILED-400     | 3-17609@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:45:32.959 | FAILED-400     | 2-17609@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:45:31.959 | TERMINATED-0   | 1-17609@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:45:14.210 | TERMINATED-200 | 5-17548@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:45:13.211 | TERMINATED-200 | 4-17548@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |
| 2012-06-14 15:45:12.210 | TERMINATED-200 | 3-17548@192.168.200.226 | sip:tes@192.168.204.71:5060 | *:2273630#*tel:781-414-23... | sul-sip:kam@192.168.204.7... | access        | core         |          |               |

From the Ladder Diagram Page

## Monitor and Trace Tab

**[+] Session Summary**

| Time                    | Direction | Message                                                                  |
|-------------------------|-----------|--------------------------------------------------------------------------|
| 2012-04-27 08:08:27.550 | →         | INVITE (1)                                                               |
| 2012-04-27 08:08:27.552 | ←         | Status:100 (1)                                                           |
| 2012-04-27 08:08:27.558 |           | MEDIA FLOW ADD, ID=65783, DIRECTION=CALLING                              |
| 2012-04-27 08:08:27.558 |           | MEDIA FLOW ADD, ID=65784, DIRECTION=CALLED                               |
| 2012-04-27 08:08:27.562 |           | EGRESS ROUTE, TYPE=local-policy, NEXT HOP=sip.service@192.168.34.17:5060 |
| 2012-04-27 08:08:27.562 |           | INVITE (1)                                                               |
| 2012-04-27 08:08:27.564 |           | Status:180 (1)                                                           |
| 2012-04-27 08:08:27.568 | ←         | Status:180 (1)                                                           |
| 2012-04-27 08:08:27.569 |           | Status:200 (1)                                                           |
| 2012-04-27 08:08:27.573 |           | MEDIA FLOW MODIFY, ID=65783, DIRECTION=CALLING                           |
| 2012-04-27 08:08:27.578 | ←         | Status:200 (1)                                                           |
| 2012-04-27 08:08:27.580 | →         | ACK (1)                                                                  |
| 2012-04-27 08:08:27.584 |           | ACK (1)                                                                  |
| 2012-04-27 08:09:14.732 | →         | BYE (2)                                                                  |
| 2012-04-27 08:09:14.736 |           | BYE (2)                                                                  |

**SIP Message Details**

**[-] QoS Stats**

| Flow ID | Direction | Total Pkts |          | Total Octets |            | RTCP       |             |             |          | RTP        |            |          | QoE |   |
|---------|-----------|------------|----------|--------------|------------|------------|-------------|-------------|----------|------------|------------|----------|-----|---|
|         |           | Received   | Received | Pkt Lost     | Avg Jitter | Max Jitter | Avg Latency | Max Latency | Pkt Lost | Avg Jitter | Max Jitter | R-Factor | MOS |   |
| 65783   | CALLING   | 0          | 0        | 0            | 0          | 0          | 0           | 0           | 0        | 0          | 0          | 0        | 0   | 0 |

Export Diagram    Export Session Details    Close

*Click here to export the session's Ladder diagram*

*Click here to export the session's details*


The following table identifies the buttons to use to export specific information from Monitor and Trace. All the export buttons in the GUI export to text files.

| Button                                                                       | Description                                                                                                                                                                                                        |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| From the Sessions, Registrations, Subscriptions, and Notable Events Reports: |                                                                                                                                                                                                                    |
| Export Session Details                                                       | Exports the SIP messages and media events associated with the selected session, to a file in text format on the local machine.                                                                                     |
| Export Summary                                                               | Exports all logged session summary records to a file in text format on the local machine.<br>Note: This button exports ALL call session summary records or the records that matched a search criteria to the file. |
| From the Ladder Diagram:                                                     |                                                                                                                                                                                                                    |
| Export Diagram                                                               | Exports all of the information in the Ladder Diagram (Session Summary, SIP Message Details, and QoS statistics), to an HTML file format on the local machine.                                                      |
| Export Session Details                                                       | Exports detailed information about the SIP messages and media events in the Ladder Diagram associated with the selected session, to a file in text format on the local machine.                                    |

The following procedure is an example of using the export buttons in Monitor and Trace:

### Export Report Information to a Text File

To export information from a Monitor and Trace report to a text file:

 **Note:** The GUI exports Ladder Diagrams as HTML files.

1. From the Web GUI, click the **Monitor and Trace** tab.
2. On the Monitor and Trace page, select a report type. For example, Subscriptions.
3. On the report Summary page, select a report from the list, and do one of the following:
  - Click **Export session details**.
  - Click **Export summary**.
4. In the SessionDetails.txt or SummaryExport.txt dialog, do one of the following:
  - Click **Open with**, and select the application with which to open the resulting text file.
  - Click **Save file** to save the text file to your local PC.
5. Click **OK** to export the report information.




---

## System Tab

The System tab on the Web GUI provides the following ways to manage files on the system:

- File Management. Refresh, Upload, Download, Backup, Restore, and Delete files.
- Force HA Switchover. Force the system to switch from the primary to the secondary.
- Reboot. Reboot the system.
- Support information. Generate a file that displays troubleshooting information.
- Upgrade software. Verify system health, upload software, and reboot the system.

 **Note:** You can activate an LRT file, fraud protection file, or an SPL file dynamically upon an upload, if required. You can also immediately apply a backup configuration file during the upload process.


---

## Upload a File

Procedure and conditions for uploading a file to the Enterprise Session Director.

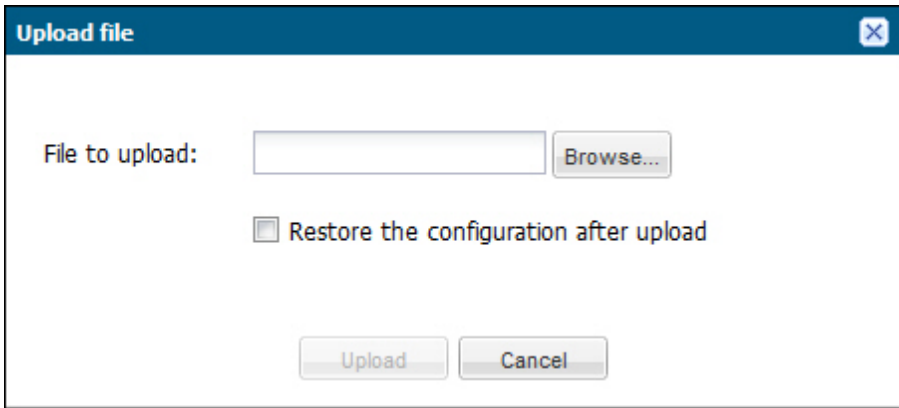
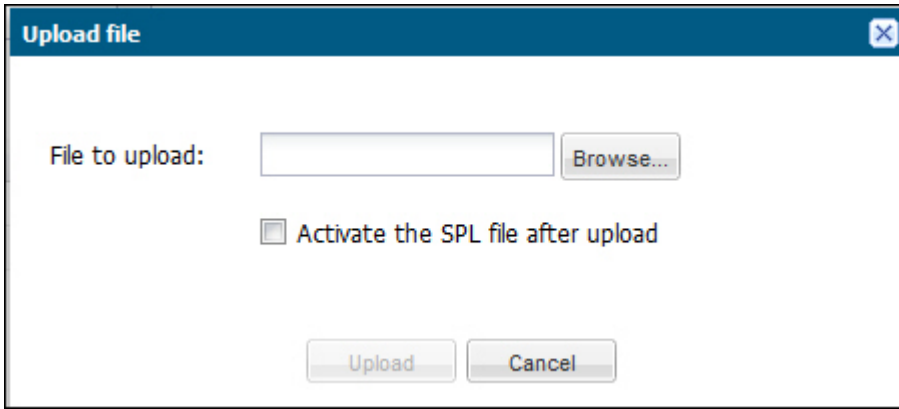
You can upload any of the following file types from your local server or PC to the Enterprise Session Director:

- Local route table (LRT)
- SPL Plug-in (SPL)
- Backup configuration
- Software image
- SIP Trunk Xpress bootstrap
- Playback media


 **Note:** You cannot upload log files.

You can dynamically activate the “Local route table” and “SPL Plug-in” during the upload process. You can also immediately restore a backup configuration file after an upload is complete.

1. (optional) In the “Select the file type” field, select the type of file you want to upload from your local server or PC to the Enterprise Session Director.
2. In the “Name” column, place a checkmark next to the file you want to upload.
3. Click <Upload>. The following are examples of the dialog box that display, dependant on which file type you chose.



4. In the “File to upload” field, click the <Browse> button, and navigate to the location on your server or PC where the file resides.

 **Note:** The file extension on the file must be applicable to the file type you select. For example, an SPL Plug-in file must have the file format of “<filename>.lua”. The following table indicates the file formats required for each File Type, and the applicable directory to which the upload process stores the file on the Enterprise Session Director.

| File Type               | File Format                                   | Directory      |
|-------------------------|-----------------------------------------------|----------------|
| Local route table (LRT) | .xml, .gz                                     | /code/gzConfig |
| SPL Plug-on (SPL)       | .lua                                          | /code/spl      |
| Backup Configuration    | .gz                                           | /code/bkups    |
| Software image          | .bz                                           | /code/images   |
| Playback media          | Any media format valid in an RTP audio stream | /code/media    |

If you select a file with an incorrect file extension, the following message displays: “The file name extension doesn’t match the file type. The file should have the extension: <file type extension>” (For example, “.xml.gz”).

5. Perform the following, based on your filetype.

For the “Local route table” file type, place a checkmark in the “Activate the LRT file after upload” box, to immediately apply the LRT to the Enterprise Session Director after upload is complete.

or

For the “SPL Plug-in” file type, place a checkmark in the “Activate the SPL file after upload” box, to immediately apply the SPL file to the Enterprise Session Director after upload is complete.

or

For the “Backup configuration” file, place a checkmark in the “Restore the configuration after upload” box, to immediately apply a previous backed up configuration file to the Enterprise Session Director after upload is complete. Uncheck the box to restore the backup configuration at a later time. You can use the <Restore> button to restore the configuration to the Enterprise Session Director when required.

- Click <Upload> or click <Cancel> to cancel the upload function.

After clicking <Upload>, the Enterprise Session Director checks if the file you are uploading already exists on the system. If the file exists, the following prompt displays:

“Would you like to replace the current file?”

Click <Yes> to replace the file.

or

Click <No> to cancel the upload function.

## Download a File

Procedure and conditions for downloading from the Enterprise Session Director.

You can download any of the following file types from your local server or PC to the Enterprise Session Director:

- Backup configuration
- Local route table (LRT)
- Log
- Playback media
- Software image
- SPL Plug-in (SPL)

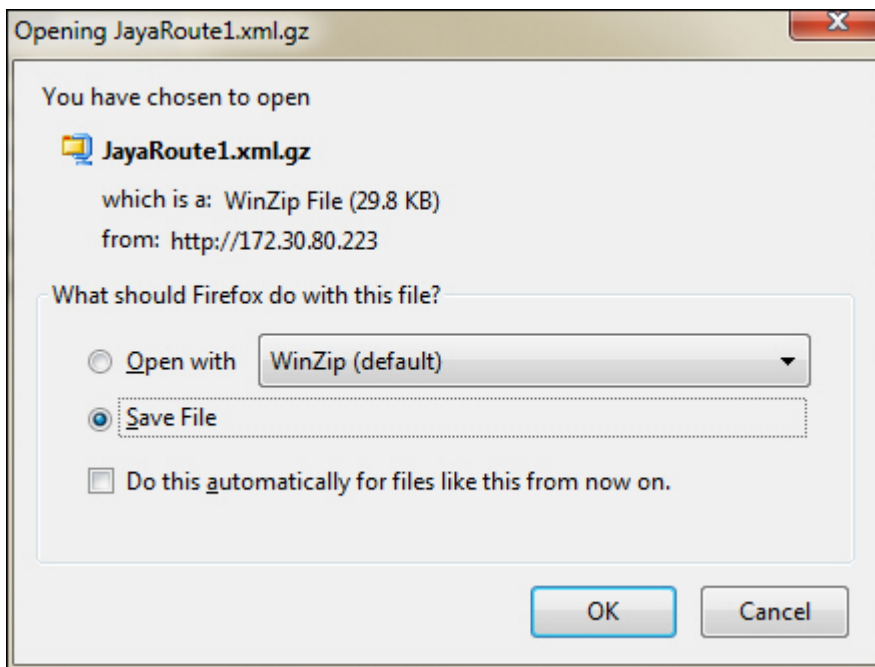
- In the “Select the file type” field, select the type of file you want to download from your local server, PC, or Enterprise Session Director.
- In the “Name” column, select the file you want to download.

For Log file types, you can select multiple log files to download, or place a checkmark in the box to the left of the “Name” column heading to select all log files to download. When downloading multiple log files, the File Management GUI compresses the files into one “.tar” file and downloads that file to your local server or PC.

The screenshot shows a dialog box titled "System files". At the top, there is a label "Select the file type:" followed by a dropdown menu currently set to "Log". Below this are three buttons: "Upload", "Download", and "Delete". The main area contains a table with columns for "Name", "Date modified", and "Size (Bytes)". Each row in the table has a checkmark in the "Name" column. The rows are grouped by file type: "access.log (1 File)", "acmelog (1 File)", and "appweb.log (1 File)".

| <input checked="" type="checkbox"/> Name                | Date modified        | Size (Bytes) |
|---------------------------------------------------------|----------------------|--------------|
| <input checked="" type="checkbox"/> access.log (1 File) |                      |              |
| <input checked="" type="checkbox"/> access.log          | JUL 13 2012 12:20:54 | 24,874       |
| <input checked="" type="checkbox"/> acmelog (1 File)    |                      |              |
| <input checked="" type="checkbox"/> acmelog             | JUL 13 2012 12:20:56 | 173,080      |
| <input checked="" type="checkbox"/> appweb.log (1 File) |                      |              |
| <input checked="" type="checkbox"/> appweb.log          | JUL 13 2012 12:20:56 | 298,603      |

- Click <Download>. The following is an example dialog box that displays



4. Click “Open with” and select the application for which to open the file type for decompressing and/or editing. Or click “Save File” to save the file type to your local server or PC.
5. Click <OK>. The file type downloads to the folder on your local server or PC where your Browser sends all downloads (typically your “Download” folder) or opens (decompresses) the file type on your local server or PC (typically in the “Download” folder).


## Delete a File

---

Procedure and conditions for deleting a file from the Enterprise Session Director (E-SBC).


You can delete any of the following file types from your local server, PC, and E-SBC:

- Backup configuration Software image
- Local route table (LRT)
- Fraud protection table
- Log
- Playback media
- Software image
- SPL Plug-in (SPL)

 **Note:** You can select a single or multiple files to delete.

### Procedure

1. On the System tab, in the **File type** drop down list, select the type of file that you want to delete.
2. In the Name column, select one or more files you want to delete.

 **Note:** For Log file types, place a checkmark in the box to the left of the Name column heading to select all log files to delete.

3. Click **Delete**. The system displays following message.  
Are you sure you want to delete the file?
4. Click **Yes**.



---

## Back up a File

---

You can backup a configuration file from the Enterprise Session Director (E-SBC) to your local server or PC. This allows you to save configurations that you can restore to your E-SBC at a later time.

### Procedure

1. From the Web GUI, click **System**.
2. In the Select the file type field, select Backup configuration.
3. Select one or more configuration files to backup to your server or PC.
4. Click **Backup**.
5. Click **OK** to backup the configuration.  
The system downloads the file to your server or PC, typically into the download directory.

---


## Restore a File

---

You can restore a backed up configuration file to the Enterprise Session Director (E-SBC).

When you select a file to restore, and click Restore, the system restores the selected backup configuration file to the E-SBC.

### Procedure

1. In the **Select the file type** field, select **Backup configuration**.
2. Select a backup file to restore to the E-SBC.  
 **Note:** Restore activates only when you select a backup file.
3. Click **Restore**.
4. Click **Yes**.  
The system downloads the backup file to the E-SBC. The E-SBC reboots and restores the configuration from the backup file.

---

## System Reboot

---

If required, you can manually reboot the Enterprise Session Director. If you reboot the system, all connectivity is lost. If you have a High Availability (HA) deployment, connectivity to the secondary (backup) Enterprise Session Director is lost as well.

When the reboot is complete, the logon screen displays on both the primary and secondary systems. You must manually logon to both systems.

The screenshot shows the acme packet web interface. At the top right, it says "Welcome: admin". Below the logo, there are three tabs: "Configuration", "Monitor and Trace", and "System". The "System" tab is selected. On the left, there is a sidebar with "File management" and "Reboot" (which is highlighted). The main content area is titled "Reboot" and contains a warning message: "If you reboot the system, you lose connectivity to this Web GUI and the login screen displays. You cannot log back in until the reboot is complete. Also, if you attempt reboot during an HA failover, you lose connectivity to this Web GUI. When the secondary system is finished booting, log into the Web GUI on the secondary system." Below the text is a "Reboot" button.

| IF                                                                                                                               | THEN                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| You perform a reboot from the Web GUI                                                                                            | The GUI session closes and displays the Logon screen. You cannot logon to the Web GUI until the reboot is complete on the Enterprise Session Director.                                                                                                                                                                                                       |
| You perform a reboot from the Web GUI, and a reboot is already in progress                                                       | A message displays indicating that a reboot cannot occur. The first reboot must complete before another reboot is initiated.                                                                                                                                                                                                                                 |
| You perform a reboot from the Web GUI, and the primary system is currently failing over to the secondary system (HA environment) | A message displays indicating that a reboot cannot occur. The HA switch over is underway. The secondary system is updating and getting its configuration from the primary server. When the reboot is complete, you can no longer logon to the primary system Web GUI. You need to logon to the secondary system's Web GUI (which is now the primary system). |

---

## Format of Exported Text Files

### Introduction

---

This Appendix provides a sample and format of each type of exported file from the Web-based GUI. Sample information in these files are provided as a reference for your convenience.

Exported file examples include:

- Session Summary exported file (text format)
- Session Details exported file (text format)
- Ladder Diagram exported file (HTML format)



**Note:** Oracle recommends you open an exported text file using an application that provides advanced text formatting to make it easier to read.

### Exporting Files

---

The Web-based GUI allows you to export Monitor and Trace information to a text file from the Sessions, Registrations, Subscriptions and Notable Events Reports, as well as from a specific ladder diagram, or from a page containing the results of a search. The data exports to a file that you can open and view as required.

You can export any of the following to a file:

From the Sessions, Registrations, Subscriptions, and Notable Events Reports:

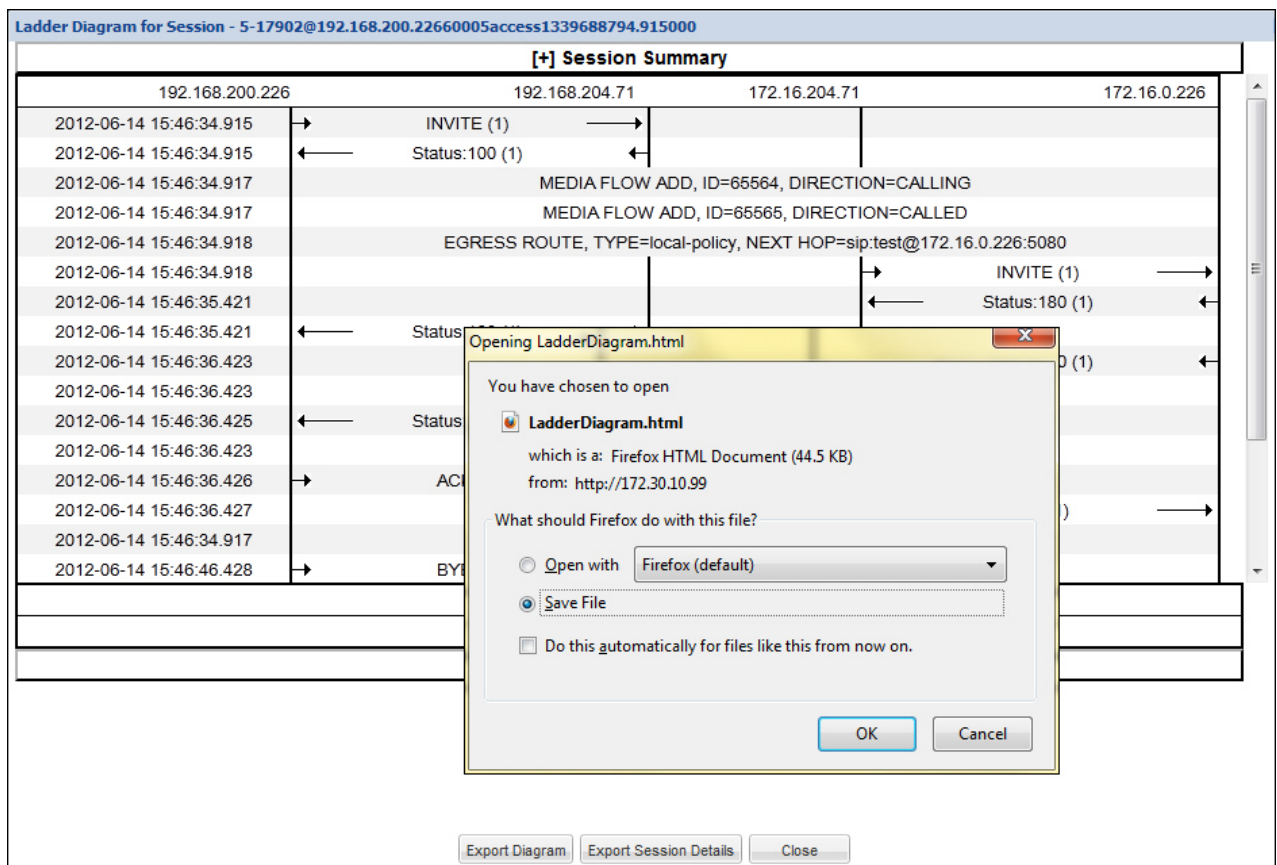
- Export session details - Exports the SIP messages and media events associated with the selected session, to a text file.
- Export summary - Exports all logged session summary records, to a text file. (Exports ALL call session summary records or the records that matched a search criteria).

From the Ladder Diagram:

- Export diagram - Exports all of the information in the Ladder Diagram to an HTML file (Session Summary, SIP Message Details, and QoS statistics).
- Export session details - Exports detailed information about the SIP messages and media events in the Ladder Diagram associated with the selected session, to a text file.

The following example shows the export of a Ladder Diagram to a file called LadderDiagram.html.

## Format of Exported Text Files



## Session Summary Exported Text File

The following is an example of a Session Summary exported text file from the Web-based GUI.

### Example

```
-----Session Summary-----
Startup Time: 2011-09-20 12:58:44.375
State: TERMINATED-200
Duration: 5
From URI: sipp << sip:sipp@172.16.34.16:5060&&tag=1
To URI: sut << sip:service@172.16.34.225:5060&&tag=13451
Ingress Src Address: 172.16.34.16
Ingress Src Port: 5060
Ingress Dest Address: 172.16.34.225
Ingress Dest Port: 5060
Egress Source Address: 192.168.34.225
Egress Source Port: 5060
Egress Destination Address: 192.168.34.17
Egress Destination Port: 5060
Ingress Realm: access
Egress Realm: backbone
Ingress NetworkIf: access
Egress NetworkIf: backbone
-----Session Summary-----
Startup Time: 2011-09-20 12:58:05.340
State: TERMINATED-200
```

```

Duration: 5
From URI: sipp < sip:sipp@172.16.34.16:5060 >;tag=1
To URI: sut < sip:service@172.16.34.225:5060 >;tag=13450
Ingress Src Address: 172.16.34.16
Igress Src Port: 5060
Igress Dest Address: 172.16.34.225
Igress Dest Port: 5060
Egress Source Address: 192.168.34.225
Egress Source Port: 5060
Egress Destination Address: 192.168.34.17
Egress Destination Port: 5060
Igress Realm: access
Egress Realm: backbone
Igress NetworkIf: access
Egress NetworkIf: backbone

```

## Session Details Exported Text File

The following is an example of the a Session Details exported text file from the Web-based GUI.

### Example

```

Session Details:

Nov 3 08:50:56.852 On [2:0]172.16.34.225:5060 received from 172.16.34.16:5060

INVITE sip:service@172.16.34.225:5060 SIP/2.0
Via: SIP/2.0/UDP 172.16.34.16:5060;branch=z9hG4bK-1-0
From: sipp < sip:sipp@172.16.34.16:5060 >;tag=1
To: sut < sip:service@172.16.34.225:5060 >
Call-ID: 1-668@172.16.34.16
CSeq: 1 INVITE
Contact: sip:sipp@172.16.34.16:5060
Max-Forwards: 70
Subject: Performance Test
Content-Type: application/sdp
Content-Length: 135

v=0
o=user1 53655765 2353687637 IN IP4 172.16.34.16
s=-
c=IN IP4 172.16.34.16
t=0 0
m=audio 6000 RTP/AVP 0
a=rtpmap:0 PCMU/8000

Nov 3 08:50:56.855 On [2:0]172.16.34.225:5060 sent to 172.16.34.16:5060

SIP/2.0 100 Trying
Via: SIP/2.0/UDP 172.16.34.16:5060;branch=z9hG4bK-1-0
From: sipp < sip:sipp@172.16.34.16:5060 >;tag=1
To: sut < sip:service@172.16.34.225:5060 >
Call-ID: 1-668@172.16.34.16
CSeq: 1 INVITE

----MBCD Evt
Nov 3 08:50:56.862 On 127.0.0.1:2945 sent to 127.0.0.1:2944
mbcdEvent=FLOW ADD
FlowCollapsed=enabled

```

## Format of Exported Text Files

---

```
FlowDirection=CALLING
FlowID=65541
MediaFormat=0
MediaReleased=disabled
MediaType=audio/PCMU/
OtherFlowID=0
TOSBits=0
InputSourcev4Addr=
InputSourcePort=0
InputDestv4Addr=172.16.34.225
InputDestPort=10004
OutputSourcev4Addr=192.168.34.225
OutputDestv4Addr=
OutputDestPort=0
InputRealm=access
OutputRealm=backbone
----MBCD Evt
Nov 3 08:50:56.862 On 127.0.0.1:2945 received from 127.0.0.1:2944

mbcdEvent=FLOW ADD
FlowCollapsed=enabled
FlowDirection=CALLED
FlowID=65542
MediaFormat=0
MediaReleased=disabled
MediaType=audio/PCMU/
OtherFlowID=0
TOSBits=0
InputSourcev4Addr=
InputSourcePort=0
InputDestv4Addr=192.168.34.225
InputDestPort=20004
OutputSourcev4Addr=172.16.34.225
OutputDestv4Addr=172.16.34.16
OutputDestPort=6000
InputRealm=backbone
OutputRealm=access

Nov 3 08:50:56.865 On [1:0]192.168.34.225:5060 sent to 192.168.34.17:5060

INVITE sip:service@192.168.34.17:5060 SIP/2.0
Via: SIP/2.0/UDP 192.168.34.225:5060;branch=z9hG4bK4od0io20183g8ssv32f1.1
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1
To: sut <sip:service@172.16.34.225:5060>
Call-ID: 1-668@172.16.34.16
CSeq: 1 INVITE
Contact: <sip:sipp@192.168.34.225:5060;transport=udp>
Max-Forwards: 69
Subject: Performance Test
Content-Type: application/sdp
Content-Length: 140

v=0
o=user1 53655765 2353687637 IN IP4 192.168.34.225
s=-
c=IN IP4 192.168.34.225
t=0 0
m=audio 20004 RTP/AVP 0
a=rtpmap:0 PCMU/8000

Nov 3 08:50:56.868 On [1:0]192.168.34.225:5060 received from
192.168.34.17:5060
```

```
SIP/2.0 180 Ringing
Via: SIP/2.0/UDP 192.168.34.225:5060;branch=z9hG4bK4od0io20183g8ssv32f1.1
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1
To: sut <sip:service@172.16.34.225:5060>;tag=2578
Call-ID: 1-668@172.16.34.16
CSeq: 1 INVITE
Contact: <sip:192.168.34.17:5060;transport=UDP>
Content-Length: 0
```

-----

Nov 3 08:50:56.872 On [2:0]172.16.34.225:5060 sent to 172.16.34.16:5060

```
SIP/2.0 180 Ringing
Via: SIP/2.0/UDP 172.16.34.16:5060;branch=z9hG4bK-1-0
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1
To: sut <sip:service@172.16.34.225:5060>;tag=2578
Call-ID: 1-668@172.16.34.16
CSeq: 1 INVITE
Contact: <sip:service@172.16.34.225:5060;transport=udp>
Content-Length: 0
```

-----

Nov 3 08:50:56.872 On [1:0]192.168.34.225:5060 received from 192.168.34.17:5060

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP 192.168.34.225:5060;branch=z9hG4bK4od0io20183g8ssv32f1.1
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1
To: sut <sip:service@172.16.34.225:5060>;tag=2578
Call-ID: 1-668@172.16.34.16
CSeq: 1 INVITE
Contact: <sip:192.168.34.17:5060;transport=UDP>
Content-Type: application/sdp
Content-Length: 137
```

```
v=0
o=user1 53655765 2353687637 IN IP4 192.168.34.17
s=-
c=IN IP4 192.168.34.17
t=0 0
m=audio 6000 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

----MBCD Evt

Nov 3 08:50:56.878 On 127.0.0.1:2945 sent to 127.0.0.1:2944

```
mbcdEvent=FLOW MODIFY
FlowCollapsed=enabled
FlowDirection=CALLING
FlowID=65541
MediaFormat=0
MediaReleased=disabled
MediaType=audio/PCMU/
OtherFlowID=0
TOSBits=0
InputSourcev4Addr=
InputSourcePort=0
InputDestv4Addr=172.16.34.225
InputDestPort=10004
OutputSourcev4Addr=192.168.34.225
OutputDestv4Addr=192.168.34.17
OutputDestPort=6000
InputRealm=access
OutputRealm=backbone
```

## Format of Exported Text Files

---

-----  
Nov 3 08:50:56.881 On [2:0]172.16.34.225:5060 sent to 172.16.34.16:5060

SIP/2.0 200 OK  
Via: SIP/2.0/UDP 172.16.34.16:5060;branch=z9hG4bK-1-0  
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1  
To: sut <sip:service@172.16.34.225:5060>;tag=2578  
Call-ID: 1-668@172.16.34.16  
CSeq: 1 INVITE  
Contact: <sip:service@172.16.34.225:5060;transport=udp>  
Content-Type: application/sdp  
Content-Length: 138  
v=0  
o=user1 53655765 2353687637 IN IP4 172.16.34.225  
s=-  
c=IN IP4 172.16.34.225  
t=0 0  
m=audio 10004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

-----  
Nov 3 08:50:56.883 On [2:0]172.16.34.225:5060 received from 172.16.34.16:5060

ACK sip:service@172.16.34.225:5060 SIP/2.0  
Via: SIP/2.0/UDP 172.16.34.16:5060;branch=z9hG4bK-1-5  
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1  
To: sut <sip:service@172.16.34.225:5060>;tag=2578  
Call-ID: 1-668@172.16.34.16  
CSeq: 1 ACK  
Contact: sip:sipp@172.16.34.16:5060  
Max-Forwards: 70  
Subject: Performance Test  
Content-Length: 0

-----  
Nov 3 08:50:56.887 On [1:0]192.168.34.225:5060 sent to 192.168.34.17:5060

ACK sip:192.168.34.17:5060;transport=UDP SIP/2.0  
Via: SIP/2.0/UDP 192.168.34.225:5060;branch=z9hG4bK48k3k1301ot00ssvf1v0.1  
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1  
To: sut <sip:service@172.16.34.225:5060>;tag=2578  
Call-ID: 1-668@172.16.34.16  
CSeq: 1 ACK  
Contact: <sip:sipp@192.168.34.225:5060;transport=udp>  
Max-Forwards: 69  
Subject: Performance Test  
Content-Length: 0

-----  
Nov 3 08:51:01.883 On [2:0]172.16.34.225:5060 received from 172.16.34.16:5060

BYE sip:service@172.16.34.225:5060 SIP/2.0  
Via: SIP/2.0/UDP 172.16.34.16:5060;branch=z9hG4bK-1-7  
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1  
To: sut <sip:service@172.16.34.225:5060>;tag=2578  
Call-ID: 1-668@172.16.34.16  
CSeq: 2 BYE  
Contact: sip:sipp@172.16.34.16:5060  
Max-Forwards: 70  
Subject: Performance Test  
Content-Length: 0

-----  
Nov 3 08:51:01.887 On [1:0]192.168.34.225:5060 sent to 192.168.34.17:5060



```

BYE sip:192.168.34.17:5060;transport=UDP SIP/2.0
Via: SIP/2.0/UDP 192.168.34.225:5060;branch=z9hG4bK5oq46d301gv0dus227f1.1
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1
To: sut <sip:service@172.16.34.225:5060>;tag=2578
Call-ID: 1-668@172.16.34.16
CSeq: 2 BYE
Contact: <sip:sipp@192.168.34.225:5060;transport=udp>
Max-Forwards: 69
Subject: Performance Test
Content-Length: 0

```

```

Nov 3 08:51:01.889 On [1:0]192.168.34.225:5060 received from
192.168.34.17:5060

```

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP 192.168.34.225:5060;branch=z9hG4bK5oq46d301gv0dus227f1.1
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1
To: sut <sip:service@172.16.34.225:5060>;tag=2578
Call-ID: 1-668@172.16.34.16
CSeq: 2 BYE
Contact: <sip:192.168.34.17:5060;transport=UDP>
Content-Length: 0

```

```

Nov 3 08:51:01.892 On [2:0]172.16.34.225:5060 sent to 172.16.34.16:5060

```

```

SIP/2.0 200 OK
Via: SIP/2.0/UDP 172.16.34.16:5060;branch=z9hG4bK-1-7
From: sipp <sip:sipp@172.16.34.16:5060>;tag=1
To: sut <sip:service@172.16.34.225:5060>;tag=2578
Call-ID: 1-668@172.16.34.16
CSeq: 2 BYE
Contact: <sip:service@172.16.34.225:5060;transport=udp>
Content-Length: 0

```

```

----MBCD Evt

```

```

Nov 3 08:51:01.891 On 127.0.0.1:2945 sent to 127.0.0.1:2944

```

```

mbcdEvent=FLOW DELETE
FlowCollapsed=enabled
FlowDirection=CALLING
FlowID=65541
MediaFormat=0
MediaReleased=disabled
MediaType=audio/PCMU/
OtherFlowID=0
TOSBits=0
InputSourcev4Addr=
InputSourcePort=0
InputDestv4Addr=172.16.34.225
InputDestPort=10004
OutputSourcev4Addr=192.168.34.225
OutputDestv4Addr=192.168.34.17
OutputDestPort=6000
InputRealm=access
OutputRealm=backbone

```

```

----MBCD Evt

```

```

mbcdEvent=FLOW DELETE
FlowCollapsed=enabled
FlowDirection=CALLED
FlowID=65542
MediaFormat=0
MediaReleased=disabled

```

## Format of Exported Text Files

```
MediaType=audio/PCMU/
OtherFlowID=65541
TOSBits=0
InputSourcev4Addr=
InputSourcePort=0
InputDestv4Addr=192.168.34.225
InputDestPort=20004
OutputSourcev4Addr=172.16.34.225
OutputDestv4Addr=172.16.34.16
OutputDestPort=6000
InputRealm=backbone
OutputRealm=access

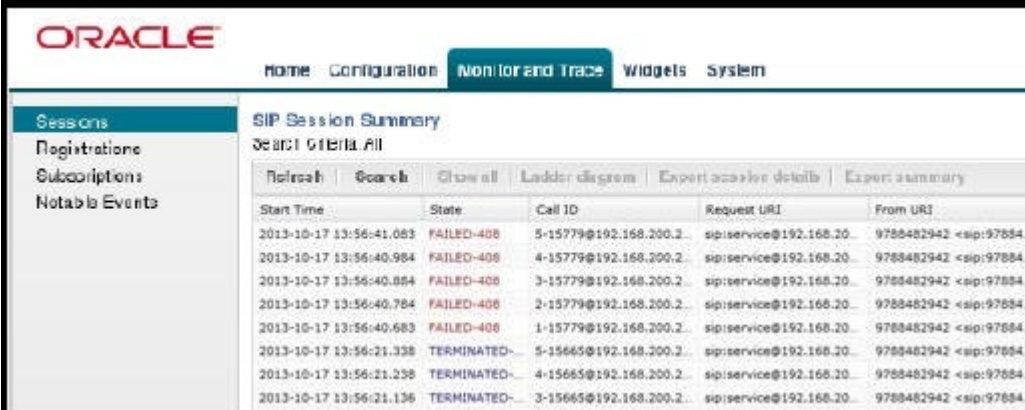
-----Session Summary-----
Startup Time: 2012-01-25 10:28:30.394

State: TERMINATED-200
Duration: 5
From URI: sipp << sip:sipp@172.16.34.16:5060&>>;tag=1
To URI: sut << sip:service@172.16.34.225:5060&>>;tag=2578
Ingress Src Address: 172.16.34.16
Igress Src Port: 5060
Igress Dest Address: 172.16.34.225
Igress Dest Port: 5060
Egress Source Address: 192.168.34.225
Egress Source Port: 5060
Egress Destination Address: 192.168.34.17
Egress Destination Port: 5060
Igress Realm: access
Egress Realm: backbone
Igress NetworkIf: access
Egress NetworkIf: backbone
```

## Ladder Diagram Exported HTML File

The following is an example of a Ladder Diagram for a session, exported to an HTML file from the Web-based GUI.

### Example



The screenshot shows the Oracle Enterprise Session Border Controller GUI. The main content area displays a "SIP Session Summary" table. The table has columns for Start Time, State, Call ID, Request URI, and From URI. The table contains several rows of session data, including failed and terminated sessions.

| Start Time              | State       | Call ID               | Request URI               | From URI              |
|-------------------------|-------------|-----------------------|---------------------------|-----------------------|
| 2013-10-17 13:56:41.083 | FAILED-408  | 5-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:40.984 | FAILED-408  | 4-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:40.884 | FAILED-408  | 3-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:40.784 | FAILED-408  | 2-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:40.683 | FAILED-408  | 1-15779@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:21.338 | TERMINATED- | 5-15665@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:21.238 | TERMINATED- | 4-15665@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |
| 2013-10-17 13:56:21.138 | TERMINATED- | 3-15665@192.168.200.2 | sip:service@192.168.200.2 | 9788482942 <sip:97884 |

| [-] Session Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                         |                     |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------|----------------------------------------------------------------------|---------------------|---------------------------------------------|------------|-------------|-------------|----------|------------|------------|----------|-----|-----------------|----------------|---------------|--------------|-------------------------|--------------|---|--|-------------------------|------------------|---|--|-------------------------|--|--|---------------------------------------------|-------------------------|--|--|--------------------------------------------|-------------------------|--|--|----------------------------------------------------------------------|-------------------------|--|--|--------------|-------------------------|------------------|---|------------------|-------------------------|--|--|------------------|-------------------------|--|--|--------------------------------------------------|-------------------------|------------------|---|--|-------------------------|--|--|-------------------------------------------------|-------------------------|-----------|---|--|-------------------------|--|--|-----------|-------------------------|--|--|------------------------------------------------|-------------------------|-----------|---|--|-------------------------|--|--|-----------|-------------------------|--|--|------------------|-------------------------|------------------|---|--|-------------------------|--|--|------------------------------------------------|-------------------------|--|--|-----------------------------------------------|
| State                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TERMINATED-200                          |                     |                                                                      | Duration            | 10                                          |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| From URI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | "+2273636" <tel:781-414-2345>;tag=60005 |                     |                                                                      | To URI              | sut <sip:kam@192.168.204.71:5060>;tag=50004 |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| Ingress Src IP:Port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 192.168.200.226:5070                    |                     |                                                                      | Egress Src IP:Port  | 172.16.204.71:5060                          |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| Ingress Dest IP:Port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 192.168.204.71:5060                     |                     |                                                                      | Egress Dest IP:Port | 172.16.0.226:5070                           |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| Ingress Realm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | access                                  |                     |                                                                      | Egress Realm        | core                                        |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| Ingress Network Intf                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | M00                                     |                     |                                                                      | Egress Network Intf | M10                                         |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| Ingress Transport                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | UDP                                     |                     |                                                                      | Egress Transport    | UDP                                         |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| <table border="1"> <thead> <tr> <th>192.168.200.226</th> <th>192.168.204.71</th> <th>172.16.204.71</th> <th>172.16.0.226</th> </tr> </thead> <tbody> <tr> <td>2012-06-14 15:46:34.915</td> <td>→ INVITE (1)</td> <td>→</td> <td></td> </tr> <tr> <td>2012-06-14 15:46:34.915</td> <td>← Status:100 (1)</td> <td>←</td> <td></td> </tr> <tr> <td>2012-06-14 15:46:34.917</td> <td></td> <td></td> <td>MEDIA FLOW ADD, ID=65564, DIRECTION=CALLING</td> </tr> <tr> <td>2012-06-14 15:46:34.917</td> <td></td> <td></td> <td>MEDIA FLOW ADD, ID=65565, DIRECTION=CALLED</td> </tr> <tr> <td>2012-06-14 15:46:34.918</td> <td></td> <td></td> <td>EGRESS ROUTE, TYPE=local-policy, NEXT HOP=sip:test@172.16.0.226:5080</td> </tr> <tr> <td>2012-06-14 15:46:35.421</td> <td></td> <td></td> <td>→ INVITE (1)</td> </tr> <tr> <td>2012-06-14 15:46:35.421</td> <td>← Status:180 (1)</td> <td>←</td> <td>← Status:180 (1)</td> </tr> <tr> <td>2012-06-14 15:46:36.423</td> <td></td> <td></td> <td>← Status:200 (1)</td> </tr> <tr> <td>2012-06-14 15:46:36.423</td> <td></td> <td></td> <td>→ MEDIA FLOW MODIFY, ID=65564, DIRECTION=CALLING</td> </tr> <tr> <td>2012-06-14 15:46:36.425</td> <td>← Status:200 (1)</td> <td>←</td> <td></td> </tr> <tr> <td>2012-06-14 15:46:36.423</td> <td></td> <td></td> <td>→ MEDIA FLOW LATCH, ID=65564, DIRECTION=CALLING</td> </tr> <tr> <td>2012-06-14 15:46:36.426</td> <td>→ ACK (1)</td> <td>→</td> <td></td> </tr> <tr> <td>2012-06-14 15:46:36.427</td> <td></td> <td></td> <td>→ ACK (1)</td> </tr> <tr> <td>2012-06-14 15:46:34.917</td> <td></td> <td></td> <td>→ MEDIA FLOW LATCH, ID=65565, DIRECTION=CALLED</td> </tr> <tr> <td>2012-06-14 15:46:46.428</td> <td>→ BYE (2)</td> <td>→</td> <td></td> </tr> <tr> <td>2012-06-14 15:46:46.428</td> <td></td> <td></td> <td>→ BYE (2)</td> </tr> <tr> <td>2012-06-14 15:46:46.430</td> <td></td> <td></td> <td>← Status:200 (2)</td> </tr> <tr> <td>2012-06-14 15:46:46.431</td> <td>← Status:200 (2)</td> <td>←</td> <td></td> </tr> <tr> <td>2012-06-14 15:46:46.430</td> <td></td> <td></td> <td>MEDIA FLOW DELETE, ID=65564, DIRECTION=CALLING</td> </tr> <tr> <td>2012-06-14 15:46:46.430</td> <td></td> <td></td> <td>MEDIA FLOW DELETE, ID=65565, DIRECTION=CALLED</td> </tr> </tbody> </table> |                                         |                     |                                                                      |                     |                                             |            |             |             |          |            |            |          |     | 192.168.200.226 | 192.168.204.71 | 172.16.204.71 | 172.16.0.226 | 2012-06-14 15:46:34.915 | → INVITE (1) | → |  | 2012-06-14 15:46:34.915 | ← Status:100 (1) | ← |  | 2012-06-14 15:46:34.917 |  |  | MEDIA FLOW ADD, ID=65564, DIRECTION=CALLING | 2012-06-14 15:46:34.917 |  |  | MEDIA FLOW ADD, ID=65565, DIRECTION=CALLED | 2012-06-14 15:46:34.918 |  |  | EGRESS ROUTE, TYPE=local-policy, NEXT HOP=sip:test@172.16.0.226:5080 | 2012-06-14 15:46:35.421 |  |  | → INVITE (1) | 2012-06-14 15:46:35.421 | ← Status:180 (1) | ← | ← Status:180 (1) | 2012-06-14 15:46:36.423 |  |  | ← Status:200 (1) | 2012-06-14 15:46:36.423 |  |  | → MEDIA FLOW MODIFY, ID=65564, DIRECTION=CALLING | 2012-06-14 15:46:36.425 | ← Status:200 (1) | ← |  | 2012-06-14 15:46:36.423 |  |  | → MEDIA FLOW LATCH, ID=65564, DIRECTION=CALLING | 2012-06-14 15:46:36.426 | → ACK (1) | → |  | 2012-06-14 15:46:36.427 |  |  | → ACK (1) | 2012-06-14 15:46:34.917 |  |  | → MEDIA FLOW LATCH, ID=65565, DIRECTION=CALLED | 2012-06-14 15:46:46.428 | → BYE (2) | → |  | 2012-06-14 15:46:46.428 |  |  | → BYE (2) | 2012-06-14 15:46:46.430 |  |  | ← Status:200 (2) | 2012-06-14 15:46:46.431 | ← Status:200 (2) | ← |  | 2012-06-14 15:46:46.430 |  |  | MEDIA FLOW DELETE, ID=65564, DIRECTION=CALLING | 2012-06-14 15:46:46.430 |  |  | MEDIA FLOW DELETE, ID=65565, DIRECTION=CALLED |
| 192.168.200.226                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 192.168.204.71                          | 172.16.204.71       | 172.16.0.226                                                         |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:34.915                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | → INVITE (1)                            | →                   |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:34.915                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ← Status:100 (1)                        | ←                   |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:34.917                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | MEDIA FLOW ADD, ID=65564, DIRECTION=CALLING                          |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:34.917                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | MEDIA FLOW ADD, ID=65565, DIRECTION=CALLED                           |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:34.918                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | EGRESS ROUTE, TYPE=local-policy, NEXT HOP=sip:test@172.16.0.226:5080 |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:35.421                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | → INVITE (1)                                                         |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:35.421                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ← Status:180 (1)                        | ←                   | ← Status:180 (1)                                                     |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:36.423                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | ← Status:200 (1)                                                     |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:36.423                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | → MEDIA FLOW MODIFY, ID=65564, DIRECTION=CALLING                     |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:36.425                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ← Status:200 (1)                        | ←                   |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:36.423                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | → MEDIA FLOW LATCH, ID=65564, DIRECTION=CALLING                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:36.426                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | → ACK (1)                               | →                   |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:36.427                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | → ACK (1)                                                            |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:34.917                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | → MEDIA FLOW LATCH, ID=65565, DIRECTION=CALLED                       |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:46.428                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | → BYE (2)                               | →                   |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:46.428                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | → BYE (2)                                                            |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:46.430                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | ← Status:200 (2)                                                     |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:46.431                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ← Status:200 (2)                        | ←                   |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:46.430                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | MEDIA FLOW DELETE, ID=65564, DIRECTION=CALLING                       |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 2012-06-14 15:46:46.430                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                         |                     | MEDIA FLOW DELETE, ID=65565, DIRECTION=CALLED                        |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| SIP Message Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                         |                     |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| [-] QoS Stats                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                         |                     |                                                                      |                     |                                             |            |             |             |          |            |            |          |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| Flow ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Direction                               | Total Pkts Received | Total Octets Received                                                | RTCP                |                                             |            |             |             | RTP      |            |            | QoE      |     |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                         |                     |                                                                      | Pkt Lost            | Avg Jitter                                  | Max Jitter | Avg Latency | Max Latency | Pkt Lost | Avg Jitter | Max Jitter | R-Factor | MOS |                 |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 65564                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | CALLING                                 | 0                   | 0                                                                    | 0                   | 0                                           | 0          | 0           | 0           | 0        | 0          | 0          | 0        | 0   | 0               |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |
| 65565                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | CALLED                                  | 0                   | 0                                                                    | 0                   | 0                                           | 0          | 0           | 0           | 0        | 0          | 0          | 0        | 0   | 0               |                |               |              |                         |              |   |  |                         |                  |   |  |                         |  |  |                                             |                         |  |  |                                            |                         |  |  |                                                                      |                         |  |  |              |                         |                  |   |                  |                         |  |  |                  |                         |  |  |                                                  |                         |                  |   |  |                         |  |  |                                                 |                         |           |   |  |                         |  |  |           |                         |  |  |                                                |                         |           |   |  |                         |  |  |           |                         |  |  |                  |                         |                  |   |  |                         |  |  |                                                |                         |  |  |                                               |

