

SIP Trunk Monitoring Service User's Manual

Version 7.0

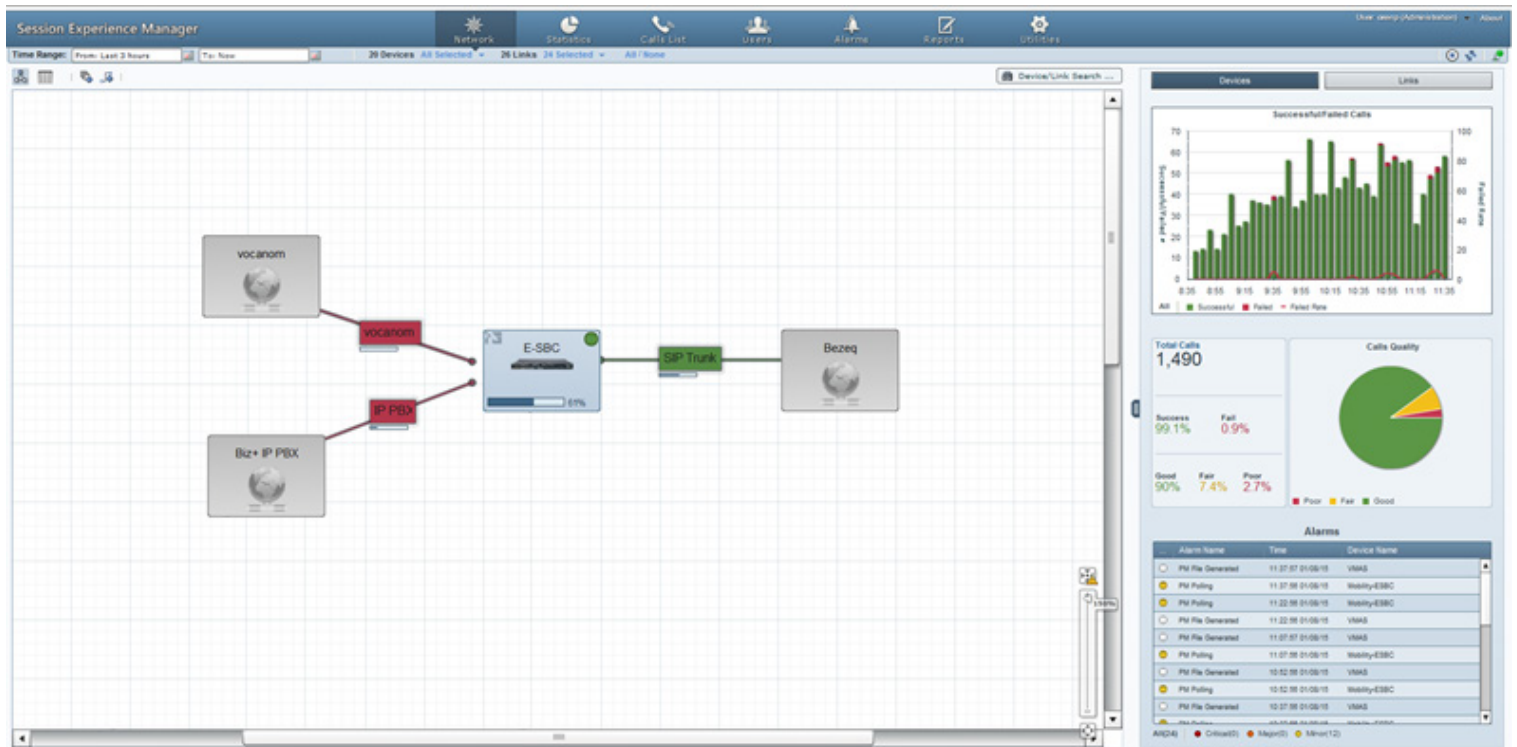


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Notice

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Date Published: Oct-15-2015

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Related Documentation

Manual Name
Mediant 9000 SBC User's Manual
Mediant 4000 SBC User's Manual
Mediant 2600 E-SBC User's Manual
Mediant SE SBC User's Manual
Mediant SE-H SBC User's Manual
Mediant VE SBC User's Manual
Mediant VE-H SBC User's Manual
Mediant 3000 Media Gateway User's Manual
Mediant 2000 Media Gateways User's Manual
Mediant 1000B Gateway and E-SBC and Mediant 1000B MSBR User's Manual
Mediant 800B Gateway and E-SBC and Mediant 800B MSBR User's Manual
Mediant 500 E-SBC User's Manual
Mediant 500L MSBR and Mediant 500 MSBR User's Manual
SIP Trunk Monitoring Service Configuration Note

Document Revision Record

LTRT	Description
91120	GA
91121	Name change to SBC
91122	Name change to SIP Trunk Monitoring Service

1 Overview

AudioCodes' Session Experience Manager (SEM) is a valuable new tool that delivers important technical and business statistics based on AudioCodes methodologies developed over years of experience in VoIP. The SEM provides real-time management of VoIP traffic, giving VoIP network administrators a network health monitoring functionality that includes alarms and diagnostics capability.

The SIP Trunk Monitoring Service is a cloud-based service to monitor, analyze and alert in real time VoIP call failures and voice quality issues, based on the SEM application running from the cloud.

This document shows how to deploy and utilize the SIP Trunk Monitoring Service to maximum advantage, to enhance VoIP users' quality of experience.

1.1 Specifications

Following are the SEM specifications:

- Modular tool featuring distinct views for Network, Statistics, Calls, Alarms and Reports.
- Graphical representation of your managed AudioCodes SBC, and its links in Map and Table view, featuring popup summaries of critical metrics.
- Voice quality diagnostics for devices/links and users in the VoIP network.
- Real-time, as well as historical monitoring, of VoIP network traffic health.
- Call quality rating metrics (MOS, jitter, packet loss, delay (or latency) and echo).
- Call trend statistics according to key metrics, traffic load, average call duration and call success.
- SEM alerts based on user defined call success rate and quality thresholds.
- Active alarms and history alarms display.
- Monitoring the quality of the links between AudioCodes and non-AudioCodes devices.
- Filtering according to time range, devices and links.

1.2 SEM Monitored Devices

The following devices can be monitored by the SEM:

- Mediant 9000 SBC
- Mediant 4000 SBC
- Mediant 2600 E-SBC
- Mediant SE SBC
- Mediant SE-H SBC
- Mediant VE SBC
- Mediant VE-H SBC
- Mediant 3000 Media Gateways
- Mediant 2000 Media Gateways
- Mediant 1000B Gateway and E-SBC and Mediant 1000B MSBR

- Mediant 800B Gateway and E-SBC and Mediant 800B MSBR
- Mediant 500 E-SBC
- Mediant 500L MSBR and Mediant 500 MSBR



Note: All devices monitored by the SEM should be version 6.8 or later.

1.3 Benefit to VoIP Network Administrators

The SEM enables VoIP network administrators to:

- Quickly identify the metric or metrics responsible for degradation in the quality of any VoIP call made over the network.
- Accurately diagnose voice quality problems in response to VoIP user criticism.
- Prevent VoIP quality degradation.
- Optimize quality of experience for VoIP users.

1.4 Measuring Voice Quality in a VoIP Network

The following important metrics are factorized into the equation when measuring voice quality of calls made over a VoIP network:

- **Mean Opinion Score (MOS)** (specified by ITU-T recommendation P.800) is the average grade on a quality scale of Good to Failed, given by the SEM to voice calls made over a VoIP network, after testing.
 MOS-LQ = listening quality, i.e., the quality of audio for listening purposes; it doesn't take bi-directional effects, such as delay and echo into account.
 MOS-CQ = conversational quality; it takes listening quality in both directions into account, as well as the bi-directional effects.
- **Jitter**, measured by the SEM, can result from uneven delays between received voice packets. To space evenly, the jitter buffer adds delay. The higher the measurement, the greater the impact of the jitter buffer's delay on audio quality.
- **Packet Loss**, measured by the SEM, can result in choppy voice transmission. Lost packets are RTP packets that aren't received by the voice endpoint for processing.
- **Delay** (or latency), calculated by the SEM, is the time it takes for information to travel from source to destination (round-trip time). Sources of delay include voice encoding / decoding, link bandwidth and jitter buffer depth.

2 Configuring Devices to Report to the SEM

This section shows how configure devices to report to the SEM. Before you can use the SEM to monitor a device you need to:

1. Configure the SEM server address on the device (see Section 2.1 below)
2. Configure QoE Profile Rules (see Section 2.2 below)



Note: Customers who subscribe to AudioCodes' SIP Trunk Monitoring Service receive an 'incremental' ini file which can be loaded to the device and which provides all necessary parameter settings, including SEM server IP address, NTP server IP address, and SNMP configuration.

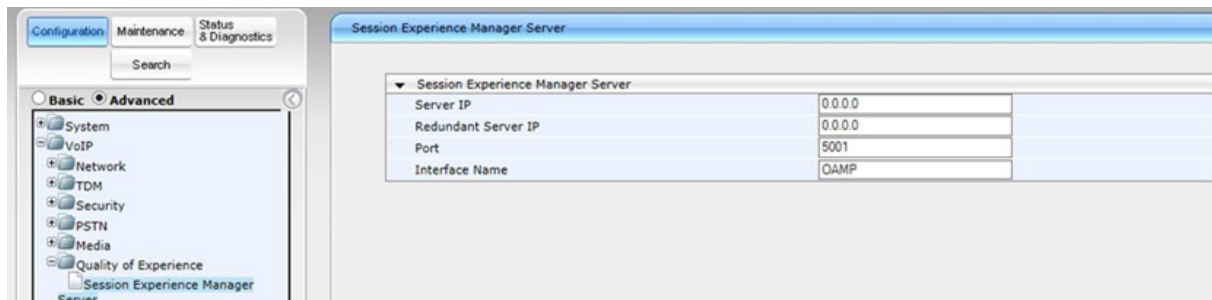
2.1 Configuring the SEM Server Address on the Device

You need to configure the SEM's server address on the device so that the device will report to the SEM.

- **To configure the SEM's server address on the device:**

1. In the Web interface, open the Session Experience Manager page (select the **Advanced** option > **VoIP** > **Quality of Experience** > **Session Experience Manager**):

Figure 2-1: Session Experience Manager Server



2. For detailed information on configuring the SEM's server address (if necessary), see the device's *User's Manual*.

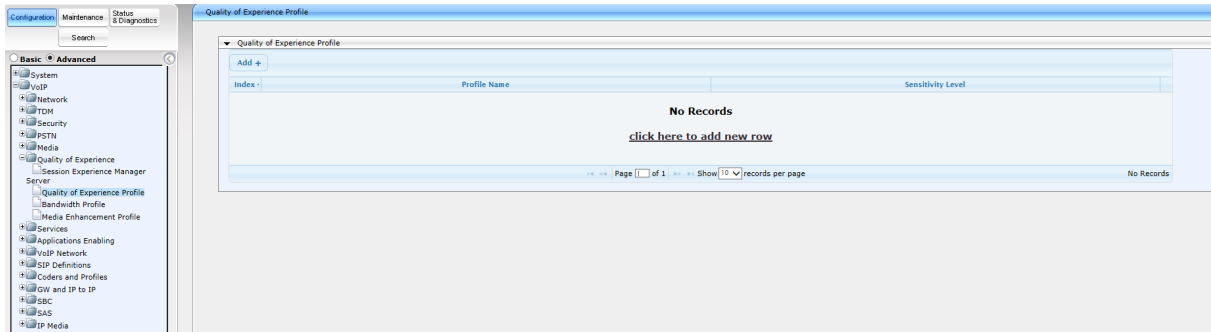
2.2 Configuring a Quality of Experience Profile

You need to configure a Quality of Experience Profile on the device.

➤ **To configure a Quality of Experience Profile on the device:**

1. In the Web interface, open page (select the **Advanced** option > click the **Configuration** tab > **VoIP** > **Quality of Experience** > **Quality of Experience Profile**):

Figure 2-2: Quality of Experience Profile



2. For detailed information on configuring a Quality of Experience Profile (if necessary), see the device's *User's Manual*.

2.3 Configuring a Bandwidth Profile

For details on configuring a bandwidth profile see the device's *User's Manual*.

2.4 Synchronizing Clocks

2.4.1 Synchronizing SEM Server Time with Device Time

For the SEM server to monitor the device, the device and SEM server clocks must be synchronized. Date and time must be identical on both.

If the SEM server is unsynchronized with a device in the network, an alarm is sent. Associated with the unsynchronized device, the alarm has two severity levels: Critical / Clear. If the difference between the Server Time and the Device Time is less than one minute, no alarm is sent. If there's a problem, connection with the device is disallowed.

You'll receive the following message if one of the device NTPs is either SEM IP or SEM NTP IP:

"NTP configuration is correct, please check your network conditions (Firewalls, Ports, etc.) and make sure that NTP sync of SEM Server and/or Devices is performed correctly."

You'll receive the following message if the SEM IP or the SEM NTP IP are not present as one of the device NTPs:

"Please make sure that the time in the SEM server and the device is properly synchronized."

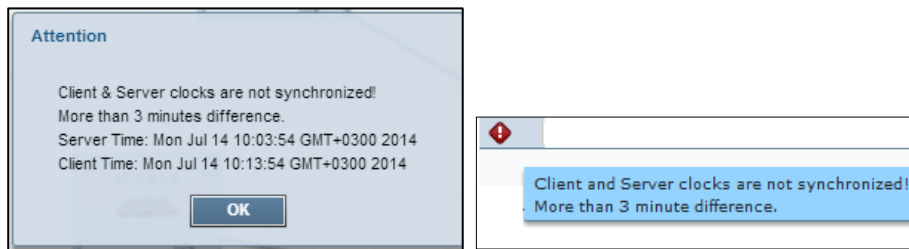
2.4.2 Synchronizing SEM Client Time with SEM Server Time

The same feature applies if SEM client-server are unsynchronized. The SEM client notifies you if it's unsynchronized with the NTP server. Client-server time difference should not exceed three minutes (currently) for correct GUI display. When times are unsynchronized, a message pops up notifying you of the server/client times; a red icon appears near the dates filter; position your mouse over it to view the tooltip.

Synchronization status is checked every client-server refresh (same as other stats/calls refresh) but the popup message appears when an unsynchronized status is first encountered. The red icon is cleared when times are resynchronized.

When selecting a dates range, incorrect results may be received if there's a client-server synchronization issue, because the dates selected in the GUI (client clock) are not the same as the server-related dates (server clock). In this case, after login (or when clocks become unsynchronized), the indications below are displayed.

Figure 2-3: Client and Server Clocks Not Synchronized



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3 Starting the SEM Tool

Users can directly access the SEM by pointing their web browser to its location on the internet, for example, to **http://10.3.180.8/EMS-VQ/Main.html#**

Users can then log in with Username and Password, for example:

acladmin

pass_1234



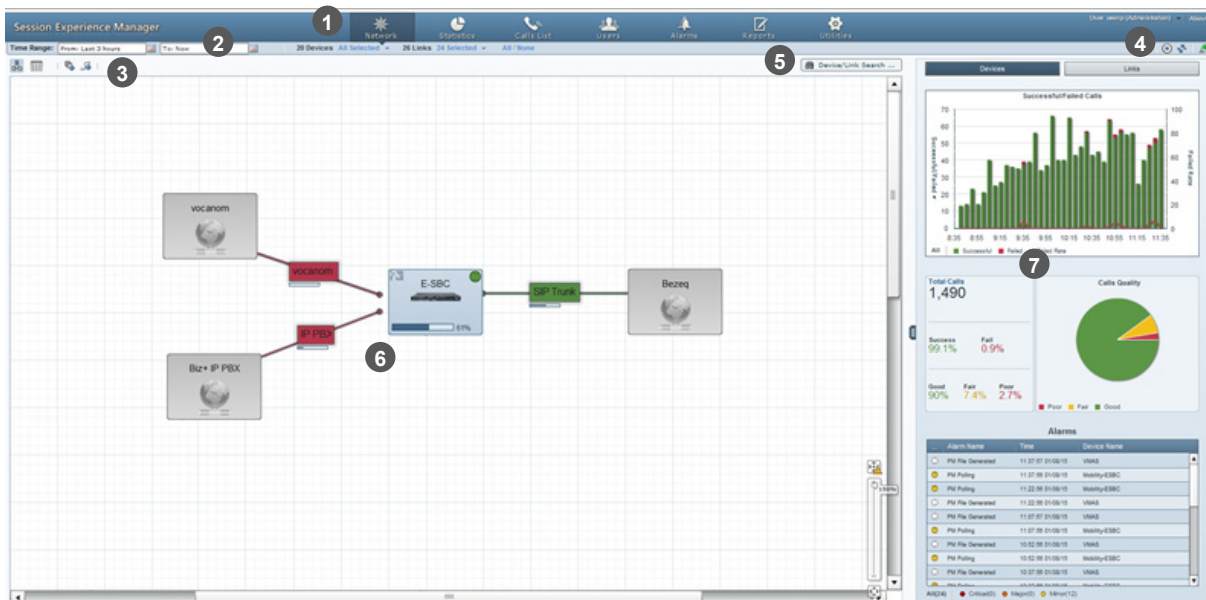
Note: It's strongly recommended to change your initial password after first login.

By default, all VoIP devices managed in the network are displayed. By default, data on calls made in the Time Range of the past 3 hours are displayed.

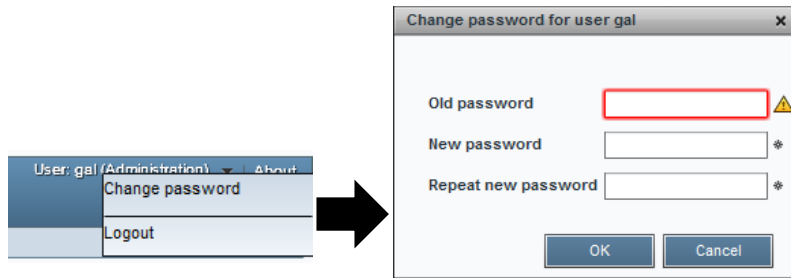
3.1 Getting Acquainted with the SEM GUI

This section familiarizes you with the SEM GUI. See the figure below and [Table 3-1](#) below it.

Figure 3-1: SEM GUI Areas




Users can change password by selecting **Change password** from the User menu:



The table below describes the SEM GUI areas.

Table 3-1: SEM GUI Areas

#	GUI Area	Description
1	Toolbar	Toolbar icons let you navigate to the following SEM pages: Network (default), Statistics, Calls List, Alarms, Reports and Utilities.
		Username (read-only); Logout; Help (pending)
2	Filters	Time Range, Devices, Links
3	Actions Bar	<ul style="list-style-type: none"> ▪ Map view / Table view ▪ Add Non ACL Device ▪ Add Link
4	Refresh Functionalities and Change Password / Logout	[Start/Stop Auto Refresh] Switches on/off automatic page refresh.
		[Refresh Now] Refreshes the page
		Connected or Disconnected (read-only).
		User / admin name menu, to change password or log out.
5	Search	Lets you locate specific information in Network view, Calls List and Alarms view.
6	Main Screen	Each SEM view's main working area. In Network view, for example, the main screen displays devices configured on the SEM server.
		Zoom
		= Save devices locations

#	GUI Area	Description
7	Summary Panes	<p>Network view displays these summary panes:</p> <ul style="list-style-type: none">• Devices<ul style="list-style-type: none">✓ Successful/Failed Calls✓ Calls Quality✓ Alarms• Links<ul style="list-style-type: none">✓ Successful/Failed Streams✓ Streams Quality✓ Alarms <p>Statistics view displays these summary panes:</p> <ul style="list-style-type: none">✓ Devices (Calls Total #, Successful %, Fail %, Max Concurrent)✓ Quality % and Color✓ Quality Cause
		Click  to expand the main screen/hide the summary panes.

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4 Filtering to Display Specific Info

Filters let you exclude unwanted information from the Network, Statistics, Calls List, AD Users and Alarms pages. Filters let you display only information you require:

Figure 4-1: Filters



Table 4-1: Filters

Filter	Description
Time Range	Lets you display time range-specific information.
Devices	Lets you display device-specific information.
Links	Lets you display information on specific communication paths (links) between devices.

Filters can help you speed access to required information.



Note:

- To filter a device, select **None** in the Links filter and then select the device in the Devices filter. Alternatively, select **Select Just Me** from devices' Actions menu.
- After defining a filter, it remains unchanged in all views until the next time you set a new filter. You can filter again in any view, any time.
- The Calls List page and the Reports page display their own filter bar with page-specific options.

4.1 Filtering by Time Range

This section shows how to filter by time range.

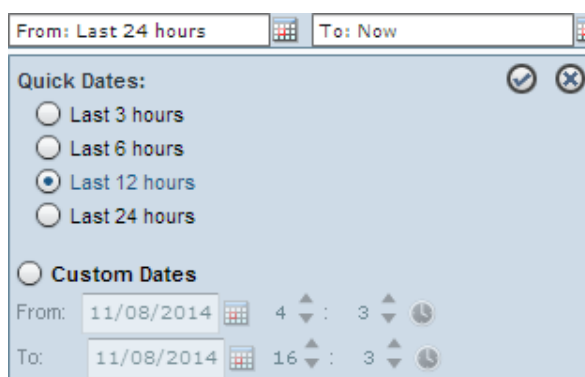
4.1.1 Quick Filters

You can filter by time range using use quick filters.

➤ **To use a quick filter:**

1. On the filters bar, click the 'From' or 'To' field:

Figure 4-2: Time Filter




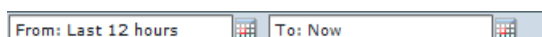
2. Under 'Quick Dates', select a time range and click ; filtering is performed; the filter bar shows this:

Figure 4-3: Filter Bar Showing Quick Date



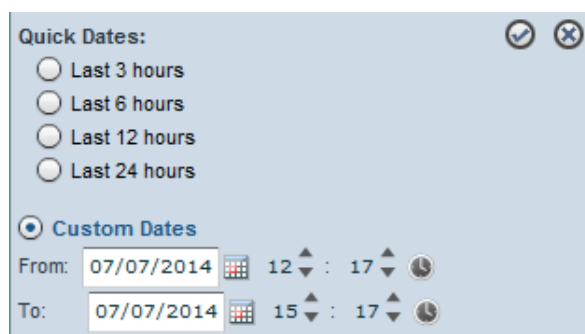
4.1.2 Custom Filters

This section describes how to custom filters.

➤ **To customize a time range filter:**

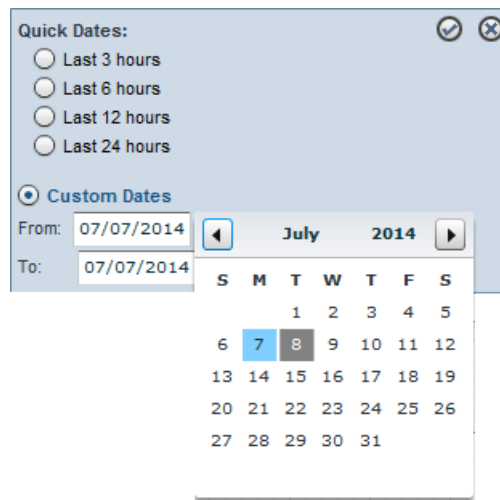
1. On the Filter bar, click the 'From' field or the 'To' field and select the **Custom Dates** option:

Figure 4-4: Time Range Filter - Custom



- Under **Custom Dates**, define the **From** date and then **To** date using the  calendar icon:

Figure 4-5: Time Range Filter – Custom Dates



Quick Dates: Last 3 hours
 Last 6 hours
 Last 12 hours
 Last 24 hours

Custom Dates

From: 07/07/2014 July 2014

To: 07/07/2014

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		


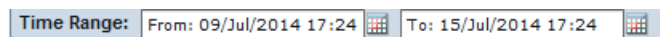
- Define the time of day/night, if you require; click ▲▼.
- Click the  icon to accept; the filtering process is performed and the Filter bar shows the following:

Figure 4-6: Filter Bar - From Date-To Date



Time Range: From: 09/Jul/2014 17:24 To: 15/Jul/2014 17:24



Note: Seven days is the maximum time you can define. If you exceed it, you are notified.

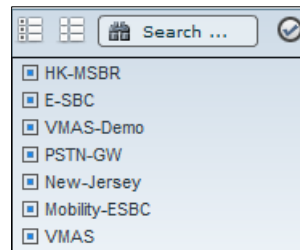
4.2 Filtering by Device

You can filter from a list of AudioCodes devices currently connected to the SEM server.

➤ **To filter by device:**

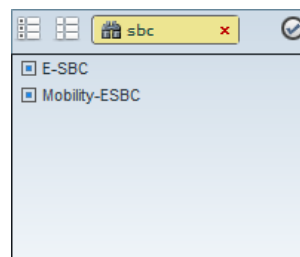
1. On the Filter bar, click the 'Devices' drop-down list.

Figure 4-7: Devices Filter



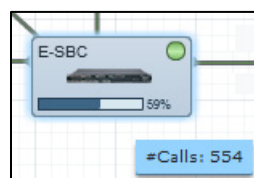
2. Do one of the following:
 - Click the **Select All** icon to automatically select all devices (save the time of manual selection) -OR-
 - Click the **Select None** icon to clear all selections (save the time of manually clearing) -OR-
 - Individually select each device for the SEM to display
 - Search for devices to filter: In the 'Search... ' field, enter the name of an AudioCodes device, for example, **sb**c, as shown in the figure below; the list is filtered to display only those devices.

Figure 4-8: 'Search' for Devices to Filter



3. Click ; only devices that you selected are displayed in blue; unselected devices are displayed in light gray. If calls were made on a device, a counter bar is displayed showing percentage share of total calls made. Point your mouse over the bar to display the number of calls made on the device:

Figure 4-9: Filter Results



4.3 Filtering by Links

You can also filter by links. Links are IP communication paths between devices that measure and display key metrics on calls made on them. Links are defined according to IP Group, Trunk Group, Phone Number or SIP IP address.

The 'source' device on which key metrics monitoring is based must be an AudioCodes device. The second device can be an AudioCodes device or a non-AudioCodes device defined by users. Users can define one or more links between devices. The links are displayed in Network Map view. Each device and link status is displayed as 'Red' or 'Green'. If red, then:

- Failed Calls threshold is reached (default = 30%)

-OR-

- Poor Calls Quality threshold is reached (default = 15%)

Users can define third-party non-AudioCodes devices in Network Map view. The SEM doesn't directly monitor them but enables users to view all relevant devices in the VoIP network and to monitor links with AudioCodes devices.

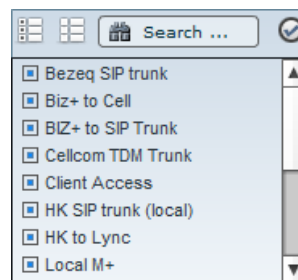
Most commonly used non-AudioCodes devices are IP PBX, ITSP and routers. The SEM can calculate, for example, call quality for the link defined between the AudioCodes device and the Internet Telephony Service Provider (ITSP).

Non-AudioCodes devices are defined by name and IP address.


➤ To filter by links:

1. On the Filter bar, click the 'Links' drop-down list; the links are displayed.

Figure 4-10: Links Filter



2. Either:
 - Click **Select All** to automatically select all links and save the time of manually selecting -OR-
 - Click **Select None** to clear all selections and save the time of manually deselecting -OR-
 - Individually select each link for the SEM to display.

After selecting, click ; only links you selected are displayed (in blue); unselected devices are displayed in light gray.

This page is intentionally left blank.

5 Displaying VoIP Network Entities

The SEM opens by default on the Network page which you can choose to view in:

- Map view (default) (shows devices and links located on a map)
- Table view (shows devices and links in a table)

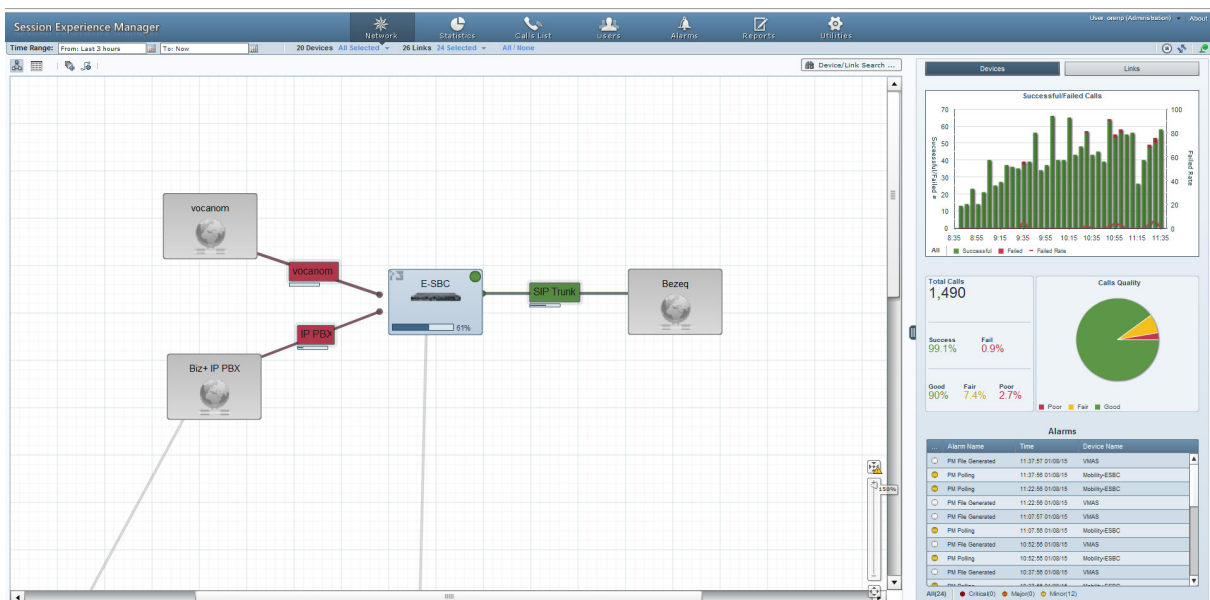


Note: Generic (non-AudioCodes) devices must be defined in the SEM for them to be displayed in the SEM Network view.

5.1 Map View

On the Actions bar, click the **Map** icon ; VoIP network entities and their links are graphically displayed as icons.

Figure 5-1: Map View



About Map view:

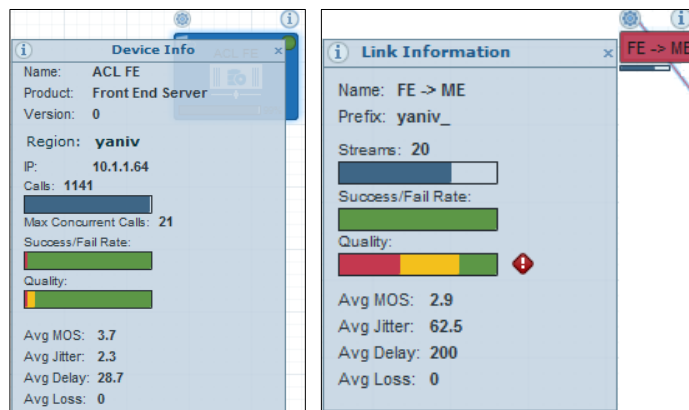
- AudioCodes devices are colored light blue
- Non-Audiocodes' devices have gray background color
- Filtered-out entities are displayed without background color.
- Devices found using search filter surrounded by yellow.
- Selected entities are surrounded with light blue.
- If an entity displays it indicates that the percentage of failed calls > 30% or that the percentage of poor quality calls > 15%.
- If an entity displays it indicates that the percentage of failed calls < 30% and that the percentage of poor quality calls < 15%.

- Entities can be positioned or repositioned in the map. After dragging an entity and dropping it in a different location, click **Topology changed! Save devices locations** at the top of the zoom bar.
- Three summary panes (to the right) enable quick assessment of (1) successful/failed calls/streams (2) calls/streams quality and (3) alarms.

5.1.1 Viewing Device / Link Information

In Map view, click a device or a link and then click the now-displayed ; the Device/Link Info popup opens:

Figure 5-2: Device Info / Link Info

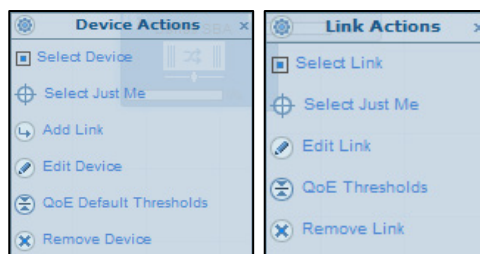


See Section 1.4 on page 12 for quality metrics descriptions.

5.1.2 Performing Device / Link Actions

In Map view, click a device / link and then click the now-displayed ; the Device/Link Actions popup opens:

Figure 5-3: Device Actions / Link Actions



[AudioCodes Device Actions] Select Device, Select Just Me, Add Link.

[Non-AudioCodes Device Actions] Edit Device, Remove Device.

[Link Actions] Select Link, Select Just Me, Edit Link, Edit Link QoE Profile, Remove Link.

5.2 Table View

In addition to viewing the network in map view, you can also view the network as a table. Table view features two options: Devices -or- Links


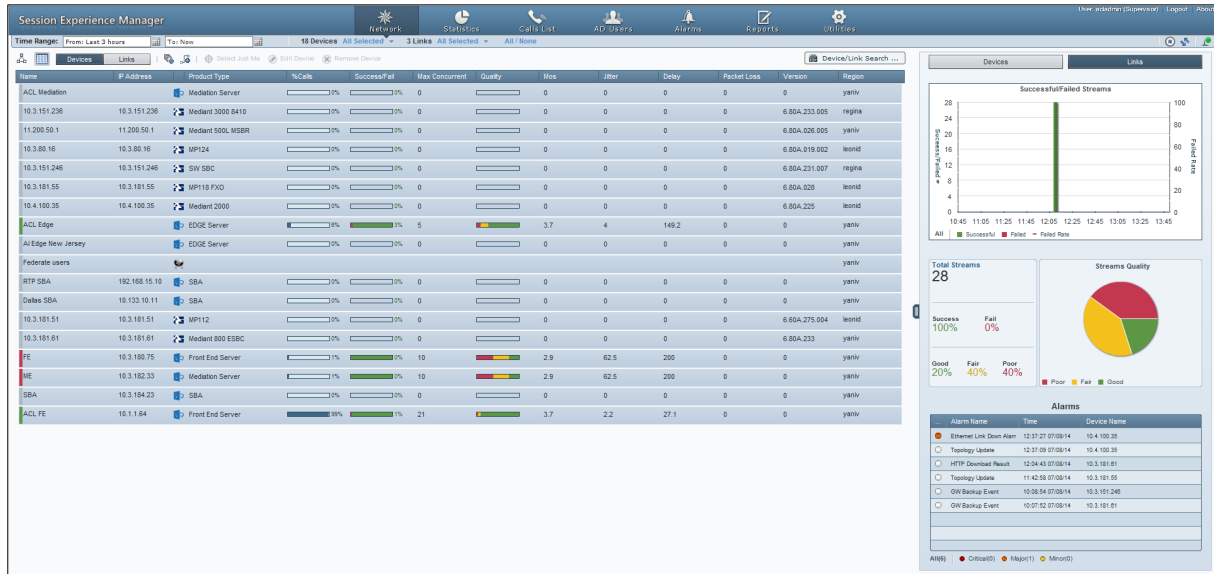
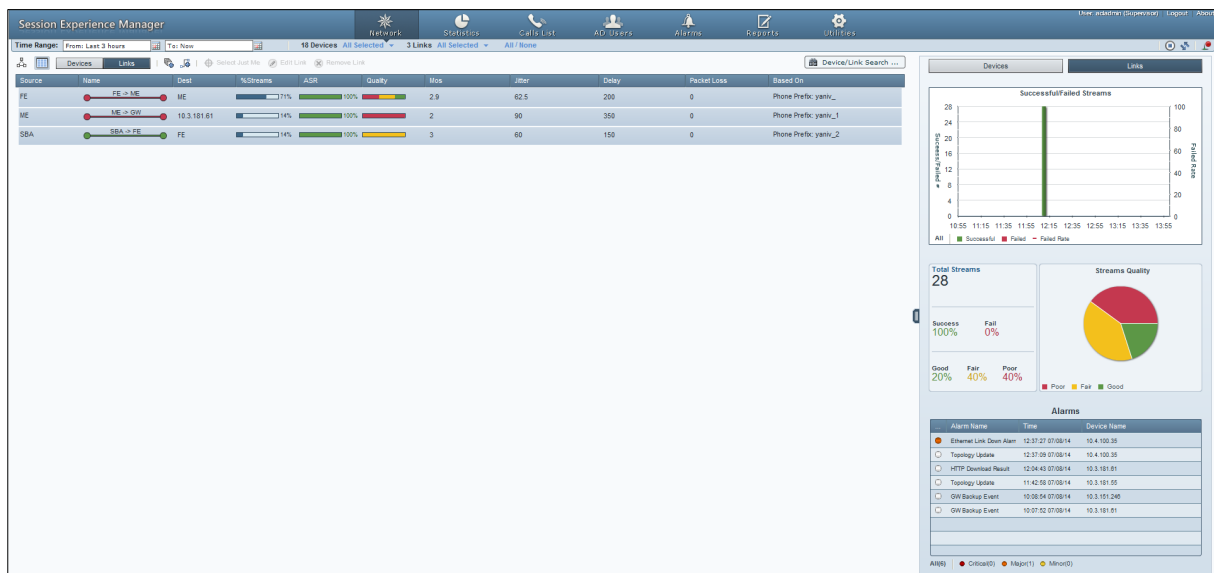
Click the **Table** icon  on the Actions bar; the table displays devices by default:

Figure 5-4: Table View - Devices



Columns show each device's share of calls as a percentage, Success/Fail ratio, Quality distribution, MOS, Jitter, Delay and Packet Loss, allowing you access to specific information and consequently enhancing management efficiency.

To display links in the table, click the **Links** button  ; the **Links** button turns navy blue:



Figure 5-5: Table View – Links


Columns show each link's Source, Name, Destination, %Streams, Success/Fail ratio, Quality MOS, Jitter, Delay, Packet Loss, Version, and Region, allowing you access to specific information and consequently enhancing management efficiency.

Sorting by Column

Table view features sorting by column, enabling administrators to quickly compare across devices/links for enhanced comparative analysis capability.



Tip: Before sorting columns, in the Refresh Page, stop Auto Refresh  and Start it again  after the sorting results have been displayed.

For example:

- **To sort columns according to %Calls:**
 - Click the column header and click again if necessary until ▼ is displayed; entities whose percentage share of calls is highest are listed highest, and those whose percentage share of calls is lowest are listed lowest.
 - Click the header again; ▲ is displayed; entities whose percentage share of calls is highest are listed lowermost, and those whose percentage share of calls is lowest are listed uppermost.

5.3 Adding Devices to the SEM

5.3.1 Adding a Non-AudioCodes (Generic) Device

You can view generic (non-AudioCodes) devices in the SEM if they're supported. To view a generic device in the SEM you must first add it.

➤ **To add a generic device to the SEM:**


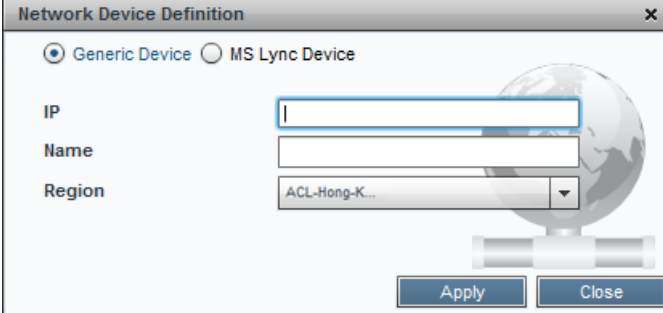
1. Click the  icon on the actions bar; this screen opens:

Figure 5-6: Adding a Generic Device



2. Make sure the default **Generic Device** option is selected.
3. Define the device's IP address, Name, and Region, and then click **Apply**; the device is added and displayed in the SEM.

5.4 Adding a Link

You can view links in the SEM. To view a link, you must first add it.

➤ **To add a link to the SEM:**


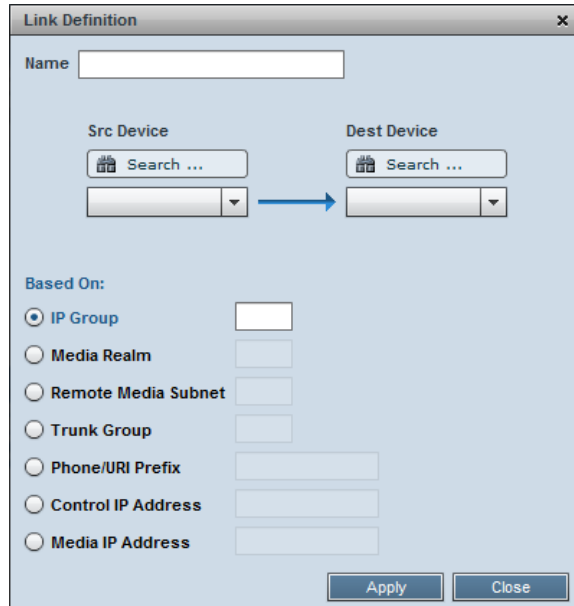
1. Click the  icon on the actions bar; this screen opens:

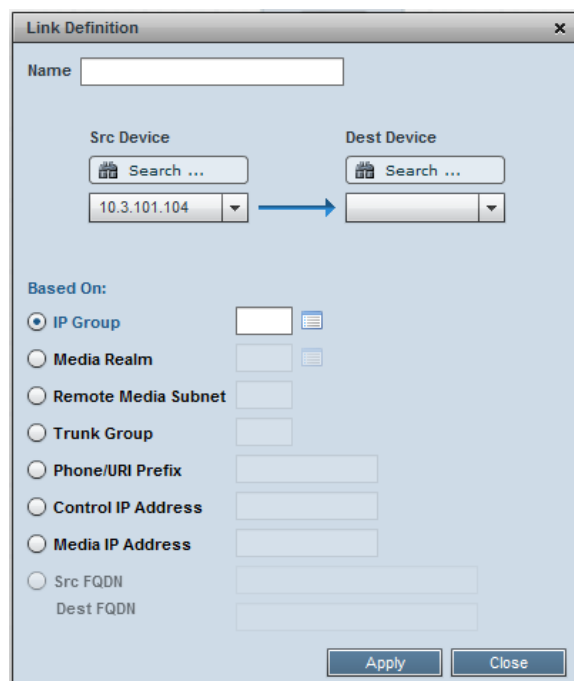
Figure 5-7: Adding a Link



The screenshot shows a 'Link Definition' dialog box. At the top is a 'Name' text field. Below it are two columns: 'Src Device' and 'Dest Device'. Each has a search icon and a 'Search ...' button, followed by a dropdown menu. A blue arrow points from the Src Device dropdown to the Dest Device dropdown. Underneath is a 'Based On:' section with several radio buttons and corresponding text input fields: 'IP Group' (selected), 'Media Realm', 'Remote Media Subnet', 'Trunk Group', 'Phone/URI Prefix', 'Control IP Address', and 'Media IP Address'. At the bottom right are 'Apply' and 'Close' buttons.

2. After you select the **Src Device**, the screen below opens, showing the available options retrieved from the device.

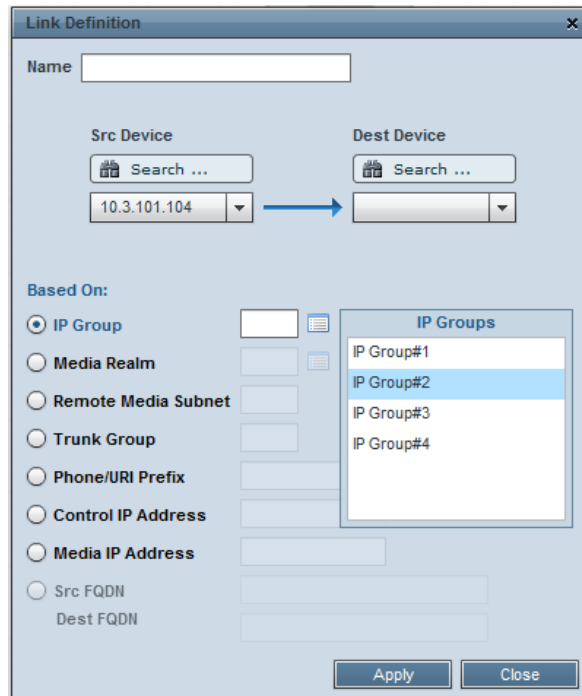
Figure 5-8: Available Options after Selecting Src Device



This screenshot is similar to Figure 5-7, but the 'Src Device' dropdown now displays the IP address '10.3.101.104'. In the 'Based On:' section, the 'Src FQDN' radio button is now visible, with a 'Dest FQDN' text field below it. The other options and buttons remain the same.

3. Select the **IP Group** option from the device's configured IP-Groups:

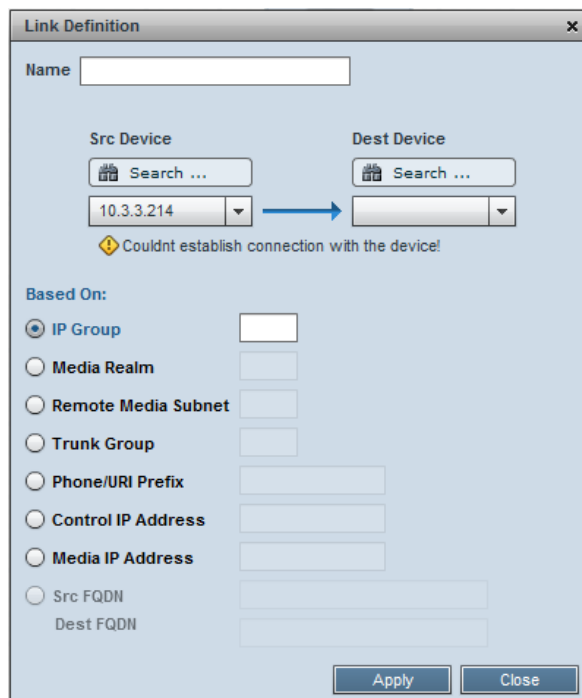
Figure 5-9: Selecting IP Group



The screenshot shows the 'Link Definition' dialog box. The 'Name' field is empty. Under 'Src Device', there is a search button and a dropdown menu showing '10.3.101.104'. Under 'Dest Device', there is a search button and an empty dropdown menu. A blue arrow points from the 'Src Device' dropdown to the 'Dest Device' dropdown. Below this, the 'Based On:' section has several radio button options: 'IP Group' (selected), 'Media Realm', 'Remote Media Subnet', 'Trunk Group', 'Phone/URI Prefix', 'Control IP Address', 'Media IP Address', 'Src FQDN', and 'Dest FQDN'. To the right of these options is a list box titled 'IP Groups' containing 'IP Group#1', 'IP Group#2' (highlighted), 'IP Group#3', and 'IP Group#4'. At the bottom right are 'Apply' and 'Close' buttons.

- If there's no SNMP connection to the device, no options will be available and the error message shown in the figure below will be displayed. Enter the value manually.

Figure 5-10: No SNMP Connection to Device, No Options Available



The screenshot shows the 'Link Definition' dialog box. The 'Name' field is empty. Under 'Src Device', there is a search button and a dropdown menu showing '10.3.3.214'. Under 'Dest Device', there is a search button and an empty dropdown menu. A blue arrow points from the 'Src Device' dropdown to the 'Dest Device' dropdown. Below this, there is a yellow warning icon and the text 'Couldnt establish connection with the device!'. Below this, the 'Based On:' section has several radio button options: 'IP Group' (selected), 'Media Realm', 'Remote Media Subnet', 'Trunk Group', 'Phone/URI Prefix', 'Control IP Address', 'Media IP Address', 'Src FQDN', and 'Dest FQDN'. At the bottom right are 'Apply' and 'Close' buttons.

4. Use the table below as reference when configuring the parameters.

Table 5-1: Adding a Link

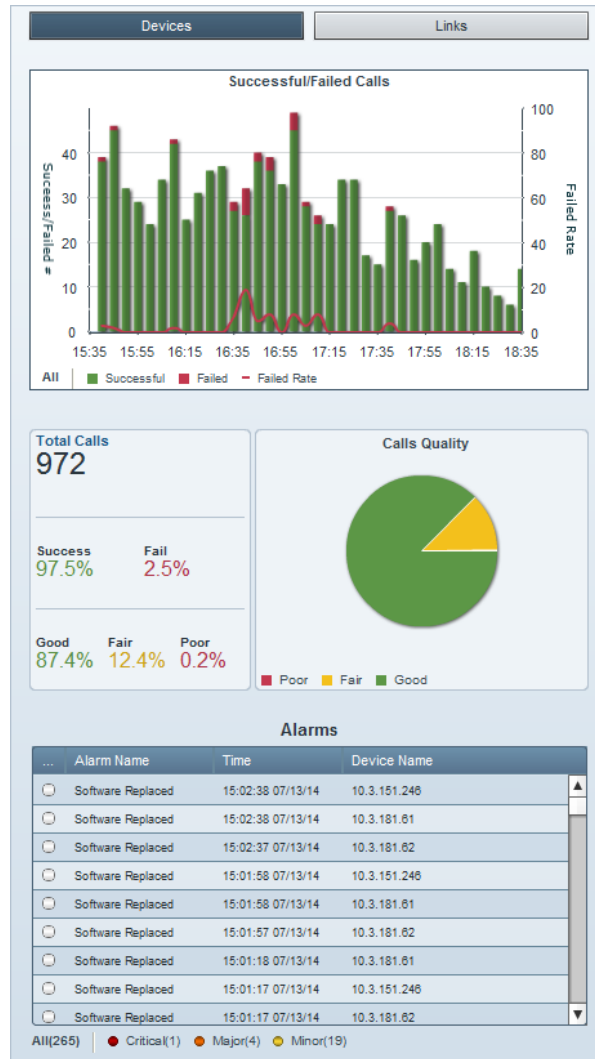
Parameter	Description
Name	Enter an intuitive name for the link.
Src Device	From the dropdown list, select the source device <i>from which</i> to link to the destination device. You can alternatively search for it.
Dest Device	From the dropdown list, select the destination device <i>to which</i> to link from the source device. You can alternatively search for it.
The link counts and computes statistics on all calls that originate in the source device, based on one of the following filter options:	
IP Group	Defines the source device IP-Group index (a list of options may be available).
Media Realm	Defines the source device Media Realm index (a list of options may be available).
Remote Media Subnet	Defines the source device Media Realm subnet index (a list of options may be available; Media Realm must also be defined).
Trunk Group	Defines the source device Trunk Group index (a list of options may be available).
Phone/URI Prefix	Defines the prefix text of a phone number or SIP URI string.
Control IP Address	Defines a valid IP-Address on which SIP control messages are originated.
Media IP Address	Defines a valid IP-Address on which SIP media messages (voice/fax) are originated.

5. Click **Apply**; the link is added and displayed in the SEM.

5.5 Network Health Overview Panes

Map and Table views feature three overview panes, enabling at-a-glance assessment of the overall health of the VoIP network.

Figure 5-11: Network Health Overview Panes



Network health overview panes (top to bottom):

1. **Successful/Failed Calls** lets you quickly assess how the successful / failed calls rate distributes over time.
2. **Calls Quality** pie chart lets you quickly assess % and # of calls whose voice quality was measured as Good (green), Fair (yellow) or Poor (red).
3. Total # of calls made, % of successful and failed calls, and the % of Good, Fair or Poor quality calls.
4. **Alarms** lists the names of the most recently active alarms, each alarm's Severity level (color-coded), the Time it was received, and the Name of the device triggering it. Sorting by column enhances information accessibility.

5.5.1 Successful/Failed Calls

The uppermost 'Successful/Failed Calls' chart lets you quickly access detailed information on calls performance. You can see at a glance the rate of successful versus failed calls distributed over time, in 5 minute intervals, where each bar is an interval.

➤ **To view information:**

- Point your cursor over a green-coded bar segment; a popup shows the # of successful calls made in that 5-minute interval out of the total # of calls made, the % of successful calls made relative to the total # of calls made in the interval.
- Point your cursor over a red-coded bar segment; a popup shows the # of failed calls made in that 5-minute interval out of the total # of calls made, the % of failed calls made relative to the total # of calls made in the interval.
- Point your cursor over the red-coded line chart; a popup shows the rate of calls that failed during that interval (i.e., Failed Rate) and the end time of the interval.
- Click the **Successful (n)** link below the pie; the Calls List page opens showing information on *all* successful calls in the network (see Section 7 on page 49).
- Click the **Failed (n)** link below the pie; the Calls List page opens showing information on *all* failed calls in the network (see Section 7 on page 49).
- Click a green-coded bar segment; the Calls List page opens showing information on calls that failed in that 10-minute interval (see Section 7 on page 49).
- Click a red-coded bar segment; the Calls List page opens showing information on calls that failed in that specific 10-minute time interval (see Section 7 on page 49).

5.5.2 Calls Quality Pie

The pie chart lets you quickly access information related to calls' voice quality.

You can see at a glance the % and # of calls whose voice quality was good relative to the % and # of calls whose voice quality was fair, for example.

➤ **To view information:**

- Point your cursor over a *green / yellow / red* pie segment; the % and # of calls whose voice quality was graded *good / fair / poor* pops up.

➤ **To view detailed information:**

- Click a *green / yellow / red* pie segment; the Calls List page opens showing detailed information on calls whose voice quality was graded *good / fair / poor* (see Section 7 on page 49).

5.5.3 Alarms

- The lowermost 'Alarms' pane lets you quickly access alarms-related information.

- You can see at a glance the # of alarms currently active, for example, **All(265)**, as shown in [Figure 5-11](#), and the # of alarms of each severity level currently active (Critical, Major, Minor).

➤ **To view detailed information:**

- Click **All (n)**; the Alarms page opens showing alarms of all Severity levels and detailed information on them (see [Table 9-1](#)).
- Click **Critical (n) / Major (n) / Minor (n)**; the Alarms page opens showing alarms of that specific Severity level and detailed information on them (see [Table 9-1](#)).

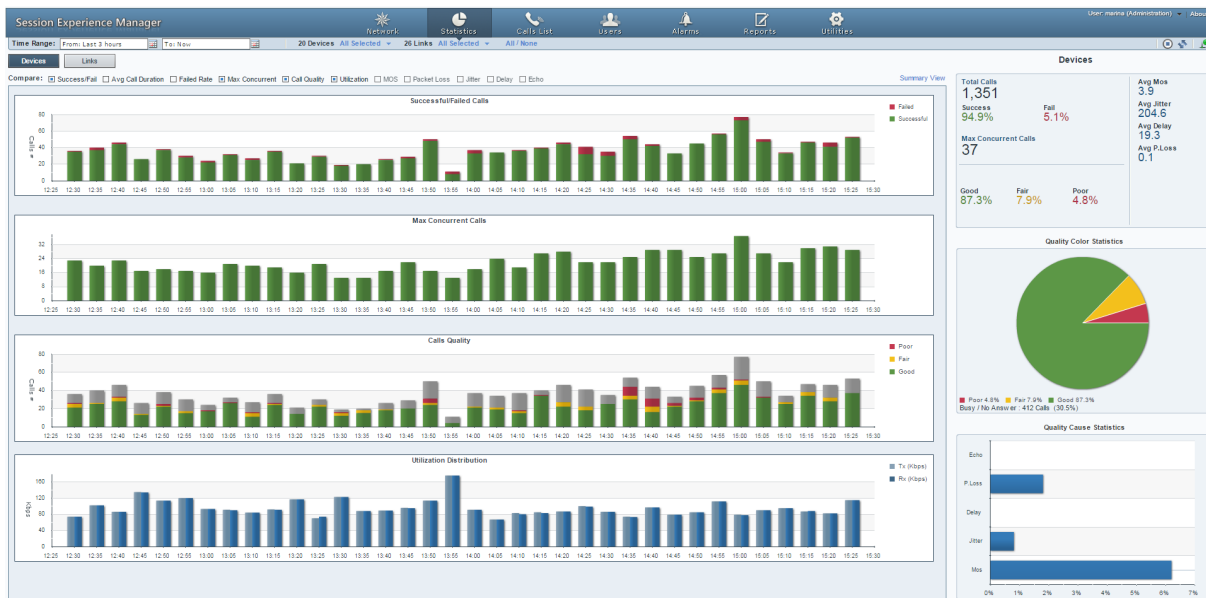
This page is intentionally left blank.

6 Displaying Statistics

The Statistics page opens by default in Comparative View, displaying four charts (top to bottom):

- Successful / Failed Calls (by default always displayed) (see Section 6.1)
- Max Concurrent Calls (see Section 6.4)
- Calls Quality (Good, Fair, Poor or Unknown) (see Section 6.5)
- Utilization Distribution (Rx/Tx Rate Kbit/sec) (see Section 6.6)

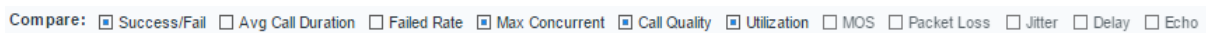
Figure 6-1: Statistics – Comparative View (Default)



You can compare other statistics charts.

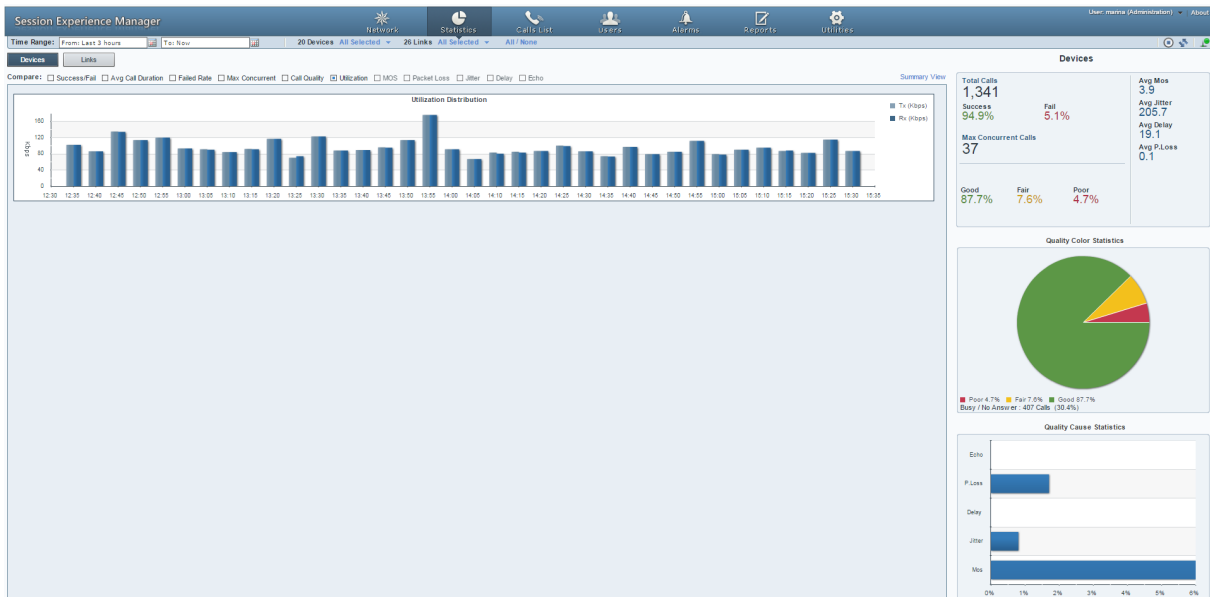
- From the **Compare** bar you can select or deselect Call Quality, Utilization, MOS, Packet Loss, Jitter, Delay, and/or Echo:

Figure 6-2: Compare Options



Clear all compare options except the **Utilization** option; the Statistics page displays this:


Figure 6-3: Utilization Distribution



- You can hide/display any chart.
- This feature lets you easily identify correlations.

6.1 Successful/Failed Calls Chart

This chart shows successful / failed calls distributed over time. It can be displayed as a bar chart or linear chart.

To display a bar chart, select  ▼


To display a linear chart, select 

Figure 6-4: Successful/Failed Calls – Bar Chart

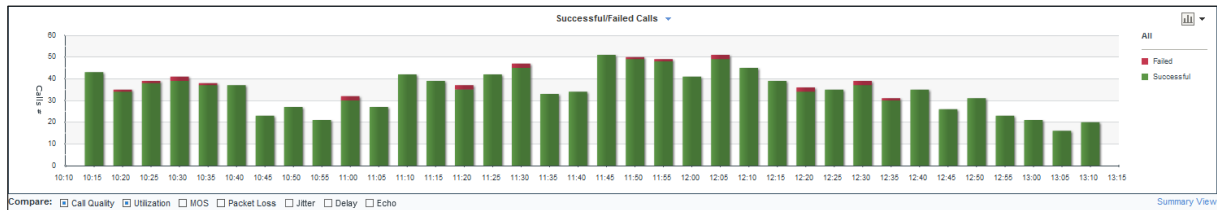
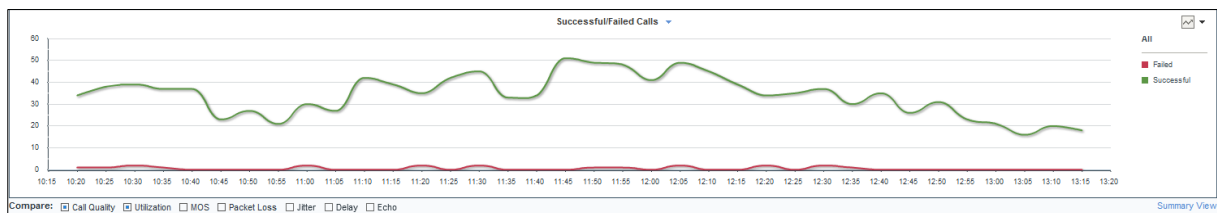


Figure 6-5: Successful/Failed Calls – Linear Chart

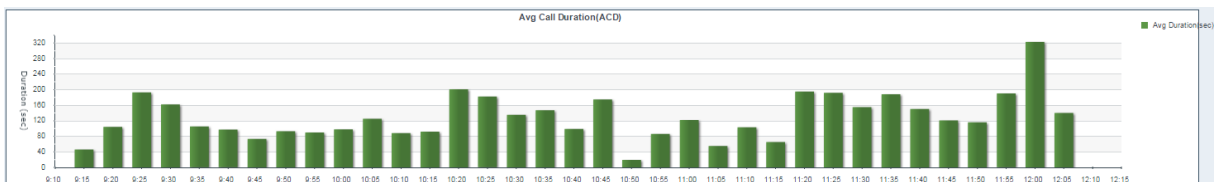


The chart lets you assess calls performance at a glance. The chart shows *when successful calls peaked* compared to *when failed calls peaked*. You can compare this to Average Call Duration, Failed Rate, Maximum Concurrent, Calls Quality, Utilization Distribution, MOS, Packet Loss, Jitter, Delay, or Echo charts, to identify correlation and make a diagnosis.

6.2 Average Call Duration (ACD) Chart

This chart shows the average duration of calls, distributed over time.

Figure 6-6: Average Call Duration

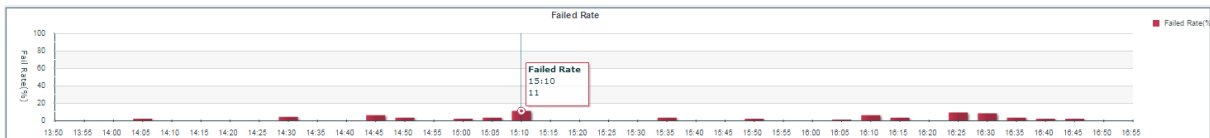


The chart helps you assess calls performance at a glance. The chart shows when the the ACDs were longest compared to when shortest. You can compare this to Successful/Failed Calls, Failed Rate, Call Quality, Utilization, MOS, Packet Loss, Jitter, Delay or Echo charts, to identify correlation and make a diagnosis.

6.3 Failed Rate Chart

The chart below shows the Failed Rate distributed over time.

Figure 6-7: Failed Rate

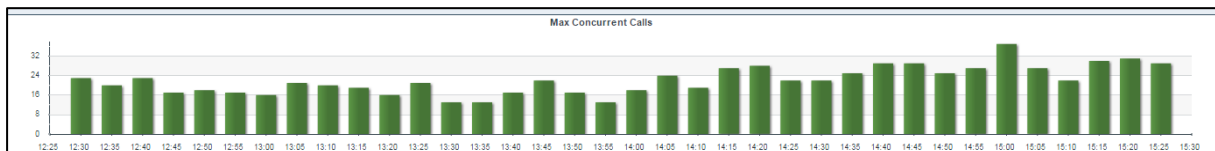


The chart helps you assess calls performance at a glance. The chart shows the failure rate at a point on the time axis. You can compare this to Successful/Failed Calls, ACD, Maximum Concurrent, Call Quality, Utilization, MOS, Packet Loss, Jitter, Delay and/or Echo charts, to identify correlation and make a diagnosis.

6.4 Maximum Concurrent Calls Chart

The chart below shows the maximum concurrent calls distributed over time.

Figure 6-8: Maximum Concurrent Calls Chart

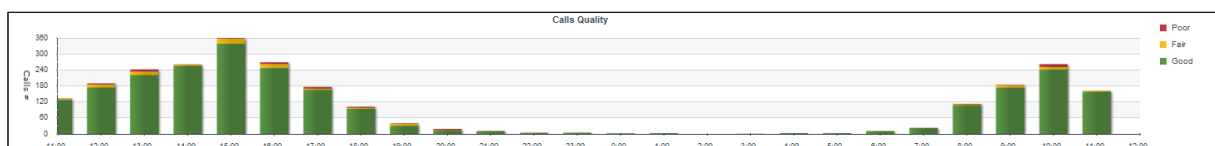


The chart helps you assess calls performance at a glance. The chart shows when the maximum concurrent calls *peaked* compared to when they *dipped*. You can compare this to Successful/Failed Calls, Average Call Duration, Failed Rate, Call Quality, Utilization, MOS, Packet Loss, Jitter, Delay and/or Echo charts, to identify correlation and make a diagnosis.

6.5 Calls Quality Chart

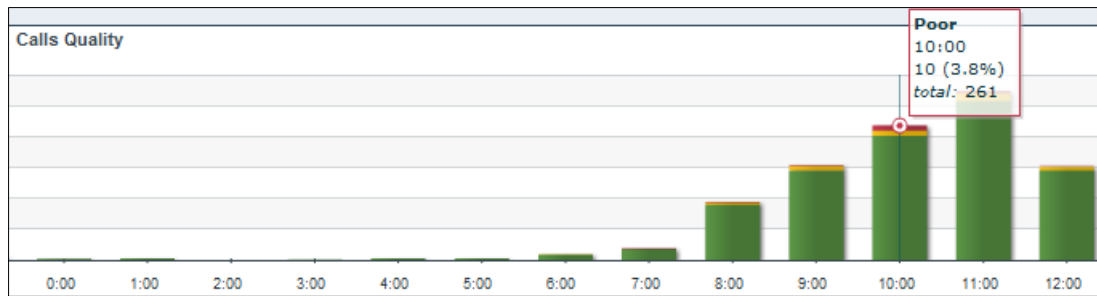
The Calls Quality bar chart shows the distribution of voice quality of calls over time. A glance at the chart shows when, and in what measure, voice quality of calls scored 'Good' (green), 'Fair' (yellow) and 'Poor' (red). Gray indicates 'Unknown' voice quality. The Calls Quality chart is only displayed as a bar chart.

Figure 6-9: Calls Quality Chart



- Point the cursor over a color-coded bar segment in any time period; a popup (see below) shows the time the period ended, the number and percentage of calls made whose quality scored in the category represented by the color-coded bar segment, and the total number of calls made in the period.

Figure 6-10: Calls Quality Chart - Popup



- To view detailed information on calls scoring 'Good', 'Fair' or 'Poor' in any time interval; click the relevant color-coded segment of the bar; the Calls List page opens (see Section 7 on page 49).
- To view information on *all* calls whose voice quality scored:
 - 'Poor' - click the ■ **Poor** link; the Calls List page opens
 - 'Fair' - click the ■ **Fair** link; the Calls List page opens
 - 'Good' - click the ■ **Good** link; the Calls List page opens (see Section 7 on page 49).

Compare Calls Quality to Utilization Distribution, MOS, Packet Loss, Jitter, Delay and/or Echo. Use the **Compare** check boxes located below the Success/Fail Calls chart to select a measurement for which to compare.

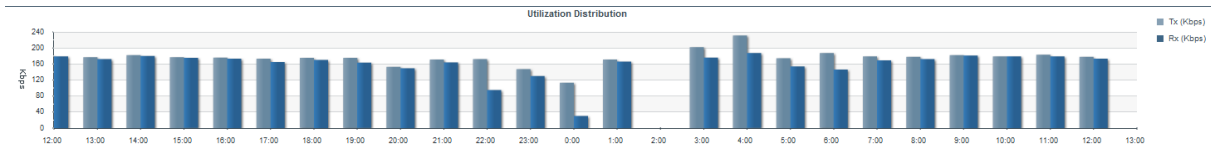
If for example, you identify a correlation over time between 'Failed' quality calls, and Jitter, then this metric is the reason for the quality failure.

6.6 Utilization Distribution Chart

The Utilization Distribution chart shows distribution of network utilization over time. A glance at the chart shows when a high rate (in Kbps) was received or transmitted. The chart thus indicates when a network is congested or uncongested, i.e., when voice quality scores may be lower.

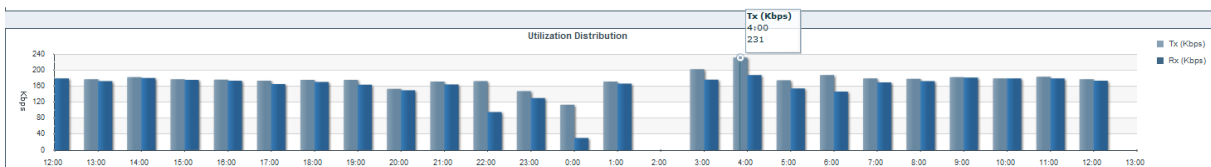
The chart is displayed as a bar chart.

Figure 6-11: Utilization Distribution Chart



To view information on a specific time period, position the cursor over the bar representing the time period; a popup (see below) pops up showing the time at which the period ended, the Rx / Tx rate in Kbps, and the kilobits consumed per second during the time period.

Figure 6-12: Utilization Distribution Chart – Popup



6.7 Summary View

In addition to viewing the Statistics page in the (default) Comparative View, you can also view it in Summary View: Click the **Summary View** link located above and to the right of the chart displayed topmost:

Figure 6-13: Statistics Page - Summary View - 'Call Quality' Selected as Primary Chart



The figure above shows the Statistics page in Summary View. (To revert to Comparative View, click the **Comparative View** link located above and to the right of the chart displayed topmost). Instead of **Compare** options, **Primary Chart** options are now displayed. By default, the Calls Quality chart is displayed as the Primary Chart (displayed topmost), but you can select any of the other Primary Chart options.

Summary View displays all metrics charts. All charts are identical to the bar charts displayed in Comparative View, only condensed. The Primary Chart is not condensed.

In the figure above you can see:

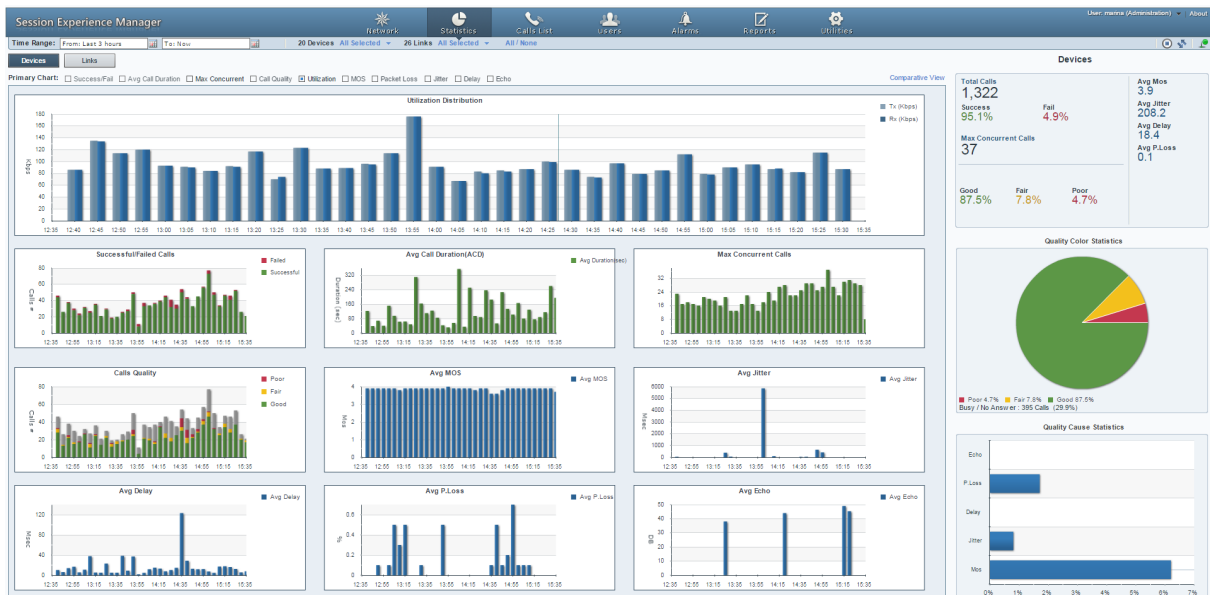
- Calls Quality (Primary Chart). Point your mouse over a bar to determine the # and % of calls whose quality was good (green), fair (yellow), or poor (red) in that time interval.
- Successful/Failed Calls. Point your mouse over a bar to determine the # and % of calls that were successful (green) or failures (red) in that time interval.
- Average Call Duration (ACD). Point your mouse over a bar to determine average call duration in that time interval.
- Maximum Concurrent Calls. Point your mouse over a bar to determine the maximum concurrent calls measured in that time interval.
- Utilization Distribution. Point your mouse over a bar to determine the transmitted (Tx) or received (Rx) kbps at that time. Click the link **Tx (Kbps)** or **Rx (Kbps)** to view either.
- Average MOS. Point your mouse over a bar to determine the average MOS scored in that time interval.
- Average Jitter. Point your mouse over the time axis to determine the average

jitter measured at that time, in milliseconds.

- Average Delay. Point your mouse over a bar to determine the average delay measured in that time interval, in milliseconds.
- Average Packet Loss. Point your mouse over the time axis to determine the average packet loss, as a percentage of the total number of packets sent, measured at that time.
- Average Echo. Point your mouse over the time axis to determine the precise average echo measured at that time, in DB.

If **Utilization** is selected as **Primary Chart**, then **Call Quality** is included in Summary View, as shown in the figure below.

Figure 6-14: Statistics Page - Summary View - 'Utilization' Selected as Primary Chart



- Call Quality. Identical to Comparative View, only condensed. See Section 6.2 for a detailed information.



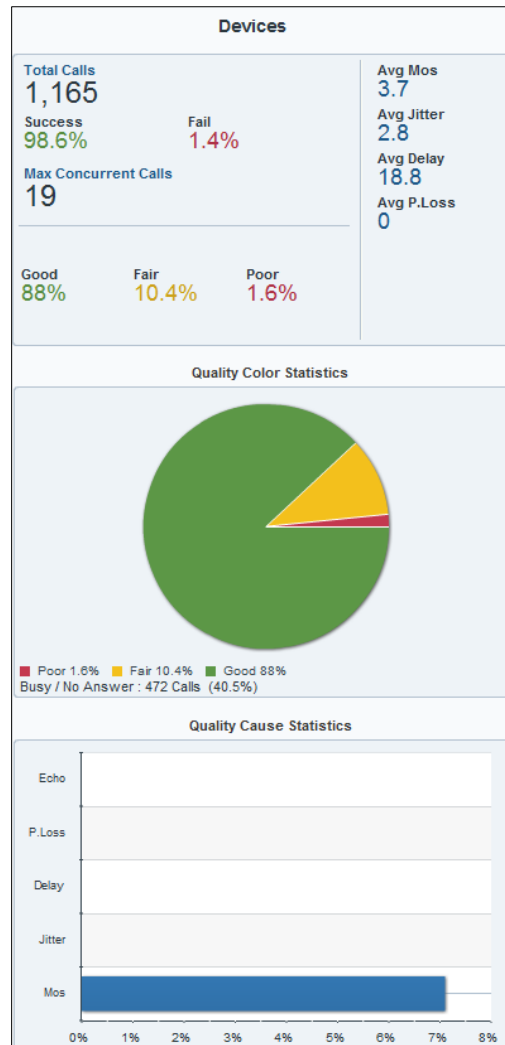
Note: See Section 1.4 for descriptions of the voice quality metrics.

6.8 Network Health Overview Panes

The Statistics page displays three panes to the right of the charts, letting you assess at a glance the VoIP network's overall health statistics (top to bottom):

- Total Calls
- Quality Color Statistics
- Quality Cause Statistics

Figure 6-15: Network Health Overview Panes



6.8.1 Total Calls Pane

This pane shows:

- the total number of calls made
- % successful/failed calls
- Maximum concurrent calls
- the percentage of calls in each voice quality category
- each voice quality metric's score

6.8.2 Quality Color Statistics

This pane displays a color-coded pie showing the percentage of calls whose voice quality was measured as good (green), fair (yellow), or poor (red). The pane also displays the # and % of Busy / No Answer.

➤ **To view information:**

- Point your cursor over a segment of the pie; a popup indicates % and # of calls classified in this voice quality category.

➤ **To view detailed information:**

- Click a segment in the pie; the Calls List page opens letting you view detailed information on calls in this voice quality category (see Section 7 on page 49).

6.8.3 Quality Cause Statistics

This pane shows which of the five voice quality metrics (Echo, Packet Loss, Delay, Jitter, MOS) impacted voice quality the most, and which least.

➤ **To view detailed information:**

- Point your cursor over a bar to view the precise % and # of calls impacted by the metric.

7 Displaying the Calls List

The Calls List page lists and shows details on all calls made in the network. The page features advanced filtering capabilities to facilitate obtaining precise information on calls quickly and efficiently.

Figure 7-1: Calls List

Call Source	Call Status	Call Quality	Caller	Callee	Call Start Time	Call End Time	Call Duration (sec)	Media Type	Monitoring Endpoint	Device Name	Link Name	Termination Reason
Alon Rozen	Successful	●	ofr.avitan	ofr.avitan	14:14:02 Aug 13	14:14:19 Aug 13	17	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Shava Ben-Dan	Successful	●	ofr.avitan	ofr.avitan	14:14:08 Aug 13	14:14:08 Aug 13	0	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
ofr.avitan	Successful	○	ofr.avitan	ofr.avitan	14:13:42 Aug 13	14:13:42 Aug 13	0	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Irma Weiss	Successful	○	ofr.avitan	ofr.avitan	14:13:58 Aug 13	14:13:58 Aug 13	0	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Itzhak Shitzer	Successful	●	ofr.avitan	ofr.avitan	14:13:39 Aug 13	14:13:39 Aug 13	0	Voice	SBC	E-SBC	HD Lync SIP Tr	Normal Call Clear
0072593164	Successful	○	ofr.avitan	ofr.avitan	14:13:18 Aug 13	14:13:18 Aug 13	0	Voice	SBC	E-SBC	HD Lync SIP Tr	Normal Call Clear
ofr.avitan	Successful	○	ofr.avitan	ofr.avitan	14:13:21 Aug 13	14:13:21 Aug 13	0	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Adi Goldberg	Successful	○	ofr.avitan	ofr.avitan	14:13:17 Aug 13	14:13:29 Aug 13	12	Voice	MS Lync	IL Lync FE	IL FE to Edge	486 Busy Here
Yair Votzer	Successful	●	ofr.avitan	ofr.avitan	14:13:25 Aug 13	14:13:25 Aug 13	0	Voice	SBC	E-SBC	HD Lync SIP Tr	Normal Call Clear
Itzhak Shitzer	Successful	●	ofr.avitan	ofr.avitan	14:11:15 Aug 13	14:13:23 Aug 13	122	Voice	SBC	E-SBC	HD Lync SIP Tr	Normal Call Clear
Alon Rozen	Successful	●	ofr.avitan	ofr.avitan	13:32:42 Aug 13	14:13:14 Aug 13	2418	Voice	SBC	E-SBC	HD Lync SIP Tr	Normal Call Clear
Yair Votzer	Successful	●	ofr.avitan	ofr.avitan	14:09:22 Aug 13	14:13:12 Aug 13	409	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
FAX - WAREHOUSE 411	Successful	●	ofr.avitan	ofr.avitan	14:11:25 Aug 13	14:13:10 Aug 13	100	Voice	SBC	E-SBC	IP PBX SIP Tr	Normal Call Clear
ofr.avitan	Successful	○	ofr.avitan	ofr.avitan	14:13:00 Aug 13	14:13:10 Aug 13	2	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Shava Ben-Dan	Successful	●	ofr.avitan	ofr.avitan	14:08:44 Aug 13	14:13:04 Aug 13	371	Voice	SBC	E-SBC	HD Lync SIP Tr	Normal Call Clear
ofr.avitan	Successful	○	ofr.avitan	ofr.avitan	14:12:57 Aug 13	14:12:57 Aug 13	0	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Guy Yaffe	Successful	●	ofr.avitan	ofr.avitan	14:12:28 Aug 13	14:12:38 Aug 13	7	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Mer Parker	Successful	●	ofr.avitan	ofr.avitan	14:03:28 Aug 13	14:12:32 Aug 13	537	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
ofr.avitan	Successful	○	ofr.avitan	ofr.avitan	14:12:19 Aug 13	14:12:29 Aug 13	8	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Adi Goldberg	Successful	○	ofr.avitan	ofr.avitan	14:12:13 Aug 13	14:12:24 Aug 13	0	Voice	SBC	E-SBC	HD Lync SIP Tr	User Busy
0072593164	Successful	○	ofr.avitan	ofr.avitan	14:12:07 Aug 13	14:12:24 Aug 13	0	Voice	SBC	E-SBC	HD Lync SIP Tr	No Answer
Itzhak Shitzer	Successful	○	ofr.avitan	ofr.avitan	14:12:33 Aug 13	14:12:17 Aug 13	161	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
Alon Rozen	Successful	○	ofr.avitan	ofr.avitan	14:11:55 Aug 13	14:12:13 Aug 13	2	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK
ofr.avitan	Successful	○	ofr.avitan	ofr.avitan	14:11:59 Aug 13	14:12:09 Aug 13	3	Voice	MS Lync	IL Lync FE	IL FE to Edge	200 OK

Click the **Save As** icon to download calls information (numbers and text) in a comma-separated *calls.csv* file format that can later be easily opened and read in any text editor, as well as sent as an attachment in an email to others.

Go to a page using the pager:

Figure 7-2: Pager



- Select the number of calls to display per page from the 'Items per page' drop-down list: 10, 25, 30, 40, 50, 100 or 1000.
- Click the **Page 1** link; a popup menu listing page numbers and a ▼ scroll enables direct access to a specific page.
- Page forwards or backwards, one page at a time.
- Use the **Go to last page** or **Go to first page** icons, in combination with the previous paging capability.

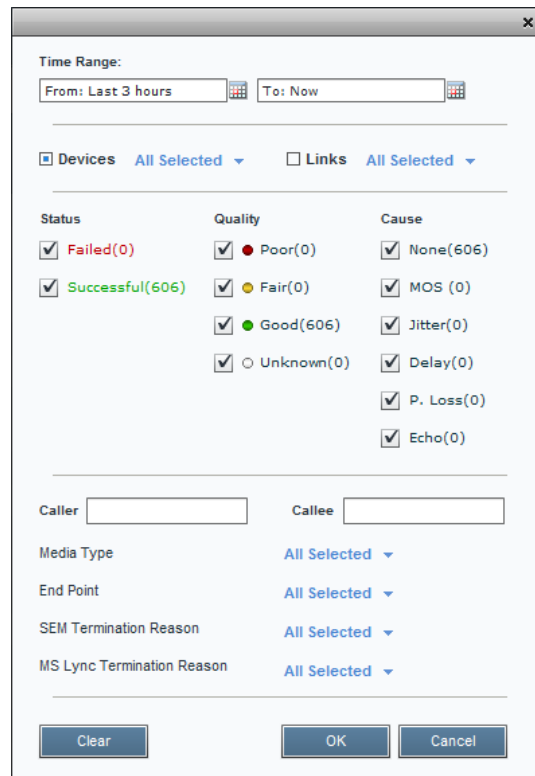
7.1 Filtering to Display Required Information Only

Filtering options on the Calls List page let users exclude irrelevant information and display only required information. Filtering is an essential feature in the management of call sessions, thereby facilitating enhanced call session experiences.

➤ **To filter the Calls List:**

1. Click the **Get Calls** button; this screen opens:

Figure 7-3: Calls List



2. Filter for 'Time Range', and/or 'Devices', and/or 'Links'. These filters are identical to those on the Network page. See Section 0 on page 20.
3. Filter for
 - a. Status - Failed or Successful
 - b. Quality - Poor, Fair, Good or Unknown
 - c. Cause - None, MOS, Jitter, Delay, P. Loss or Echo.

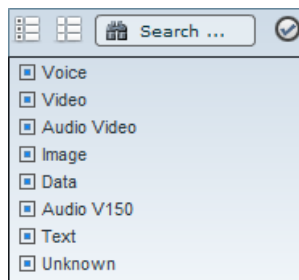
Select, for example, the **Poor** quality option, and deselect the other three quality options. The figure below shows the result:

Figure 7-4: Poor Quality Calls Only

Call Source	Call Status	Call Quality	Cause	Caller	Callee	Call Start Time	Call End Time	Call Duration (sec)	Media Type	Monitoring Endpoint	Device Name	Line Name	Termination Reason
...	Successful	MOS	MOS	Moshé Sharanbo	+9725913205@audio	13:43:54 Jul 14	13:45:05 Jul 14	65	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Tova Shoham	tova.sl@audiocodes.com	11:57:58 Jul 14	11:58:36 Jul 14	5	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Meytal Patel	+9723918051@audio	11:57:54 Jul 14	11:57:49 Jul 14	8	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Meytal Patel	+9723918051@audio	11:57:52 Jul 14	11:57:18 Jul 14	10	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Tova Shoham	tova.sl@audiocodes.com	11:55:10 Jul 14	11:55:54 Jul 14	8	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Tova Shoham	tova.sl@audiocodes.com	11:51:38 Jul 14	11:54:12 Jul 14	140	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Tova Shoham	tova.sl@audiocodes.com	11:51:00 Jul 14	11:51:28 Jul 14	0	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Shirly Golan	+9723918051@audio	11:44:53 Jul 14	11:49:11 Jul 14	253	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Tova Shoham	tova.sl@audiocodes.com	11:43:36 Jul 14	11:43:39 Jul 14	2	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Tova Shoham	tova.sl@audiocodes.com	11:43:36 Jul 14	11:43:30 Jul 14	2	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Yvonne Tai	yvonne.tai@audiocodes.com	11:36:50 Jul 14	11:37:44 Jul 14	41	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Aviv Shoham	+9725418051@audio	10:36:51 Jul 14	10:39:51 Jul 14	226	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Tova Shoham	tova.sl@audiocodes.com	10:24:39 Jul 14	10:26:30 Jul 14	12	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Tova Shoham	tova.sl@audiocodes.com	10:23:47 Jul 14	10:23:21 Jul 14	20	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Yoram Shoshan	yoram.shoshan@audiocodes.com	09:12:47 Jul 14	09:14:16 Jul 14	80	Unknown	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Boris Yadashny	+489365339@audio	22:57:20 Jul 13	22:58:38 Jul 13	72	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Boris Yadashny	+489365339@audio	22:39:31 Jul 13	22:45:53 Jul 13	377	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Shauli Lehai	shauli.lehai@audiocodes.com	15:10:51 Jul 13	15:49:57 Jul 13	2356	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Roni Perach	+9725418051@audio	14:48:11 Jul 13	14:50:47 Jul 13	329	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Daniel Kechem	daniel.kechem@audiocodes.com	14:44:59 Jul 13	14:50:49 Jul 13	331	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Yehuda Ashash	yehuda.ashash@audiocodes.com	14:47:28 Jul 13	14:50:39 Jul 13	174	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Avi Rayan	avi.rayan@audiocodes.com	14:48:04 Jul 13	14:50:15 Jul 13	125	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Yaacov Tsabikov	yaacov.tsabikov@audiocodes.com	14:47:51 Jul 13	14:49:50 Jul 13	118	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	+972722201124@audio	+972722201124@audio	14:48:41 Jul 13	14:49:38 Jul 13	47	Voice	MB Lync	ACL FE		200 OK
...	Successful	MOS	MOS	Gilad Moyal	gilad.moyal@audiocodes.com	14:48:22 Jul 13	14:49:30 Jul 13	59	Voice	MB Lync	ACL FE		200 OK

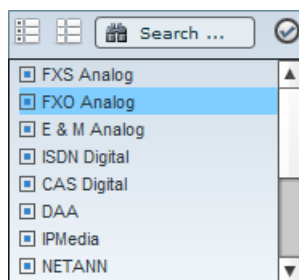
Only calls of poor quality are displayed. The causes can be Packet Loss, Jitter, Delay and MOS.

4. Filter these poor quality calls for those whose poor quality was caused *only* by **Delay**, for example. Deselect every cause except **Delay**.
5. Filter for 'Caller' and/or 'Callee'. The fields are case-sensitive.
6. Filter for 'Media Type'.
 - a. Click its **All Selected** link. By default, all media types are selected. The dialog below opens.



- b. Click the **Select None** icon and then select the media type for which to filter.
 - c. Click the ✓ and then click **OK**.

7. Filter for 'End Point'.
 - a. Click its **All Selected** link. By default, all end points types are selected. The dialog below opens.





- b. Click the **Select None** icon and then scroll down if necessary and select the end point for which to filter.
 - c. Click the ✓ and then click **OK**.
8. Filter for 'SEM Termination Reason'.
- a. Click its **All Selected** link. By default, all termination reasons are selected. The dialog below opens.



- b. Click the **Select None** icon and then scroll down if necessary and select the end point for which to filter.
- c. Click the ✓ and then click **OK**.

7.1.1 Sorting Calls in the Calls List



Tip: Before sorting calls in the list, in the Refresh Page, stop Auto Refresh  and Start it again  after the sorting results have been displayed.

Sort calls in the list by clicking a column header; calls are sorted in the order of that column. Click another column header's sort arrow; calls already sorted are now further sorted in the order of *this* column. Therefore, the Calls List enables you to set multiple sort keys to determine correlations between the information displayed in the different columns. This capability facilitates quick and easy access to those calls on which information is most required. Calls on which information is less critical is listed lower.

Below is an intuitive example of how to perform multiple columns sorting.

➤ **To sort the calls in the list:**

1. Click the column header 'Call Status'; the sort arrow points down ▼ indicating that successful calls are displayed first, followed by failed calls. If you then click the sort arrow, it points up ▲ indicating that failed calls are displayed first followed by successful calls; indicated by **1** in the column header.
2. Position your cursor over another column and click its now-displayed sort arrow, for example, 'Call Quality'; calls are now sorted successful-failed *and* in order of quality (Good > Fair > Poor > Unknown), indicated by **2** in the column header.
3. Click a third column header's sort arrow, for example, 'Cause'; calls are now sorted (1) successful-failed (2) in order of quality *and* (3) in order of cause (Delay, Echo, Jitter, MOS, Packet Loss and None, in *alphabetic order*), indicated by **3** in the Cause column header.

Calls have now been sorted in three separate columns each in the respective desired sort order. You can now visually draw correlations between the data displayed in each respective sorted column, whilst at the same time, the integrity of each record is maintained.



Note: To reset column sort ordering, click any column header; a new column sort order begins.

Table 7-1: Calls List Columns

Column	Description	
Call Status	Successful or Failed	
Call Quality	● = Good ● = Fair ● = Poor ● = Unknown	
Cause	Delay (msec)	Delay (or latency) - the time it takes for information to travel from source to destination (round-trip time). Sources of delay include voice encoding / decoding, link bandwidth and jitter buffer depth. Two Delay values are shown, one value for the caller side and one value for the callee side.
	Echo	The level difference (measured in dB) between the signal transmitted to the listener and the residual echo of this signal.
	Jitter (msec)	Jitter can result from uneven delays between received voice packets. To space packets evenly, the jitter buffer adds delay. The higher the measurement, the greater the impact of the jitter buffer's delay on audio quality. Two Jitter values are shown, one value for the caller side and one value for the callee side.
	MOS	MOS - Mean Opinion Score (specified by ITU-T recommendation P.800) - the average grade on quality scales of Good to Failed, given by the SEM to voice calls made over a VoIP network at the conclusion of the testing.
	Packet Loss (%)	Lost packets - RTP packets that aren't received by the voice endpoint for processing, resulting in distorted voice transmission. Two Packet Loss % values are shown, one value for the caller side and one value for the callee side.
	None	Indeterminate cause
Caller	The phone number or address of the person who initiated the call.	
Callee	The phone number or address of the person who answered the call.	
Call Start Time	The precise time (hour, minutes and seconds) and date (month, day and year) when the call was started.	
Call End Time	The precise time (hour, minutes and seconds) and date (month, day and year) when the call was terminated.	
Call Duration (sec)	The duration of the call, in seconds.	
Media Type	Voice or Fax.	
Monitoring Endpoint	SBC (session board controller), ISDN Digital, or IP2IP.	
Device Name	The IP address of the device on which the call was made.	
Termination Reason	The reason why the call was terminated, e.g., No Answer.	

7.1.2 Filtering Using the 'Search' Field

Use the 'Search' field as a quick alternative to other filtering methods, or use it combined with other methods as a supplement.

The 'Search' option is a single filter; it cannot filter calls already filtered by a previous filter, or order calls already ordered, as the other methods can do. But you can perform an initial quick filter and then use another method to narrow the results. Enter an employee's name, e.g., Alan, in the 'Search' field (see the figure below); only calls made and answered by Alan are listed.

Figure 7-5: Results after Searching for an Employee's Name

The screenshot shows the Session Experience Manager interface with a search filter set to 'ALAN'. The call list table displays the following data:

Call Source	Call Status	Call Quality	Cause	Caller	Callee	Call Start Time	Call End Time	Call Duration (sec)	Media Type	Monitoring Endpoint	Device Name	Link Name	Termination Reason
	Successful			Alan Roberts	alan.net +9729636020@audiod	13:34:43 Jul 14	13:34:45 Jul 14	0	Voice	MB Lync	ACL FE		498 Busy Here
	Successful			Alan Roberts	alan.net +9729636020@audiod	13:33:10 Jul 14	13:33:12 Jul 14	0	Voice	MB Lync	ACL FE		498 Busy Here
	Successful			Alan Roberts	alan.net +9729636020@audiod	13:33:46 Jul 14	13:33:54 Jul 14	17	Voice	MB Lync	ACL FE		200 OK
	Successful			Alan Roberts	alan.net +9729636020@audiod	13:39:42 Jul 13	13:44:08 Jul 13	487	Voice	MB Lync	ACL FE		200 OK
	Successful			Alan Roberts	alan.net Call Eric: galera2@	17:50:17 Jul 13	17:50:43 Jul 13	4	Voice	MB Lync	ACL FE		200 OK
	Successful		MOS	Alan Roberts	alan.net Assaf Cohen +972391	17:32:04 Jul 13	17:35:28 Jul 13	200	Voice	MB Lync	ACL FE		200 OK
	Successful			Alan Roberts	alan.net Assaf Cohen +972391	16:34:43 Jul 13	16:34:57 Jul 13	10	Voice	MB Lync	ACL FE		200 OK
	Successful			Alan Roberts	alan.net Assaf Cohen +972391	16:22:23 Jul 13	16:22:59 Jul 13	2	Voice	MB Lync	ACL FE		200 OK

After the search results are displayed, click the 'x' in the Search field to undo the filter, or narrow the search using another filter method.

Access a call's details by clicking its row; the Call Details page opens (see Section 7.2 following).

7.2 Displaying Call Details

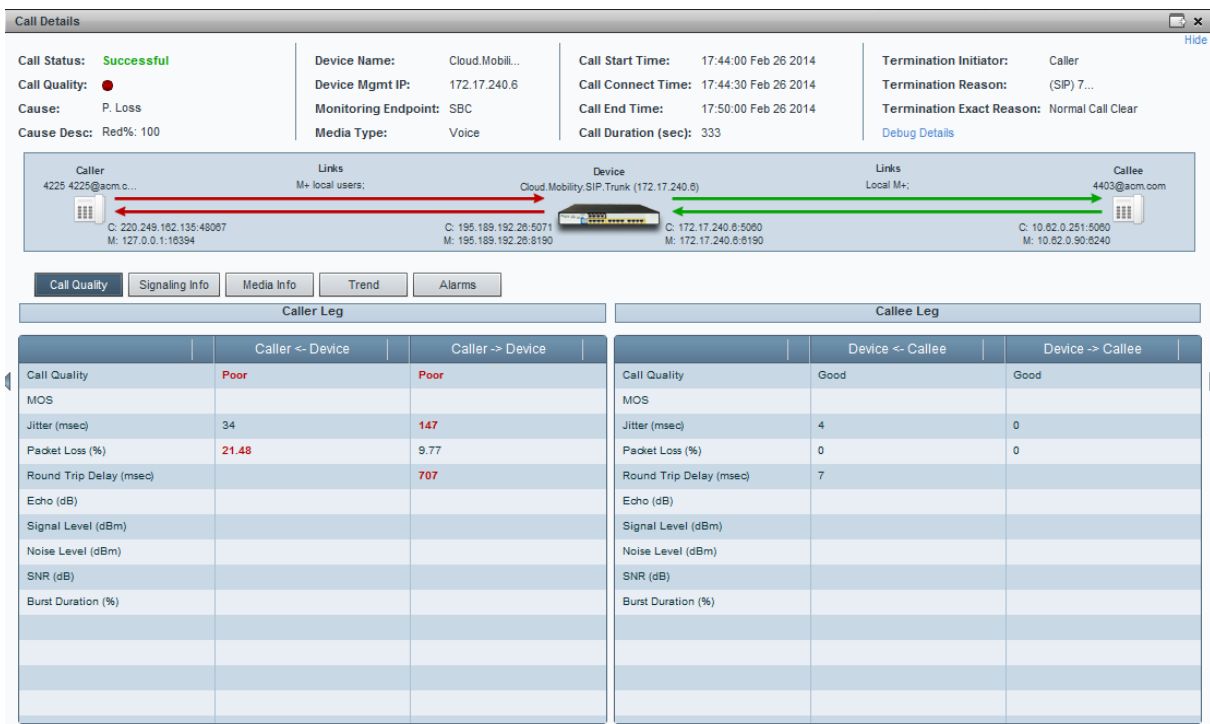
You can view the details of a call listed in the Calls List, by clicking its row.

7.2.1 Displaying Details of a Call over a VoIP Networking Device

You can display the details of calls made/received over a VoIP Networking Device (Gateway / SBC / MSBR).

The Call Details page displays detailed diagnostic information on a call, in graphic and textual format, facilitating effective management, precise diagnosis and targeted remedial action to prevent recurrence of unsuccessful call performance or poor call quality. The figure below shows the details of a call made over an AudioCodes VoIP networking device (Gateway / SBC / MSBR).

Figure 7-6: Details of a Call over a VoIP Networking Device (Gateway/SBC/MSBR)



The table below describes the page's subdivisions.

Table 7-2: Call Details Page Subdivisions

Page Subdivision	Description
(Uppermost) Call summary	Displays parameters and values identical to those displayed in the Calls List rows. See Section 7 on page 49.
(Middle) Graphic illustration	Displays a graphical illustration of voice quality on each leg of the call, on both the caller and callee side. Each leg is: <ul style="list-style-type: none"> Connected via the VoIP cloud to the device

Page Subdivision	Description
	<ul style="list-style-type: none"> Color-coded to indicate quality (green = good, yellow = fair, red = poor, grey = unknown) Tagged by C and M C = Control summary (point the cursor to view as tooltip) M = Media IP address and Port (point cursor to view tooltip)
(Lowermost) Five tabs	Each opens a page displaying detailed information: <ul style="list-style-type: none"> Call Quality (see Section 7.2.1.1 on page 57 below) Signaling Info (see Section 7.2.1.3 on page 60 below) Media Info (see Section 7.2.1.4 on page 62 below) Trend (see Section 7.2.1.5 on page 63 below) Alarms (see Section 7.2.1.6 on page 65 below)

7.2.1.1 Call Quality

The Call Quality tab centralizes all parameters associated with the quality of an individual call, including Round Trip Delay, Signal Level, Noise Level, SNR, RERL and Burst Duration, in a central location for users to comprehensively assess voice quality, perform precise diagnosis and effectively troubleshoot and manage session experience.

Figure 7-7: Call Quality

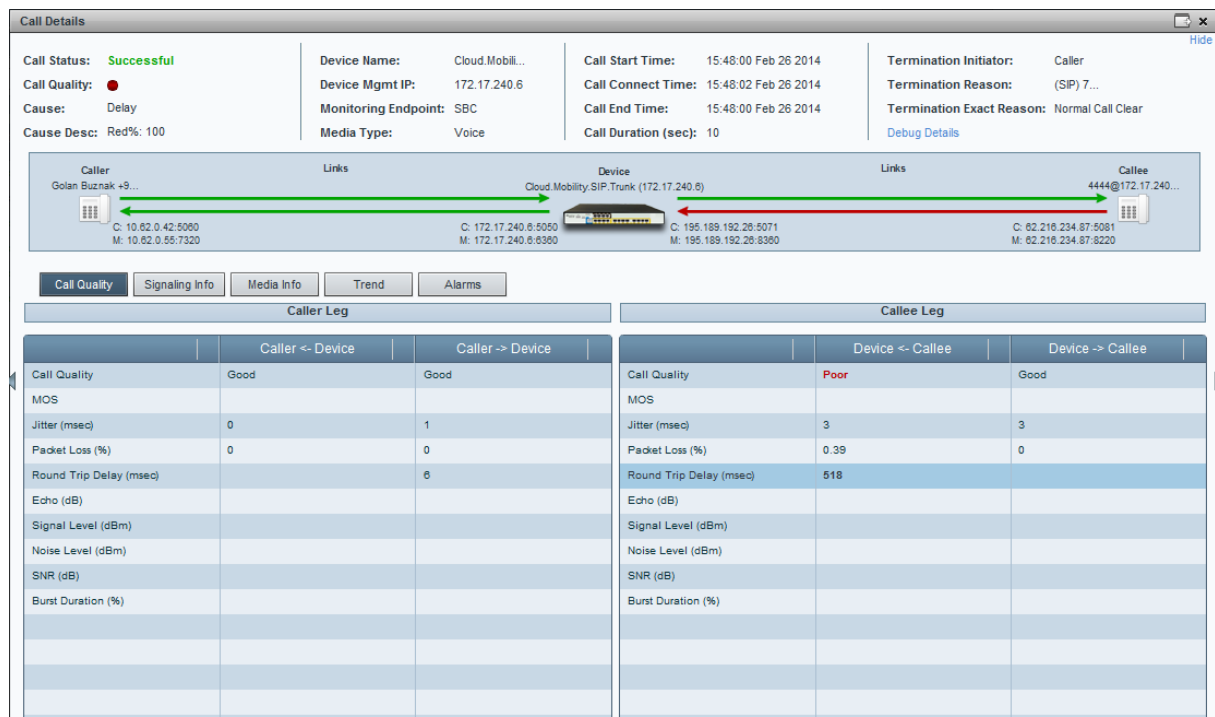


Table 7-3: Call Quality Parameters

Parameter	Description
Call Quality	Good (green), Fair (yellow), Poor (red), Unknown (grey). Indicates call quality grades scored by caller <i>and</i> device side, on both caller <i>and</i> callee legs.
MOS LQ / CQ	<p>MOS = Mean Opinion Score (specified by ITU-T recommendation P.800). Defines the average grade, on a quality scale of Good to Poor, determined by the SEM after testing calls made over a VoIP network.</p> <p>MOS-LQ = listening quality, i.e., the quality of audio for listening purposes. Doesn't account for bi-directional effects such as delay and echo. Two values are shown: (1) for the device side on the caller leg (2) for the device side on the callee leg.</p> <p>MOS-CQ = conversational quality; it takes listening quality in both directions into account, as well as the bi-directional effects. Two values are shown: (1) for the device side on the caller leg (2) for the device side on the callee leg.</p>
Jitter	Jitter can result from uneven delays between received voice packets. To space evenly, the jitter buffer adds delay. The higher the measurement, the greater the impact of the jitter buffer's delay on audio quality. Two Jitter values are shown, one value for the caller side and one value for the callee side.
Packet Loss	Lost packets = RTP packets that aren't received by the voice endpoint for processing, resulting in distorted voice transmission. Two Packet Loss % values are shown, for the caller and for the callee side.
Round Trip Delay (msec)	The round trip delay is the estimated time (in milliseconds) that it takes to transmit a packet between two RTP stations. Sources of delay include voice encoding / decoding, link bandwidth and jitter buffer depth. Two values are shown, one caller side and another for the callee side.
Echo	The residual echo return loss is the level difference (measured in dB) between the signal transmitted to the listener and the residual echo of that signal.
Signal Level (mW)	<p>The ratio of the voice signal level to a 0 dBm0 reference.</p> <p>Signal level = 10 Log₁₀ (RMS talk spurt power (mW)).</p> <p>A value of 127 indicates that this parameter is unavailable.</p>
Noise Level (mW)	<p>The ratio of the level of silent-period background noise level to a 0 dBm0 reference. Noise level = 10 Log₁₀ (Power Level (RMS), in mW, during periods of silence). A value of 127 indicates that this parameter is unavailable.</p>
SNR (mW)	<p>The ratio of the signal level to the noise level (Signal-Noise Ratio).</p> <p>SNR = Signal level – Noise level.</p>
Burst Duration (msec)	The mean duration (in milliseconds), of the burst periods that have occurred since the initial call reception.
Discard Rate	The fraction of RTP data packets from the source, discarded since initial call receipt due to late/early arrival, under-run, or overflow at the receiving jitter buffer.

For detailed information, see:

- RFC-3611 RTCP-XR protocol (go to <http://tools.ietf.org/rfc/rfc3611.txt>)
- RFC-3350 RTP protocol (go to <http://tools.ietf.org/html/rfc3550>)

7.2.1.2 Call Quality – PSTN Leg

Quality can also apply to voice over PSTN (not only to VoIP). The figure below shows the Call Details screen of an IP to PSTN call whose callee leg is over PSTN.

Figure 7-8: Call Quality - PSTN Leg

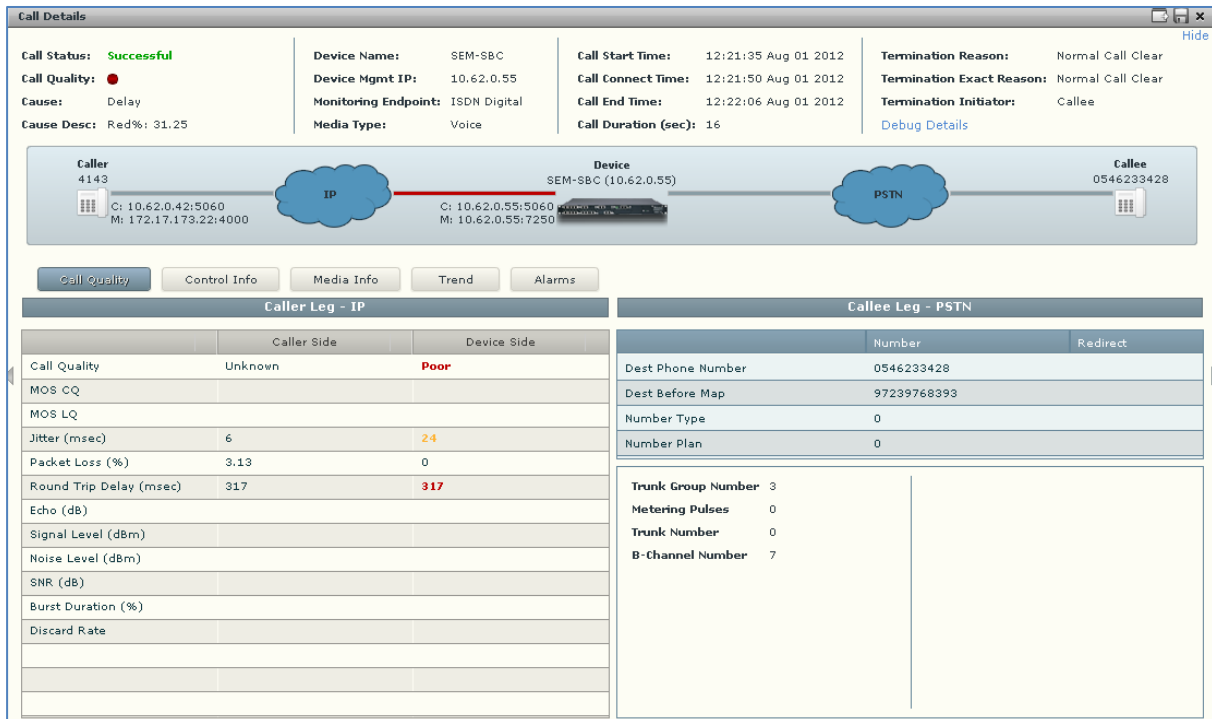


Table 7-4: Call Quality Parameters – PSTN Leg

Parameter	Description
Dest Phone Number (Callee)	Called (destination) phone number
Source Phone Number (Caller)	Caller's (source) phone number
Dest Before Map (Callee)	Called (destination) number before manipulation (if any) was done on it
Source Before Map (Caller)	Caller's number before manipulation (if any) was done on it
Number Type	Applies only to IP to Tel calls. Options are: Unknown, Level 2 Regional, Level 1 Regional, PISN Specific, Level 0 Regional (Local), International, National, Network Specific, Subscriber or Abbreviated.
Number Plan	Applies only to IP to Tel calls. Options are: Unknown, Private, E.164 Public, Value Received from PSTN/IP
Trunk Group Number	Defines the Trunk Group number provisioned by the user.
Metering Pulses	Applies only to gateways. Number of 12/16 KHz metering pulses generated toward the Tel side, e.g., for connection to a pay phone or private meter.

Parameter	Description
Trunk Number	Applies only to gateways. Defines the physical trunk number, where 0 is the first trunk.
B-Channel Number	Applies only to gateways. Defines the selected B (bearer) channel, i.e., the channel in which primary voice communication is carried).

7.2.1.3 Signaling Info

The Signaling Info tab shows a call's signaling protocol (SIP) parameter settings that users can refer to for diagnostic, troubleshooting and session experience management issues.

The same parameters apply to both the Caller and Callee legs. These parameters are explained in the table below.

Figure 7-9: Signaling Info

Call Details

Call Status: **Failed**
 Call Quality: ●
 Cause: Jitter
 Cause Desc: Red%: 77.83

Device Name: Cloud.Mobili...
 Device Mgmt IP: 172.17.240.6
 Monitoring Endpoint: SBC
 Media Type: Voice

Call Start Time: 10:19:00 Feb 26 2014
 Call Connect Time: 10:19:26 Feb 26 2014
 Call End Time: 10:22:00 Feb 26 2014
 Call Duration (sec): 212

Termination Initiator: Unknown
 Termination Reason: (SIP) 408...
 Termination Exact Reason: Recovery O...
[Debug Details](#)

Network Diagram: Caller (2002.2002@acm.com) -> Links (M+ local users) -> Device (Cloud.Mobility.SIP.Trunk (172.17.240.6)) -> Links (Local M+) -> Callee (4358@acm.com)

Caller Leg

	Caller <- Device	Caller -> Device	Redirect
SIP IP	37.119.203.195	195.189.192.26	
SIP Port	7075	5071	
URI	2002@acm.com	4358@acm.com	
URI Before Map	2002@acm.com	4358@acm.com	

Callee Leg

	Device <- Callee	Device -> Callee	Redirect
SIP IP	172.17.240.6	10.62.0.251	
SIP Port	5080	5080	
URI	2002@acm.com	4358@acm.com	
URI Before Map	2002@acm.com	4358@acm.com	

SRD and Transport Settings

Parameter	Value	Parameter	Value
SRD Name	WAN_SRD	Transport Type	TLS
IP Group	2	Signalling Diff Serv	40
SIP Interface	2		
Proxy Set ID	0		
IP Profile ID	2		

SRD and Transport Settings (Callee)

Parameter	Value	Parameter	Value
SRD Name	LAN_SRD	Transport Type	UDP
IP Group	1	Signalling Diff Serv	40
SIP Interface	1		
Proxy Set ID	1		
IP Profile ID	1		

Table 7-5: Signaling Info Parameters Descriptions

Parameter	Description
SIP IP	IP address (source and destination) of the SIP call
SIP Port	Port number used for the SIP call
Host	The URI (Uniform Resource Identifier) of the host. The SIP URI is the user's SIP phone number (after manipulation, if any). The SIP URI resembles an e-mail address and is written in the following format: sip:x@y:Port, where x=Username and y=host (domain or IP).
Host Before Map	SIP URI address before manipulation (if any) was done on the URI.
Phone number	Caller's phone number after manipulation (if any) was performed on it.
Number Before Map	Caller's phone number before manipulation (if any) was performed on it.
SRD Name	The unique name configured for the signaling routing domain (SRD).
IP Group	The ID of the IP Group with which call is associated.
SIP Interface	The ID of the SIP Interface with which the call is associated.
Proxy Set ID	The ID of the Proxy Set to which the call is associated. A Proxy Set is a group of Proxy servers defined by IP address. Typically, for IP-to-IP call routing, at least two Proxy Sets are defined for call destination – one for each leg (IP Group) of the call (i.e., both directions). For example, one Proxy Set for the Internet Telephony Service provider (ITSP) interfacing with one 'leg' of the device and another Proxy Set for the second SIP entity (e.g., ITSP) interfacing with the other 'leg' of the device.
IP Profile ID	The ID of the IP Profile assigned to this IP destination call. The IP Profile assigns numerous configuration attributes (e.g., voice codes) per routing rule.

7.2.1.4 Media Info

The Media Info tab displays a call's media parameter settings that users can refer to for diagnostics, troubleshooting and session experience management issues.

The same parameters apply to both the Caller and Callee legs. These parameters are described in the table below.

Figure 7-10: Media Info

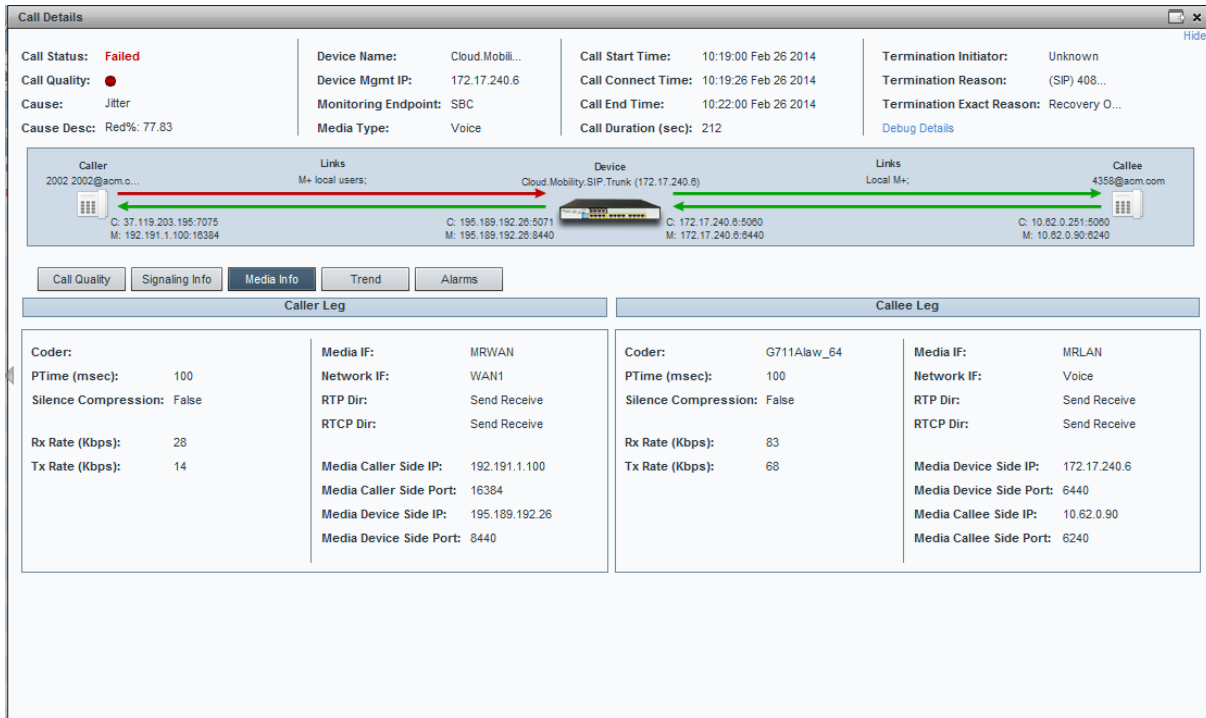


Table 7-6: Media Info Parameters

Parameter	Description
Coder	Up to 10 coders (per group) are supported. See the device manual for a list of supported coders.
PTime (msec)	Packetization time, i.e., how many coder payloads are combined into a single RTP packet.
Silence Compression	Method for conserving bandwidth on VoIP calls by not sending packets when silence is detected. True = Enabled (On), False = Disabled (Off).
Rx Rate (Kbps)	Shows the call's reception rate, in Kbps.
Tx Rate (Kbps)	Shows the call's transmission rate, in Kbps.
Media IF	Media Realm name.
Network IF	Network Interface Name.
RTP Dir	RTP Directional Control. Controlled internally by the device according to the selected coder.
RTCP Dir	RTCP Directional Control. Controlled internally by the device according to

Parameter	Description
	the selected coder.
Media Caller Side IP	The device's source IP address in the operations, administration, maintenance, and provisioning (OAMP) network.
Media Caller Side Port	The device's source port in the operations, administration, maintenance, and provisioning (OAMP) network.
Media Device Side IP	IP address of the destination host / media network.
Media Device Side Port	Port of the destination host / media network.

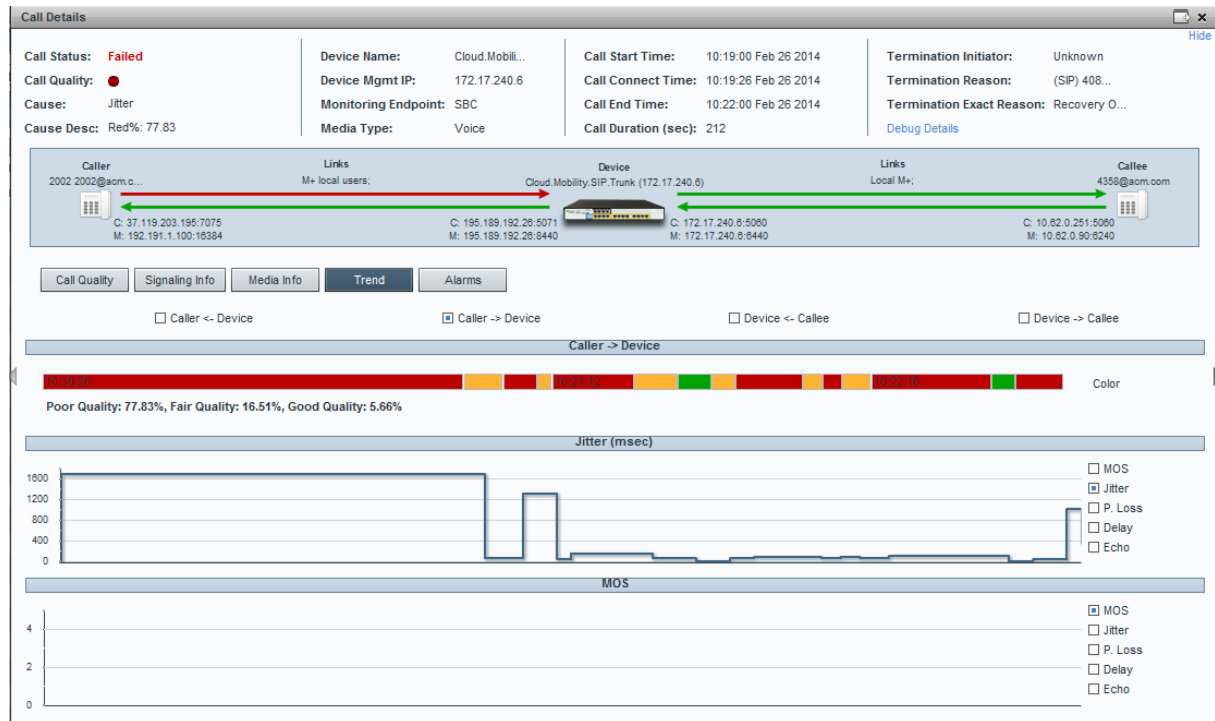
7.2.1.5 Trend

The Trend tab shows the quality trend of a call that users can refer to for diagnostic, troubleshooting and session management experience issues.



Note: Trends will be provided only for poor quality calls.

Figure 7-11: Trend



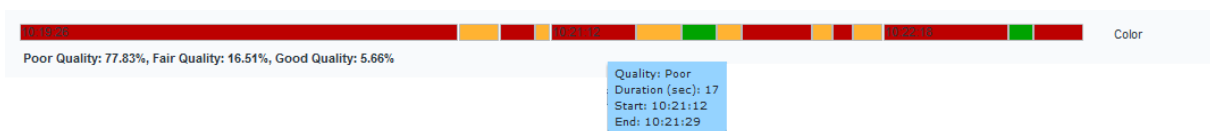
Quality applies to two legs of the call:

- Caller leg
 - caller side (of cloud)
 - device side (of cloud)
- Callee leg
 - callee side (of cloud)
 - device side (of cloud)

➤ **To assess call quality:**

1. Select one of the four leg options (uppermost row of check boxes).
2. Point the cursor over the color bar; a popup shows data at that point:

Figure 7-12: Call Quality Color Bar



The popup in [Figure 7-12](#) indicates the quality measurement that the call scored in this segment (good = green, fair = yellow, poor = red), how long the segment lasted, and the time the segment started and ended.

Each quality category's percentage of the total length of the call is textually indicated below the color bar.



Note: Legs over PSTN are not measured for quality, only legs over IP. Check box options are disabled for legs over PSTN.

➤ **To compare one call quality metric with another:**

1. Select one of the four leg options (uppermost row of check boxes).
2. Adjacent to the two lower panes, select MOS, Jitter, Packet Loss, Delay or Echo check boxes; you can immediately visually compare one metric with another (see [Figure 7-11](#) above).
3. Optionally select another of the four leg check box options; you can immediately compare the same metrics across this leg, or, optionally, select different metrics to compare.

7.2.1.6 Alarms

The Alarms tab lists alarms (if any) issued by the device associated with the call. Users can refer to the data displayed to quickly assess a call's alarm/s and consequently effectively diagnose, troubleshoot and manage session experience issues.

Figure 7-13: Alarms

Severity	Time	MG Name	Source	Alarm Name	Description
Info	11:49:28 Jan 06 2014	SEM	SEM		Call Details Storage Level changed from {0} to {1}.

Table 7-7: Alarms Columns*

Column	Description
Severity	For detailed information, see Section 8 below.
Time	The precise time (hour, minutes and seconds) and date (month, day and year) at which the alarm was received.
MG Name	The name of the device on which the individual call's alarm/s were issued.
Source	The entity that triggered the alarm.
Alarm Name	The name of the alarm.
Description	A textual description of the alarm.

* Extracted from ITU X.733

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8 Managing Users Experience



Note: This feature does not apply to the SIP Trunk Monitoring Service.

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9 Displaying Alarms

The Alarms page features three distinct functionalities:

- Active Alarms
- Historical Alarms
- SEM Quality Alerts

Three tabs in the page enable quick access to each of these:

Figure 9-1: Alarms Page - Active Alarms

Severity	Time	MC Name	Source	Alarm Name	Description
<input type="checkbox"/>	17:17:51 Jul 15 2014	10.3.151.245	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:18:38 Jul 15 2014	10.3.151.01	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:18:36 Jul 15 2014	10.3.151.62	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:18:41 Jul 15 2014	10.3.151.248	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:18:18 Jul 15 2014	10.3.151.01	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:18:16 Jul 15 2014	10.3.151.02	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:14:25 Jul 15 2014	10.3.151.248	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:13:58 Jul 15 2014	10.3.151.61	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:13:56 Jul 15 2014	10.3.151.62	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:13:51 Jul 15 2014	10.3.151.248	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:12:37 Jul 15 2014	10.3.151.01	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:12:36 Jul 15 2014	10.3.151.62	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:11:40 Jul 15 2014	10.3.151.248	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:11:17 Jul 15 2014	10.3.151.61	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:11:16 Jul 15 2014	10.3.151.02	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:10:20 Jul 15 2014	10.3.151.248	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:09:57 Jul 15 2014	10.3.151.01	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:09:56 Jul 15 2014	10.3.151.62	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:09:50 Jul 15 2014	10.3.151.248	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:08:37 Jul 15 2014	10.3.151.61	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:08:35 Jul 15 2014	10.3.151.62	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:07:40 Jul 15 2014	10.3.151.248	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:07:17 Jul 15 2014	10.3.151.01	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:07:15 Jul 15 2014	10.3.151.02	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version
<input type="checkbox"/>	17:06:20 Jul 15 2014	10.3.151.248	EMS Server	Software Replaced	Upgrade Mfo Version Alarm changing software version

9.1 Displaying Active Alarms

The Active Alarms page lists all active alarms on devices selected in the 'Devices' filter and on links selected in the 'Links' filter, issued during the period defined in the 'Time Range' filter. Filtering using the 'Time Range', 'Devices' and the 'Links' filter is performed identically across all pages. For filtering information see under Section 0 on page 20.

9.1.1 Filtering Using the 'Search' Field

The 'Search' field is used to filter active alarms exactly as it's used on other pages to quickly find specific information. Enter a device name, e.g., PSTN-GW, in the 'Search' field; only active alarms made and answered on this device are listed. Click the 'x' to delete a search entry.

Figure 9-2: Alarms Page - Active Alarms – Search Filter

Severity	Time	MG Name	Source	Alarm Name	Description
Major	15:55:47 Mar 20 2014	PSTN-GW	SEMPSTN-GW/Celcom TDM Trunk	SEM - Failed Calls Alarm	Failed 7% of calls, 40 of 530 calls.
Major	15:55:47 Mar 20 2014	PSTN-GW	SEMPSTN-GW/Orange TDM Trunk	SEM - Failed Calls Alarm	Failed 7% of calls, 40 of 530 calls.
Critical	15:55:45 Mar 20 2014	PSTN-GW	SEMPSTN-GW/Biz+ to Cell	SEM - Failed Calls Alarm	Failed 11% of calls, 22 of 191 calls.
Critical	15:55:42 Mar 20 2014	PSTN-GW	SEMPSTN-GW/Lync 2013 to SEM-GW	SEM - Failed Calls Alarm	Failed 18% of calls, 22 of 116 calls.
Critical	15:55:41 Mar 20 2014	PSTN-GW	SEMPSTN-GW	SEM - Failed Calls Alarm	Failed 11% of calls, 22 of 196 calls.

9.1.2 Sorting Listed Alarms

Alarms can be sorted in the same manner as calls in the Calls List (see Section 7.1.1 on page 53). Click the header of the Severity column for example; calls are sorted according to severity, in order of *most to least severe* (▼). Most severe alarms are highest in the list. To sort from *least to most severe*, click the column header again; the sort order is reversed (▲); less severe alarms are listed lower.

Click another column header, e.g., Time; calls already ordered by severity level are now also ordered in order of time. Multiple ordering is supported.

The feature of multiple sorting columns facilitates quick and easy access to required alarm information.

Table 9-1: Severity in Ascending Order*

Severity	Description
	Critical (red): Indicates that a service affecting condition has occurred and an immediate corrective action is required. Such a severity can be reported, for example, when a device becomes totally out of service and its capability must be restored.
	Major (orange): Indicates that a service affecting condition has developed and an urgent corrective action is required. Such a severity can be reported, for example, when there is a severe degradation in the capability of the device and its full capability must be restored.
	Minor (yellow): Indicates the existence of a non-service affecting fault condition and that corrective action should be taken to prevent a more serious (for example, service affecting) fault. Such a severity can be reported, for example, when the detected alarm condition is not currently degrading the capacity of the device.
	Warning (blue): Indicates the detection of a potential or impending service affecting fault, before any significant effects occur. Action should be taken to further diagnose (if necessary) and correct the problem to prevent it from becoming a more serious service affecting fault.
	Info (grey): Indicates that the severity level cannot be determined.
	Cleared (green): Indicates the clearing of one or more previously reported alarms. This alarm clears all alarms for this device that have the same Alarm type, Probable cause and Specific problems (if given).

* Extracted from ITU X.733

9.1.3 Filtering Using a Severity Filter

The page can be filtered according to a severity level, where only required alarms are displayed. The figure below shows alarms filtered according to the 'Severity' filter (Critical). By contrast, the *sorting* feature displays all alarms; however, with the required alarm/s are listed highest.

Figure 9-3: Severity Filters - Critical

Severity	Time	MG Name	Source	Alarm Name	Description
Critical	15:34:45 Feb 26 2014	Mobility-ESBC	SEM/Mobility-ESBC	SEM - Voice Quality Alarm	Poor Quality 11% of calls, 6 of 56 calls
Critical	18:05:33 Feb 23 2014	Hong-Kong-MSBR	EMS Server	GW Connection Alarm	Connection Lost
Critical	18:05:28 Feb 23 2014	Hong-Kong-MSBR	EMS Server (SBA)	GW Connection Alarm	Connection Lost

9.1.4 Displaying Alarm Details

Alarm Details can quickly and easily be accessed to determine the incidence of the severity across the network. Click any row page before or after filtering:

Figure 9-4: Alarm Details

Alarm Details [X]

Severity ● Critical

Time

Alarm Name

MG Name

Source

Description

Alarm Category

Probable Cause

Status

Type

GW IP

GW Port

SNMP OID

Additional Info

Click the ► or ◀ handlebar to move to the next or previous. Refer to this table:

Table 9-2: Alarm Details – Parameters

Parameter	Description
Alarm Category	The category in which the alarm is classified, according to ITU X.733. Five categories are specified: Communications: the procedures and/or processes required to convey information from one point to another. Quality of service: Degradation in the QoS. Processing error: Software or processing faults. Equipment: Equipment faults. Environmental: Conditions relating to an enclosure in which the equipment resides.
Probable Cause	The probable cause. See ITU X.733 for probable causes and descriptions.
Status	Can be either one of the following: <ul style="list-style-type: none"> • Active Alarms: New, Ack (acknowledged by the user). • Historical Alarms: Cleared (manually cleared by the user), Automatically Cleared (by the device) or ColdStart Cleared (if system is reset, all alarms are cleared).
Type	The alarm type. EVENT or ALARM. According to RFC 3877: EVENT = User Information, for example, a fault, a change in status, crossing a threshold, or an external input to the system. ALARM = Persistent indication of a fault (where fault = a lasting error or warning condition, and error = a deviation of a system from normal operation). An alarm is automatically cleared when the condition disappears; by contrast an event is not automatically cleared.
GW IP	The IP address of the device from which the alarm was sent.
GW Port	The port number of the device from which the alarm was sent.
SNMP OID	Identifier used to identify the alarm information available on a managed VoIP network entity, in the alarm management information base (MIB).
Additional Info	Possible corrective action, when applicable.

9.2 Displaying History Alarms

The History Alarms page lists currently active alarms and already-cleared historical alarms on devices selected in the 'Devices' filter and on links selected in the 'Links' filter, issued in the period defined in the 'Time Range' filter. These filters are identical on all pages (see under Section 0 on page 20). The page shows retroactive diagnostic data informative when taking proactive steps to prevent future repetitions and improve future VoIP network functionality.

Figure 9-5: Historical Alarms

Severity	Time	MG Name	Source	Alarm Name	Description
Critical	13:53:38 Jul 15 2014	SEMNumber of Sessions	SEMNumber of Sessions	SEM License Key Alarm	Current server load reached 100% of SEM License capacity.
Major	13:53:38 Jul 15 2014	SEMNumber of Sessions	SEMNumber of Sessions	SEM License Key Alarm	Current server load reached 80% of SEM License capacity.
Critical	10:33:41 Jul 15 2014	10.3.151.02	EMIS Server	GW Connection Alarm	Connection Lost
Major	01:12:01 Jul 15 2014	10.3.101.104	Chassis0 PowerSupply#2	Power Supply Alarm	Power-Supply Alarm: Power-Supply is missing
Major	18:09:24 Jul 13 2014	10.3.151.240	Board#1 EthernetGroup#3	Ethernet Group Alarm	[Bottom] Ethernet Group alarm: Ethernet Group 3 is Down.
Minor	18:09:24 Jul 13 2014	10.3.151.240	Board#1 EthernetLink#3	Ethernet Link Down Alarm	[Bottom] Ethernet link alarm: LAN port number 3 is down.
Critical	18:05:57 Jul 13 2014	10.3.151.240	EMIS Server	GW Connection Alarm	Connection Lost
Minor	17:59:32 Jul 13 2014	10.3.151.240	Board#1 EthernetLink#3	Ethernet Link Down Alarm	[Bottom] Ethernet link alarm: LAN port number 3 is down.
Major	17:59:32 Jul 13 2014	10.3.151.240	Board#1 EthernetGroup#3	Ethernet Group Alarm	[Bottom] Ethernet Group alarm: Ethernet Group 3 is Down.
Critical	17:56:36 Jul 13 2014	10.3.151.240	EMIS Server	GW Connection Alarm	Connection Lost
Minor	17:54:26 Jul 13 2014	10.3.151.240	Board#1 EthernetLink#3	Ethernet Link Down Alarm	[Bottom] Ethernet link alarm: LAN port number 3 is down.
Major	17:54:26 Jul 13 2014	10.3.151.240	Board#1 EthernetGroup#3	Ethernet Group Alarm	[Bottom] Ethernet Group alarm: Ethernet Group 3 is Down.
Critical	17:51:15 Jul 13 2014	10.3.151.240	EMIS Server	GW Connection Alarm	Connection Lost
Critical	10:49:14 Jul 13 2014	10.3.181.4_32320859	EMIS Server	GW Connection Alarm	Connection Lost
Critical	15:30:00 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:29:29 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:29:20 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:19:19 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:18:59 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:18:59 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:11:59 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:11:18 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:11:18 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:10:38 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No
Critical	15:10:38 Jul 13 2014	10.4.100.35	Board#1	Board Fatal Error	Board Fatal Error: No

- The 'Search' field operates identically to its counterpart in the Active Alarms page (see under Section 9.1.1 on page 69).
- Order alarms precisely as you order alarms in the Active Alarms page (see under Section 9.1.2 on page 70).
- Filter alarms using the 'Severity' filter precisely as alarms in the Active Alarms page are filtered with its counterpart filter (see under Section 9.1.3 on page 71).

9.3 Triggering Quality Alerts

Quality alerts optimize session experience management by providing VoIP network administrators *automatic quality analysis* capability, *automatically triggering alerts* if the quality of service analyzed falls below that defined in rules.

Alerts are triggered by rules defined by network administrators. Alerts, triggered after SEM data analysis, are displayed in the Alarms page as regular alarms and/or sent to administrators as mail, SMSs, SNMP traps or syslog message.

9.3.1 Adding a New Alert Rule

You can add a new rule for an alert to be triggered.

➤ **To add a rule:**

1. Open the SEM Quality Alerts page (Alarms page>**SEM Quality Alerts** tab).

Figure 9-6: SEM Quality Alerts

Level	Monitored Entities	Frequency (min)	Time Window (min)	Calls #	Failed Calls %		Poor Quality Calls %		Avg Call Duration (sec)				
					Critical	Major	Critical	Major	Critical	Major			
Node	All	15	60	50	10	5	10	5	3	5			
Link	SIP Trunk Lync	60	120	20	5	0	0	0	0	0			
Link	Lync2013 to SEM-GW,Biz+ to Cell,BIZ+ to SIP Trunk,outgain	15	60	50	10	5	10	5	3	5			


2. Click the **Add Alert** icon ; rule the Add New Alert Rule popup opens:

Figure 9-7: Add New Alert Rule

Add New Rule [Close]

Global Alert Settings

Level to Monitor: Node

Entities to Monitor: All Selected

Monitoring Frequency (min): 15

Analyze the Past (min): 60

Minimum Calls to Analyze: 50

Failed Calls Alarm

Critical Threshold (Calls %) 10 Major Threshold (Calls %) 5

Poor Quality Calls Alarm

Critical Threshold (Calls %) 10 Major Threshold (Calls %) 5

Avg Call Duration Alarm

Critical Threshold (sec) 3 Major Threshold (sec) 5

Bandwidth Alarm

Critical threshold (Kb/sec) 0 Major threshold (Kb/sec) 0

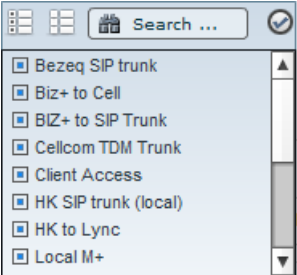
Max Concurrent Calls Alarm

Critical threshold (Calls #) 0 Major threshold (Calls #) 0

[OK] [Cancel]

3. Define the following settings:

Table 9-3: Add New Alert Rule

Setting	Definition
Level to Monitor	Device or Link. Use this filter to select Link or Node .
Entities to Monitor	<p>Use this filter to select the entities to monitor.</p> <p>If you selected Link for 'Level to Monitor' (previous setting), the links selection popup opens:</p>  <p>Select the links to filter (the default is All Selected).</p>
Monitoring Frequency (min)	Determines how frequently the SEM automatically performs data analysis. Defines every 15 (default), 30 or 60 minutes.
Analyse the Past (min)	Determines the period up to the present for which the SEM will perform data analysis. Define 60 minutes (default), 90 minutes or 120 minutes.
Minimum Calls to Analyze	<p>Defines the number of calls to analyze. Default = 50 calls. Up to 1000 calls can be defined.</p> <p>If the number of calls made doesn't exceed the defined # of calls to analyze, the SEM won't perform data analysis.</p>
Failed Calls Alarm	<p>Critical Threshold: 5% of calls (default); if this threshold is exceeded, the alert is triggered.</p> <p>Major Threshold: 3% of calls (default); if this threshold is exceeded, the alert is triggered.</p>
Poor Quality Calls Alarm	<p>Critical Threshold: 10% of calls (default); if this threshold is exceeded, the alert is triggered.</p> <p>Major Threshold: 8% of calls (default); if this threshold is exceeded, the alert is triggered.</p>
Avg Call Duration Alarm	<p>Critical Threshold: 5 seconds (default), up to 100 seconds; if the average duration of calls is below this, the alert is triggered.</p> <p>Major Threshold: 10 seconds (default), up to 100 seconds; if the average duration of calls is below this, the alert is triggered.</p>



Setting	Definition
Bandwidth Alarm	Sends an alarm when the media bandwidth falls below, or exceeds, minimum or maximum threshold values, in Kbps. Minimum: 0. Maximum: 1000000 (1Gbps).
Max Concurrent Calls Alarm	Sends an alarm when the number of concurrent calls falls below, or exceeds, minimum or maximum threshold values. Minimum: 0. Maximum: 100000.

4. Click **OK**; see the alert listed now in the SEM Quality Alerts page.

9.3.2 Manually Activating an Alert Rule

You can manually activate an alert.


- **To manually activate an alert:**

1. In the SEM Quality Alerts page (see [Figure 9-6](#)), click  to manually activate the rule.
2. Click  to manually deactivate the rule. The rule will continue to be automatically triggered.

9.3.3 Editing an Alert Rule

You can edit an alert rule.

- **To edit an alert rule:**

1. In the SEM Quality Alerts page (see [Figure 9-6](#)), click  **Update Rule**; the **Add New Alert Rule** dialog opens (see [Figure 9-7](#)).
2. Edit the settings. Use [Table 9-3](#) as reference.

9.3.4 Defining a Rule to Trigger an Alert (Example)

This example shows how to define rule settings to determine monitoring. Using this example, you can intuitively determine how to define a rule to trigger an alert.


If you define in a rule with the following settings:

- 'Level to Monitor' = Device
- 'Monitored Devices' = All
- 'Monitoring Frequency' = 15 minutes
- 'For the Past' = 60 minutes
- 'Minimum # of Calls to Analyze' = 50
- 'Failed Calls Alarm' = defaults
- 'Poor Quality Calls Alarm' = defaults
- 'Avg Call Duration Alarm' = defaults

Then the SEM will perform the following:

- Check every 15 minutes the # of calls made on all devices in the past 60 minutes and for devices on which the # of calls is greater than 50:
 - Compare failed / successful calls % to the defined settings
 - Compare poor quality calls % (red-coded) to the defined settings
 - Compare average call duration to the defined settings

9.4 Distributing Alarm Information

Alarms information displayed in the Active Alarms, History Alarms and Quality Alerts pages are easily downloaded and saved by clicking the **Save As** icon .

- Active Alarms information is saved in a plain-text *ActiveAlarms.csv* file.
- History Alarms information is saved in a plain-text *HistoryAlarms.csv* file.
- SEM Quality Alerts information is saved in a plain-text *SEMQualityAlerts.csv* file.

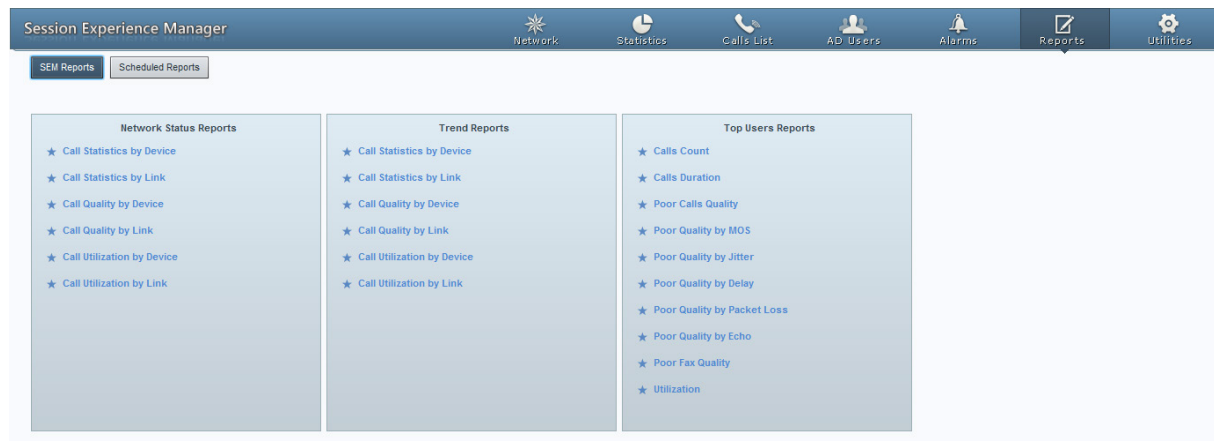
Open and read in any text editor, these files can be sent as an attachment in an email to others to distribute the information.

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10 Producing Reports

The SEM features essential reports-generation capability that administrators can utilize *to distribute session experience data and comparative analyses* quickly and effectively to responsible persons within the enterprise and to external authorities associated with the enterprise's VoIP network, for *accurate diagnosis and correction* of degraded sessions and for general *network optimization*.

Figure 10-1: SEM Reports Page



Three categories of reports help users to quickly and thoroughly analyze different aspects of calls made over the VoIP network:

1. Network Status Reports
2. Trend Reports
3. Top Users Reports

Categories 1 and 2 are identical in terms of the information displayed (columns); however the *calculation* differs.

Category 1 is calculated as a *summary of calls made over the entire period* for specified entities (devices / links). The x axis represents the specified entities.

Category 2 is calculated *per time interval* specified, summarizing the same entity in the specified interval. The x axis represents the time interval (hour / day / week / month).

[Table 10-1](#) shows the categories and the reports options in each.













Table 10-1: Reports Categories



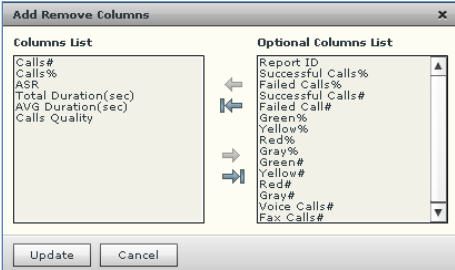
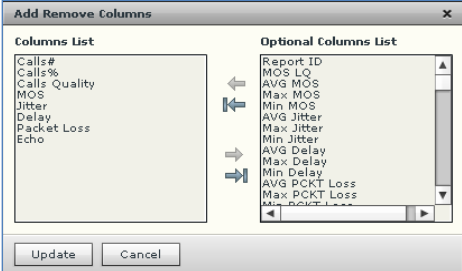
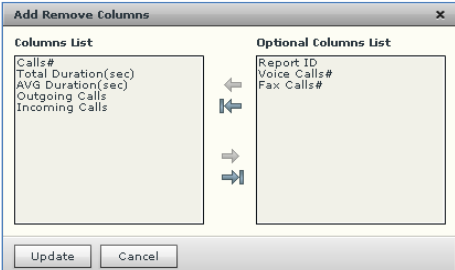

Report Category	Explanation
Network Status Reports <ul style="list-style-type: none"> ▪ Call Statistics by Device ▪ Call Statistics by Link ▪ Call Quality by Device ▪ Call Quality by Link ▪ Call Utilization by Device ▪ Call Utilization by Link 	Displays a summary of key call metrics during a specified time period with a separate row entry for each device/link. Purpose: To compare performance, quality and utilization across devices/links. For example, the 'Call Statistics by Device' report summarizes the % of successful and failed calls and the # of calls that scored in each quality, across specified devices/links. By contrast, a 'Call Quality by Device' report summarizes key metrics affecting voice quality (jitter, delay, packet loss).
Trend Reports <ul style="list-style-type: none"> ▪ Call Statistics by Device ▪ Call Statistics by Link ▪ Call Quality by Device ▪ Call Quality by Link ▪ Call Utilization by Device ▪ Call Utilization by Link 	Displays a summary of key call metrics over specified time intervals of a specified device/link. For example, the 'Calls Trend by Device' report displays 'Number of Calls', 'ASR' and 'Total Duration' in hourly intervals.
Top Users Reports <ul style="list-style-type: none"> ▪ Calls Count ▪ Calls Duration ▪ Poor Calls Quality ▪ Poor Quality by MOS ▪ Poor Quality by Jitter ▪ Poor Quality by Delay ▪ Poor Quality by Packet Loss ▪ Poor Quality by Echo ▪ Poor Fax Quality ▪ Utilization 	Displays users graded according to number of calls made, calls duration, and calls whose quality scored 'Poor' based on specified metrics.


10.1 Using Reports Features

The features below apply to all reports pages across all three reports categories unless stated otherwise:

Table 10-2: Reports Features

Feature	Description
 Save as CSV	Lets you save a report as a Comma-Separated Value (CSV) file which represents charts, data bars, sparklines, gauges, indicators, etc., in a standardized, plain-text format easily readable and exchangeable with many applications. You can open the file in a spreadsheet such as Microsoft Excel or use it as an import format for other programs.
 Export to PDF	Lets you generate a PDF file of the report reflecting selected filters, columns, graphs, etc.
Filters	Let you specify: <ul style="list-style-type: none"> • The Time Range for the report to cover (in the Network Status Reports page) • The Time Range <i>and</i> the Interval for the report to cover (in the Trend Report page; Hourly, Daily, Weekly or Monthly) • Devices / Links on which to produce the report • Top 10/20/30 Users on which to produce the report (in the Top Users Report page)
SEM Reports	Click the button at any time to return to the Reports page displaying the three reports categories and the report options available under each. Click an option to produce a report.
Scheduled Reports	Click the button to schedule a report.
 Run now	Displayed after selecting a report to produce in the reports menu. First filter (see above) and then click it; the report is produced and displayed.
Charts view / Table view	Two views are displayed in every report produced: Charts (uppermost) and table (lowermost). Click  to expand charts view; table view is eclipsed. Click  to revert to both views.
Switch to horizontal / Switch to vertical	Charts are by default displayed vertically, one below the other, in this order: Calls #, Calls %, Success/Fail ratio, Total Duration, AVG Duration and Calls Quality. Use the scrollbar to scroll down from one to the next. They can optionally be displayed horizontally to suit user preference. To display horizontally, click the link. Click next  or previous  to navigate from chart to chart.
 Bar /  Linear	[Only applies to Network Status Reports] By default, charts are displayed as bar charts. Click the drop-down to choose linear charts if required.
 Add / Remove Columns	Click the icon; optional table view columns are displayed. To add, if required, select an optional column and click  or select all and click  . To remove a column, select it in the Columns List pane

Feature	Description
	<p>and click  or select all and click .</p> <p>Default metrics columns (left pane) and optional metrics columns (right pane) in the Summary/Trend category (except 'Call Quality by Device / Link') are as follows:</p>  <p>Default metrics columns (left pane) and optional metrics columns (right pane) in a 'Call Quality by Device / Link' report in the Summary/Trend category are:</p>  <p>Default metrics columns (left pane) and optional metrics columns (right pane) in the Top Users reports category are:</p>  <p>See under Section 10.1.3 for variations across reports in the Top Users Reports category.</p>
 <p>Show Column Graphical Representation Display column as chart</p>	<p>Table column headers display this icon. Click one to display the metric as a chart. If the chart is already open, you're notified. After report generation, the table's Success/Fail metric column is the only one displayed as a chart in Charts view.</p>
<p>Table Bottom Line (Total)</p>	<p>The table's bottom line shows column's total. For example:</p> <ul style="list-style-type: none"> • Calls # column's bottom line shows the total sum of all counts of all calls on all devices / links • Success/Fail column's bottom line shows the average success rate of all devices / links.

Feature	Description
	'Total' is calculated according to the measured parameter. It can be SUM, AVG, MIN or MAX.
Search 	Users can use the 'Search' option to search for and find precise information related to a query. When information related to the search query is found, the report exclusively displays only that information.

10.1.1 Producing a Network Status Report

Network Status Reports show *the sum totals, over the entire period*, of calls performance scores, quality scores, #s, %s, total duration and average duration (default metrics). Reports in this category are identical in terms of metrics measured. Metrics columns can optionally be added / removed (see 'Add / Remove Columns' in Table 10-2).

➤ **To produce a Network Status Report:**



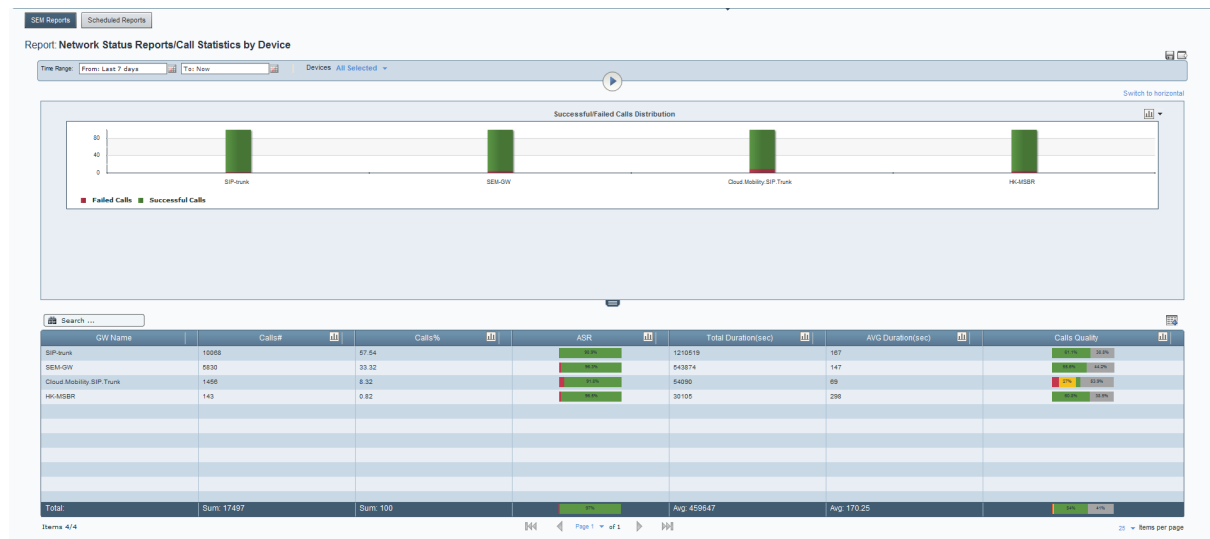
1. Click an option in the 'Network Status Reports' category, for example, click the first option, i.e., **Call Statistics by Device**; the 'Run now'  page opens.
2. Filter for 'Time Range' and 'Devices' (see Section 0 on page 20 for details).
3. Click ; the report is produced:

Figure 10-2: Network Status Reports – Call Statistics by Device



Following report generation, the ASR metric column is the only one displayed in charts view.

➤ **To display a metric as a chart:**







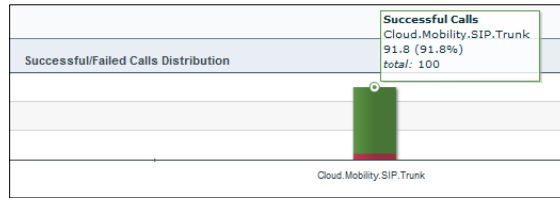
- In the table, click  in the metric's column header. For example, click  in the **Success/Fail** column header; the ASR chart is displayed:

Figure 10-3: Displaying the Success/Fail Chart



In a Network Status Report you can:

- Click the **Switch to horizontal** link (see Table 10-2) to switch from vertical view (default) to horizontal view.
- Click  to expand the charts pane. Click it again to contract it.
- Click  to switch from bar charts (default) to linear charts. Select  from the drop-down (see 'Charts view / Table view' in Table 10-2).
- Click  to add/remove a column to/from the table (see 'Add / Remove Columns' in Table 10-2).
- See in the chart which entities registered the highest failed / successful calls rate.
- See in the table on which entities most calls were made, what % of calls were made on each, on which entities most failed / successful calls were made, on which entities most call time was recorded, on which entities the average call duration was longest / shortest and on which entity voice quality scored highest (green = good, yellow = fair, red = poor, grey = unknown).
- See in the chart an entity's success / fail rate (%). Point your cursor over a color in a bar (green = successful, red = failed):



- See in the table an entity's success / fail rate (%). Point your cursor over the entity's row (green = successful, red = failed):

GW Name	Calls#	Calls%	ASR
Cloud.Mobility.SIP.Trunk	1643	8.11	<div style="display: flex; align-items: center;"> <div style="width: 91.8%; height: 10px; background-color: green; margin-right: 2px;"></div> 91.8% </div> <div style="display: flex; align-items: center; margin-top: 2px;"> <div style="width: 8.2%; height: 10px; background-color: red; margin-right: 2px;"></div> Failed:7.9% </div>

- See in the table quality scores by pointing your cursor over a color in the entity's Calls Quality row (green = good, yellow = fair, red = poor, grey = unknown):

GW Name	Calls#	Calls%	ASR	Calls Quality
Cloud.Mobility.SIP.Trunk	1643	8.11	<div style="display: flex; align-items: center;"> <div style="width: 91.8%; height: 10px; background-color: green; margin-right: 2px;"></div> 91.8% </div> <div style="display: flex; align-items: center; margin-top: 2px;"> <div style="width: 8.2%; height: 10px; background-color: red; margin-right: 2px;"></div> Failed:7.9% </div>	<div style="display: flex; align-items: center;"> <div style="width: 85%; height: 10px; background-color: green; margin-right: 2px;"></div> 85% </div> <div style="display: flex; align-items: center; margin-top: 2px;"> <div style="width: 12.5%; height: 10px; background-color: red; margin-right: 2px;"></div> Poor:12.5% </div>

Default and optional table columns in Network Status Reports are:

Table 10-3: Table Columns in Network Status Reports

Report	Default Columns	Optional Columns
Call Statistics by Device/Link	Calls #, Calls %, ASR, Total Duration, Average Duration, Calls Quality	Successful/Failed Calls % Successful/Failed Calls # Green/Yellow/Red/Gray % Green/Yellow/Red/Gray # Voice Calls # Fax Calls #
Call Quality by Device/Link	Calls #, Calls %, Calls Quality, MOS, Jitter, Delay, Packet Loss, Echo	MOS LQ AVG/Max/Min MOS/Jitter/Delay/Packet Loss/Echo AVG MOS LQ AVG Signal Level/SNR MOS/MOS LQ/Jitter/Delay/Packet Loss/Echo Remote AVG/Max/Min MOS R/Jitter R/Delay R/P. Loss R/Echo R Red #, Yellow #, Green #, Gray # Red %, Yellow %, Green %, Gray % MOS/MOS LQ/Jitter/Delay/Packet Loss/Echo Red % [Same for Yellow, Green and Gray] MOS Red Remote % [Same for Yellow, Green and Gray] MOS/Jitter/Delay/Packet Loss/Echo LQ Red Remote % [Same for Yellow, Green and Gray]
Call Utilization by Device/Link	AVG Total Kbps AVG Rx Kbps AVG Tx Kbps AVG Packet Loss	AVG Total Kbps Remote AVG Rx/Tx Kbps Remote AVG Packet Loss R

- You can re-filter and re-run the report (see 'Filters' in [Table 10-2](#)).
- You can generate another report. Click the **SEM Reports** button.
- You can schedule a report. Click the **Scheduled Reports** button (for details see [Section 10.2](#)).

10.1.2 Producing Trend Reports

Trend reports show *general tendencies over intervals* of calls performance, quality, #s, %s, total duration and average duration (default metrics measured).

Reports in this category are identical in terms of metrics columns displayed. Columns can optionally be added / removed (see 'Add / Remove Columns' in [Table 10-2](#)).

➤ **To produce a trend report:**



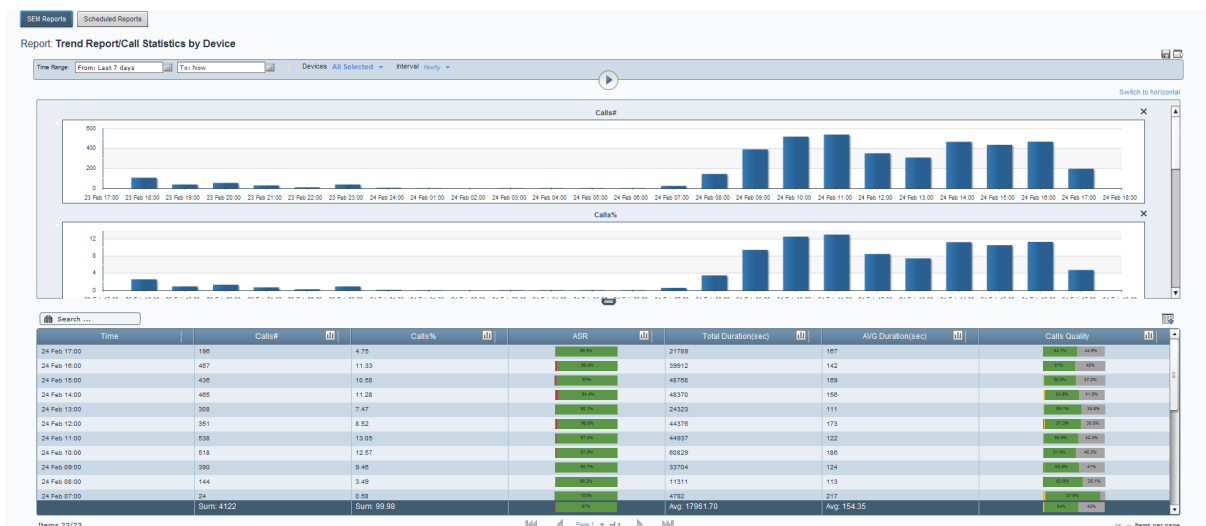






1. Click an option in the 'Trend Reports' category, e.g., the first; the 'Run now'  page opens
2. Filter for 'Time Range' and 'Devices' (described under Section 0 on page 20). For the 'Interval' filter select Hourly, Daily, Weekly or Monthly.
3. Click the 'Run now'  icon; the report opens:

Figure 10-4: Trend Reports – Call Statistics by Device



In a Trend Report you can:

- See when most/least calls were made, how many, % of total, each period's success/fail rate and each period's quality scores.
- Click the **Switch to horizontal** link to switch from vertically viewed charts (default) to horizontally viewed charts (see [Table 10-2](#)).
- Click  to switch from bar (default) to linear charts. Select  from the drop-down (see 'Charts view / Table view' in [Table 10-2](#)).
- Click  in a column header in the table to display that column as a chart (see 'Show Column Graphical Representation' in [Table 10-2](#))
- Click  to add a column to table view or remove a column from table view (see 'Add / Remove Columns' in [Table 10-2](#)). Default columns and optional columns are identical to the 'Call Statistics by Device/Link' and 'Call Quality by Device/Link' reports in the Network Status Reports category.

- Use the pager to navigate to a page if there are multiple pages (see under [Figure 7-2](#))
- Re-filter and re-run the report (see 'Filters' in [Table 10-2](#))
- Export the report to PDF. Click  (see 'Export...' in [Table 10-2](#))
- Save the report as a CSV file. Click  (see 'Save...' in [Table 10-2](#))
- Choose to produce another report by clicking the **SEM Reports** button.

10.1.3 Producing Top Users Reports

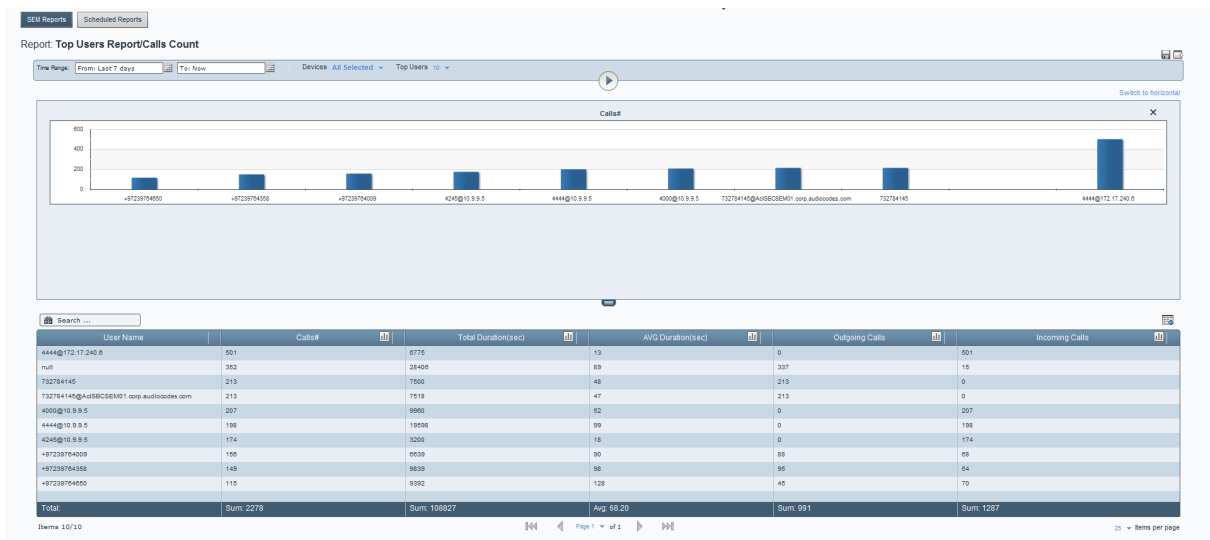
Top Users reports display the *top 10, 20 or 30 users* in terms of # of calls made, total duration, average duration, outgoing calls and incoming calls (default metrics measured).

Reports in this report category are identical in terms of metrics columns displayed. Metrics columns can optionally be added / removed (see 'Add / Remove Columns' in Table 10-2).

➤ **To produce a top users report:**

1. Click an option in the 'Top Users Reports' category, for example, click the first report option, i.e., Calls Count; the 'Run now' page opens.
2. Filter for 'Time Range' and 'Devices' (described under Section 0 on page 20). For the 'Top Users' filter, select 10, 20 or 30.
3. Click the 'Run now' icon; the report opens:

Figure 10-5: Top Users Report – Calls Count



In a Top Users Report you can:

- Save the report as a CSV file. Click (see 'Save...' in Table 10-2)
- Export the report to PDF. Click (see 'Export...' in Table 10-2)
- Click the **Switch to horizontal** link to switch from vertically viewed charts (default) to horizontally viewed charts (see Table 10-2)
- Click in a column header in the table to display that column as a chart (see 'Show Column Graphical Representation' in Table 10-2)
- Click to add a column to table view or remove a column from table view (see 'Add / Remove Columns' in Table 10-2).

Default and optional table columns in Top Users reports are:

Table 10-4: Table Columns in Top Users Reports

Report	Default Columns	Optional Columns
Calls Count	Calls #, Total Duration, Average Duration, Outgoing Calls, Incoming Calls	Voice Calls #/Fax Calls #
Calls Duration	Total Duration, Calls #, Average Duration, Outgoing Calls, Incoming Calls	None
Poor Calls Quality	Poor Quality Calls, Calls #, Calls Quality	Gray/Green/Yellow/Red % Yellow/Red #
Poor Quality by MOS / Jitter / Delay / Packet Loss / Echo	AVG MOS / Jitter / Delay / Packet Loss / Echo, Calls #, Total Duration	None
Poor Fax Quality	Poor Quality Faxes, Poor Quality Pages, Total Faxes, Total Pages	None
Utilization	Total Bytes, RX Bytes, TX Bytes	None

- User the pager to navigate if there are multiple report pages (see under Section 7 on page 49)
- Re-filter and re-run the report (see 'Filters' in Table 10-2)
- Choose to produce another report by clicking the **SEM Reports** button.

10.2 Scheduling a Report

You can schedule the SEM to automatically produce a report periodically.

➤ **To schedule a report:**

1. Click the **Reports** icon; the SEM Reports page opens (see [Figure 10-1](#))
2. Click the **Scheduled Reports** button; this page opens:

Figure 10-6: Scheduled Reports

Report Name	Report Topic Name	Report Group Name	Scheduler Name	Description	Scheduling Frequency	Num to Run	Num of Run Times	Reports	User	Last Run Time	Next Run Time	Forward Mail Addresses
Call Statistics by Device	Network Status Rep	SEM Report	Call_Stats		Hourly	1	1	Generated	onmp	21:20:00 Jan 23		onmp@audiocodes.com
Call Statistics by Device	Network Status Rep	SEM Report	Test		Weekly	1	4	Generated	onmp	08:00:00 Feb 16	08:00:00 Mar 09	onmp@audiocodes.com


3. Click  to add a schedule; the Scheduler opens:

Figure 10-7: Scheduler

Scheduler Main Settings

Report Name:

Scheduler Name:

Description:

Report Filter Settings

Devices:

Scheduler Settings

Hourly
 Daily
 Weekly
 Monthly

Selected daily report generation, set day time

Generate report at: Hours Minutes

Run Report

No End
 Run times

Mail Settings

Forward to Mail:

Mail Addresses:

OK Cancel

4. Under 'Schedule ID', select a report to schedule from the 'Report' drop-down list. All reports under all three report types are listed.
5. In the 'Schedule Name' field define a name that will let you easily identify the schedule.
6. In the 'Description' field, provide a description to help you distinguish this schedule from others.
7. Under 'Report Filter' you can filter the devices on which the report which you're scheduling will be produced. By default, all devices will be included. Click **All Selected** to change the default. For detailed information on how to filter devices, see Section 4.2.
8. Under 'Report Frequency', select either **Hourly**, **Daily** (default), **Weekly** or **Monthly**. If the frequency you select is **Daily**, set the 'Time'.
9. Under 'Run Times', select **Unlimited** or **Limit** to limit the schedule to a limited number of report run times (you can limit to up to 100 run times).
10. Under 'Forward Report', select the **Mail** option for the report to be automatically forwarded to your email address.
11. In the 'Mail Addresses' field, define the email address/addresses to which to automatically forward the report.
12. Click **OK**; the report is scheduled; you can expect the first to arrive in your mail according to schedule.

10.2.1 Viewing a Scheduler Generated Report

You can view a report generated by the scheduler.

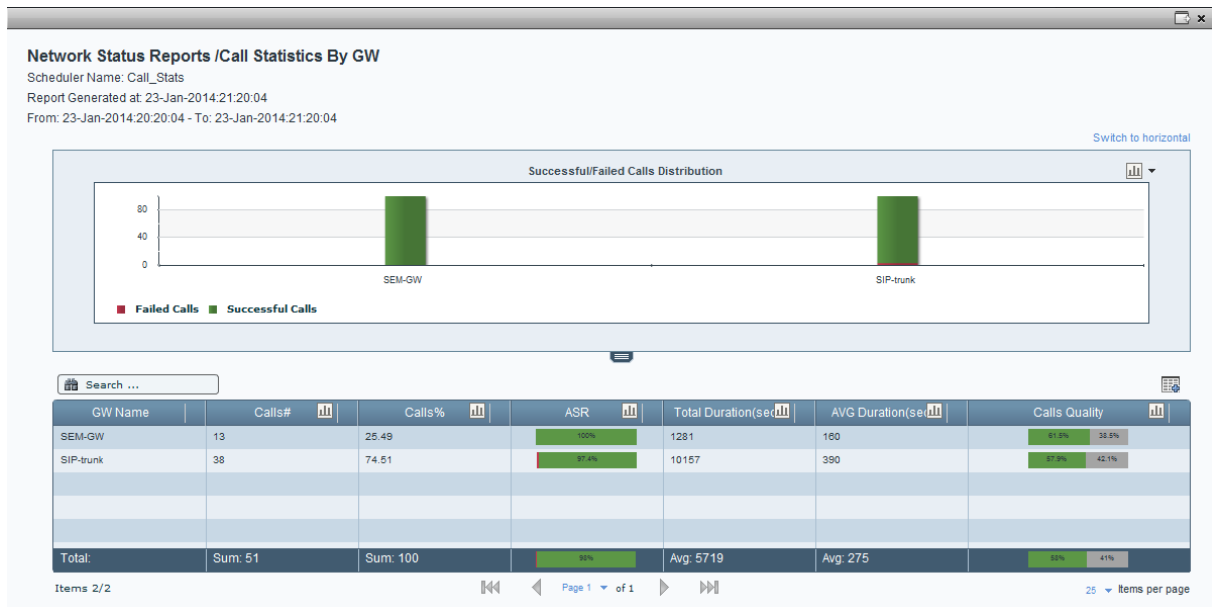
➤ **To view a report generated by the scheduler:**

1. In the Scheduled Reports page under the Reports column (see Figure 10-6), click the **Generated** hyperlink in the row of the report generated by the scheduler; the Report Generated by Scheduler opens (see the figure below).

Figure 10-8: Report Generated by Scheduler

SEM Reports		Scheduled reports	
Reports Generated by Scheduler: Call_Stats			
	File Creation Date	File size	File Name
  	21:20:05 Jan 23	1030 byte	Report_Call_Stats_Call_Statistics_by_Device_23_Jan_2014_21_20.csv

2. Click  **View Report**; the report is displayed:

Figure 10-9: Viewing a Scheduler Generated Report


10.2.1.1 Saving the File of a Scheduler Generated Report

You can save the file of a report generated by the scheduler.

➤ **To save the file:**

1. In the Report Generated by Scheduler page (see Figure 10-8), click **Save Report File**.
2. Select the location on your pc in which to save the file and click **Save**.

10.2.1.2 Deleting the File of a Scheduler Generated Report

You can delete the file of a report generated by the scheduler.

➤ **To delete the file:**

1. In the Report Generated by Scheduler page (see Figure 10-8), click **Delete File**; you're prompted 'Delete Generated Report File?'
2. Click **Yes**; the file is deleted.

10.2.2 Editing a Schedule

You can edit a report schedule.


➤ **To edit a schedule:**

1. In the Scheduled Reports page (see Figure 10-6), click **Update Scheduler**; the Scheduler opens (see Figure 10-7).
2. Edit the reports schedule. See under Section 10.2 for detailed information.

10.2.3 Deleting a Schedule

You can delete a report schedule.



➤ **To delete a schedule:**

1. In the Scheduled Reports page (see [Figure 10-6](#)), click  **Delete Scheduler**; you're prompted 'Are you sure?'.
2. Click **Yes**; the report schedule is deleted.



10.2.4 Manually Running or Pausing a Schedule

You can manually run or pause a report schedule.

➤ **To manually run a schedule:**

- In the Scheduled Reports page (see [Figure 10-6](#)), click  **Run Scheduler**; the icon changes to  and the report scheduler is run.

➤ **To manually pause a schedule:**

- Click  **Pause Scheduler**; the icon reverts to  and the scheduler is paused.

User's Manual

Version 7.0



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