Troubleshooting and Maintaining Avaya Session Border Controller for Enterprise

Release 7.0
Issue 1
December 2015

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Contents

Chapter 1: Introduction

Purpose

This document describes how to use troubleshooting tools and utilities. The document also describes the procedures to contact Avaya Support and contains typical error messages and resolution tasks.

Intended audience

This document is intended for people who perform troubleshooting tasks.

Related resources

Documentation

The following table lists the documents related to this product. Download the documents from the Avaya Support website at http://support.avaya.com

Title	Description	Audience
Design		
Avaya Session Border Controller for Enterprise Overview and Specification	High-level functional and technical description of characteristics and capabilities of the Avaya SBCE.	Sales Engineers, Solution Architects and Implementation Engineers
Implementation		
Deploying Avaya Session Border Controller for Enterprise	Hardware installation and preliminary configuration procedures for installing Avaya SBCE into a SIP enterprise VoIP network.	Implementation Engineers

Table continues…

Title	Description	Audience
Deploying Avaya Session Border Controller for Enterprise in Virtualized Environment	Virtual installation and preliminary configuration procedures for installing Avaya SBCE into a SIP enterprise VoIP network.	Implementation Engineers
Upgrading Avaya Session Border Controller for Enterprise	Procedures for upgrading to Avaya SBCE 7.0	Implementation Engineers
Maintenance and Troubleshooting		
Administering Avaya Session Border Controller for Enterprise	Configuration and administration procedures.	Implementation Engineers, Administrators

Finding documents on the Avaya Support website

About this task

Use this procedure to find product documentation on the Avaya Support website.

Procedure

1. Use a browser to navigate to the Avaya Support website at http://support.avaya.com/.
2. At the top of the screen, enter your username and password and click **Login**.
3. Put your cursor over **Support by Product**.
4. Click **Documents**.
5. In the **Enter your Product Here** search box, type the product name and then select the product from the drop-down list.
6. If there is more than one release, select the appropriate release number from the **Choose Release** drop-down list.
7. Use the **Content Type** filter on the left to select the type of document you are looking for, or click **Select All** to see a list of all available documents.

   For example, if you are looking for user guides, select **User Guides** in the **Content Type** filter. Only documents in the selected category will appear in the list of documents.
8. Click **Enter**.

Training

The following courses are available on the Avaya Learning website at www.avaya-learning.com. After logging into the website, enter the course code or the course title in the **Search** field and click **Go** to search for the course.

Course code	Course title
5U00090E	Knowledge Access: Avaya Session Border Controller
5U00160E	Knowledge Collection Access: Avaya Unified Communications Core Support

Viewing Avaya Mentor videos

Avaya Mentor videos provide technical content on how to install, configure, and troubleshoot Avaya products.

About this task

Videos are available on the Avaya Support website, listed under the video document type, and on the Avaya-run channel on YouTube.

Procedure

- To find videos on the Avaya Support website, go to http://support.avaya.com and perform one of the following actions:
  - In **Search**, type `Avaya Mentor Videos` to see a list of the available videos.
  - In **Search**, type the product name. On the Search Results page, select **Video** in the **Content Type** column on the left.
- To find the Avaya Mentor videos on YouTube, go to www.youtube.com/AvayaMentor and perform one of the following actions:
  - Enter a key word or key words in the **Search Channel** to search for a specific product or topic.
  - Scroll down Playlists, and click the name of a topic to see the available list of videos posted on the website.

Note:

Videos are not available for all products.

Support

Go to the Avaya Support website at http://support.avaya.com for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions, or request an agent to connect you to a support team if an issue requires additional expertise.

Warranty

Avaya provides a one-year limited warranty on Avaya SBCE hardware and 90 days on Avaya SBCE software. To understand the terms of the limited warranty, see the sales agreement or other applicable documentation. In addition, the standard warranty of Avaya and the support details for Avaya SBCE in the warranty period is available on the Avaya Support website http://

support.avaya.com/ under **Help & Policies** > **Policies & Legal** > **Warranty & Product Lifecycle**. See also **Help & Policies** > **Policies & Legal** > **License Terms**.

Chapter 2: Troubleshooting fundamentals

Network configuration

Network configuration checklist

Use this checklist while troubleshooting network configurations.

No.	Task	Description	✔
1	Create a site network map.	Identifies where each device is physically located on your site. Use the map to systematically search each part of your network for problems.	
2	Identify logical connections.		
3	Document device configurations.	Maintain online and paper copies of device configuration information.	
4	Store passwords in a safe place.	Keep records of your previous passwords if you must restore a device to a previous software version and need to use the old password that was valid for that version.	
5	Create a device inventory checklist.	List all devices and relevant information for the network including device type, MAC addresses, ports, and attached devices.	
6	Create an IP address and port number list.	List the IP addresses and port number of all devices.	
7	Maintain a change control system.		
8	Create a support contact list.	Store details for support contracts, support numbers, engineering details, telephone and fax numbers.	

Verifying integration configuration

You can verify the operational status of the EMS by either attempting to access the EMS server using the web interface or by establishing a CLI session via a secure shell session (SSH) and manually checking the status of various internal processes.

Logging on to the EMS web interface

Procedure

1. Open a new browser tab or window by using any of the following web browsers:
   - Microsoft Internet Explorer (5) 8.0+
   - Mozilla Firefox 31+ / 31.0 ESR+
   - Google Chrome 35.0+
   - Apple Safari (4) 6.0+
2. Type the following URL:

   ```
   https://<Avaya EMS IP address>
   ```
3. Press **Enter**.

   The system displays a message indicating that the security certificate is not trusted.
4. Accept the system message and continue to the next screen.

   If the Welcome screen is displayed, the EMS is operating normally and available for use. You can log in to EMS and perform normal administrative and operational tasks. See *Administering Avaya Session Border Controller for Enterprise*.

Logging in to EMS through console

To log in to EMS through a console, you can use a serial connection.

Note:

You can use a VGA connection only if you earlier manually reinstalled the software on the EMS by using a VGA connection.

Logging in to EMS through a serial console

Before you begin

Change the BIOS settings and enable serial redirection.

About this task

Connect the laptop to the serial port on the Avaya SBCE server by using the cable that Avaya provided or a DB9 null modem cable.

Note:

From Avaya SBCE Release 7.0, the default output can be a serial console or VGA depending on the installation.

Procedure

1. Configure the serial connection parameters of the terminal program to the settings in the following table.

Parameter	Value
Baud rate	19200
Parity	None
Data bits	8
Stop bits	1
Connection Setting	Direct to Com1 **Note:** Because the com port number is not fixed, use Device Manager to find out the correct port number.

2. Press **Enter** to establish a serial connection.

   The system displays a prompt asking for the User Name and Password.

3. Provide the required information and press **Enter**.

Logging in to EMS through VGA connection

Before you begin

Connect the monitor to EMS through a VGA cable. Connect a keyboard to EMS.

About this task

Procedure

1. Press `Enter` to establish a communications connection.

   The system prompts you to enter the username and password.

2. Enter your username and password, and press `Enter`.

Logging in to Avaya SBCE through SSH connection

Before you begin

Ensure that Avaya SBCE is installed and available on the network.

Procedure

1. Open an SSH client, such as PuTTy.
2. Type the IP address for Avaya SBCE.
3. Specify the port as **222**.

4. Select the connection type as SSH and press `Enter`.
5. Enter the user name and password to log in.

Note:

You cannot gain access to shell with user account `ucsec`.

User account `ipcs` or user accounts that have shell access can be used for logging in to Avaya SBCE.

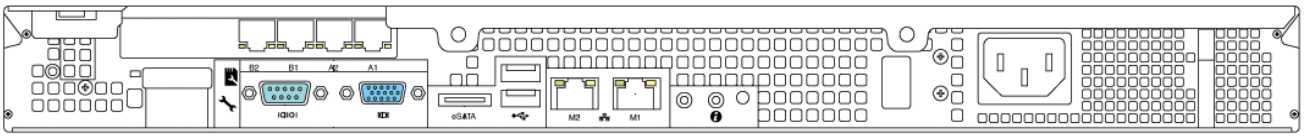
Ethernet port labels

Portwell CAD 0208 server

The Portwell CAD 0208 server is used only for single server (EMS plus Avaya SBCE) deployments.

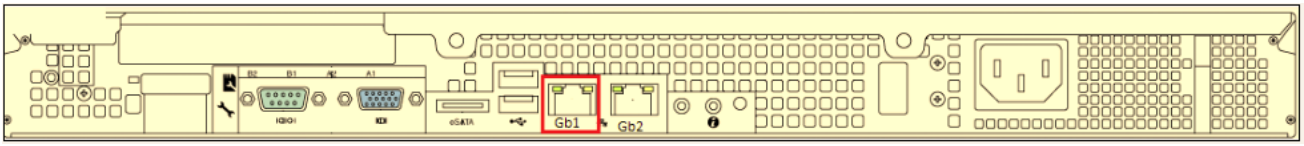
Ethernet port labels	Number of ports
M1, A1, A2, and B1	4

Dell R210-II



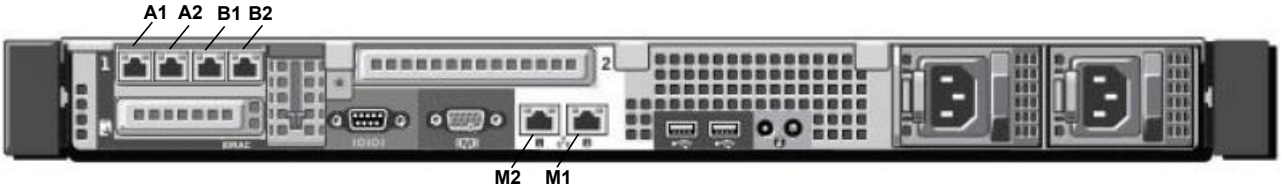
Ethernet port labels	Number of ports
M1, M2, A1, A2, B1, and B2	6

Dell EMS



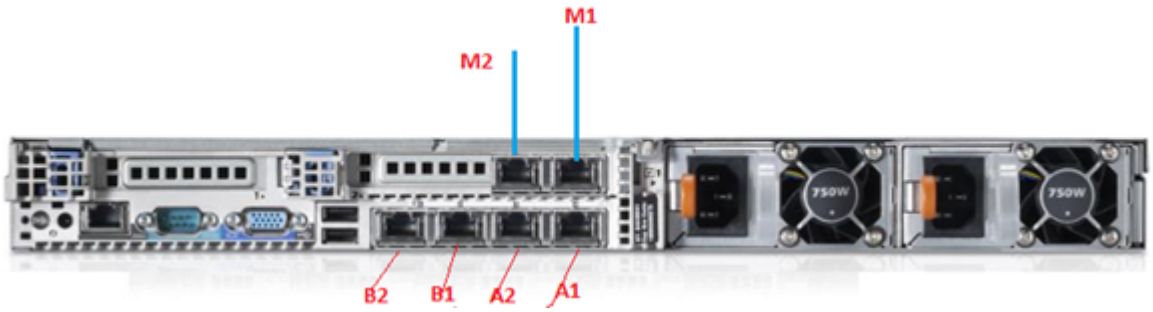
Ethernet port labels	Number of ports
Gb1	2 (1 unused - the right port is unused)

Dell R320



Ethernet port labels	Number of ports
M2, M1, A1, A2, B1, and B2	6

Dell R620

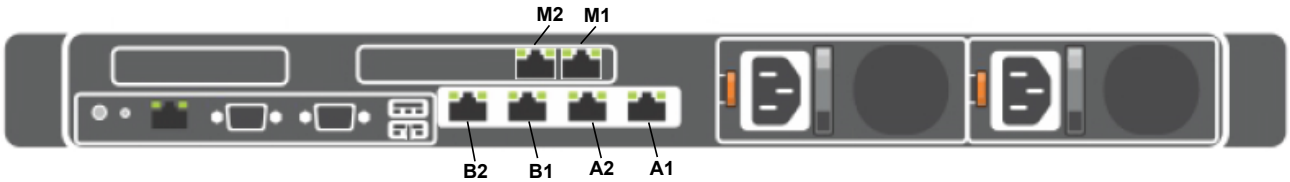


Ethernet port labels	Number of ports
M1, M2, B2, B1, A2 and A1	6

Note:

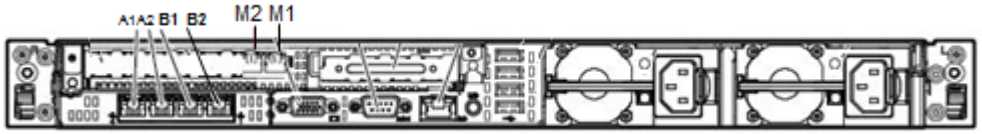
When you configure the server as EMS, A1, A2, B1, B2, and M2 are not to be used. For more information about hardware specifications, see *Deploying Avaya Session Border Controller for Enterprise*.

Dell R630



Ethernet port labels	Number of ports
M2, M1, B2, B1, A2, and A1	6

HP DL360 G8

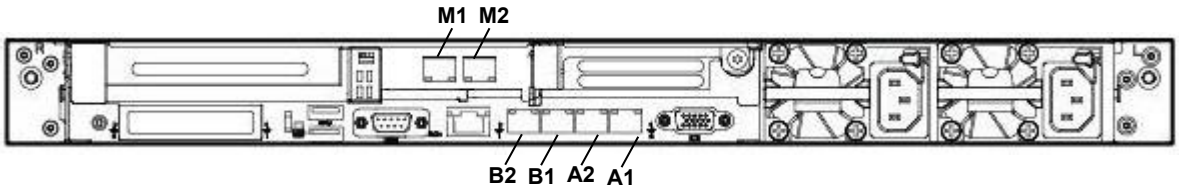


Ethernet port labels	Number of ports
M1, M2, B2, B1, A2, and A1	6

Note:

When you configure the server as EMS, A1, A2, B1, B2, and M2 are not used. For more information about server specifications, see *Deploying Avaya Session Border Controller for Enterprise*.

HP DL360 G9



Ethernet port labels	Number of ports
M1, M2, B2, B1, A2, and A1	6

Loss of audio and active call drops during HA failover

During high availability failover, you might notice loss of audio or active call drops. This issue can occur if the internal IP of Avaya SBCE and the internal Avaya Aura® core are on the same subnet. To resolve this issue, move the internal IP of Avaya SBCE to a different subnet. For more information, see the Configuring High Availability section in *Administering Avaya Session Border Controller for Enterprise*.

System Monitoring

Dashboard

The Dashboard screen displays system information, installed devices, alarms, and incidents. The screen displays additional separate summary windows, such as Alarms, Incidents, Statistics, Logs,

Diagnostics, and Users. The summary windows contain active, up-to-the-minute alarms, incident, statistical, log, diagnostic, and user information, and review and exchange textual messages with other administrative user accounts.

The Content area of the Dashboard screen contains various summary areas that display top-level, systemwide information, such as:

- Which alarms and incidents are currently active.
- Links to available Quick Links.
- List of installed Avaya SBCE security devices.
- Avaya SBCE deployment information.
- Area for viewing and exchanging text messages with other administrators.

Dashboard content descriptions

Name	Description
System Time	The current system time.
Version	The system software version.
Build Date	The system software build date.
License State	The license state.
Aggregate Licensing Overages	The aggregate license information.
Peak Licensing Overage Count	The peak licensing count.
Installed Devices	A list of all Avaya SBCE security devices currently deployed throughout the network.
Incidents (past 24 hours)	A list of current incidents reported by Avaya SBCE security devices to the EMS web interface.
Alarms (past 24 hours)	A list of current alarms reported by Avaya SBCE security devices to the EMS web interface.
Add	A user-editable text message exchange area.
Notes	The text message created by using the **Add** function.

Manage system alarms

Current system alarms are reported to the EMS web interface. The alarms are displayed as a red indicator on the Alarm viewer page and on the dashboard for the respective device.

The notifications provide the information necessary to clear the condition causing the alarm notification.

Viewing current system alarms

About this task

The Alarms screen displays a summary of all currently active system alarms. If no alarms are active, the system displays a blank screen. The Alarms screen is accessed only if the **Alarm Status**

Indicator on the toolbar indicates an alarm status, flashed red. Use the following procedure to view current system alarms.

Procedure

1. Log on to the EMS web interface.
2. On the toolbar, click **Alarms** or click on the specific alarm you want to view from the **Alarms (past 24 hours)** section of the Dashboard screen.

   The system displays the Alarms Viewer screen.
3. Select the Avaya SBCE device for which you want to view the alarms.

   The Alarms section displays all the currently active alarms for the selected Avaya SBCE security device.

   For the field description of each security reporting component of the Alarms screen, see Alarm Viewer field descriptions.

Alarm Viewer field descriptions

Name	Description
ID	Sequential, numerical identifier of the alarm being reported.
Details	The specific or descriptive name of the active alarm.
State	Current state of the alarm: ON The **State** field for any displayed alarm is always: ON
Time	Date and time when the alarm was generated.
Device	The Avaya SBCE device that generated the alarm.

Clearing system alarms

About this task

You can either delete a selected alarm or all alarms. Most of the alarms are cleared automatically when the condition to create these alarms no longer exist. However, there are some alarms that need to be cleared manually.

Procedure

1. To clear the selected alarm or all alarms, on the Alarms screen, click **Clear Selected** or **Clear All**.

   The system displays a confirmation pop-up window.
2. Click **OK**.

Viewing system incidents

About this task

You can view a complete descriptive list of all system incidents that have occurred since the last viewing period by using the Incident screen. The screen displays the last five incidents at any point of time. With this feature, you can view system-wide incidents according to category, such as DoS, Policy, and Scrubbing. When the Incident screen is open, the latest incident information is available, and the operator can scroll through the incidents list. The screen can display up to 15 incidents at one time. Use the following procedure to view current system incidents.

Note:

Incidents can only be viewed. They cannot be edited or deleted.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. On the toolbar, click **Incidents**.

   The system displays the Incidents Viewer page.

   You can view the incidents by clicking the specific incident on the **Incidents (past 24 hours)** section of the Dashboard screen.
3. Using the **Device** and **Category** fields, choose a search filter to find and display the particular incidents that you want to view.

   The Incident screen display changes to reflect the search criteria when a selection is made.

   The options for Incidents category selections include:

   - All
   - Authentication
   - Black White List
   - CES Proxy
   - DNS
   - DoS
   - High Availability
   - Licensing
   - Media Anomaly Detection
   - Policy
   - Protocol Discrepancy
   - RSA Authentication
   - Scrubbing
   - Spam

- TLS Certificate
- TURN/STUN

4. To ensure that the system displays all required incidents, periodically click **Refresh** to refresh the display.
5. Click **Clear Filters**.

   The system clears the filtering criteria of the **Device** and **Category** fields and sets the value of the fields to All.
6. Click **Generate Report** and select the start and end date to generate the report.

Viewing system SIP statistics

About this task

The Statistics screen provides a snapshot display of certain cumulative, system-wide generic and SIP-specific operational information.

Note:

You can only view the statistics information. You cannot edit or delete the statistics information. However, you can reset the counters for the SIP statistics.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. On the **Status** toolbar, click **SIP Statistics**.

   The system displays the Statistics Viewer screen.
3. To view the statistics, click one of the following tabs:

   - **SIP Summary**
   - **CES Summary**
   - **Subscriber Flow**
   - **Server Flow**
   - **Policy**
   - **From URI**
   - **To URI**

   On the **SIP Summary** tab, you can view information such as the number of:

   - Active calls
   - User registrations
   - Calls through the Avaya SBCE after the last restart

Real Time SIP Server Status

With Avaya SBCE Release 7.0, you can view the current status of the configured SIP servers. The system displays the connectivity status for trunk servers and enterprise call servers. You can use the **Server Status** option of the **Status** toolbar to view the status of the connection. The Server Status screen displays the list of servers based on the settings on the Server Configuration screen.

For the servers to show up in the Status window, you must configure server heartbeat in Server Configuration.

Viewing the status of the SIP servers

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. On the **Status** toolbar, click **Server Status**.

   The system displays the Status screen.

   The system displays server information, such as Server Profile, FQDN, IP address, Transport, Port, Status (UP/DOWN/UNKNOWN), and Time when the status field was last updated.

User registration

From Avaya SBCE Release 6.3 onwards, you can view the list of users that are registered through Avaya SBCE. You can also enter custom search criteria for the fields that are displayed on the system.

Viewing the list of registered users

Procedure

1. Log on to the EMS web interface.
2. On the **Status** toolbar, click **User Registrations**.

   The system displays the list of registered users.
3. For complete details of a registered user, click the user details.

   The system displays the following information:

   - User information:
     - Address of record of the user
     - User Agent information related to the type of endpoint and SIP instance information
     - Firmware type and the controller mode
   - Servers:
     - The Avaya SBCE device through which the user is registered to Avaya Aura®

- The subscriber flow and server flow that were used for registration
- Session Manager address, port, and transport used for registration
- Endpoint private IP, natted IP, and transport
- Endpoint registration state and last reported time

User Registrations field description

The User Registrations screen displays the list of endpoints registered through Avaya SBCE with the following details for each registration.

Name	Description
AOR	The SIP URI used by the endpoint to register to Session Manager.
SIP Instance	The MAC address of the endpoint.
Last Reported Time of Registration	The time when the user registration status was last updated.

When the endpoint tries to register to Avaya SBCE, each call server uses the following information:

Name	Description
SBC device	The Avaya SBCE device that receives the REGISTER message.
Session Manager address	The address of the call server with the primary or secondary status.
Registration state	The registration status of the endpoint.

Viewing system logs

About this task

SysLog Viewer displays the syslog file according to certain user-definable filtering criteria, such as log type, time period, and severity. Use the following procedure to define and view syslog reports.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. Select the **Logs** option from the toolbar, and click the **System Logs** menu.

   The system displays the Syslog Viewer screen. On this screen, you can specify criteria in the **Query Options** section to filter the results displayed.
3. In the **Start Date** and **End Date** fields, filter the results displayed in a search report to fall within starting and ending dates and times. In previous Avaya SBCE Syslog Viewer windows, there were four separate fields: **Start Date**, **Start Time**, **End Date**, and **End Time**.

Note:

The date and time entries are combined in a single field, mm/dd/yyyy [hh:mm], with the time entry, [hh:mm], being optional. An **End Date** or **End Time** entry is not required when you enter a **Start Date** or **Start Time**.

You can also select additional search criteria in the **Query Options** section.

4. In the **Keyword** field, type one or more words to define the limits of the log report, and click **Search**.

   The system runs the report and displays the output.

Note:

Keyword searches are case-insensitive and tokenized. Each keyword term entered in the **Keyword** field is searched. However, for a log line to be included in a report, all keyword terms that are entered in the **Keyword** field must be found in that log line.

Query Options field descriptions

The Query Options section on the Syslog Viewer screen contains options for filtering the Syslog logs.

Name	Description
Keyword	Search keywords for viewing logs.
Start Date	Date and time from which you want to view logs. You can enter values in the format mm/dd/yyyy [hh:mm]. Entering time is optional.
End Date	Date and time up to which you want to view logs You can enter values in the format mm/dd/yyyy [hh:mm]. Entering time is optional.
Show	Number of entries to be displayed on a page.
Class	Class of the logs to be displayed. The following options are available: • All • Platform • Trace • Security • Protocol • Incidents • Registration • Audit • GUI

Table continues…

Name	Description
	• Unknown
Severity	Severity of the logs to be displayed. The following options are available: • Unknown • Info • Notice • Warning • Error • Critical • Alert • Emergency

Viewing audit logs

About this task

Audit Log Viewer displays the contents of the audit log. The audit log contains a record of security related events, such as logins, session starts, session ends, new user additions, and password attempts/retries/changes. Use the following procedure to view the Audit Log Viewer information.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. On the toolbar, click **Logs** > **Audit Logs**.

   The system displays the Audit Log Viewer page.
3. In the **Start Date** and **End Date** fields, you can filter the results that are displayed in a search report to fall within starting and ending dates and times.
4. In the **Keyword** field, type one or more words to define the limits of the log report, and click **Search**.

   In the Results section, the system displays the report output.
5. To see additional details about a particular log line in a report, select the log line.

   The system displays the Audit Log Details page.
6. On the **Device Specific Settings** > **Syslog Management** page, you can set the log level rules for the Audit Log and other logs.

   Audit Logging is enabled in the Log Level row for the Audit class and Audit Facility as LOG_LOCAL6.

The Log Level Facility name, LOG_LOCAL6, is reserved for Audit Logging and cannot be changed. The LOG_LOCAL6 file path destination cannot be changed either. The file path is `/archive/syslog/ipcs/audit.log`.

Viewing diagnostics results

About this task

The Diagnostics screen provides a variety of tools to aid in troubleshooting Avaya SBCE operation. Available tools include a full diagnostic test suite, and individual tabs to monitor certain functional aspects of Avaya SBCE, such as TCP and TLS activity.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. On the toolbar, click **Diagnostics**.

   The system displays the Diagnostics page.
3. Click **Full Diagnostics**.
4. Click **Start Diagnostic**.

   The tests listed in the **Task Description** column of the display are sequentially run, with the results of the test displayed in the **Status** column. If an error is encountered while running a test, the test continues until all tests are run. The system displays the reason for the error in the **Status** column.
5. Click **Ping Test**.

   The ping test can be used to verify basic IP connectivity to elements beyond the gateways. For example, ASM or the trunk server.

Viewing administrative users

About this task

The Active Users page provides a summary of all active system administrative accounts currently logged on to the EMS web interface.

Note:

You can only view the users account information. You cannot modify the information.

Use the following procedure to view the system administrative accounts that are currently logged on to the interface.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. On the toolbar, click **Users**.

The system displays the Active Users page.

Roll back to an earlier release

For information about upgrading to Avaya SBCE Release 7.0 and rolling back to an earlier release, see *Upgrading Avaya Session Border Controller for Enterprise*.

Support contact checklist

Use this checklist to collect the critical information that you must gather before you contact Avaya Technical Support.

Try to resolve the issue using this document before you contact Avaya. Contacting Avaya is the final step only after you are unable to resolve the issue.

Gather the following information before you contact Avaya Technical Support:

No.	Task	Description	Notes	✔
1	Your full name, organization, and telephone number where an Avaya representative can contact you about the problem.			
2	The Sold To number.	Also known as the Functional Location (FL) number.		
3	Detailed description of the problem.			
4	The type of service contract your organization has with Avaya.			
5	Your product release information.	Include the software versions, hardware deployment type, operating system, third-party software and database versions.		
6	Description of any Avaya Professional Services contracts.			

Table continues…

No.	Task	Description	Notes	✔
7	Description of remote access availability.			
8	Date and time when the problem started.	Refer to log files if applicable.	If the problem is intermittent, determine when the problem started and stopped.	
9	Frequency of the problem.			
10	What InSite Knowledge Base solutions have you tried?	Use the Advanced Search option to narrow your search to specific categories and document types.		
11	Detailed information about recent system upgrades, network changes, or custom applications.	Include the date and the time when the changes were made. Also include information about who made the changes.		
12	Appropriate logs and packet captures of the issue	Take packet captures when the issue occurs and save appropriate logs to facilitate investigation.		

Chapter 3: Monitoring and analysis

Tools and utilities

traceSBC tool

The tcpdump tool is the main troubleshooting tool of Avaya SBCE, which can capture network traffic. Using tcpdump is a reliable way to analyze the information arriving to and sent from the SBC. However, tcpdump has its own limitations, which can make troubleshooting difficult and time consuming. This traditional tool is not useful in handling encrypted traffic and real-time troubleshooting.

SIP and PPM traffic is encrypted especially in Remote Worker configurations. Checking encrypted traffic with a network capture is difficult and time consuming. The delay occurs because the unencrypted private key of the Avaya SBCE is needed to decrypt the TLS and HTTPS traffic.

The traceSBC tool offers solutions for both issues. traceSBC is a perl script that parses Avaya SBCE log files and displays SIP and PPM messages in a ladder diagram. Because the logs contain the decrypted messages, you can use the tool easily even in case of TLS and HTTPS. traceSBC can parse the log files downloaded from Avaya SBCE. traceSBC can also process log files real time on Avaya SBCE, so that you can check SIP and PPM traffic during live calls. The tool can also work in the noninteractive mode, which is useful for automation.

Log files

Avaya SBCE can log SIP messages as processed by different subsystems and also log PPM messages. The traceSBC utility can process the log files real-time by opening the latest log files in the given directories. traceSBC also checks regularly if a new file is generated, in which case the old one is closed and processing continues with the new one. A new log file is generated every time the relevant processes restart, or when the size reaches the limit of ~10 M.

Log locations:

SIP messages are found at /archive/log/tracesbc/tracesbc_sip/ and PPM messages can be found at /archive/log/tracesbc/tracesbc_ppm/.

Active files are of the following format:

```
-rw-rw---- 1 root root 112445 Aug 21 10:12 tracesbc_sip_1408631651
```

Inactive or closed files are of the following format:

-rw-rw---- 1 root root 175236 Aug 21 06:33 tracesbc_sip_1408617250_1408620820_1 or

-rw-rw---- 1 root root 31706 Jul 10 13:34 tracesbc_sip_1436549674_1436553270_1.gz

SIP and PPM logging administration

Starting from Release 6.3, SIP and PPM logging is always enabled by default.

Advantages

Memory

After 10000 captured messages, traceSBC stops processing the log files to prevent exhausting the memory. This check is done during the capture when the tool is parsing the log files. The tool counts the number of SIP and PPM messages in the logs. This number is not the number of messages sent or received on the interfaces. This counter is a summary of messages from all logs, not for each log. Note that this safeguard is present only for real-time mode. When the tool is used in nonreal-time mode, this counter does not stop processing the logs specified in the command line. The counter continues processing the logs specified in the command line to be able to process more files or messages in off-line mode.

Processor

A built-in mechanism is available to prevent high CPU usage. Throttling is not tied to CPU level. In the current implementation, throttling is done by releasing the CPU for a short period after each line of the file is processed. The result is that CPU occupancy is low on an idle system when the tool actively processes large log files. You can disable throttling by the –dt command line parameter which can be useful when processing large log files offline. However, in this case CPU occupancy might go up to 100%, and so you must not use this option on a live system.

Operation modes

Non real-time mode

The tool starts with at least one file in the command line parameters. The tool automatically detects the type of files, processes the files, and finally displays messages from the different files in one diagram ordered by the timestamp. If filters are set, only the messages that match the filters are displayed in the diagram. In this mode, enabling live capture is not an option.

Examples:

```
# traceSBC tracesbc_sip_1408635251
```

```
# traceSBC /archive/log/tracesbc/tracesbc_sip/tracesbc_sip_1408635251 archive/log/
tracesbc/tracesbc_ppm/tracesbc_ppm_1408633429
```

Real-time mode

In this mode, traceSBC must be on active Avaya SBCE. traceSBC is started without specifying a file in the command line parameters. The tool automatically starts processing the log files. The live capture can be started and stopped anytime without affecting service.

Example:

```
 # traceSBC
```

Automatic mode

In this mode, traceSBC must be on the Avaya SBCE and the command is called with -a and -w parameters at a minimum.

Example:

```
# traceSBC -a "sip|ppm" -w /tmp/trace.log
```

Use this mode for test automation. You can also use this mode to stop capture when a certain condition is met, and then save filtered messages automatically. Multiple stop triggers are present, such as number of packets, time, regular expression, and a combination of these. When a stop trigger fires, or when you press `CTRL+C`, the tool automatically saves the filtered messages and stops the captures.

User interface

Window header

The window header shows the hostname, the name of the script, the number of captured messages, and the number of displayed messages that matched the filters. The header also displays warning messages such as MAX NUM PACKETS 10000 EXCEEDED.

Ladder diagram

The ladder diagram displays the filtered messages. The arrow shows the direction of the message between the SBC and the host from where the message arrived or was sent to. The IP of the host is at the top of the column. If the host is an Avaya phone, traceSBC attempts to extract the user information from the message, and replaces the IP with the user handle. To navigate between the messages, use the UP/DOWN arrow keys. The message is highlighted. To see the details of the message, press `Enter`. The header of the message detail form shows the source and destination IP or port and the transport protocol.

Status bar

The bottom line has two areas, and its content depends on which mode the tool is in. The left side of the status bar shows the filename in nonreal-time mode, or shows Multiple files when the tool was called with more than one file. In real-time mode, this area shows which trace is active. Red means disabled, and green means enabled.

The rest of the status bar lists the available commands:

`s=Start / s=Stop` : Starts or stops live capture, which means the tool enables or disables the appropriate logging. Capture can be enabled for SIP and PPM individually. Stop disables all logging at the same time and stops processing the log files. This command shows only if the tool was started in real-time mode.

Note:

Depending on the traffic and the capture modes, at the time of stopping the trace, the log files might contain more messages than the messages already captured by the tool.

`q=Quit`: Quit from the tool. If capture is running, the tool shows a pop-up to confirm the exit without stopping the logging.

`f=Filters`: Set new filter options. The filter options set in the dialog window, override the command line filter settings. If no New Filter is entered, the Current Filter will remain active. To clear all filters, type **e** or **erase** in the **New Filter** field.

w=Write: Export filtered messages to a file. The dialog prompts you for a filename. The system saves SIP messages in the specified file to the current directory. The system saves PPM messages in a separate file with .ppm extension. The system also exports SIP messages in pcapng format to a file with .pcapng extension. SIP messages can be exported if text2pcap and tshark utilities are available on the machine where traceSBC is run.

i=IP / i=Name: Toggle between IP and user name presentation of the hosts in the header of the ladder diagram.

r=RTP: Turn RTP simulation on or off. When a session is established either early or confirmed, the tool inserts a line in the diagram. This line represents the RTP stream between the two hosts described by the SDP. The diagram also shows the negotiated codec type.

Note:

The RTP stream is created based on the negotiated information in SDP. However, there is no guarantee that these RTP streams come to the system.

u=Full Screen: Use the full screen for the message detail box without having the left and right side of the frame. This option is useful not only to see more about the message, but to easily copy or paste the content.

d=Calls: Shows the summary of all calls.

Trace

With the Trace function, you can trace an individual packet or group of packets comprising a call through Avaya SBCE. The information shows how the call traversed the Avaya SBCE-secured network.

Configuring Packet Capture

About this task

Use the following procedure to set the filtering options and to capture packets or message flow.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **Device Specific Settings** > **Troubleshooting** > **Trace**.
3. In the **Devices** section, click the Avaya SBCE device for which you want to configure packet capture.
4. Click **Packet Capture**.

   The system displays the Packet Capture page.
5. On the Packet Capture page, do the following:
   a. In the **Interface** field, click `Any` or the required interface. The default value is Any.
   b. In the **Local Address** field, click `All` or the required local address. You can type the port number for the required local address. The default value is All.

c. In the **Remote Address** field, type the remote IP address and port.

   The default value is *.

d. In the **Protocol** field, click the protocol.

   The options are: All, TCP, and UDP.

e. In the **Maximum Number of Packets to Capture** field, type the number of packets to capture the data. You can enter values between 1 to 10,000.

   Note:

   Do not capture more than 10,000 packets. The system displays a warning message.

f. In the **Capture Filename** field, type the name of the file to capture the data.

   Using the name of an existing capture will overwrite it.

g. Click **Start Capture**.

   The system displays a message that `A packet capture is currently in progress. This page will automatically refresh until the capture completes.`

h. Click **Stop Capture**.

   The system stops capturing the data and saves the packet capture file in the pcap format on the Captures page.

6. On the Captures page, click **Refresh**.

   The system displays the file with the file size information in bytes and the date when the file is last modified.

7. On the Captures page, click the file name.

   The system displays the File Download window.

8. On the File Download window, click **Save** or open the file directly.

   The system displays the Save As window.

9. Navigate to a directory for saving the Packet Capture (pcap) file and click **Save** to save the file to the new directory.

10. Use Wireshark or a similar application to open up the Packet Capture (pcap) file. If Wireshark is already installed, you can double-click on the file to open it with Wireshark. Otherwise, start Wireshark first and then either open the file from within the Wireshark application or double-click on the Packet Capture file.

    Note:

    You can view the file using Wireshark (originally named Ethereal), a free and open-source packet analyzer application used for network troubleshooting, analysis, and software protocol development. You can download and install Wireshark, or a similar network analyzer program, to view the Packet Capture (pcap) file.

tcpdump

You can use tcpdump to capture packets from the CLI if you need to capture more than 10000 packets. After the captures are taken, ensure you stop the command.

For packet capture started through GUI, the output files are stored in `/archive/pcapfiles/IPCS2`.

Running tcpdump in CLI

Procedure

1. Log on to the EMS server through SSH with ipcs user credentials.
2. At the command prompt, type `cd /archive/pcapfiles/ICPS2`.
3. Type `tcpdump -ni any -s 0 -w '`*filename*`.pcap'`, where *filename* is the name of the packet capture file.
4. Wait for the capture to end, and press `Ctrl+C`.
5. Type `chown ipcs:ipcs` *filename*`.pcap`.

   The system displays the packet capture file in the **Captures** tab in the EMS web interface.

---

showflow

A flow is a connection between an endpoint and Avaya SBCE. Types of flows are:

- Static: A static flow is configured on the Avaya SBCE only one time. Static flows do not change until the administrator changes the flows. Static flows are used, for example, for connections between endpoints and an Avaya SBCE signaling address.
- Dynamic: A dynamic flow is a transient connection between an endpoint and Avaya SBCE. Software creates, modifies, and deletes dynamic flows to support the transfer of media packets through Avaya SBCE.

Many flows can exist on Avaya SBCE simultaneously. To troubleshoot issues with Avaya SBCE, you can use the **showflow** command to display flows with varying levels of detail.

Syntax

```
showflow 310 flow-type detail-levelfilter-ip
```

flow-type The flow type can be:

- static: Shows all static flows.
- dynamic: Shows all dynamic flows.
- turn_client_side: Shows all TURN flows on the listen interface of Avaya SBCE.
- turn_far_side: Shows all TURN flows on the relay interface of Avaya SBCE.
- blacklist: Shows all IP addresses that are currently blacklisted. Packets from blacklisted addresses do not match any flows.

- whitelist: Shows only those static flows that require whitelisting of the endpoint IP address.

detail-level You can specify the detail level for dynamic flows. The detail level for all other flows is fixed. When levels exceed the default detail level 0, you can see the default flow information and also additional information for the flow. The detail levels for dynamic flows can be:

- 0: Shows the default level of information. If a detail level is not specified in the command, the system uses 0 detail level.
- 1: Adds more decrypt information to every flow.
- 2: Adds more encrypt information to every flow.
- 3: Adds the physical port number for the output of the flow. Packets matching this flow are sent out of this physical port.
- 4: Adds relay information. Packets matching this flow are changed according to this relay before they are forwarded.
- 5: Adds VLAN identifiers and flow statistics.
- 6: Adds SIPREC information. This option does not change non-SIPREC flows.
- 7: Adds encrypt information for a SIPREC flow. This option does not change non-SIPREC flows.
- 8: Adds decrypt information for a SIPREC flow. This option does not change non-SIPREC flows.

filter-ip If you specify a filter IP address, the **showflow** command displays dynamic flows that use the IP address that you specified as:

- An input or a packet source
- An output or a packet destination

When you specify a filter IP address, the **showflow** command displays dynamic flows pertaining to an endpoint with that IP address. If you do not provide a filter IP address, the system displays all dynamic flows.

Description

Showflow is a root-level console command to display the flows that are currently active on Avaya SBCE.

Example

The following example displays full details of all dynamic flows with 10.20.30.40 as a source or destination:

```
showflow 310 dynamic 8 10.20.30.40
```

The following example displays all static flows:

```
showflow 310 static
```

Debugging logs

Enabling application debug logs

About this task

The debugging logs are located at `/archive/log/ipcs/log/ss/logfiles/elog/`. You can collect the logs from the console.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **Device Specific Settings** > **Troubleshooting** > **Debugging**.
3. Click the **Subsystem Logs** tab.
4. Select the device on which you want to toggle the log settings.
5. Do one of the following:
   - To turn on all debug information on the device, select the **Debug**, **Info**, and **Warning** log level check boxes at the top of the table.
   - To select a specific log level for all devices, select the **Debug**, **Info**, or **Warning** log level check box at the top of the table.
   - To select log levels for a specific subsystem, select the **Debug**, **Info**, or **Warning** log level check box next to the subsystem.
6. Click **Save**.

Disabling application debug logs

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **Device Specific Settings** > **Troubleshooting** > **Debugging**.
3. Click the **Subsystem Logs** tab.
4. Deselect all the **Debug/Info/Warning** log level check boxes. If you want to deselect a specific log level check box for all the devices, click the check box on the top of the table.
5. Click **Save**.

Enabling GUI debug logs

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **Device Specific Settings** > **Troubleshooting** > **Debugging**.
3. In the Application pane, click the EMS device.
4. In the Content area, click **GUI** Logs.
5. Select the required log levels. For more information about the log levels, see GUI Logs components description.
6. Click **Save**.

GUI Logs components description

GUI Logs

Controls master log level for all GUI logs.

Components	Description
IH	Creates detailed logs generated by GUI IH client. Handles statistics retrieval from the application.
SOAP	Creates detailed logs generated by GUI SOAP client. Handles communication with EMS/SBC CM servers, for example, restart application, reboot device, and uninstall device.
EMS-CM Relay	Creates detailed logs generated by SOAP relay module. Handles communication relay between EMS CM and SBC CM, for example, device registration and configuration retrieval
Shell Commands	Creates detailed logs when you start any external process.
File Uploads	Creates detailed logs for user file uploads, for example, upgrade packages, scrubber packages, and certificates.
Licensing	Creates detailed logs generated by GUI WebLM client.

Third Party Components

Controls master log level for third party logs. Covers any logs from third party libraries the GUI uses.

Component	Description
SSH	Controls log level for third party SSH library used for backup/restore and remote actions. The available options are: • Inherit • Debug • Info • Warn • Error

Disabling GUI Logs

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **Device Specific Settings** > **Troubleshooting** > **Debugging**.
3. In the Application pane, click the EMS device.
4. In the Content area, click **GUI Logs**.
5. Click **Reload From File**.
6. Click **Save**.

Debug logs location

The debug logs can be collected from the console.

The elog files for processes running on Avaya SBCE are available at `/archive/log/ipcs/ss/logfiles/elog/`. The elog files for processes running on EMS are available at `/archive/log/ipcs/sems/logfiles/elog/`.

Table 1: Elog locations for processes

Process	elog Path	Purpose
EMS		
SYSMON	`/archive/log/ipcs/sems/logfiles/elog/SYSMON`	To debug connectivity issues between Avaya SBCE and EMS, process restart due to ping failure, and HA issues

Table continues…

Process	elog Path	Purpose
SEMS	`/archive/log/ipcs/sems/logfiles/elog/SEMS`	To debug issues related to the database
OAMPSERVER	`/archive/log/ipcs/sems/logfiles/elog/OAMPSERVER`	To debug SNMP and statistics
LOGSERVER	`/archive/log/ipcs/sems/logfiles/elog/LogServer`	To debug issues related to logging for other processes
Avaya SBCE		
SBC SYSMON	`/archive/log/ipcs/ss/logfiles/elog/SYSMON`	To debug connectivity issues between Avaya SBCE and EMS, process restart due to ping failure, and HA issues
SSYNDI	`/archive/log/ipcs/ss/logfiles/elog/SSYNDI`	To debug SIP application and media issues
CONFIG_PROXY	`/archive/log/ipcs/ss/logfiles/elog/CONFIG_PROXY`	To debug PPM related issues debugging logs To debug PPM related issues, you require nginx logs along with the CONFIG_PROXY logs
OAMPSERVER	`/archive/log/ipcs/ss/logfiles/elog/OAMPSERVER`	To debug SNMP and statistics
TURNCONTROLLER	`/archive/log/ipcs/ss/logfiles/elog/TURNCONTROLLER`	To debug issues with TURN/STUN

TraceSBC logs for SIP are available at `/archive/log/tracesbc/tracesbc_sip`. TraceSBC logs for PPM are available at `/archive/log/tracesbc/tracesbc_ppm`

Core dumps are generated at `/usr/local/ipcs/bin`. Smdumps for each process is available at `/usr/local/ipcs/smdump/`.

Traps

From Release 7.0, Avaya SBCE can send traps to System Manager. To see Avaya SBCE alarms on System Manager, you must upload the Avaya SBCE common alarms definition file (cadf) to System Manager. For more information, see *Administering Avaya Session Border Controller for Enterprise*.

Trap	Cause
avAuraSbceCpuUsageAlarm	CPU utilisation exceeds a set threshold
avAuraSbceMemoryUsageAlarm	Memory utilisation exceeds a set threshold

Table continues…

Trap	Cause
avAuraSbceDiskUsageAlarm	Disk space utilization exceeds a set threshold
avAuraSbceDiskFailureAlarm	Hard Disk fails
avAuraSbceNwFailureAlarm	Network fails
avAuraSbceHAFailureAlarm	HA failure When Avaya SBCE generates this trap, the primary SBCE goes down and secondary SBCE switches to primary state.
avAuraSbceHaHeartBeatFailureAlarm	Connection between SM and Avaya SBCE breaks OR SM stops sending responses
avAuraSbceScpFailureAlarm	SCP of LogArchive fails
avAuraSbceCopyFAilureAlarm	Copy of Log Archive fails
avAuraSbceProcessFAilureAlarm	A process starts after the process fails

Incidents

The following sections describe the incidents that can occur in Avaya SBCE.

Denial of Service (DoS) incidents

Incident Name	Cause
ipcsSingleSourceDoS	Avaya SBCE detects a single source DoS
ipcsSingleSourceCallWalkDoS	Avaya SBCE detects a call walk DoS
ipcsPhoneDoS	Avaya SBCE detects a phone DoS
ipcsPhoneStealthDoS	Avaya SBCE detects a phone stealth DoS
ipcsServerDoS	Avaya SBCE detects a server DoS or blocks a server DoS The incident occurs due to any of the following reasons: • Initiated Threshold Crossed - Action Whitelist • Pending Threshold Crossed- Action Whitelist • Failed Threshold Crossed- Action Whitelist • attack from Server side - Initiated Threshold Crossed- Action SIV • attack from Server side - Pending Threshold Crossed- Action SIV • attack from Server side - Failed Threshold Crossed- Action SIV • Initiated Threshold Crossed- Action Limit • Pending Threshold Crossed- Action Limit

Table continues…

Incident Name	Cause
	• Failed Threshold Crossed- Action Limit
ipcsPhoneStealthDDoS	Avaya SBCE detects a phone stealth DDoS
ipcsDomainDoS	Avaya SBCE detects a domain DoS

Blacklist/Whitelist incidents

Incident Name	Cause
ipcsBlackipcsListCallBlocked	Avaya SBCE comes across a blacklisted caller

Scrubbing related incidents

Incident Name	Cause
ipcsDroppedScrubMsg	Avaya SBCE comes across a SDP parser error or scrubber anomaly
ipcsRejectedScrubMsg	Avaya SBCE comes across a scrubber anomaly
ipcsDetectedScrubMsg	Avaya SBCE comes across a scrubber anomaly

Protocol discrepancy incidents

Incident Name	Cause
ipcsACKMsgOutofDialogue	Avaya SBCE gets an out of dialogue ACK message
ipcsBYEMsgOutofDialogue	Avaya SBCE gets an out of dialogue BYE message
ipcsCANCELMsgOutofDialogue	Avaya SBCE gets an out of dialogue CANCEL message
ipcsNOTIFYMsgOutofDialogue	Avaya SBCE gets an out of dialogue NOTIFY message
ipcsPRACKMsgOutofDialogue	Avaya SBCE gets an out of dialogue PRACK message
ipcsREINVITEMsgOutofDialogue	Avaya SBCE gets an out of dialogue REINVITE message
ipcsREFERMsgOutofDialogue	Avaya SBCE gets an out of dialogue REFER message
ipcs1XXMsgOutofTransaction	Avaya SBCE gets an out of dialogue 1xx class response
ipcs2XXMsgOutofTransaction	Avaya SBCE gets an out of dialogue 2xx class response
ipcs3XXMsgOutofTransaction	Avaya SBCE gets an out of dialogue 3xx class response
ipcs4XXMsgOutofTransaction	Avaya SBCE gets an out of dialogue 4xx class response
ipcs5XXMsgOutofTransaction	Avaya SBCE gets an out of dialogue 5xx class response
ipcs6XXMsgOutofTransaction	Avaya SBCE gets an out of dialogue 6xx class response
ipcsAuthRealmMismatch	Avaya SBCE comes across a realm mismatch

Policy related incidents

Incident Name	Cause
ipcsCallDenied	Calls to the Avaya SBCE are denied due to any of the following reasons: • Video is disabled or disallowed • Audio is disabled or disallowed

Table continues…

Incident Name	Cause
	• Maximum number of video sessions is exceeded • Maximum number of audio sessions is exceeded • Maximum number of audio sessions per endpoint is exceeded • Maximum number of video sessions per endpoint is exceeded • No Server Flow is matched for incoming message • No Server Flow is matched for outgoing message • No Subscriber Flow is matched • Prop method disallowed out of dialog message • Standard method disallowed out of dialog message • No Routing Rule is matched • Codec is disallowed • Method is disallowed
ipcsRegistrationDenied	Avaya SBCE denies registration because of any of the following reasons: • No Server Flow is matched for incoming message • No Server Flow is matched for outgoing message • No Subscriber Flow is matched • Prop method disallowed out of dialog message • Standard method disallowed out of dialog message • No Routing Rule is matched • Method is disallowed
ipcsSubscriptionDenied	Avaya SBCE denies subscription because of any of the following reasons: • No Server Flow is matched for incoming message • No Server Flow is matched for outgoing message • No Subscriber Flow is matched • Prop method disallowed in dialog message • Standard method disallowed in out of dialog message • No Routing Rule is matched • Method is disallowed
ipcsRedirectionDenied	Avaya SBCE denies redirection because of any of the following reasons: • No Server Flow is matched for incoming message • No Server Flow is matched for outgoing message

Table continues…

Incident Name	Cause
	• No Subscriber Flow is matched • Prop method disallowed in dialog message • Standard method disallowed in dialog message • Prop method disallowed in out of dialog message • Standard method disallowed in out of dialog message • No Routing Rule is matched • Method is disallowed
ipcsMessageDropped	Avaya SBCE drops a message because of any of the following reasons: • No Server Flow is matched for incoming message • No Server Flow is matched for outgoing message • No Subscriber Flow is matched • Response prop header is disallowed • Response standard header is disallowed • Response prop header is mandatory • Response standard header is mandatory • Response prop header is disallowed • Response standard header is disallowed • Request prop header is mandatory • Request standard header is mandatory • Prop method disallowed in dialog message • Standard method disallowed in dialog message • Method is disallowed • Prop method disallowed in out of dialog message • Standard method disallowed in out of dialog message

Route incidents

Incident Name	Cause
ipcsPrimaryRadiusServerUnreachable	Primary Radius server is unreachable
ipcsSecondaryRadiusServerUnreachable	Secondary Radius server is unreachable

TLS certificate failure incidents

Incident Name	Cause
ipcsTlsCertificate	Avaya SBCE comes across a TLS certificate error because of any of the following causes: • Could not create TLS context - for default client mode • No cipher list is provided • Could not create TLS context for either server or client mode • Could not read Certificate • Could not read private key • Private key does not correspond to the loaded certificate • Unable to load Root Certificate or CA list • Unable to load CRL list • Unable to cipher list provided • No cipher list provided

Media anomaly detection incidents

Incident Name	Cause
ipcsPacketSizeViolation	Avaya SBCE comes across a packet size violation
ipcsSSRCViolation	Avaya SBCE comes across a synchronization source
ipcsSeqNoViolation	Avaya SBCE comes across a sequence number violation
ipcsTimestampViolation	Avaya SBCE comes across a timestamp violation
ipcsMediaInActivityFromBothSides	Avaya SBCE comes across a media inactivity from both sides of the call
ipcsUnsupportedMedia	Avaya SBCE comes across unsupported media
ipcsRTPDoSAttack	Avaya SBCE comes across an RTP denial of service attack
ipcsMediaPortUnavailable	No free media ports are available
ipcsRTPInjectionAttack	Avaya SBCE comes across an RTP injection attack

HA link failover incident

Incident Name	Cause
ipcsHAGracefulFailover	The primary server has gone down voluntarily
ipcsHAKaFail	High Availability keep alive messages fail
ipcsHATakeoverDone	HA takeover is completed
ipcsHASecondaryDown	HA secondary server is down and HA will not be available until the secondary server is up

License incidents

Incident Name	Cause
sbcLicenseExceeded	Avaya SBCE gets requests after the maximum number of licensed sessions is exceeded

TURN/STUN incidents

Incident Name	Cause
sbcTurnStunMediaRelayCreationFailed	Media relay flow creation failed
sbcTurnStunMediaRelayDeletionFailed	Media relay flow deletion failed
sbcTurnStunServerError	Avaya SBCE detects a TURN/STUN error because of any of the following reasons: • Invalid User Name is configured • Invalid Realm is configured • Invalid Password is configured • Invalid Realm is configured • Relay Port is unavailable • TCP/TLS Listener has failed • Invalid User Account is configured • Invalid User Name is configured

CES Proxy incidents

Incident Name	Cause
sbcCesProxy1xMUserLoginFailed	Login attempts from an Avaya one-X® Mobile user to the CES proxy fails because of any of the following reasons: • Protocol Type validation failed • CesProxy data is not present • Avaya SBCE received an invalid response other than login response • Object Type validation failed • Login request data type validation failed • Login request key id validation failed • API object type validation failed • API data type and key Id validation failed • API data type validation failed • API key id validation failed • Object type validation failed

Incident Name	Cause
	• Avaya one-X® Mobile user login failed

SNMP MIB

Management Information Base (MIB) are defined in RFC-1213. Avaya SBCE supports rfc1213.mib.

MIB-II support

Avaya SBCEsupports MIB-II (RFC1213) for Avaya SBCE data interfaces.

SBCE OID Descriptions

This section describes the key Object Identifiers (OIDs).

Private Enterprise OIDs support

Avaya SBCE supports the following private enterprise OIDs.

ipcs stats sip calls: .1.3.6.1.4.1.6889.2.77.1.3.1	.iso.org.dod.internet.private.enterprises.Avaya.ipcsstatisticsinfo.ipcsstatssip.ipcsstatssipcalls
ipcs stats sip protocol: .1.3.6.1.4.1.6889.2.77.1.3.3	.iso.org.dod.internet.private.enterprises.Avaya.ipcsstatisticsinfo.ipcsstatssip.ipcsstatssipprotocol
Ipcsincidencesinfo: .1.3.6.1.4.1.6889.2.77.4	.iso.org.dod.internet.private.enterprises.Avaya.ipcsincidencesinfo
Ipcsalarmsinfo: .1.3.6.1.4.1.6889.2.77.2	.iso.org.dod.internet.private.enterprises.Avaya.ipcsalarmsinfo

Key OIDs

Ipcsstatssipcalls

ipcssipcTotalRegistrationRequests	Number of Registration Requests received at node. This number does not include the registration triggered by node for keeping the pinhole open.
ipcssipcTotalRegistrationsChallenged	Number of Registrations Challenged by node and also includes the number of challenges from the Call Server. The number of registrations challenged by IPCS node includes the SIP 401/407 based Radius Authentication Responses (AAA feature) and SIP

Table continues…

	407 based SIV Authentication Responses (DOS feature).
ipcssipcTotalRegistrationsRejected	Number of Registrations Rejected by the node and also includes the failed registration responses observed from the call server at the node. Failed registration responses include the SIP 4xx-6xx class responses excluding SIP 400, SIP 401/407 Responses. The registrations are rejected by the node due to failed registration challenges, failed registration processing, and registrations blocked due to security features.
ipcssipcTotalCallsReceived	Total Number of SIP Calls received at the node. This number equals Calls Blocked + Calls Allowed.
ipcssipcTotalCallsBlocked	Number of SIP calls Blocked by the node due to SIP Parse errors, failed AAA challenges, and calls blocked due to security features.
ipcssipcTotalCallsAllowed	Number of SIP calls classified by the node as Legitimate.

Classification of Requests/Responses matching a particular Domain Policy Group at the node

ipcsTotalINVITES	Number of SIP INVITE messages
ipcsTotalINVITERetransmits	Number of SIP INVITE Retransmits
ipcsTotalINVITE100Responses	Number of SIP INVITE 100 Responses
ipcsTotalINVITE1XXResponses	Number of SIP INVITE 1XX class Responses excluding SIP 100 Response.
ipcsTotalINVITE200Responses	Number of SIP INVITE 200 Responses
ipcsTotalINVITE200ResponseRetransmits	Number of SIP INVITE 200 Response Retransmits
ipcsTotalINVITE4XX6XXResponses	Number of SIP INVITE 4XX 6XX Responses
ipcsTotalINVITE4XX6XXResponseRetransmits	Number of SIP INVITE 4XX 6XX Response Retransmits
ipcsTotalBYESent	Number of SIP BYE requests
ipcsTotalBYERetransmits	Number of SIP BYE Retransmits
ipcsTotalBYE200Responses	Number of SIP BYE 200 Responses
ipcsTotalCANCELSent	Number of SIP CANCEL requests
ipcsTotalCANCEL200Responses	Number of SIP CANCEL 200 Responses
ipcsTotalACK200Responses	Number of SIP ACK requests for INVITE 200 OK Response
ipcsTotalACK4XX6XXResponses	Number of SIP ACK requests for INVITE 4xx-6xx class Responses

Table continues…

ipcsTotalACKTimeOuts	Number of SIP ACK timeouts ie. Number of ACK requests missing for the INVITE 200 OK/4xx-6xx class responses
ipcsTotalNonInviteRequests	Number of NonInvite Requests
ipcsTotalNonInvite1xxResponses	Number of NonInvite 1xx Responses
ipcsTotalNonInvite2xxResponses	Number of NonInvite 2xx Responses. Also includes the 200 OK responses for BYE and CANCEL requests

Out of Dialog Requests dropped

ipcsTotalOutOfDialogReferMesFromNW	Number of Out of Dialog REFER requests dropped at the node
IpcsTotalAckMessageOutOfDialogue	Number of Out of Dialog ACK requests dropped at the node
IpcsTotalByeMessageOutOfDialogue	Number of Out of Dialog BYE requests dropped at the node
IpcsTotalCancelMessageOutOfDialogue	Number of Out of Dialog CANCEL requests dropped at the node
IpcsTotalNotifyMessageOutOfDialogue	Number of Out of Dialog NOTIFY requests dropped at the node
ipcsTotalReinviteMessageOutOfDialogue	Number of Out of Dialog RE-INVITE requests dropped at the node

Out of Dialog Responses dropped

ipcsTotal1XXMessageOutOfDialogue	Number of Out of Dialog 1XX class responses dropped by the node
ipcsTotal2XXMessageOutOfDialogue	Number of Out of Dialog 2XX class responses dropped by the node
ipcsTotal3XXMessageOutOfDialogue	Number of Out of Dialog 3XX class responses dropped by the node
ipcsTotal4XXMessageOutOfDialogue	Number of Out of Dialog 4XX class responses dropped by the node
ipcsTotal5XXMessageOutOfDialogue	Number of Out of Dialog 5XX class responses dropped by the node
ipcsTotal6XXMessageOutOfDialogue	Number of Out of Dialog 6XX class responses dropped by the node

Out of Transaction Responses dropped

ipcsTotal1XXMessageOutOfTransaction	Number of 1XX Messages received out of transaction dropped by the node

Table continues…

ipcsTotal2XXMessageOutOfTransaction	Number of 2XX Messages received out of transaction dropped by the node
ipcsTotal3XXMessageOutOfTransaction	Number of 3XX Messages received out of transaction dropped by the node
ipcsTotal4XXMessageOutOfTransaction	Number of 4XX Messages received out of transaction dropped by the node
ipcsTotal5XXMessageOutOfTransaction	Number of 5XX Messages received out of transaction dropped by the node
ipcsTotal6XXMessageOutOfTransaction	Number of 6XX Messages received out of transaction dropped by the node
ipcsTotalCancelMessageOutOfTransaction	Number of CANCEL requests received out of transaction dropped by the node

WebRTC statistics

OID	Description
ipcswebrtcStunBindingSuccess	Number of successful STUN bindings
ipcswebrtcStunBindingFailure	Number of failed STUN bindings
ipcswebrtcAllocateSuccess	Number of successful TURN allocations
ipcswebrtcAllocateFailure	Number of failed TURN allocations
ipcswebrtcRefreshSuccess	Number of successful TURN allocation refreshes
ipcswebrtcRefreshFailure	Number of failed TURN allocation refreshes
ipcswebrtcChannelBindSuccess	Number of successful channel bindings
ipcswebrtcChannelBindFailure	Number of failed channel bindings

Other OIDs

OID	Description
ipcssipcTotalActiveRegistrations	Number of active SIP registrations
ipcssipcTotalActiveCalls	Number of active SIP calls
ipcssipcTotalActiveTCPRegistrations	Number of active TCP registrations for SIP calls
ipcssipcTotalActiveUDPRegistrations	Number of active UDP registrations for SIP calls
ipcssipcTotalActiveTLSRegistrations	Number of active TLS registrations for SIP calls
ipcssipcTotalActiveSRTPCalls	Number of active SIP SRTP calls
ipcssipcTotalRegistrations	Total number of registrations for SIP calls
ipcssipcTotalTCPRegistrations	Total number of TCP registrations for SIP calls
ipcssipcTotalUDPRegistrations	Total number of UDP registrations for SIP calls
ipcssipcTotalTLSRegistrations	Total number of TLS registrations for SIP calls
ipcssipcTotalCalls	Total number of SIP calls
ipcssipcTotalCallsFailed	Total number of failed SIP calls

Table continues…

OID	Description
ipcssipTtlCallsDeniedDueToPolicy	Number of SIP calls rejected because of policy violation
ipcssipcTotalRegistrationsDroppedByMissingPolicy	Total number of SIP registrations dropped because of missing policy
ipcssipcTotalInvitesDroppedByMissingPolicy	Number of SIP invites dropped because of missing policy
ipcssipTtlSessDroppedDueToMaxNumofConcSessExc	Number of SIP sessions dropped because the maximum number of concurrent sessions was exceeded
ipcsTotalCANCELSent	Number of SIP CANCEL requests
ipcsTotalCANCEL200Responses	Number of SIP CANCEL 200 responses
ipcsTotalCANCELRetransmits	Number of SIP CANCEL retransmits
ipcsTotalFromAndToHeaderMatchFailure	Number of From and To header match failures
ipcsTotalRegMesWithMoreContacts	Number of registration messages with more contacts
ipcsTotalMesWithAddrIncomplete	Number of messages with incomplete addresses
ipcsTotalAuthHeaderMatchFailure	Number of Auth header match failures
ipcsTotalContactSrcAddrMatchFailure	Number of Contact Source Address match failures
ipcsTotalViaMatchFailure	Number of Via match failures
ipcsTotal3XXMesFromNW	Number of 3XX messages from network
ipcsTotalRegistrationMatchFailure	Number of Registration Match failures
ipcsTotalContactSDPConnMatchFailure	Number of Contact SDP Match failures
ipcsTotalSpoofedSipBye	Number of spoofed SIP Bye requests
ipcsTotalSpoofedReinvite	Number of spoofed Reinvite requests
ipcsTotalSpoofedCancel	Number of spoofed Cancel requests
ipcsTotalSpoofedCancelToRemote	Number of spoofed Cancel To Remote requests
ipcsTotalSpoofed200	Number of spoofed 200 responses
ipcsTotalSpoofedErrorResp	Number of spoofed error responses
ipcsTotalRegistrationFailed	Number of failed registrations
sbcTotal1xMCesUserLoginFailed	Number of failed Avaya one-X® Mobile user logins
sbcTotal1xMCesUserLoginSucceeded	Number of successful Avaya one-X® Mobile user logins

Statistics details with examples

Call between two remote workers through Avaya SBCE

In the following scenario, a call is made from A to B.

- Number of Registrations in Statistics: Counter increases by 2

  One registration per phone, so in total 2 registrations from both A and B

  In a multi-Session Manager deployment, if the phone is configured with the IPs for two different Session Managers as external IP1 and external IP2, the registration counter increases by 2 for one phone. Therefore, if both phones A and B are configured for multi-Session Manager deployment, the counter increases by 4.

- Number of Invites in Statistics: Counter increases by 2

  The counter increases whenever Avaya SBCE receives an INVITE
  First INVITE from phone A towards Avaya SBCE, which is sent to the call server
  Second INVITE from Call Server towards Avaya SBCE, which is sent to phone B

- Number of Invites 200 Responses in Statistics: Counter increases by 2

  The counter increases whenever Avaya SBCE receives a 200 OK for INVITE sent
  First 200 ok response from phone B towards Avaya SBCE which is sent to the call server
  Second 200 ok response from Call Server towards Avaya SBCE which is sent to phone A

- Number of Bye in Statistics: Counter increases by 2

  The counter increases whenever Avaya SBCE receives a Bye
  First Bye from phone A towards Avaya SBCE which is sent to the call server
  Second Bye from Call Server towards Avaya SBCE which is sent to phone B

Call between a remote worker and an internal phone through Avaya SBCE

In the following scenario, a call is made from A to C and the call is disconnected at A.

- Number of Registrations in Statistics: Counter increases by 1

  One registration per phone, so in total 1 registration

  Phone C registration will not be seen by Avaya SBCE as this phone is an internal phone

  In a multi-Session Manager deployment, if the phone is configured with the IPs for two different Session Managers as external IP1 and external IP2, the registration counter increases by 2 for one phone. Therefore, if phone A is configured for multi-Session Manager deployment, the counter increases by 2.

- Number of Invites in Statistics: Counter increases by 1

  The counter increases whenever Avaya SBCE receives an INVITE
  INVITE from phone A towards Avaya SBCE, which is sent to the call server

- Number of Invites 200 Responses in Statistics: Counter increases by 1

  The counter increases whenever Avaya SBCE receives a 200 Ok for INVITE sent
  200 ok response from phone C towards Avaya SBCE, which is sent to phone A

- Number of Bye in Statistics: Counter increases by 1

  The counter increases whenever Avaya SBCE receives a Bye
  Bye from phone A towards Avaya SBCE, which is sent to the call server

Avaya SBCE MIB

The latest Avaya SBCE MIB file is available in the downloads section on the support website at http://support.avaya.com/downloads/.

System alarms

System alarms list

This section covers the description of the following alarms.

Some system alarms require manual intervention, while some get cleared automatically. For information about clearing these alarms, see the Clearing event and Manual intervention columns.

CPU alarms

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
CPU	CPU utilization is over 80%	CPU utilization is between 80%-89%.	No	Alarm	Minor	CPU utilization is between 80%-89%.	CPU utilization goes below 80% or above 89%.	No
CPU	CPU utilization is over 90%	CPU utilization is between 90%-99%.	No	Alarm	Major	CPU utilization is between 90%-99%.	CPU utilization goes below 90% or becomes 100%.	No
CPU	CPU utilization is 100%	CPU utilization is 100%.	Yes	Alarm	Critical	CPU utilization is 100%.	CPU utilization becomes 100%.	No

Memory alarms (including Swap Space)

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Memory	Memory utilization is over 80%	Memory utilization is between 80%-89%.	No	Alarm	Minor	Memory utilization is between 80%-89%.	Memory utilization goes below 80% or above 89%.	No
Memory	Memory utilization is over 90%	Memory utilization is between 90%-99%.	Yes	Alarm	Major	Memory utilization is between 90%-99%.	Memory utilization goes below 90% or becomes 100%.	No
Memory	Memory utilization is 100%	Memory utilization is 100%.	Yes	Alarm	Critical	Memory utilization is 100%.	Memory utilization becomes 100%.	No

Disk partition space alarms

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Disk partition space	Disk partition <partition_name> utilization is over 80%	Disk partition utilization is between 80%-89%.	No	Alarm	Minor	Disk partition utilization is between 80%-89%.	Disk partition utilization goes below 80% or above 89%.	No
Disk partition space	Disk partition <partition_name> utilization is over 90%	Disk partition utilization is between 90%-99%.	Yes	Alarm	Major	Disk partition utilization is between 90%-99%.	Disk partition utilization goes below 90% or becomes 100%.	No

Table continues…

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Disk partition space	Disk partition <partition_name> utilization is 100%	Disk partition utilization is 100%.	Yes	Alarm	Critical	Disk partition utilization is 100%.	Disk partition utilization becomes 100%.	No

Hard disk failure alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Hard disk failure	Hard disk <disk_id> failure	Hard disk failure	Yes	Alarm	Critical	The hard disk drive has failed and cannot be used.	The alarm is cleared only when the kernel detects no failures when testing the hard disk drive. This will only happen when the hard disk drive is replaced.	Yes. Hard disk drive must be replaced.

Link failure alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Link failure	Network link failure <interface>	Network link goes down on the given interface.	Yes. No traffic can be sent or received on the failed link.	Alarm	Critical	A link on a particular interface in down and cannot be used.	Network connection is restored and alarm manually cleared by user.	Yes. User needs to manually restore the link.

Process failure alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Process failure	Application failure	One or more system processes failed to send a heartbeat ping.	Yes. Port By-pass is automatically enabled.	Alarm	Critical	One or more system processes is malfunctioning	Malfunctioning process is restarted either automatically by the system or manually by the Security Administrator and the alarm cleared.	Yes. Required if automatic self-start is not successful.

Database failure alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Database failure	Database failure	Connectivity to the database has been lost.	Yes. Port By-pass is automatically enabled after multiple failed restarts.	Alarm	Critical	Either the database is down or connectivity to the database has been lost.	The database failure being cleared either automatically by the system or manually by the Security Administrator.	Yes. Required if automatic self-start is not successful.

Component failure alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Component failure	Component failure	One or more elements	Yes	Alarm	Critical	One or more SBCE	The malfunctioning	Required if self restart in

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
		(signaling, media, intelligence, or EMS) in a multi-component configuration has failed to send a heartbeat ping.				server elements (signaling, media, intelligence, or EMS) is malfunctioning.	elements could be restarted manually and the alarm cleared manually.	not successful.

GUI and console alarm list

New user-added alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
New User Added	New User Added: <username>	A new GUI/ System user was added.	No	Alarm	Informational	A new user was added to the system.	Alarm either cleared by the administrator or it times-out.	No

New Administrator-added alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
New Admin-added	Admin User Added: <username>	A new GUI/ System admin user was added.	No	Alarm	Informational	A new admin user was added to the system.	Alarm either cleared by the administrator or it times-out.	No

User privilege change alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
User Privilege Change	User Privilege Changed: <username>	A user's access privilege was changed (either from admin to normal or from normal to admin).	No	Alarm	Informational	A user's access privilege was changed (either from admin to normal or from normal to admin).	Alarm either cleared by the administrator or it times-out.	No

User deleted alarms

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
User Deleted	User deleted: <username>	A new GUI/ System admin user was deleted.	No	Alarm	Informational	A user was deleted from the system.	Alarm either cleared by the administrator or it times-out.	No

Login failure alarm

Alarm	Message	Condition	Service affecting	Type	Severity	Description	Clearing event	Manual intervention
Login failure	User login failure: <username>	A user had multiple consecutive login failures.	No	Alarm	Warning	A user had more than a certain number of consecutive login failures.	Alarm either cleared by the administrator or it times-out.	No

Chapter 4: Maintenance procedures

Backup / Restore system information

The Backup/Restore feature provides the ability to backup or create a snapshot of the EMS security configuration to a user-definable location or to a local EMS server. The location must be secure and physically separate from the Avaya SBCE equipment chassis for later retrieval or restoration. You can download the snapshot using the download link provided in the **Snapshot** tab.

Note:

A configuration backup can be taken manually and restored as needed, or automatic snapshots can be configured.

Related links

Designating a Snapshot Server on page 57
Deleting a system snapshot on page 63

Designating a Snapshot Server

About this task

A snapshot contains information such as certificates and keys, which can be misused to gain unauthorized access to the Avaya SBCE server. The administrator must ensure that the storage directory on remote server is accessible only to authorized users.

The directory with the snapshot must not have read/write/execute permission for unauthorized users.

If you want to backup to a remote server, before using the Backup/Restore feature, you can designate a server as a snapshot server to hold the backup files or save the files to the local EMS server.

Caution:

A snapshot can only be restored to the same Avaya SBCE product version on an EMS of the same hardware group. When restoring the snapshot, it is recommended that the EMS server must be configured with the same original management IP used when the snapshot was created or the system may need to be manually rebooted. If the EMS server hardware group or the Avaya SBCE product version do not match, the restore operation will fail and the system settings will revert to the earlier state.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **Backup/Restore**.

   The system displays the Backup/Restore page.
3. Click the **Snapshot Servers** tab.

   The system displays the available snapshot server profiles in the content area.
4. On the Snapshot Servers page, click **Add**.

   The system displays the Add Snapshot Servers page.
5. Add the requested information in the fields.
6. Click **Finish**.

Next steps

Making a System Snapshot on page 59

Related links

Backup / Restore system information on page 57
Add Snapshot Server field descriptions on page 58

Add Snapshot Server field descriptions

Name	Description
Profile Name	A descriptive name to refer to the snapshot server being configured.
Server Address (ip:port)	The IP address and port number of the snapshot server to which backup files or snapshots are transferred by using secure FTP (SFTP).
User Name	The user name of the administrative account that is authorized to make system backups.
Password	The password assigned to authenticate the administrative account.
Confirm Password	The password that you reenter for confirmation.
Repository Location	The path (directory) on the snapshot server where the backup files will be stored and retrieved from.
Host Key	The key used to authenticate the login of the host.

Related links

Designating a Snapshot Server on page 57

Making system snapshots

Making system snapshots

Before you begin

Designate a snapshot server.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. Select **Backup/Restore** from the Task Pane.

   The system displays the Backup/Restore screen in the content area.
3. Select **Create Snapshot**.

   The system displays the Create Snapshot window.
4. Enter a name to designate this snapshot (backup) file, and click **Create**.

   A snapshot (backup) of the EMS security configuration is made and saved to the designated snapshot server. A banner is displayed on the Create Snapshot pop-up window informing you that the snapshot has been successfully created. When the process is complete, the newly created snapshot is displayed in the content area of the snapshots screen.

Related links

Backup / Restore system information on page 57
Designating a Snapshot Server on page 57

Configuring automatic snapshots

About this task

Use this procedure to take automatic backups on a designated server or on the local EMS server.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **Backup/Restore**.

   The system displays the Backup/Restore page.
3. Click the **Automatic Snapshot Configuration** tab.

   The system displays the Automatic Snapshot Configuration page. The **Summary** section displays the configuration for a previously saved backup, if one existed. Otherwise, the default setting of **Never** is displayed.
4. In the **Configuration** section, do the following:
   a. Select the snapshot frequency.

      The options are Never, Daily, Weekly, and Monthly.

b. When the Weekly or Monthly option is selected, the system displays a group of Day(s) checkboxes. For example, Su, Mo, Tu, We, Th, Fr, and Sa.

c. When the Monthly option is selected, the system displays an additional row of checkboxes for occurrence. For example, 1st, 2nd, 3rd, 4th, and Last.

5. In the **Time** field, select the time.

   When you type in the **Time** field, the system displays a Select Time pop-up.

6. Click **Save**.

Related links

Backup / Restore system information on page 57

Restoration of a system snapshot

The two methods of restoring a snapshot to the EMS server are manual and automatic.

Manual

The manual method of restoring a snapshot to EMS is a two-step process. The snapshot is first retrieved from the snapshot server to the local workstation and then uploaded to EMS for reconfiguration. See the following procedures to restore EMS to a previous snapshot configuration:

- Retrieving a snapshot file
- Restoring a snapshot file

Automatic

The automatic method of restoring a snapshot to EMS is a single-step process that restores EMS to the previous configuration without further intervention. See the Restoring a snapshot file automatically section.

Caution:

During the process, manual and automatic, of restoring a snapshot file, EMS goes in the offline mode when the files are being transferred and the device is being reconfigured.

No Avaya SBCE detection or mitigation features are available for the entire duration of the restore procedure, making the system vulnerable to intrusions and attacks.

Restoration procedures must be done only during times of relative system inactivity or during scheduled periods of maintenance.

Snapshots can be restored to an EMS system of the same hardware category, manufacturer, and model of EMS and the network of Avaya SBCE. The following table lists the hardware categories:

Hardware Model	No. of NICs	Hardware Category
CAD 0208	4	110
Dell 210	2	EMS
Dell 210	6	310

Table continues…

Hardware Model	No. of NICs	Hardware Category
Dell R320	6	310
Dell R620	6	310
Dell R630	6	310
HP DL360 G8	6	311
HP DL360 G9	6	311
VMWare	2	EMS
VMWare	4	110
VMWare	6	310

Retrieving a snapshot file

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. From the Task Pane, click **Backup/Restore**.

   The system displays the Backup/Restore screen in the content area.
3. Click the **Snapshot** tab.
4. In the drop-down box, click the snapshot server or the local server on which you have created the snapshot.
5. Click the checkbox corresponding to the snapshot file that you want to retrieve and then click **Download**.

   The system saves the snapshot file on default download directory.

Next steps

Restoring a Snapshot File

Restoring a snapshot file manually

Before you begin

Retrieve a snapshot file.

About this task

After you retrieve the snapshot file from the snapshot server, save the file on the local workstation. You can upload the file to the EMS server where the file is uncompressed and used to reconfigure the EMS to a previous state.

Use the following procedure to upload the snapshot from your local workstation to the EMS server and reconfigure the EMS.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the Task pane, click **Backup/Restore**.

The Content area displays the Backup/Restore screen.

3. Select the corresponding **Restore by File** option.

   The system displays the Restore by File pop-up window.

4. Click **Browse**.

   The system displays a dialog pop-up window.

5. Select the desired snapshot file, and click **Open**.

   The system enters the selected snapshot file in the **Restore Point File** field of the Restore by File window.

6. Select **Finish**.

   The system displays a warning window for confirmation to proceed with the restoration procedure.

7. Click **OK**.

   The EMS server goes offline and the snapshot file transferred to the EMS server, where the file is uncompressed and used to reconfigure the EMS software to a previous configuration.

   Note:

   After the system successfully restores a snapshot, in an HA configuration both Avaya SBCE devices reboot. In a standalone configuration, the EMS+SBCE single box reboots. The system takes 2 to 3 minutes to reboot after backup configuration.

Related links

Retrieving a snapshot file on page 61

Restoring a snapshot file automatically

Before you begin

Create a system snapshot.

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the Task pane, click **Backup/Restore**.

   The Content area displays the Backup/Restore screen.

3. Using the drop-down menu in the Content Area, select the snapshot server that contains the snapshot file that you want to retrieve.

   The system displays all snapshot files on the selected snapshot server in the content area.

4. Select the snapshot file that you want to restore to the EMS by clicking the corresponding **Restore** option.

   The system displays a warning pop-up window, asking for confirmation to proceed with the automatic restoration procedure.

5. Click **OK**.

   The EMS goes offline and reconfigures the snapshot file.

   Note:

   After the system successfully restores a snapshot, in an HA configuration both Avaya SBCE devices reboot. In a standalone configuration, the EMS+SBCE single box reboots. The system takes 2 to 3 minutes to reboot after backup configuration.

Deleting a system snapshot

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **Backup/Restore**.

   The system displays the Backup/Restore screen.
3. Select the local server or the designated snapshot server from where you want to delete the file.
4. Select the file and click the corresponding **Delete** option.

   The system displays a warning message, asking for a confirmation to delete.
5. Click **OK**.

   The system deletes the snapshot file.

Related links

Backup / Restore system information on page 57

Commands for creating and restoring snapshots

The following root-level console commands are available for creating and restoring snapshots:

- #gui-snapshot-create
- #gui-snapshot-restore

Console command-gui-snapshot-create

Use the **`gui-snapshot-create`** console command to create a snapshot from the command line. The structure of the command is:

`gui-snapshot-create` options description

Description

The description can be any string value and does not need to be quoted. If not specified, the description has the default value Restore Point through CLI.

Options

The following options are available for this command:

- --version: Displays the command version that is equal to the GUI version. Usually, the GUI version matches ipcs-version.
- --help: Displays detailed information about the command, possible arguments, and a few examples.
- --debug: Sends the output of debug logs to stdout when executing the command.
- --quiet: Suppresses all output. If both the quiet option and debug option are specified, the quiet option takes precedence.

When the command is run, an exit code is returned. Any relevant details for a failure are passed to stderr. The following are examples of the returned exit codes:

- 0 – Completed successfully.
- 1 – Invalid command syntax.
- 2 – Snapshot creation partially successful. This exit code occurs when a snapshot was created successfully, but could not be uploaded to one or more snapshot servers.
- 3 – Snapshot creation failed. This exit code occurs if the snapshot creation fails.
- 1000 – An unknown error has occurred.

Examples

A few sample commands with descriptions are listed here:

- `gui-snapshot-create`: Creates a new snapshot with the default description Restore Point via CLI.
- `gui-snapshot-create --quiet This is a test snapshot`: Creates a new snapshot with the description This is a test snapshot. The system does not send any output to stdout or stderr.

Console Command-gui-snapshot-restore

With the **`gui-snapshot—restore`** console command, you can restore a snapshot from the command line. The general structure of the command is:

`gui-snapshot-restore` options *file*

File

Use the absolute or relative path for a valid snapshot file.

Options

Use one of the following options:

- --version: Displays the command version, which is equal to the GUI version. The GUI version usually matches the ipcs-version.
- --help: Displays detailed information about the command, possible arguments, and a few examples.
- --debug: Sends debug logs to stdout when running the command.

- --quiet: Suppresses all output. If both the quiet option and debug option are specified, the quiet option takes precedence.

After the command runs, the system returns an exit code. Any relevant details for a failure are passed to stderr. A list of possible returned exit codes follows:

- 0 – Completed successfully.
- 1 – Invalid command syntax.
- 2 – Snapshot creation partially successful. This exit code occurs when a snapshot is created successfully, but cannot be uploaded to one or more snapshot servers.
- 3 – Snapshot creation failed. This exit code occurs if the snapshot creation failed.
- 1000 – An unknown error occurred.

Examples

A few sample commands with descriptions are listed here:

- `gui-snapshot-restore /home/ipcs/snapshot folder/snapshot.zip`: Restores from a snapshot file named snapshot.zip in /home/ipcs/snapshot folder/.
- `gui-snapshot-restore ../snapshots/snapshot-1.2.3.zip`: Restores from a snapshot file named snapshot-1.2.3.zip in the sibling of the parent directory, named snapshots.

Handling duplicate hostnames in a multiserver deployment

About this task

If the hostnames of two or more Avaya SBCE servers are the same, and if this deployment is upgraded to Release 6.3 or later, the Avaya SBCE servers do not enter the COMMISSIONED state. To resolve this issue, all hostnames of Avaya SBCE servers must be made unique.

Note:

This procedure is service affecting. If the current version is Release 6.2.x, then update the hostnames before upgrading to Release 7.0.

Before you begin

1. Log in to each Avaya SBCE server, and run the hostname command to determine if the hostnames are duplicated.
2. Note down the management IP addresses of the Avaya SBCE server.
3. Ensure that all Avaya SBCE servers are in the Commissioned mode.

Procedure

1. Take a snapshot of the system and save the snapshot offline. For information about creating snapshots, see *Making a system snapshot*.

2. Determine the server for which the hostname needs to be changed.
   a. Log in to the EMS server through SSH with ipcs user credentials.
   b. As an ipcs user, SSH to each Avaya SBCE server by using the following command: `ssh -p 222 a.b.c.d`.
   c. Note down the server for which a password was required. If you have two Avaya SBCE servers with the same hostname, then SSH to one of them requires a password.
3. Change the hostname and Avaya SBCE properties which was identified in Step 2.
   a. SSH to the Avaya SBCE server for which the password was required.
   b. Type `sudo su`.
   c. Take a backup of `/etc/hostname` by typing `cp /etc/hostname /etc/hostname.bak`.
   d. Edit `/etc/hostname` by using vi and change the hostname to a unique hostname.
   e. Take a backup of `/usr/local/ipcs/etc/sysinfo` by typing `cp /usr/local/ipcs/etc/sysinfo /usr/local/ipcs/etc/sysinfo.bak`.
   f. Using vi edit the sysinfo file.
      - Change the **ApplianceName** property to the new hostname set in Step 3(d).
      - Change the **STATE** property to INSTALLED.
4. Ensure that the EMS server is reachable from the Avaya SBCE server.
5. Reboot the Avaya SBCE server.
6. Repeat step 2 and ensure that SSH from the EMS server to all Avaya SBCE servers does not require password.
7. Check the EMS web interface and confirm that the Avaya SBCE servers are in the Commissioned mode.

Swapping a bad Avaya SBCE device

Procedure

1. Log in to the EMS web interface.
2. Click **System Management**.
3. In the **Devices** tab, click **Add**.
4. In the **Host name** field, type a host name.
5. In the **Management IP** field, type a management IP, and click **Finish**.

   Ensure that the Management IP you enter is different from the IP of the Avaya SBCE device that is being swapped.

6. Wait until the device is in Registered state.
7. Click **Swap Device**.
8. In the **Device to Replace** field, click the device you want to replace.
9. Click **Finish**.

   The bad Avaya SBCE device is replaced with the new device that you added.

Starting a graceful switchover

Procedure

1. Open the console to the active server.

   Alternatively, you can start a secure shell (SSH) connection to begin a graceful switchover. However, if you use SSH for a switchover, an SSH inactivity timeout can cause the system to disconnect. The switchover proceeds even after the system is disconnected.

2. Type `sudo su` after the dollar sign ($) prompt.

   The system displays the new pound sign (#) prompt.

3. Type `ipcs-options` after the pound sign (#) prompt.

   The system displays the Avaya SBCE Runtime Options screen.

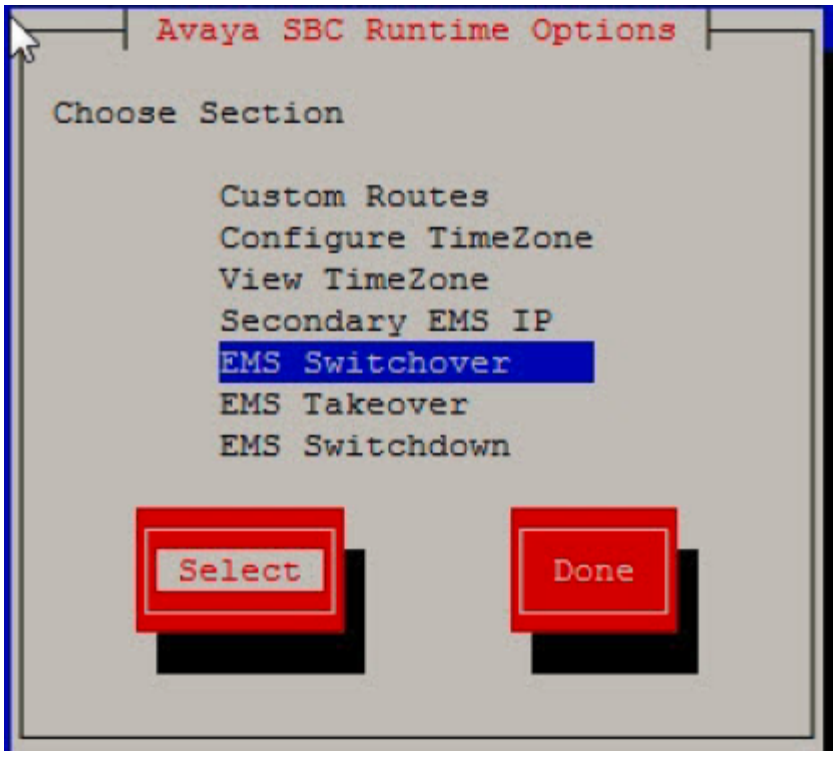
4. Scroll down to select the **EMS Switchover** option.

   The Avaya SBCE devices must be reachable from the EMS during switchover.

5. Click **Select** , and press `Enter`.

   The active EMS server runs the switchover process.

Example



Starting an EMS failover

Before you begin

- Verify whether the Avaya SBCE devices are in Commissioned state and are reachable from the current secondary EMS.
- Ensure that the current primary EMS is shutdown, inactive, or not a part of the network.
- Go to `/usr/local/ipcs/etc/sysinfo` and verify that the status is primary and the management interface of EMS is disabled.

Procedure

1. Start a secure shell (SSH) connection to the secondary EMS server to display the initial login screen.
2. Log in as a root user.

   The system displays the new pound sign (#) prompt.
3. Go to `/usr/local/ipcs/etc/sysinfo` and check that the status of the server is secondary.
4. Go to the scripts directory by typing `cd /usr/local/ipcs/icu/scripts/`.
5. Type `./takeover.py`.

The current secondary EMS is rebooted.

6. Verify if the Avaya SBCE processes are up and running.
7. Go to `/usr/local/ipcs/etc/sysinfo` and verify that the status has changed from secondary to primary.

Avaya SBCE reconfiguration script options

Table 2: SBCEConfigurator.py command options

#	Command	Description	Usage
1	**change-ip-gw-mask**	Changes the management IP address, gateway, and subnet mask.	**SBCEConfigurator.py change-ip-gw-mask** *MGMT_IP* / *GW_IP* / *NW_MASK*
2	**change-ems-ip**	1. Changes the primary or active EMS IP address on the secondary or standby EMS. 2. Changes the secondary or standby EMS IP address on the primary or active EMS and all the Avaya SBCE servers connected to EMS. 3. Changes the primary or active EMS IP address on the connected Avaya SBCE servers, which were not reachable while changing the primary or active EMS IP address.	**SBCEConfigurator.py change-ems-ip** *old EMS IP address new EMS IP address*
3	**generate-client-vpn-cert**	Generates VPN Certificates for Avaya SBCE that were not reachable during the IP change of primary or active EMS.	**SBCEConfigurator.py generate-client-vpn-cert** *SBC_MGMT_IP*
4	**change-hostname**	Changes host name.	**SBCEConfigurator.py change-hostname** *HOSTNAME*
5	**change-ntp-ip**	Changes NTP IP address.	**SBCEConfigurator.py change-ntp-ip** *NTP IP*
6	**change-dns-ip-fqdn**	Changes DNS IP address.	**SBCEConfigurator.py change-dns-ip-fqdn** *DNS IP*

Table continues…

#	Command	Description	Usage
7	**change-nw-passphrase**	Changes network passphrase.	**SBCEConfigurator.py change-nw-passphrase** *passphrase*
8	**change-ssl-certs**	Generates self-signed certificate for EMS and single servers.	**SBCEConfigurator.py change-ssl-certs** *first, last name Org.unit Org.Name City State 2-digit-country_code*
9	**change-sbce-ip**	Changes the Avaya SBCE IP address on the EMS database. Sequence to execute this command: 1. Change Management IP address, gateway, mask on theAvaya SBCE server by using the command **change-ip-gw-mask** 2. Run the **change-sbce-ip** command on EMS CLI to notify the EMS about the Avaya SBCE IP change.	**SBCEConfigurator.py change-sbce-ip** *sbce-old-ip sbce-new-ip*
10	**factory-reset**	Resets Avaya SBCE to the factory default state. 1. To uninstall the Avaya SBCE device in a multiple server deployment from GUI, click **System management** > **Devices** and click **Uninstall**. This operation clears the device-specific configuration and is not required on EMS and a single server deployment. 2. Run `SBCEConfigurator.py factory-reset`. This operation clears the device-specific configuration on EMS or a single server deployment. 3. Run this command from either a serial console or VGA session. Do not run this command from an SSH putty session since	**SBCEConfigurator.py factory-reset**

Table continues…

#	Command	Description	Usage
		network connectivity will be lost during this operation.	

Changing the management IP from the EMS web interface

Procedure

1. Log on to the EMS web interface with administrator credentials.
2. In the left navigation pane, click **System Management**.
3. Find the device whose IP address you want to change, and click **Edit**.

   For an Avaya SBCE, the system displays the following warning:

   ```
   Any changes to the management network on this device will reboot
   the device.
   ```

   For an EMS, the system displays the following warning:

   ```
   Any changes to the management network on this device will reboot
   the device, drop any active calls, and require each connected SBC
   to be manually restarted using Application Restart in System
   Management.
   ```

4. In the **Management IP** field, type the new management IP, and click **Finish**.

   Ensure that you include appropriate netmask and gateway details for the new IP. When you change any information in the **Network Settings** section, the device restarts to complete the change. If you change the management IP of the EMS, the EMS web interface displays a new URL. After the system restarts, you must use the new URL to go to the EMS.

   Note:

   From Release 6.3, you can change the management IP through the CLI. For more information about changing the management IP through the CLI, see the Changing Management IP section in the Avaya SBCE CLI commands chapter.

5. **(Optional)** Find the Avaya SBCE device on the System Management page, and click **Restart Application**.

   Note:

   If you change the management IP address of the EMS, restart each Avaya SBCE connected to the EMS.

Changing management IP, gateway and network mask details for a single server deployment

Procedure

1. Log in to the server as a super user.
2. Type `SBCEConfigurator.py change-ip-gw-mask` *`Management IP / Gateway IP / Network Mask`*.

   The server restarts indicating that the management IP has been changed successfully.

Changing management IP for an HA deployment

IP, gateway, and network mask change

Use the following command to change management IP, gateway, and network mask details on the primary EMS server.

```
SBCEConfigurator.py change-ip-gw-mask <MGMT_IP>/<GW_IP>/<NW_MASK>
```

The script does the following:

1. Checks if the database is functional.
2. If the database is functional, proceeds with stopping application processes.
3. Checks if all the Avaya SBCE servers connected to EMS are reachable. If any Avaya SBCE server is unreachable, exits or proceeds with changing the EMS IP address on the reachable Avaya SBCE servers. Later, when the devices are reachable from EMS, users can regenerate or change the EMS IP addresses on the devices.
4. Prints out the log messages, which shows the current status on screen.
5. The EMS server then reboots. The user needs to ssh using the new EMS IP address.
6. After the VPN comes up on the EMS server, the VPN connection gets established on all the Avaya SBCE servers.

To change EMS IP, you must regenerate VPN certificates on the EMS server and all Avaya SBCE servers connected to EMS. Change in management IP also requires a change in the NTP address configuration on all Avaya SBCE servers connected to EMS.

Note:

All Avaya SBCE servers must have the changed EMS IP address.

Regenerating VPN certificates when Avaya SBCE is unreachable

Procedure

1. Log on to the EMS server as a super user.
2. Type **`SBCEConfigurator.py generate-client-vpn-cert`** and press `Enter`.

Changing primary EMS IP on unreachable Avaya SBCE

About this task

Use this procedure only when Avaya SBCE is unreachable while changing the primary EMS IP address.

Procedure

1. Log on the EMS device as a super user.
2. Type **SBCEConfigurator.py change-ems-ip** <*EMS_OLD_IP*> <*EMS_NEW_IP*> and press `Enter`.

Changing NTP address on Avaya SBCE devices

About this task

Changing management IP of EMS requires a change in the NTP address configuration on all the Avaya SBCE servers connected to EMS. For the proper functionality of OpenVPN, ensure that the date and time on the Avaya SBCE servers match the date and time on the EMS server. The recommended procedure is to configure the EMS IP as the NTP IP address of the Avaya SBCE devices.

Procedure

1. Log on to the Avaya SBCE device as a super user.
2. Type **SBCEConfigurator.py change-ntp-ip**.

Changing IP address of the primary EMS server on the secondary EMS server

Procedure

1. Log on to the EMS device as a super user.
2. Type **SBCEConfigurator.py change-ems-ip** <*EMS_old_IP*> <*EMS_new_IP*> and press `Enter`.

Changing management IP, gateway IP, and network mask details on secondary EMS

Procedure

1. Log on to the Avaya SBCE server as a super user.
2. Type `SBCEConfigurator.py change-ip-gw-mask` *`Management IP / Gateway IP / Network Mask`*.

   The Avaya SBCE restarts indicating a successful completion of the management IP change. After changing the management IP, the primary EMS and Avaya SBCE devices must be notified about the new Avaya SBCE IP address of the secondary EMS.
3. Log on to the primary EMS and Avaya SBCE devices as a super user.
4. Type `SBCEConfigurator.py change—ems-ip` *`Old EMS IP New EMS IP`*.

   The system changes the IP address of the secondary EMS.

Note:

Ensure that you change the IP address of the secondary EMS in the primary EMS and each Avaya SBCE device.

Changing management IP, gateway IP, and network mask details on Avaya SBCE

Procedure

1. Log on to the Avaya SBCE server as a super user.
2. Type `SBCEConfigurator.py change-ip-gw-mask` *`Management IP / Gateway IP / Network Mask`*.

   The Avaya SBCE restarts indicating successful completion of the management IP change. After changing the management IP, the EMS must be notified about the new Avaya SBCE IP address.
3. Log on to the EMS server as a super user.
4. Type `SBCEConfigurator.py change—sbce-ip` *`Old SBCE IP New SBCE IP`*.

   The system changes the IP address of the Avaya SBCE in the EMS database.

Changing hostname

Procedure

1. Log on to the Avaya SBCE server as a super user.
2. Type `SBCEConfigurator.py change-hostname` *`Hostname`*.
3. Restart the system.

   For the hostname change to take effect, you must perform a soft reboot of the Avaya SBCE.

Changing network passphrase

About this task

Network passphrase is important for EMS-Avaya SBCE authentication. If you change the network password for an Avaya SBCE, ensure that you change the passphrase on all systems connected to the Avaya SBCE.

Procedure

1. Log on to the Avaya SBCE server as a super user.
2. Type `SBCEConfigurator.py change-nw—passphrase` *`New Passphrase`*.

   The system restarts for enabling the new passphrase.

Regenerating self-signed certificates

Procedure

1. Log on to the EMS web interface as a super user.
2. Run the following command: **`SBCEConfigurator.py change-ssl-certs`**.

Changing DNS IP and FQDN

Procedure

1. Log on to the Avaya SBCE server as a super user.
2. Type `SBCEConfigurator.py change-dns—ip—fqdn` *`DNS IP FQDN`*.

   The system changes the DNS IP and FQDN.

ipcs-options commands

Option Name	EMS only	EMS and SBC(Singlebox)	SBC Only
Custom routes	✔	✔	✔
Configure TimeZone	✔	✔	✔
View TimeZone	✔	✔	✔
Secondary EMS IP	✔	—	✔
Self-signed Certificate	✔	✔	—
EMS Switchover	✔	—	—
EMS Takeover	✔	—	—
EMS Switchdown	✔	—	—
Regenerate SSH Keys	—	✔	✔

Table continues…

Option Name	EMS only	EMS and SBC(Singlebox)	SBC Only
Enable RSS	—	✔	✔
Disable RSS	—	✔	✔

- **Custom Routes**: Deprecated. This option is no longer supported.
- **Configure TimeZone**: Used to select a new time zone.
- **View Timezone**: Used to view the currently selected time zone.
- **Secondary EMS IP**: Used to set the IP address of the secondary EMS.
- **Self-Signed Certificate**: Used to create a new self-signed certificate to be used for the EMS web administration.
- **EMS Switchover**: Used on a Primary EMS server in order to swap the roles of the Primary and Secondary EMS servers. The secondary EMS server must be available on the network. The system is rebooted during this process.
- **EMS Takeover**: Used on a secondary EMS server to take over as a Primary EMS server. The primary EMS server must not be available on the network for this process.
- **EMS Switchdown**: Used to convert the primary EMS server to a standby EMS server. After the conversion takes place, the server shuts down automatically. This option is to be run only on a primary EMS server.
- **Regenerate SSH Keys**: This option regenerates the SSH keys and reboots the server.
- **Enable RSS**: This option enables Receive Side Scaling (RSS) to tune network performance.
- **Disable RSS**: This option disables Receive Side Scaling (RSS) to tune network performance.

Note:

Receive-Side Scaling (RSS) option allows inbound network traffic to be processed by multiple CPUs. Use RSS to clear interruption during inbound traffic processing caused by overloading a single CPU and to reduce network latency. By default, this option is enabled. Do not use this option unless advised by the Avaya Support team.

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