Oracle® Enterprise Communications Broker

Administrator's Guide
Release P-CZ2.0.0

June 2017

ORACLE

Notices

Contents

About this Guide

The Oracle® Enterprise Communications Broker (ECB) is a purpose-built core communications controller designed to meet session management and other communications core requirements of enterprises.

Your Documentation Supplement

The Oracle® Enterprise Communications Broker Administrator's Essentials Guide Release Version P-CZ2.0.0 is augmented by documentation published for the Oracle Communications SBC and Oracle Enterprise SBC. This document covers the features and functions available with the Oracle Enterprise Communications Broker itself. As such, this document is dependent upon the larger body of documentation for those features and functions that are not specific to the Oracle Enterprise Communications Broker.

Oracle Enterprise Communications Broker (ECB) 2.0

This release extends upon the v1.0 release by resolving the issues documented for that release and adding new functionality, including:

- A Registrar and Registration Cache Function
- LDAP Integration Support for Routing and Registration Authentication
- A Registrar and Registration Cache Function
- The ECB Synchronization Function
- Support of Header Manipulation Rules

Product Name Notice

Although the product is named the Oracle Enterprise Communications Broker, there are multiple references to the product as an Acme Packet product within the software. Acme Packet is the name of a company recently acquired by Oracle. Please note that the naming within the software will change.

Related Documentation

The following tables lists the documentation set for this product. There are multiple versions of these documents, based on software release and revision history. For related product documentation, please refer to enterprise software version E-C[xz]6.4.0 and service provider software version S-Cx6.3.

Related Oracle ECB documentation includes:

Oracle Enterprise Communications Broker Maintenance Release Guide	Updates the Oracle ECB User's and Administrator's Guides to PCZ200M1.
Oracle Enterprise Communications Broker User Guide	Provides explanation and instruction on the Oracle ECB to Oracle ECB users.

Related service provider software documentation includes:

Document Name	Document Description
Acme Packet 3000 & 4000 Release Notes	Contains information about the current documentation set release, including new features and management changes.
Acme Packet 4000 ACLI Configuration Guide	Contains information about the administration and software configuration of the Oracle SBC.

Document Name	Document Description
Oracle Communications Session Border Controller ACLI Reference Guide	Contains explanations of how to use the ACLI, as an alphabetical listings and descriptions of all ACLI commands and configuration parameters.
Oracle Communications Session Border Controller Maintenance and Troubleshooting Guide	Contains information about Oracle SBC logs, performance announcements, system management, inventory management, upgrades, working with configurations, and managing backups and archives.
Oracle Communications Session Border Controller MIB Reference Guide	Contains information about Management Information Base (MIBs), enterprise MIBs, general trap information, including specific details about standard traps and enterprise traps, Simple Network Management Protocol (SNMP) GET query information (including standard and enterprise SNMP GET query names, object identifier names and numbers, and descriptions), examples of scalar and table objects.
Oracle Communications Session Border Controller Accounting Guide	Contains information about the Oracle SBC's accounting support, including details about RADIUS accounting.
Oracle Communications Session Border Controller HDR Resource Guide	Contains information about the Oracle SBC's Historical Data Recording (HDR) feature. This guide includes HDR configuration and system-wide statistical information.
Oracle Communications Session Border Controller Administrative Security Essentials	Contains information about the Oracle SBC's support for its Administrative Security license.

Related enterprise software documentation includes:

Oracle® Communications Enterprise Session Border Controller-SE/VME Web GUI User Guide E-C[xz]6.4	Contains generic information about the Web GUI interface, including Monitoring and Tracing and System File management.
Oracle® Communications Enterprise Session Border Controller Configuration Guide Release Version E-C[xz]6.4	Contains a wide range of information on Oracle E-SBC product, including platform information.

Release Caveats

This section advises the user on important considerations for this release.

- A user can only configure a single DNS Server IP address on the Oracle Enterprise Communications Broker.
- The Oracle Enterprise Communications Broker's SIP responses widget only displays error responses generated by ECB.

Known Issues

The table below lists known issues in the PCZ2.0.0 release of which the user should be aware. The information includes explanations of the impact of the issue and, if applicable, a workaround to the issue.

Issue	Workaround/Impact
The Broker widget does not show outbound translation information.	None
If the user presses the GUI's back button while working within the LST editor, the system does not warn the user that changes are about to be lost.	Always save desired changes before pressing Back button.
"Inner" configuration objects, such as dial patterns inside a dial context, are not searchable.	None
The HMR split and join headers function does not work in this release.	None
Using the Registration Widget to display more than 100,000 registrations degrades system performance.	None
The GUI Initial install wizard does not perform error checking on invalid IP address entries. Furthermore, the wizard may fail to complete when configured with invalid IP addresses.	Use valid IP addresses. Do not use 0.0.0.0. Gateways may be left blank.
A software upgrade on standby systems fail to acquire a configuration lock when performed using the network and flash boot method.	Perform upgrades to HA deployments using the 'Local' method.
An invalid search string does not return 0 search results. Instead, it returns invalid results.	None
The LST Editor displays a blank screen when opening LST files that do not have well-formed XML syntax.	Manually fix the LST file's XML syntax error.
The Verify config panel keeps reappearing after being minimized.	Fix the issue reported by verify config. Alternatively, log out, then log back in to clear the verify config panel.
After adding an ECB sync peer and activating the configuration, the Web GUI may appear to hang, displaying a "Loading" message.	Close the browser window, log back in and execute the save/activate function again.
Although enabling HA is not dynamically configurable, the system does not prompt the user to reboot.	Manually issue a reboot after enabling HA.
When configured with LST/LDAP authentication, the system exhibits a minimal memory leak during re-registrations. This becomes evident after days of running at high load.	None
The Ping Widget reports an error for agents that do not respond with a 200 OK to OPTION pings.	None
The system does not disable the Security icon even though a TLS license is not present.	Do not configure anything under the Security icon without a TLS license.
The user cannot configure Host Routes with the GUI.	Configure host routes from the ACLI. See The ACLI Configuration Guide for instructions on configuring host routes with the ACLI.
The Initial setup wizard does not provision a default gateway properly.	Set your management port's default gateway under "General" settings.

Issue	Workaround/Impact
The LST Editor does not indicate that a file it is opening has encryption enabled.	Leave the current password field empty when setting the secret for non-encrypted LST files.
Enabling LST or LDAP authentication is not dynamically configurable.	Reboot the system to activate LST or LDAP authentication.
LST files are not synchronized across ECBs in HA configuration.	To synchronize LST files, manually copy them to both HA systems using the System tab.

Revision History

Date	Revision Number	Description
July 3, 2014	Revision 1.00	• Initial Release
Sept 26, 2014	Revision 1.10	• Removes references to wancom2 as being supported in HA configurations.
Nov 26, 2014	Revision 1.20	• Corrects Communications monitoring probe default port as 4739.
Dec 15, 2014	Revision 1.30	• Removes unclear references to platform support for virtual machines. • Corrects interface support recommendation. • Removes documentation references to Acme Packet 4500 and 3800 platforms. • Adds documentation reference to Oracle Enterprise Communications Broker Maintenance Release Guide.
March 2016	Revision 1.40	• Adds caveat on NTP and ENUM resource configuration subnet.
April 2017	Revision 1.50	• Removes confusing console connection text
June 2017	Revision 1.60	• Removes "one or more" from the first bullet in the Communication Monitor Probe Settings topic.

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Applicable Platforms

The Oracle Enterprise Communications Broker is available either as an appliance or as a application for operation on virtual machines. When running as an appliance, the Oracle Enterprise Communications Broker software is packaged with the Netra Server X3-2 for Acme Packet and delivered to the end customers. When running as a virtual application, the Oracle Enterprise Communications Broker software can be deployed on any third-party COTS hardware that meets the specified guidelines.

When delivered as an appliance, the application comes pre-installed on Oracle's Netra Server X3-2 for Acme Packet. Server cabling instructions, which also identifies key hardware elements, such as interfaces, are presented below. Instructions on installation and maintenance of the Netra Server X3-2 for Acme Packet are generic to SBC, Session Router and other appliance applications.

The generic Netra Server X3-2 for Acme Packet documentation herein identifies all hardware interfaces. With respect to cabling the Oracle Enterprise Communications Broker, the applicable interfaces, as named in the hardware documentation, include:

- s0p0—Service access
- wancom0—Management access
- wancom1—High Availability (HA) access
- SER MGT(COM1)—Serial management access

You run the application as a virtual machine over a VM system, such as Oracle VM Server. You use VM management software, such as Oracle VM Manager, to create and maintain your virtual machines.

Virtual machine installation instructions are available in the Platforms chapter of the *Oracle Enterprise Session Border Controller Configuration Guide*. Generic hardware information is provided in the applicable documentation provided by your hardware vendor.

Software Packaging

The Release P-Cz version 2 build image is labeled nnPCz200.bz. The image is compressed by the zlib software library and includes all software components needed to install and operate the Oracle Enterprise Communications Broker.

Note: Note that you must obtain a license if you want to operate with TLS. The procedure to obtain this license is documented herein.

Oracle Enterprise Communications Broker software delivered for virtual machines includes the following packages:

Applicable Platforms

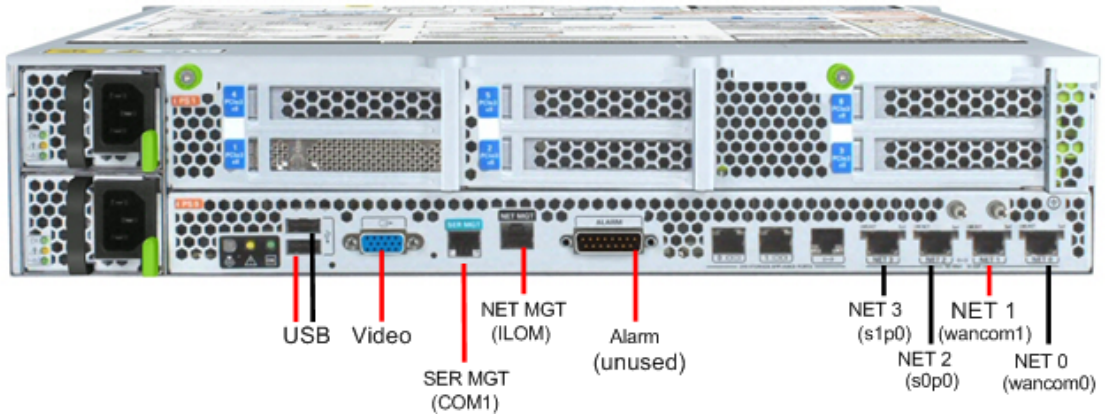
Image Name	Description
nnPCz200.bz	Standalone compressed image - This .bz image package is primarily used to load and operate the Oracle Enterprise Communications Broker software as an appliance. You can also use the .bz image as a load image to existing virtual machines. Create your virtual machine according to specifications. Then copy this image to your machine (eg /code) and point your boot parameters to it.
nnPCz200-img-bin.ova	Virtual Machine Template - Import within virtual machine hypervisor to create the entire machine.

Cabling the Netra Server X3-2 for Acme Packet

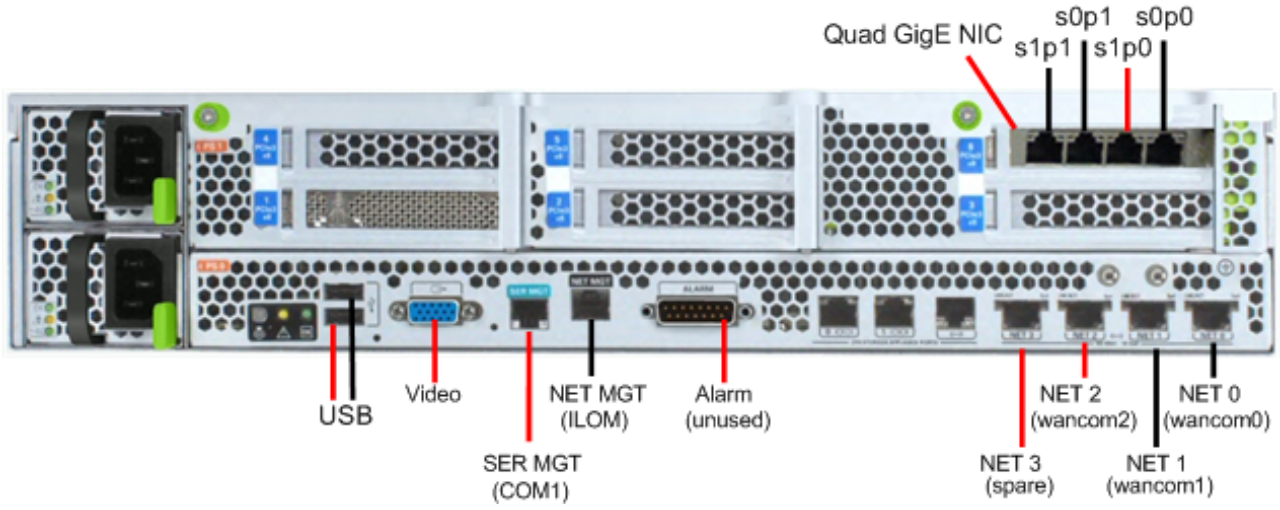
After mounting the Netra Server X3-2 for Acme Packet in an equipment rack and installing all components into it, connect all appropriate data cables to the ports before powering the system up and configuring it. This section describes how to make data cable connections.

Oracle supports the following configurations of the Netra Server X3-2 for Acme Packet (the onboard 10 GigE ports are configured for 1G operation):

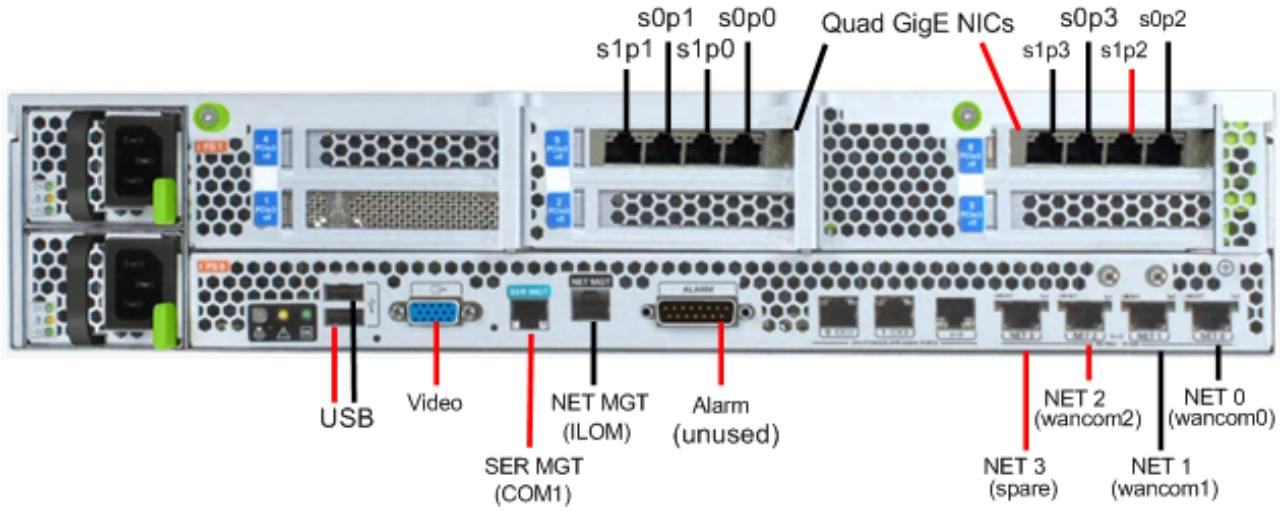
- Configuration A: Four onboard 10 GigE ports and no Quad GigE NIC
- Configuration B: Four onboard 10 GigE ports and 1 Quad GigE NIC
- Configuration C: Four onboard 10 GigE ports and 2 Quad GigE NICs



Netra Server X3-2 for Acme Packet Configuration A (4 Onboard 10 GigE Ports)



Netra Server X3-2 for Acme Packet Configuration B (4 Onboard 10 GigE Ports & 1 Quad GigE NIC)



Netra Server X3-2 for Acme Packet Configuration C (4 Onboard 10 GigE Ports & 2 Quad GigE NICs)

Oracle recommends using Category 6 (or better) for all Ethernet connections.

You can install and remove Ethernet and 1000BASE-T cables while the Netra Server X3-2 for Acme Packet is operational. Not every port needs to be utilized for proper operation. However, when a cable is disconnected and the link is lost, an alarm is generated.

Available Connections

Please read all of the information pertaining to each of the available connections prior to cabling the Netra Server X3-2 for Acme Packet.

Port	Description	You Need:
NET (0-3)	10 GigE ports - labeled Net 3, Net 2, Net 1 and Net 0 (left to right) - enable you to connect the Netra Server X3-2 for Net-Net to your network.	A Category 6 (or better) Ethernet cable to connect to the NET 0 port to your network Network parameters such as an IP address (can be provided by DHCP services or assigned a static address in the OS) Additional Category 6 (or better) Ethernet cables and Ethernet addresses as needed for additional connections to NET 1 - 3
NET MGT	Provides a 10/100BASE-T Ethernet connection to the SP through an RJ-45 connector. This port provides support connections to the SP using the Oracle ILOM CLI and Web interface. By default, this port is configured to use DHCP to automatically obtain an IP address. Alternatively, you can assign a static IP address to this port. To use this port, it must have its network settings configured. Once configured, use the NET MGT port IP address to log in to the SP using a browser or secure shell.	Category 6 (or better) Ethernet cable to connect the NET MGT port to your network IP address for this port (required from DHCP or a static address)

Port	Description	You Need:
SER MGT (COM1)	Provides a TIA/EIA-232 serial Oracle/Cisco standard connection to the SP through an RJ-45 connector. Default settings for this port are: 8N1: eight data bits, no parity, one stop bit 115200 baud Disable hardware flow control (CTS/RTS) Disable software flow control (XON/XOFF)	A terminal device (e.g., terminal, connection to a terminal server, or computer such as a laptop running terminal emulation software) A cable to connect the terminal device to the SER MGT (COM1) port
USB	Provides USB connections to the service processor (SP). The USB ports are hot pluggable, so you can connect/disconnect USB cables from these ports and peripheral devices without affecting server operations.	USB keyboard USB mouse Note: Maximum USB cable length: 5 meters
VIDEO	Provides a temporary video connection to the SP.	VGA monitor HDB-15 video cable with a maximum cable length of 6 meters (19.7 feet)

Local Console Cabling Procedure

This section explains how to physically make a console connection to the Netra Server X3-2 for Acme Packet. Administration console may be connected to either the ILOM (NET MGT), the local VGA+USB console ports, or the local SER MGT (COM1) serial console port. When configuring bootloader parameters, set the console to VGA if ILOM or VGA+USB are used, or COM1 if SER MGT is used. The bootloader is accessible on all console ports, but only input from the active console port can be recognized by the Netra Server X3-2 for Acme Packet.

Note: DO NOT configure COM2 in the bootparams menu.

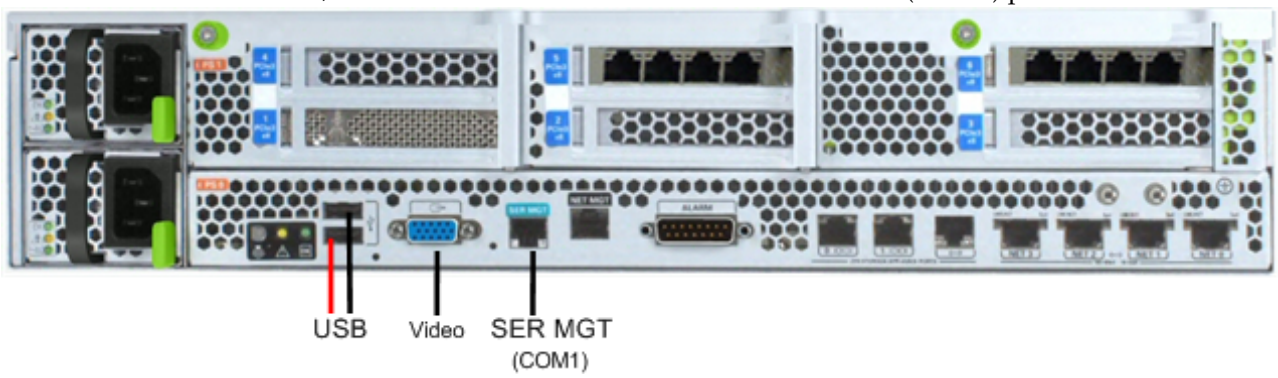
- To cable a serial console connection:
  - Serial console cable with an RJ-45 connector
- To cable a USB and Video Connection:
  - DB-15 video cable with a maximum cable length of 6 meters (19.7 feet)
  - USB cable with a maximum cable length of 6 meters (19.7 feet)
  - USB keyboard

In the following procedure, you have the option to either cable a serial connection or to cable a USB/Video connection.

To cable a local console connection:

1. Locate the appropriate cable(s) to connect to the Netra Server X3-2 for Acme Packet.

2. To cable a serial connection, insert the serial console cable into the SER MGT (COM1) port.



Connecting to USB, VGA and SER MGT (COM1) Ports

Note: Refer to the Netra Server X3-2 hardware documentation for information on how to configure your terminal application to connect to the console, and how to establish communications with the Netra Server X3-2 for Acme Packet.

3. To cable a USB/Video connection, insert the 15-pin connector on the end of the video cable into the Video port. Then insert the USB cable from the mouse and keyboard into the USB ports.
4. Lead the cables neatly away from the rear panel.
5. Plug in the cables to their respective destination components.

ILOM Cabling Procedure

This section explains how to make a connection to the Netra Server X3-2 for Acme Packet ILOM port. For a remote permanent connection to the SP over the ILOM connection, use the rear panel NET MGT port.

Refer to the Netra Server X3-2 for Acme Packet hardware documentation for information on how to configure your Web browser application to connect to the console, and how to establish communications with the Netra Server X3-2 for Acme Packet.

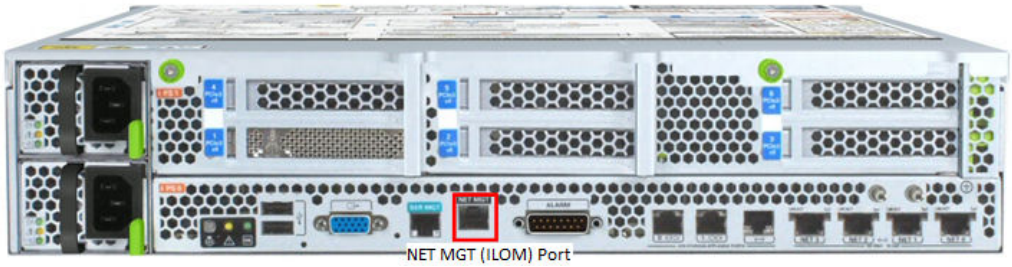
Note: Keep Ethernet cables separated from power cables by at least 60mm where possible and never run them in the same channel of the rack without segregation.

Prerequisites:

- Category 6 (or better) Ethernet cable with RJ-45 jacks

To cable an ILOM connection:

1. Locate the cable to connect to the Netra Server X3-2 for Acme Packet.
2. Plug the RJ-45 connector into the ILOM port.



3. Lead the cable neatly away from the rear panel.
4. Connect the other end of the cable to the LAN.

Network Management Ports Cabling Procedure

This section describes how to connect cables to the network management ports. These ports support 10/100/1G/10G Mbps speeds.

Note: Keep Ethernet cables separated from power cables by at least 60mm where possible and never run them in the same channel of the rack without segregation.

Prerequisites:

- Category 6 (or better) Ethernet cable with RJ-45 jacks

To connect to the network management ports:

1. Locate the Ethernet cables you plan to connect to the Netra Server X3-2 for Acme Packet.
2. Insert the RJ-45 connector on the end of the Ethernet cable into one the NET0 Ethernet port (**`wancom0`**).

   Note: The wancom0 and wancom1 ports are common to all supported Netra Server X3-2 for Acme Packet configurations. The wancom2 port is not used on the Oracle ECB.

   The release tab on the RJ-45 jack will click into place when you insert it properly.

   Network Management Ports
3. Route the cable away from the Netra Server X3-2 for Acme Packet, ensuring that the Ethernet cables are not stretched tightly or subjected to extreme stress.

Media and Signaling Network Interfaces

This section explains how to cable the media and signaling ports. These ports accept copper GigE connectors.

Note: Perform all cabling procedures according to the established standards for your organization.

Category 6 (or better) Ethernet cables with RJ-45 jacks are used for connecting to the Netra Server X3-2 for Acme Packet media and signaling ports to your production network.

Regardless of configuration, media ports support 10/100/1000BASE-T only. Do not attempt to connect 10GBASE-T equipment to the signaling and media ports.

Prerequisites:

- Category 6 (or better) Ethernet cables with RJ-45 jacks

To connect to the media and signaling ports:

1. Locate the Ethernet cables you plan to connect to the media and signaling ports of the Netra Server X3-2 for Acme Packet.
2. Insert the RJ-45 connector on the end of the Ethernet cable into one of the 1000BASE-T copper media and signaling ports. The available signaling and media ports depend on the chosen configuration:

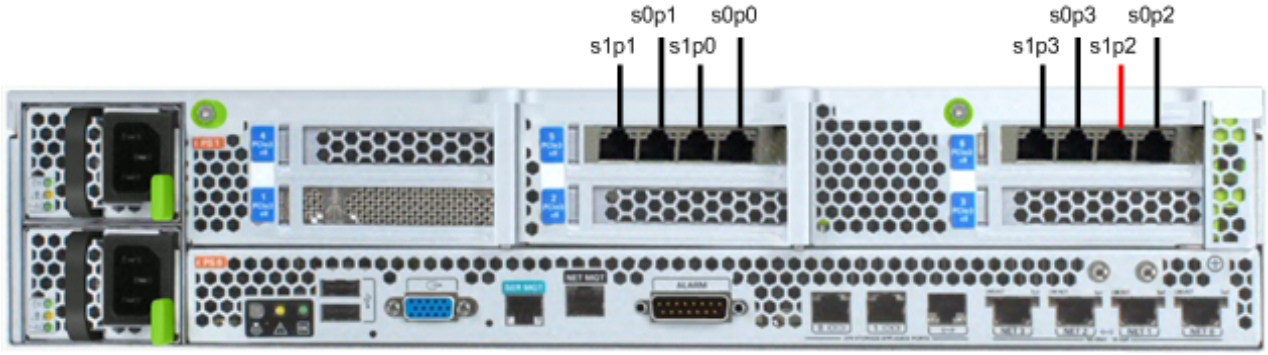
- For configurations with no Quad GigE NICs, two onboard Ethernet ports are available for use as signaling and media ports as shown in the following.

Supported Signaling/Media Ports (4 10 GigE Ports)

- When the configuration consists of four onboard 10 GigE ports and one Quad GigE NIC, the signaling and media ports include **s1p1, s0p1, s1p0,** and **s0p0** as shown in the following. The release tab on the RJ-45 jack will click into place when you insert it properly.

Supported Signaling/Media Ports (4 OB 10 GigE Ports & 1 Quad GigE NIC)

- When the configuration consists of four onboard 10 GigE ports and two Quad GigE NICs, the signaling and media ports include **s1p1, s0p1, s1p0, s0p0, s1p3, s0p3, s1p2** and **s0p2** as shown in the following. The release tab on the RJ-45 jack will click into place when you insert it properly.



Supported Signaling/Media Ports (4 OB 10 GigE Ports & 2 Quad GigE NICs)

3. Route the cable away from the Netra Server X3-2 for Acme Packet. Make sure that the Ethernet cables are not stretched tightly or subjected to extreme stress.
4. Repeat Steps 1 through 2 for each additional Ethernet cable you connect to your Netra Server X3-2 for Acme Packet.

Cabling for HA Deployments

The information and instructions in this section explain how to cable a high availability (HA) node.

HA Cabling

Category 6 Ethernet cables are required for cabling two HA nodes together.

Rear Panel Cabling

You can use one connection for HA redundancy support between the two members of an HA node. As a rule, **wancom0** should be reserved as the boot/maintenance interface. This leaves **wancom1** available for sharing HA information.

4 Onboard 10 GigE Ports & 1 Quad GigE NIC

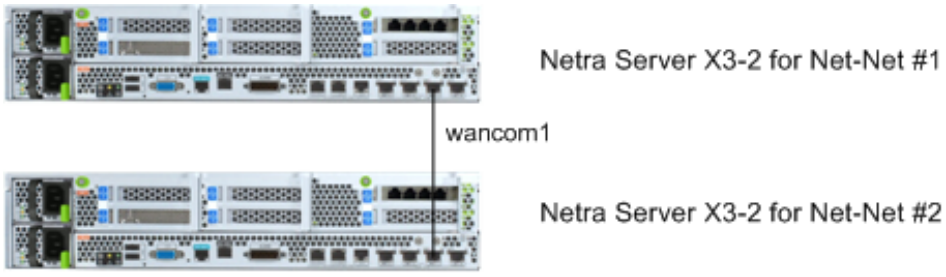
Prerequisites:

- Category 6 (or better) Ethernet cables with RJ-45 jacks

Single Rear Interface Support

To cable a Netra Server X3-2 for Acme Packet HA node using single rear interface support:

1. Insert one end of an Ethernet cable into **wancom**1 on the rear panel of Netra Server X3-2 for Acme Packet #1. The release tab on the RJ-45 jack clicks into place when you insert it properly.
2. Insert the other end of the Ethernet cable into the corresponding management interface on the rear panel of the Netra Server X3-2 for Acme Packet #2 as presented here. For example, If you use **wancom1** on Netra Server X3-2 for Acme Packet #1, then you will connect it to **wancom1** on Netra Server X3-2 for Acme Packet #2.



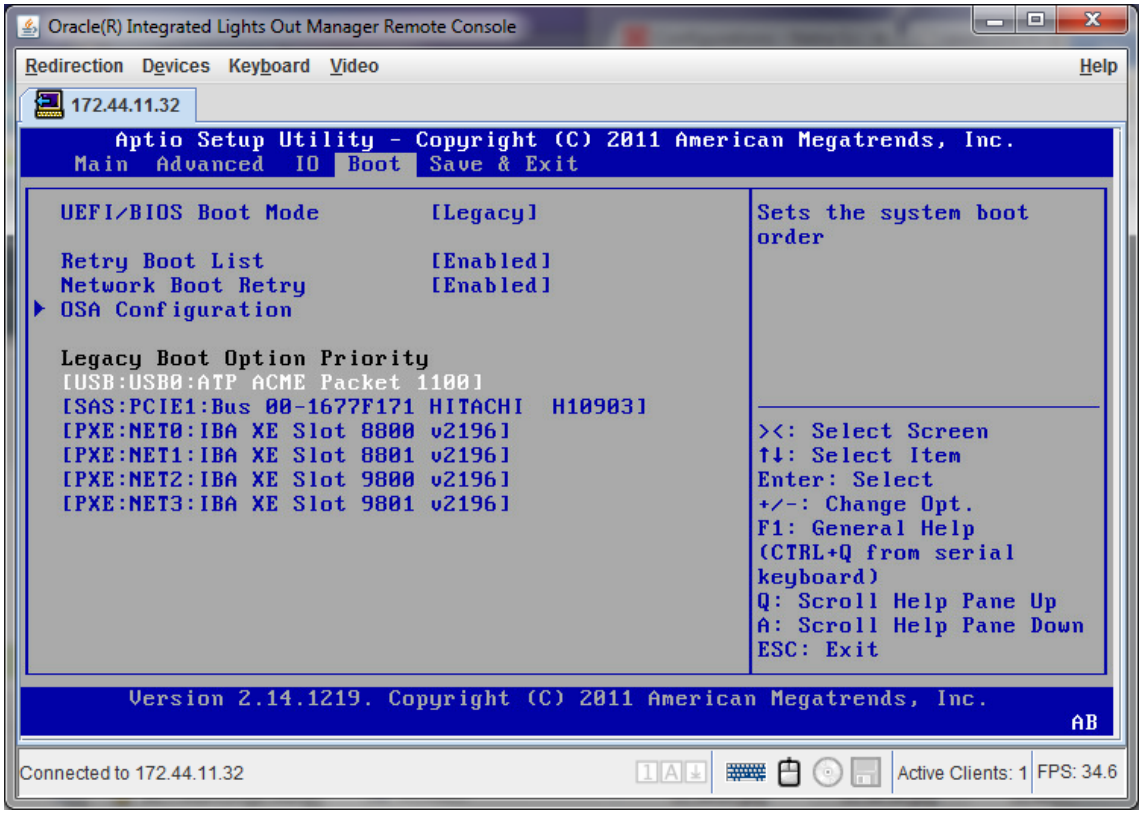
HA Node Using Single Rear Interface Support (No Quad GigE NIC)

3. Refer to the configuration procedures located in the HA Nodes information in this Configuration Guide.

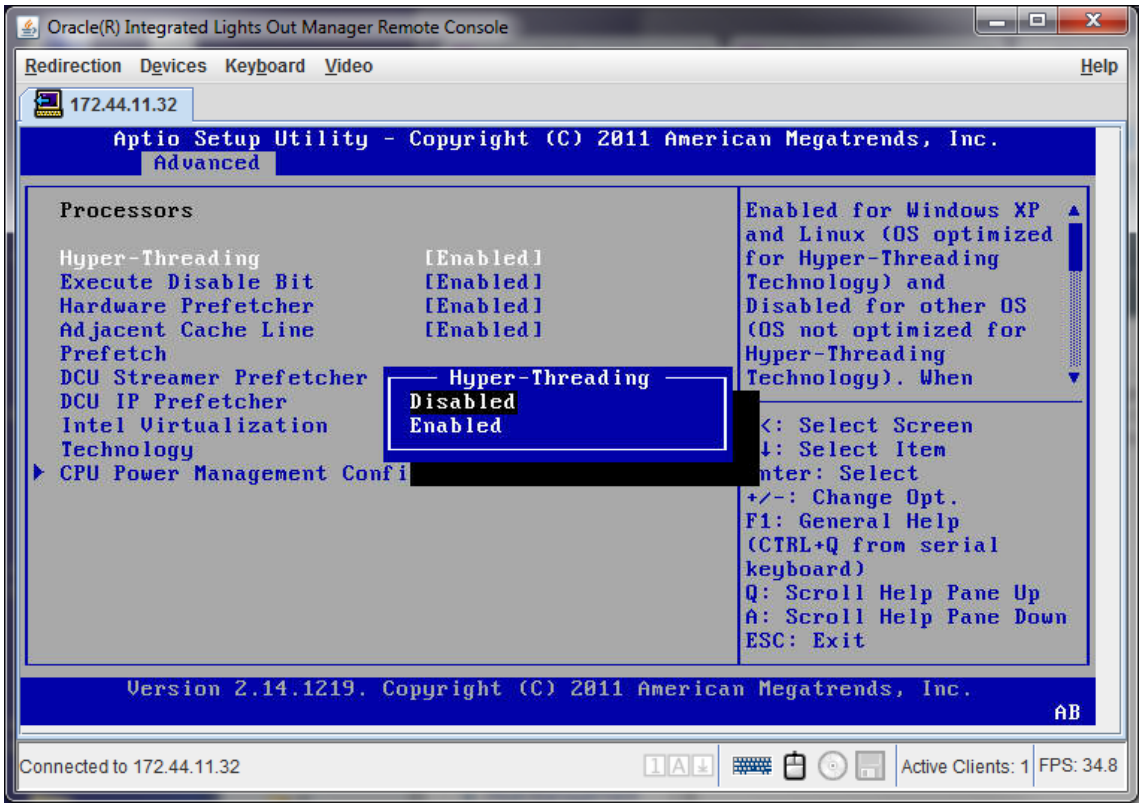
BIOS Setting Configuration

The following changes on the Netra Server X3-2 are required to run Oracle Enterprise Communications Broker. This procedure shows where to make changes in the BIOS setup utility.

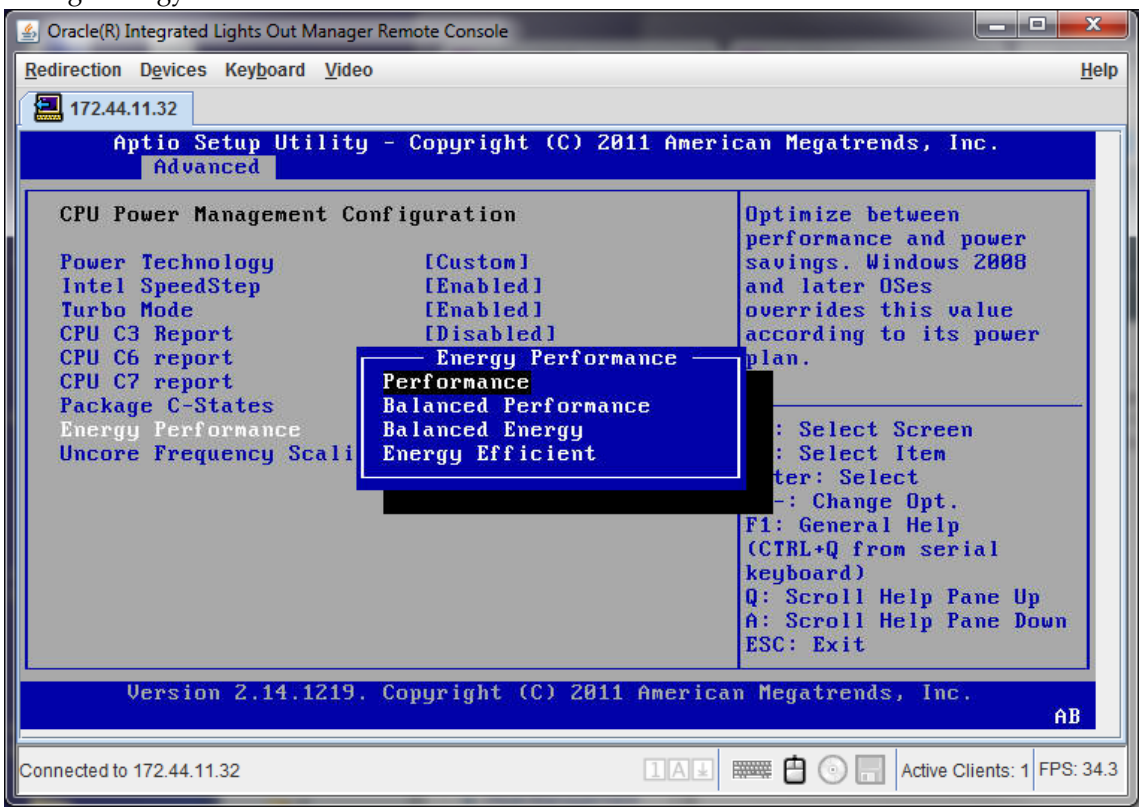
1. Set the USB slot to be the first boot device. The disk controller should be the second boot device.



2. Set Hyper-Threading to **`Disabled`**



3. Change Energy Performance to **`Performance`**



4. After setting Performance, press **`Escape`** to return to the main menu, then select **`Save & Exit`** to apply the changes.
   The system will reboot using the newly configured settings.

Virtual Systems

The Oracle Enterprise Communications Broker Software Only distribution is designed to operate on virtual machines running on generic, off-the-shelf servers. Oracle recommends the use of Oracle Virtual Machine (OVM) hypervisor for running the Oracle Enterprise Communications Broker virtual application.

The end-user installs the virtual machine software in hardware of the customer's choice. The number of VMs supported by a server is constrained only by the resources on your system.

Minimum VM Resources

Each VM instance requires the following minimum allocation or network resources.

- CPU cores: 2
- Memory: 2GB
- Hard drive storage: 40GB
- 32-bit application
- Interfaces: 4 recommended

Format Hard Drive

Run the command **`format-hard-drive`**, as described in the *Oracle® Enterprise Session Director ACLI Configuration Guide* immediately after successful installation.

2

Getting the System Operational

Appliance Installation and Start-Up

This section outlines hardware installation at a very high level and describes system power-on. It bridges hardware installation and application start-up, presenting information about what to expect from Oracle Enterprise Communications Broker software as the hardware powers up. Administrators need to know how to access the software while it boots, and what successful software startup looks like.

If running the Oracle Enterprise Communications Broker as a virtual application, refer to the hardware vendor's installation instructions for hardware to learn how to access the software while it boots. From a console connection, there is little difference to the way successful startup appears as an appliance versus a virtual machine.

Hardware Installation Summary

Installing your Oracle Enterprise Communications Broker in your rack requires the steps summarized here. This checklist is only an overview. It is not designed to substitute for following the detailed procedures in the hardware installation guides.

1. Unpacking the Oracle Enterprise Communications Broker
2. Installing the Oracle Enterprise Communications Broker into your rack
3. Installing power supplies
4. Installing fan modules
5. Installing physical interface cards
6. Cabling the Oracle Enterprise Communications Broker

   Make sure you complete installation procedures fully and note the safety warnings to prevent physical harm to yourself and/or damage to your Oracle Enterprise Communications Broker.

   After you have completed the hardware installation procedures, you are ready to establish a connection to your Oracle Enterprise Communications Broker. Then you can load the Oracle Enterprise Communications Broker software image you want to use and establish basic operating parameters.

Connecting to Your Oracle Enterprise Communications Broker

By default, the Oracle Enterprise Communications Broker is delivered with no management IP address. You must set this address the first time you start your system. Find instructions on configuring this address in the System Boot section below.

You can connect to your Oracle Enterprise Communications Broker either through a direct console connection, or by creating a remote Telnet or SSH session. Both of these access methods provide you with a wide range of configuration, monitoring, and management options. IP-based management access, including Telnet SSH and GUI, requires an IP address for your management port. This address is specified in boot parameter named "**ip address**".

Note: The **ip address** parameter is displayed using different names, depending on the context:

- The boot parameters wizard field name is also "**ip address**".
- The initial configuration wizard field name is "**Management interface ip address**".
- The ACLI **show interfaces** command field name is "**wancom0**".

By default, Telnet, sftp and web GUI connections to your Oracle Enterprise Communications Broker are enabled, but are only accessible via the "**ip address**" address. You cannot use telnet, sftp or the web GUI until you set this address.

Depending on platform, software installation may be required upon first startup. You perform/monitor software installation via the console connection. The Oracle Enterprise Communications Broker requires most configuration via the GUI. Procedures requiring the ACLI include:

- Change default management interface IP address
- Format hard drive
- Set/Change password
- Set/Change SIP Monitor and Trace filters
- Disable telnet

Local Connections and Time-outs

The ACLI is available via serial, telnet and SSH connections. Prior to software installation, you reach the ACLI via a local, serial connection.

If deploying the Oracle Enterprise Communications Broker on a virtual machine, the virtual machine manager provides console access via a virtual serial connection. See documentation on your virtual machine to learn how to access the console. Once you have accessed a virtual machine console, working within that console is the same as on dedicated hardware.

If deploying on dedicated hardware, refer to the hardware documentation or this document's Applicable Platforms chapter for instructions on connecting to Oracle Enterprise Communications Broker console.

One end of the cable plugs into your terminal, and the other end plugs into the RJ-45 port, normally on the back of your server.

To set up a console connection to your Oracle Enterprise Communications Broker:

1. Set the connection parameters for your terminal to the default boot settings:
   - Baud rate: 115,200 bits/second
   - Data bits: 8
   - Parity: No
   - Stop bit: 1
   - Flow control: None
2. Use a serial cable to connect your PC to the Oracle Enterprise Communications Broker. Refer to your hardware documentation for the location of your server's serial port.
3. Power on your Oracle Enterprise Communications Broker.
   The system boots. Upon successful boot, the system prompts you to log in.

   ```
   Password:
   ```
4. Enter the appropriate password information when prompted to log into User mode of the ACLI. The default user mode password is **acme**.

The system displays the ACLI's user mode prompt :

```
ORACLE>
```

5. If necessary enter Superuser mode, by entering **enable** at the ACLI and pressing Enter.
   The system ACLI prompts you for the superuser password:

```
ORACLE>enable
Password:
```

6. Enter the appropriate password information to log into Superuser mode of the ACLI. The default Superuser mode password is **packet**.
   The system changes the ACLI prompt to:

```
ORACLE#
```

7. Proceed with system configuration or setup.

You can control the amount of time it takes for your console connection to time out by setting the **console-timeout** parameter in the system configuration. If your connection times out, the login sequence appears again and prompts you for your passwords. The default for this field is 0, which means that no time-out is being enforced.

Telnet Remote Connections and Time-outs

You can also Telnet to your Oracle Enterprise Communications Broker. Using remote Telnet access, you can provision the Oracle Enterprise Communications Broker remotely through the management interface over IP. You configure management interface IP during system setup, described below, or via the Oracle Enterprise Communications Broker boot parameters.

The Oracle Enterprise Communications Broker can support up to five concurrent Telnet sessions. However, only one user can carry out configuration tasks at one time.

Note: Telnet does not offer a secure method of sending passwords. Using Telnet, passwords are sent in clear text across the network.

To Telnet to your Oracle Enterprise Communications Broker, you need to know the IPv4 address of its administrative interface (wancom0). The wancom0 IPv4 address of your Oracle Enterprise Communications Broker can be found using the ACLI to display the boot parameter value named **IP Address** .

You can manage the Telnet connections to your Oracle Enterprise Communications Broker by setting certain ACLI parameters and by using certain commands:

- To set a time-out due to inactivity, use the **telnet-timeout** parameter in the system configuration. You can set the number of seconds that elapse before the Telnet connection or SSH connection is terminated. The default for this field is 0, which means that no time-out is being enforced.
- To view the users who are currently logged into the system, use the command, **show users**. You can see the ID, timestamp, connection source, and privilege level for active connections.
- From Superuser mode in the ACLI, you can terminate the connections of other users in order to free up connections. Use the command, **kill user**, with the corresponding connection ID.
- From Superuser mode in the ACLI, you can globally enable and disable Telnet connections to the Oracle Enterprise Communications Broker.
  - Telnet service is enabled by default on your Oracle Enterprise Communications Broker.
  - To disable Telnet, type the command, **management disable telnet**, at the ACLI Superuser prompt and reboot your system. The Oracle Enterprise Communications Broker then refuses any attempts at Telnet connections. If you want to restart Telnet service, type **management enable telnet**.
- If you reboot your Oracle Enterprise Communications Broker from a Telnet session, you lose IP access and therefore your connection.

SSH Remote Connections

For increased security, you can connect to your Oracle Enterprise Communications Broker using SSH. An SSH client is required for this type of connection.

The Oracle Enterprise Communications Broker supports five concurrent SSH and/or SFTP sessions.

There are two ways to use SSH to connect to your Oracle Enterprise Communications Broker. The first works the way a Telnet connection works, except that authentication takes place before the connection to the Oracle Enterprise Communications Broker is made. The second requires that you set an additional password

SSH without Username and Password

Many SSH clients allow you to initiate an SSH connection without specifying a username. To initiate an SSH connection to the Oracle Enterprise Communications Broker without specifying users and SSH user passwords:

1. Open your SSH client.
2. At the prompt in the SSH client, type the **ssh** command, a Space, the IPv4 address of your Oracle Enterprise Communications Broker, and then press Enter.

   The SSH client prompts you for a password before connecting to the Oracle Enterprise Communications Broker. Enter the Oracle Enterprise Communications Broker's User mode password. After it is authenticated, an SSH session is initiated and you can continue with tasks in User mode or enable Superuser mode.

   Bear in mind that some clients interpret SSH session initiation without a username as a means of logging in with your system login name. The procedure above does not work for these clients.

   Note: You can also create connections to the Oracle Enterprise Communications Broker using additional username and password options.

SSH with Username and Password

To initiate an SSH connection to the Oracle Enterprise Communications Broker with an SSH username and password:

1. In the ACLI at the Superuser prompt, type the **ssh-password** and press Enter. Enter the name of the user you want to establish. Then enter a password for that user when prompted. Passwords do not appear on your screen.

   ```
   SYSTEM# ssh-password
   SSH username [saved]: MJones
   Enter new password: 95X-SD
   Enter new password again: 95X-SD
   ```

   Note: After you configure ssh-password, the SSH login accepts the username and password you set, as well as the default SSH/SFTP usernames: User and admin.
2. Configure your SSH client to connect to your Oracle Enterprise Communications Broker's management IPv4 address using the username you just created. The standard version of this command would be:

   ```
   ssh -l MJones 10.0.1.57
   ```
3. Enter the SSH password you set in the ACLI.

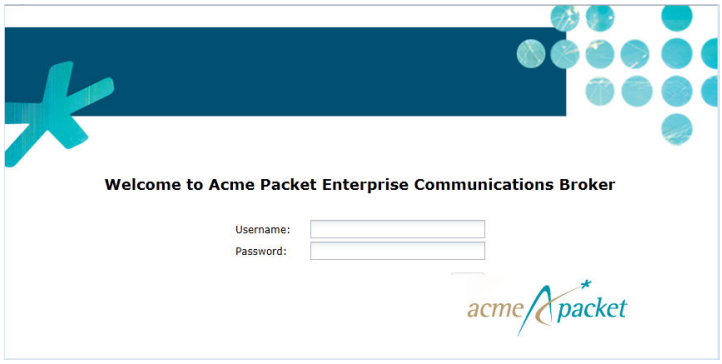
   ```
   MJones@10.0.2.54 password: 95X-SD
   ```
4. Enter your User password to work in User mode on the Oracle Enterprise Communications Broker. Enable Superuser mode and enter your password to work in Superuser mode.
5. An SSH session window opens and you can enter your password to use the ACLI.

GUI Access

Oracle requires the use of GUI for ongoing configuration and management of the Oracle Enterprise Communications Broker. Most user/provisioning procedures cannot be conducted via the ACLI. Important exceptions to this include setting the initial management IP address and changing GUI access passwords.

GUI access is available via HTTP at the configured management address. You must set this address before proceeding. You can configure HTTPS access, if desired. Disabling the GUI is not supported.

When you access the GUI via browser, you see the login screen, from which you login and then access System Administration and Service Provisioning controls.



System Boot

Whenever your Oracle Enterprise Communications Broker boots, the following information about the tasks and settings for the system appear in your terminal window.

- System boot parameters
- From what location the software image is being loaded: an external device or internal flash memory
- Requisite tasks that the system is starting
- Log information: established levels and where logs are being sent
- Any errors that might occur during the loading process

After the loading process is complete, the ACLI login prompt appears.

Note: You can set boot parameters using the ACLI or the GUI. Boot parameter definitions, which help you understand what you should set them to, are provided below.

Oracle Enterprise Communications Broker Boot Parameters

Boot parameters specify the information that your Oracle Enterprise Communications Broker uses at boot time when it prepares to run applications. The Oracle Enterprise Communications Broker's boot parameters:

- Allow you to set the IP address for the management interface (wancom0).
- Allow you to set a system prompt. The target name parameter also specifies the title name displayed in your web browser and SNMP device name parameters.
- Determine the software image to boot and from where the system boots that image.
- Sets up the username and password for network booting from an external FTP server.

In addition to providing details about the Oracle Enterprise Communications Broker's boot parameters, this section explains how to view, edit, and implement them.

When displaying the boot parameters, your screen shows a help menu and the first boot parameter (boot device). Press Enter to continue down the list of boot parameters.

Boot Parameter Changes

You can access and edit boot parameters by using either the ACLI or by interrupting the system boot process.

Note: Changes to boot parameters do not go into effect until you reboot the Oracle Enterprise Communications Broker.

Oracle recommends that you use management port 0 (wancom0) as the boot interface, and that your management network is either:

- directly a part of your LAN for management port 0
- accessible through management port 0

Otherwise, your management messages may use an incorrect source address.

Change Boot Parameters from the ACLI

To access and change boot parameters from the ACLI:

1. In Superuser mode, type configure terminal, and press Enter.

   ```
   ORACLE# configure terminal
   ```

2. Type bootparam, and press Enter. The boot device parameters display.

   ```
   ORACLE(configure)# bootparam
   '.' = clear field;  '-' = go to previous field;  ^D = quit
   boot device           : eth0
   ```

   To navigate through the boot parameters, press Enter and the next parameter appears on the following line.

   You can navigate through the entire list this way. To go back to a previous line, type a hyphen (-) and press Enter. Any value that you enter entirely overwrites the existing value and does not append to it.

3. To change a boot parameter, type the new value that you want to use next to the old value. For example, if you want to change the image you are using, type the new filename next to the old one. You can clear the contents of a parameter by typing a period and then pressing Enter.

   ```
   ORACLE(configure)# bootparam
   '.' = clear field;  '-' = go to previous field;  ^D = quit
   boot device      : eth0
   processor number    : 0
   host name    : goose
   file name    : /boot/nnPCz100.gz /boot/nnPCz200.gz
   ```

   When you have scrolled through all of the boot parameters, the system prompt for the configure terminal branch displays.

   ```
   ORACLE(configure)#
   ```

4. Exit the configure terminal branch.
5. Reboot the Oracle Enterprise Communications Broker for the changes to take effect.

   The ACLI **reboot** and **reboot force** commands initiate a reboot. With the **reboot** command, you must confirm that you want to reboot. With the **reboot force** command, you do not have make this confirmation.

   ```
   ORACLE# reboot force
   ```

   The Oracle Enterprise Communications Broker completes the full booting sequence. If necessary, you can stop the auto-boot at countdown to fix any boot parameters.

   If you configured boot parameters correctly, the system prompt displays and you can go ahead with configuration, management, or monitoring tasks.

   Note: If you configured the boot parameters incorrectly, the Oracle Enterprise Communications Broker goes into a booting loop and displays an error message.

```
Error loading file: errno = 0x226.
Can't load boot file!!
```

Press the space bar to stop the loop. Correct the error in the boot parameter, and reboot the system.

Change Boot Parameters by Interrupting a Boot in Progress

To access and change boot parameters by interrupting a boot in progress:

1. When the Oracle Enterprise Communications Broker is in the process of booting, you can press the space bar on your keyboard to interrupt when you see the following message appear:

   ```
   Press the space bar to stop auto-boot...
   ```

2. After you stop the booting process, you can enter the letter p to display the current parameters, the letter c to change the boot parameters or the @ (at-sign) to continue booting.

   ```
   [Acme Packet Boot]: c
   '.' = clear field;  '-' = go to previous field;  ^D = quit
   boot device          : wancom0
   ```

   To navigate through the boot parameters, press Enter and the next parameter appears on the following line.

   You can navigate through the entire list this way. To go back to a previous line, type a hyphen (-) and press Enter. Any value that you enter entirely overwrites the existing value and does not append to it.

3. To change a boot parameter, type the new value that you want to use next to the old value. For example, if you want to change the image you are using, type the new filename next to the old one.

   ```
   ORACLE(configure)# bootparam
   '.' = clear field;  '-' = go to previous field;  ^D = quit
   boot device     : wancom0
   processor number     : 0
   host name     : goose
   file name     : /code/nnPCz100.bz /code/nnPCz200.bz
   ```

4. After you have scrolled through the complete list of boot parameters, you return to the boot prompt. To reboot with your changes taking effect, type @ (the at-sign), and press Enter.

   ```
   [Acme Packet Boot]: @
   ```

   The Oracle Enterprise Communications Broker completes the full booting sequence, unless there is an error in the boot parameters.

   If you have configured boot parameters correctly, the system prompt displays and you can go ahead with configuration, management, or monitoring tasks.

   Note: If you have configured the boot parameters incorrectly, the Oracle Enterprise Communications Broker goes into a booting loop and displays an error message.

   ```
   Error loading file: errno = 0x226.
   Can't load boot file!!
   ```

   Press the space bar to stop the loop. Correct the error, and reboot your system.

Set Management IP Address

You must manually set your management IP address within the Oracle Enterprise Communications Broker's boot parameters.

To set your management interface IP, access the boot parameters using a serial console connection within the context of one of the methods described above.

1. Type the letter c (change) to start boot parameter editing.
2. Press Enter until you reach the parameter named **IP Address**.
3. Type in the desired IP address.
4. Press Enter until you reach the end of the boot parameter list.
5. Reboot your Oracle Enterprise Communications Broker.

After being set, the management interface IP address provides access to your system via telnet, ssh and web GUI. You can verify the status of this interface using the following command to display the address and status of wancom0.

```
Oracle ECB# show interfaces brief
Slt Prt Vlan Interface  IP                    Gateway             Adm  Oper
Num Num   ID Name       Address               Address             Stat Stat
--- --- ---- ---------- --------------------- ------------------- ---- ----
-   -    -   lo         127.0.0.1             -                    up   up
-   -    -   wancom0    122.30.204.127/16     -                    up   up
0   0    0   M00        122.170.1.200/16      0.0.0.0              up   up
-------------------------------------------------------------------------------
Oracle ECB#
```

Format Hard Drive

Manual software installation, performed on virtual and COTs machines, does not include formatting the hard drive automatically. After manual software installation and boot parameter configuration, the user must format the hard drive from the ACLI.

Generic installation documentation may not include the requirement to format the hard-disk. Run the command **format hard-disk** from the Oracle Enterprise Communications Broker ACLI to create a persistent partition for your /opt directory, within which you can store data needed after a reboot. Perform this procedure the FIRST time you start your Oracle Enterprise Communications Broker.

Partial output is presented below. Be sure to accept all defaults presented during the format by typing the letter **y** when prompted.

```
ORACLE# format hard-disk
WARNING: Please ensure device is not currently in use by any applications
before proceeding
Continue [y/n]?: y
The following system partitions will now be created:
1: /opt 8000000 bytes
2: /crash 16218284032 bytes
Create the system partitions and filesystems as configured above [y/n]?: y
```

After the drive(s) are formatted, the system mounts the newly created partitions.

System Image Filename

The system image filename is a name you set for the image. This is also the filename the bootloader uses whenever booting your system. This filename must match the filename specified in the boot parameters. When your image is located on your Oracle Enterprise Communications Broker, the parameter should start with /boot/ to indicate that the Oracle Enterprise Communications Broker is booting from it's local /boot directory.

If the filename set in the boot parameters does not point to the image you want sent to the Oracle Enterprise Communications Broker via SFTP, then you could not only fail to load the appropriate image, but you could also load an image from a different directory or one that is obsolete for your purposes. This results in a boot loop condition that you can fix by stopping the countdown, entering the appropriate filename, and rebooting the Oracle Enterprise Communications Broker.

Initializing Your System

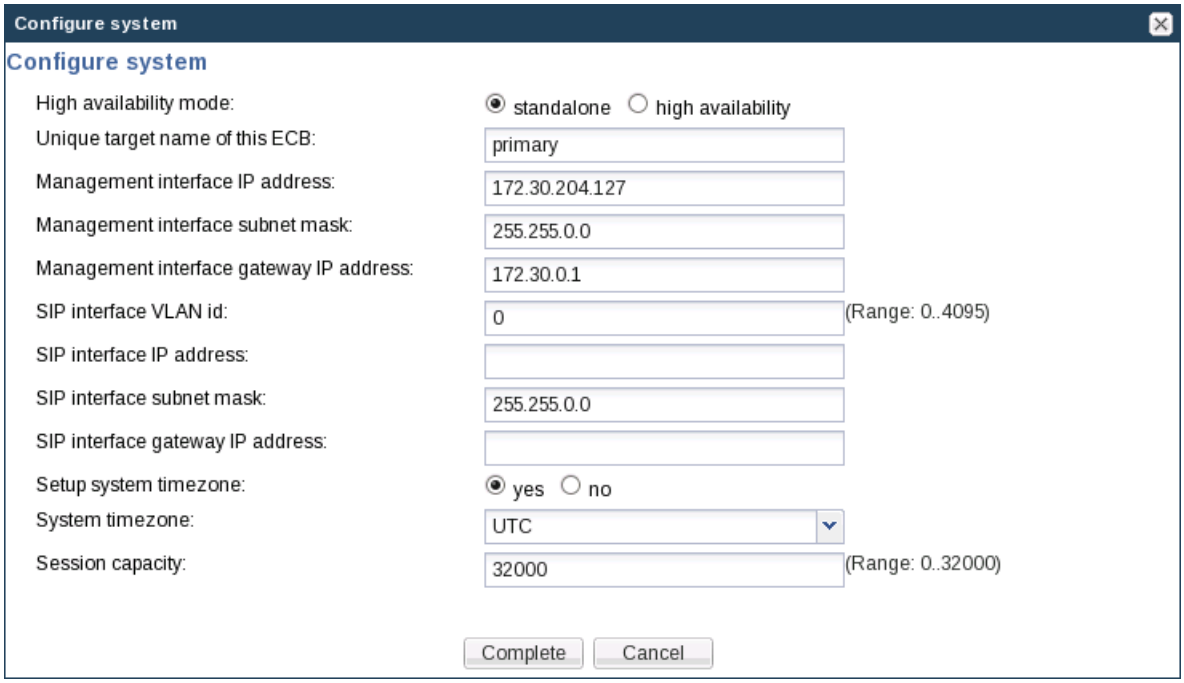
The Oracle Enterprise Communications Broker provides a means of initializing the system from the GUI. This procedure is required upon first startup. The user may need to initialize at other times, but must be aware that all configuration is lost (initialized) and that the system reboots.

With respect to getting a high availability configuration operational, note that you use the Set initial configuration wizard to configure the primary Oracle Enterprise Communications Broker first. Assuming

the configuration is correct, high availability operations begin as soon as you Set initial configuration on the secondary Oracle Enterprise Communications Broker and that system completes its subsequent reboot.

1. To initialize your system, navigate to the Configuration screen and select **Set initial configuration** wizard from the wizard drop-down list.

   The system displays the Configure system dialog, allowing you to make all the settings needed to initialize it.



   This wizard deletes any existing configuration and reboots the system when you click the **Complete** button.

2. **High availability mode**— Click the radio button that corresponds with your high availability configuration.

   - standalone—You have a single Oracle Enterprise Communications Broker.
   - high availability—You are deploying Oracle Enterprise Communications Brokers in pairs, connecting them together and configuring one as primary and the other as a secondary. The secondary can automatically take over for the primary, providing "hitless", redundant operation.

3. **Unique target name of this ECB**—Type the name of this system. This setting has an operational impact on your high availability configuration.
4. **Management interface IP address**—Enter the IP address to be used for accessing the Web GUI, and press Enter.
5. **Management interface subnet mask**—Enter subnet mask to be used for accessing the Web GUI, and press Enter.
6. **Management interface gateway IP address**—Enter the IP address to be used for reaching this network's gateway and press Enter.
7. **SIP interface VLAN id**—Enter the VLAN ID (0 to 4095), if any, required for operation on the network of your SIP interface.
8. **SIP interface IP address**—Enter the IP address to be used for accessing the SIP interface, and press Enter. This step is required; the system does not allow you to proceed without making a setting.
9. **SIP interface subnet mask**—Enter subnet mask to be used for accessing the SIP interface, and press Enter.
10. **SIP interface gateway IP address**—Enter the gateway IP address and press Enter.

11. **Setup system timezone**—Click the **yes** radio button to set the system timezone. Click **no** to skip this step.
12. **System timezone**—Select your timezone from the drop-down list.
13. **Session capacity**—Type in the number of sessions you purchased for this Oracle Enterprise Communications Broker.
14. Click the **Complete** button to proceed with deleting the existing configuration, setting the values in your wizard and rebooting your Oracle Enterprise Communications Broker. Click **Cancel** to cancel system initialization.

Adding a License with the Set License Wizard

TLS is the only software feature for which you need a license on the Oracle Enterprise Communications Broker. You must obtain a TLS license before you can add it. To obtain a license, you must present the correct system serial number to Oracle for your license to be generated.

1. From Configuration home, select **Set license** from the **Wizards** drop-down list.
   The Oracle Enterprise Communications Broker displays the **Set license** dialog.
2. Copy the serial number for your Oracle Enterprise Communications Broker and contact your customer support by logging into My Oracle Support or calling Oracle Customer support to make the request. Oracle replies shortly after with your license.
3. Having received your license from Oracle, enter your license in the Add license field.
   The system checks the license and, if correct, installs it. If the license is incorrect, the system tells you.

Setting Up System Basics

Before configuring and deploying your Oracle Enterprise Communications Broker, you might want to establish some basic attributes such as new User and Superuser passwords and system prompt.

New User and Superuser Passwords

ACLI passwords provide access for Telnet, SSH, SFTP and GUI sessions. Common security practices include changing these passwords from their defaults and at intervals defined by your organization. Refer to the ACLI's `secret` command, documented in the *Oracle Communications Session Border Controller ACLI Reference Guide* for information about changing user and superuser passwords.

New System Prompt

You can set the ACLI system prompt using **Configure system** or the **Set boot parameters** Wizard. Change the **`target name`** value to make it meaningful within your network. The target name may be up to 38 characters. A value that identifies the system in some way is often helpful.

3

Initial Configuration

Overview

This chapter provides information about the System Administration configuration procedures, performed with the GUI on the Oracle Enterprise Communications Broker. These procedures are rarely performed during day-to-day operations. Instead, the system administrator performs many of these procedures as a means of establishing static system operations for which few, if any, changes would be made once the system is deployed and providing service.

Icons grouped under System Administration, but not covered herein include:

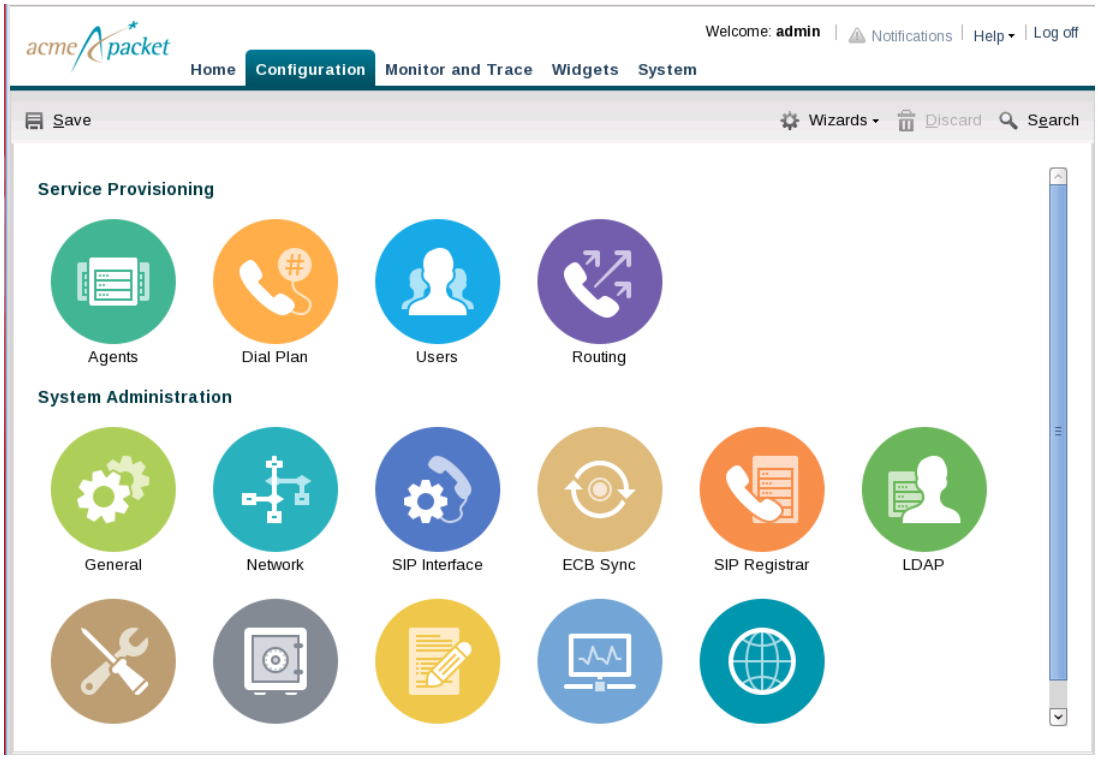
- SIP Registrar
- ECB Sync
- LDAP
- HMR

Although the above are not day-to-day procedures, they are integral to SIP service configuration and operation and require thorough understanding by the user. Refer to the *Oracle Enterprise Communications Broker User's Guide* for both conceptual and instructional information on how to work with these resources. Note that System File Management comprises another set of tasks that overlap between Administrator and User. These tasks are documented in the *Oracle Enterprise Communications Broker User's Guide*.

System Administration

The Oracle Enterprise Communications Broker GUI collects controls for administering your system under System Administration, which are covered herein. In contrast, The Oracle Enterprise Communications Broker GUI collects tools used by network architects and service provisioning technicians under Service Provisioning. Service provisioning is the focus of the *Oracle Enterprise Communications Broker User's Guide*.

Regardless, all icons are explained below for context.



Configuration Icons

The table below provides high-level descriptions of the Oracle Enterprise Communications Broker's Service Provisioning and System Administration controls. Service provisioning controls are shown to provide an overview of these items for system administrators.

Icon	Description
Service Provisioning	This set of icons provides access to the configuration required to deploy service.
Dial Plan	Add multiple dialing-contexts and dial-patterns. Dialing-contexts define the system behavior for calls placed to and from either a corporate of geographic focus. Dialing-contexts include multiple dial-patterns, which define the normalization required to most effectively manage diverse signaling structures.
Agents	Agents - Add agents. An agent is usually a SIP-aware device that serves as a transit target and/or source for signaling managed by the Oracle Enterprise Communications Broker. Agents are often specified as next-hops for the purposes of routing. Indirect agents, Oracle Enterprise Communications Broker route termination points that require further routing to reach an end station are also configured here. In addition, configuration used to access ENUM servers is performed here.

Icon	Description
Users	Add user and other key phone numbers associated with the enterprise. The user database serves as a directory for phone numbers that need communications services. This database can specify each entry's source context, which can provide a starting point for processing the logic behind a user's call treatment. It also can specify each user's home agent, providing a physical location for routing user's calls.
Routing	Add service routes. Route-entries specify strict paths for signaling traffic, allowing you to specify policy and cost for traffic based on source and/or destination.
System Administration	This set of icons provide access to configuration for which the System Administrator is responsible. This configuration is associated with system operation rather than service provisioning and management.
General	Specify standard system management information parameters. Information includes system identification information, system management information interfaces (SNMP and Syslog) and global service configurations, including Denial of Service and High Availability (system redundancy) configuration.
Network	Specify your service interface. Your signaling interface is separate from your management interface and carries all service traffic. There is only one network interface on the system.
SIP Interface	Add multiple service (SIP) ports. Service interfaces process SIP signaling. The system supports multiple SIP ports, allowing you to segregate traffic based on your own session network's architectural criteria.
Accounting	Configure connections to RADIUS servers to collect call detail records (CDRs) generated by the system. RADIUS provides a protocol for transferring CDRs for billing and troubleshooting purposes.
Security	Configure certificate records and TLS profiles, generate certificate requests, import certificates.
SNMP	Specify SNMP community for allowing access to READ functions and trap receivers.
Web Server	Specify desired web server functionality, including HTTP and/or HTTPS operation. In addition, controls for specifying the applicable TLS profile and inactivity timeout are available. Note that you cannot disable both HTTP and HTTPS operation.
ECB Sync	Provides control over multiple ECB synchronization processes, including defining applicable ECBs and initiating the synchronization.

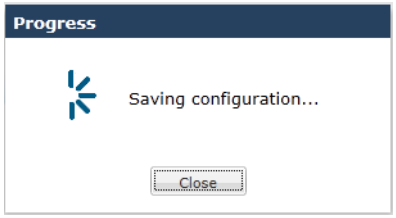
Icon	Description
LDAP	Define servers and server access rules for using an external LDAP database as a source for user authentication and routing procedures.
SIP Registrar	Creates and manages a SIP registrar object on the ECB to offload AOR registration processes from other network elements.
HMR	Create header manipulation rules, to be assigned to specific agents, that change session service messages for interoperability, policy and other deployment purposes.

Save and Activate

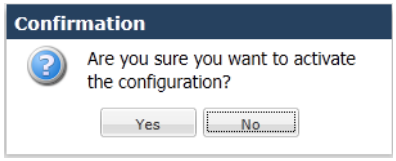
The Web GUI retains configuration changes until you send them to your device or discard them from the GUI. Configuration dialogs include an "OK" button that sends your changes to the device.

Bear in mind that you must also Save, then Activate your changes before your device actually uses your changes. The Save link, appearing as a disc icon towards the top left corner of each Web GUI page, initiates configuration Save and Activate procedures to your system.

When you click Save, the Web GUI either saves the configuration to your device or prevents you from saving invalid data. The system highlights any fields containing invalid data, allowing you to easily find and correct the mistake.



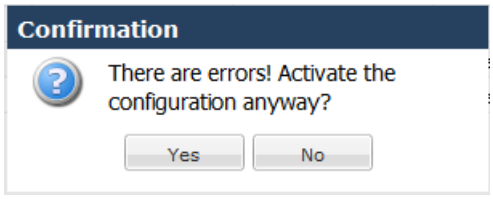
After the save is complete, the Web GUI provides you with a dialog box asking you if you wish to activate this configuration.



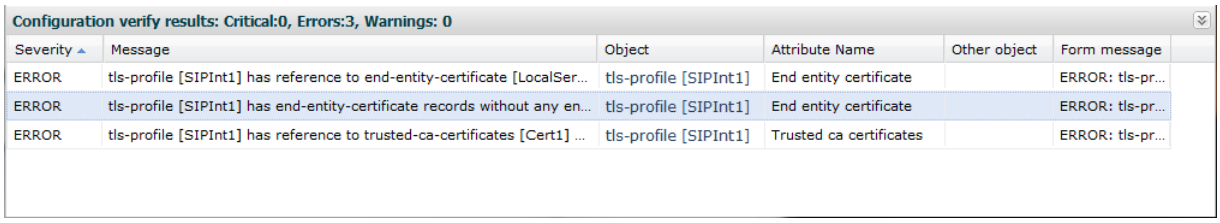
You are able to perform the save without activation, if desired. This would be common for configuration changes that need to be activated within a preferred window to avoid any service disruption.

The dialog above defaults to “No”, which leaves your changes saved to your system, but not activated. Select No if you want to activate your configuration at a later time. Select Yes to activate. The Web GUI provides a final message box indicating success when it is finished.

The Web GUI also checks your configuration for errors every time you click the Save button, indicating when it finds them prior to activation. When it discovers configuration errors, the system displays the following dialog.



The system displays configuration errors in a list at the bottom of the Web GUI. You can hide and size this error list, an example of which is displayed below. The Web GUI allows you to navigate to the each object in the list by clicking the object in the Object column.



General Settings

This section explains the fields available for configuration in General Settings, accessed by clicking the General icon. The dialog under the General icon displays fields for configuration as well as collapsed drop down lists for setting the following:

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

Refer to the dialog and control descriptions below to set your system's general settings.

System Settings

The Oracle Enterprise Communications Broker allows you to specify identification and basic global parameters using the controls under the **General** icon.

Note: By default, clicking the **General** icon displays the Modify System settings dialog with a minimum of controls. This dialog, however, includes drop-down arrow controls below the initial controls that allow you to display and make settings to further categories of controls.

Set the following parameters to configure global system identification information:

1. Hostname—Set the primary hostname used to identify the Oracle Enterprise Communications Broker system. This parameter is used by the software for informational purposes.
2. Description—Enter a textual description of the Oracle Enterprise Communications Broker system. This parameter is used for informational purposes.
3. Location—Set a location description field for your Oracle Enterprise Communications Broker system. This parameter is used for informational purposes. For example, you could include the site name and address of the location where the system chassis is located.
4. Default gateway IP address—Set the default gateway for this Oracle Enterprise Communications Broker. This is the egress gateway for traffic without an explicit destination.
   Changing this parameter can cause you to lose connectivity with the Oracle Enterprise Communications Broker GUI. Be prepared to access the Oracle Enterprise Communications Broker console if you lose connectivity. See the *Oracle Communications Session Border Controller ACLI Configuration Guide* for instructions on setting default gateway using the ACLI.
5. Enable restart on critical failure—When checked, the system attempts to restart after experiencing a failure.
6. Enable SIP monitoring and tracing—When checked, the system allows the SIP Monitoring and Tracing tool to collect traffic. Enabling this feature causes Monitor and Trace to capture and display all applicable traffic. See the chapter Oracle ECB User Guide for further information on the SIP Monitoring and Tracing tool.

NTP Servers

You configure NTP servers using the NTP Server listbox in the Modify System settings dialog. The procedure consists of simply clicking the listbox's Add link and entering the address or FQDN of each NTP server in the Add server dialog. The listbox provides you with the option of entering multiple NTP servers from the Add server listbox, as well as selecting existing entries to edit or delete them.

Note: The Oracle Enterprise Communications Broker media interface does not support management traffic for NTP. When configuring connectivity to these resources, do not configure these resources within a media interface's subnet range.

Logging (Syslog)

Logging events is a critical part of diagnosing mis-configurations and optimizing operations. Oracle Enterprise Communications Brokers can send both syslog and process log data to appropriate hosts for storage and analysis.

Overview

The Oracle Enterprise Communications Broker generates two types of logs, syslogs and process logs. Syslogs conform to the standard used for logging servers and processes as defined in RFC 3164.

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

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

Process Log Messages

Process log messages are sent as UDP packets in the following format:

```
<file-name>:<log-message>
```

In this format, <file-name> indicates the log filename and <log-message> indicates the full text of the log message as it would appear if it were written to the normal log file.

Syslog Settings

Set the following parameters to configure system-wide Syslog functionality.

1. Syslog server IP address—Set the IP address of the server to which you are sending syslog messages from the Oracle Enterprise Communications Broker. Note that Syslog message log level is always **Warning**.
2. Process log level—Set the severity level of the process log messages. Debug is most verbose. Both Debug and Trace can adversely impact system performance; configure these levels temporarily and only when required.
   - Critical (2)
   - Minor (4)
   - Warning (5)
   - Notice (6)
   - Info (7)
   - Trace (8)

- Debug (9)

SNMP

This section explains how to configure Simple Network Management Protocol (SNMP) basic parameters. SNMP is used to support monitoring of network-attached devices for conditions that warrant administrative attention. SNMP is comprised of three groups of settings on a Oracle Enterprise Communications Broker. These settings are system-wide configurations including MIB contact information, SNMP community settings, and trap receivers.

SNMP community and trap receiver configuration is performed via a separate icon on the GUI. Explanations of those fields is covered later in this document.

Basic SNMP Parameters

The Oracle Enterprise Communications Broker includes several parameters that control basic SNMP functionality. The MIB-related elements are for informational purposes, and are helpful if set. The remainder of the parameters determines if certain Oracle Enterprise Communications Broker events are reported to the SNMP system.

SNMP Settings

This section describes the system-wide SNMP parameters found in the System Configuration element. These parameters set global SNMP information.

Set the following parameters to configure system-wide SNMP functionality:

1. MIB system contact—Set the contact information used within the Oracle Enterprise Communications Broker's MIB transactions. The SNMP agent sends this information to an NMS in response to an SNMP Get for the MIB-II sysContact MIB variable. This parameter's value can be a textual identification of your company's contact person for the Oracle Enterprise Communications Broker and/or information about how to contact that person.
2. MIB system name—Set the identification of this Oracle Enterprise Communications Broker presented within MIB transactions. This value, along with the target name of the system (identified in the boot parameters) are the values reported for MIB-II when an SNMP GET is issued by the NMS for the MIB-II sysName variable. This parameter has no direct relation to the hostname parameter in the system configuration element.

   By convention, this is the node's FQDN. For SNMP MIB-II sysName GETs, the Oracle Enterprise Communications Broker returns SNMP communications in the following format:

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

   targetName is the value configured in the target name (tn) boot parameter and mib-system-name is the value configured in this field.
3. MIB system location—Set the physical location of this Oracle Enterprise Communications Broker that is reported within MIB transactions. This parameter is reported when an SNMP GET is issued by the NMS for the MIB-II sysLocation variable. This parameter has no direct relation to the location field in the system configuration element.
4. Enable event SNMP traps—When this parameter is enabled, the Oracle Enterprise Communications Broker generates traps with unique trap-IDs for each syslog event. If this parameter is disabled , a

single trap-ID is used for all events, with different values in the description string. The default is **disabled**. The valid values are:

- enabled | disabled

Configure Communications Monitoring Probe Settings

Configuring Communications Monitoring Probe settings allows you to make the Oracle Enterprise Communications Broker (ECB) act as a probe, sending network traffic information to an Oracle Communications Session Monitor Mediation Engine.

The Communications Session Monitor is Oracle's Communication Experience Manager. The manager is powered by the Oracle Communications Session Monitor Mediation Engine, a platform that collects SIP, DNS, ENUM, and protocol message traffic received from Oracle Communications Session Monitor Probes. The mediation engine stores the traffic in an internal database, and analyzes aggregated data to provide comprehensive multi-level monitoring, troubleshooting, and interoperability information.

Acting as a Probe, or as an exporter, the ECB can:

- Establish an authenticated, persistent, reliable TCP connection between itself and the Oracle Communications Session Monitor Mediation Engines.
- Send UTC time-stamped, unencrypted copy of a protocol messages to the Mediation Engine.
- Accompany the copied message with related data to include: the port and VLAN on which the message was sent or received, local and remote IP:port information, and the transport layer protocol.

1. Access the System Config configuration object.

   Configuration > **General** > **System config**.
2. Expand **Comm monitor**.

Attributes	Instructions
State	Select to enable the probe.
Sbc grp id	Set the SBC group id parameter to assign an integer value to the ECB in its role as an information exporter. Default: 0.
Monitor collector	Click **Add**, and do the following: 1. Address—Enter the collector IP address to specify the IP address of the target Oracle Communications Session Monitor Mediation Engine. 2. Port—Enter the collector port number of the target Oracle Communications Session Monitor Mediation Engine. Default: 4739. Range: 1025-65535. 3. Network Interface—Select the network interface from which to export traffic to the Oracle Communications Session Monitor Mediation Engine. Most systems use M00:0. 4. Click **OK**. 5. Optional—Repeat to add another monitor collector.

3. Do one of the following:
   - Configure other settings on the Modify System Config page, and click **OK**.
   - Click **Back**.
4. Save the configuration.

Denial of Service Settings

DoS protection on the Oracle Enterprise Communications Broker employs a means of measuring and limiting traffic based on whether the traffic is SIP signaling or ARP. This categorization aligns with queues that logically separate these traffic types, allowing a simple method of specifying limits. The means by which traffic is defined as trusted or untrusted is, in contrast, a complex set of rule that are not configurable via the GUI.

Denial of Service Configuration

Set the following parameters to configure system wide DoS functionality:

1. Click on Denial of service settings to expand the dialog box. The system expands the Modify System settings dialog to display the Denial of service settings.
2. Maximum SIP packet rate—Enter the maximum SIP packet rate, in packets per seconds. Valid values are 20 to 10,000. The default is 1000.
3. Maximum ARP packet rate—Enter the maximum ARP packet rate, in packets per seconds. Valid values are 20 to 10,000. The default is 1000.

High Availability Settings

High availability is best configured using the ACLI's SETUP wizard. If you use setup, you find the HA fields available from the GUI already configured by SETUP.

Oracle Enterprise Communications Brokers can be deployed in pairs to deliver high availability (HA). Two Oracle Enterprise Communications Brokers operating in this way are called an HA node. Over the HA node, call state is shared, keeping sessions/calls from being dropped in the event of a failure.

Two Oracle Enterprise Communications Brokers work together in an HA node, one in active mode and one in standby mode.

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

Refer to the *Oracle Enterprise Session Border Controller Configuration Guide* for more detail about High Availability operations, including:

- Synchronization
- Checkpointing

Overview

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

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

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

The standby Oracle Enterprise Communications Broker assumes the active role when:

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

Establishing Active and Standby Roles

Oracle Enterprise Communications Brokers establish active and standby roles in the following ways.

- If a Oracle Enterprise Communications Broker boots up and is alone in the network, it is automatically the active system. If you then pair a second Oracle Enterprise Communications Broker with the first to form an HA node, then the second system to boot up will establish itself as the standby automatically.
- If both Oracle Enterprise Communications Brokers in the HA node boot up at the same time, they negotiate with each other for the active role. If both systems have perfect health, then the Oracle Enterprise Communications Broker with the lowest HA interface IPv4 address will become the active Oracle Enterprise Communications Broker. The Oracle Enterprise Communications Broker with the higher HA interface IPv4 address will become the standby Oracle Enterprise Communications Broker.

If the physical link between the two Oracle Enterprise Communications Brokers fails during boot up or operation, both will attempt to become the active Oracle Enterprise Communications Broker. In this case, processing will not work properly.

High Availability Configuration

Set the following parameters to configure system wide HA functionality:

1. Click on High availability settings to expand the dialog box. In the Enable high availability field, place a check mark in the box to enable HA on the Oracle Enterprise Communications Broker.

2. In the Name of primary peer field, enter the name of the primary Oracle Enterprise Communications Broker peer. Valid values are alpha-numeric characters. Default is <primary peer name>.
3. In the Name of secondary peer field, enter the name of the secondary system you are using for HA purposes to peer with the primary system. Valid values are alpha-numeric characters. Default is blank.

Note: Both of these fields are automatically populated with the peer names that you entered when you ran the Installation Wizard.

Network Interface

The network interface element specifies a logical network interface. The Oracle Enterprise Communications Broker supports only one network interface. You configure a SIP interface and one or more application (SIP) ports over this network interface.

This section explains how to configure a network interface with the GUI. Note that the system initialization procedure creates a network interface. If desired, you can set or change this configuration using the GUI.

Network Interface Configuration

Set the following parameters to configure a network interface.

1. Click the Network icon. The system displays the Modify Network settings dialog.
2. vlan—Enter the identification of a specific virtual interface in a physical interface (e.g., a VLAN tab). If this network interface is not channelized, leave this field blank, and the value will correctly default to `0`. The sub-port-id is only required if the operation type is Media. The valid range is:
   - Minimum—0
   - Maximum—4095
3. Network IP address—Enter the IPv4 address of this network interface.
4. Network IP subnet mask—Enter the netmask of this network interface in dotted decimal notation.
5. Network IP gateway address —Enter the gateway that this network interface uses to communicate with the next hop. You can set an additional, secondary gateway via the sec-gateway parameter.
6. DNS server ip address—Enter the IP address of the targeted DNS server.
7. DNS domain—Enter the default domain name.
8. Enable ICMP—See the ensuing section on Enabling ICMP.
9. Enable gateway heartbeat—Within the context of high availability, check this checkbox to allow the network interface to continually confirm that its gateway is reachable.

Enable ICMP

To configure ICMP functionality on a media interface, you define the IPv4 address on your Oracle Enterprise Communications Broker network interface and enable ICMP. Enabling ICMP entries automatically opens the well-known port associated with a service.

Set the following parameters to enable ICMP functionality on a network interface:

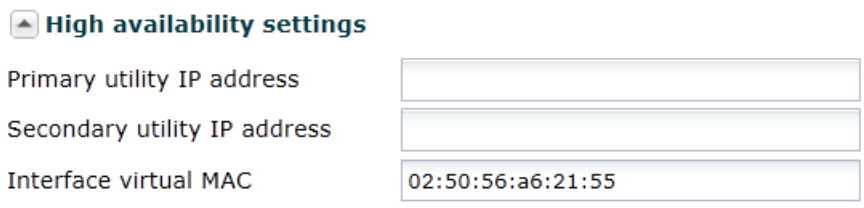
`Enable icmp`—Check the checkbox to enable ICMP on this network interface.

For security and by default, if ICMP is not enabled, the Oracle Enterprise Communications Broker discards ICMP requests or responses for the address. It is recommended that you only enable ICMP temporarily on a network interface.

Network Interface High Availability Configuration

Having configured the first parameters on the Modify Network Settings dialog, the high availability setting fields allow you to manually specify addressing to be used by this interface for high availability operation. It is recommended, however, that you use run setup to configure high availability.

1. Click the arrow next to High Availability settings. The system adds the following fields to the Modify Network Settings dialog.



2. Primary utility IP address—Enter the utility IPv4 address for the primary HA peer in an HA architecture. This address can be any unused IPv4 address within the subnet defined for the network interface. For example, given a network interface with the IPv4 address 168.0.4.15/24 (identifying the host associated with the network interface), the possible range of unused IPv4 addresses is 168.0.4.1 to 168.0.4.254. Your network administrator will know which IPv4 addresses are available for use.

3. Secondary utility IP address—Enter the utility IPv4 address for the secondary Oracle Enterprise Communications Broker peer in an HA architecture. Usually, this IPv4 address is the next in the sequence up from the primary utility address. It is also generated from the range of unused IPv4 addresses within the subnet defined for the network interface.

Virtual MAC Addresses

To create an HA node, you create virtual MAC addresses for the media interfaces. You enter these addresses in virtual MAC address parameters for physical interface configurations.

This field is automatically populated with a valid virtual MAC address during run setup. It is recommended that you retain this configuration.

The HA node uses shared virtual MAC (media access control) and virtual IP addresses for the interfaces. When there is a switchover, the standby Oracle Enterprise Communications Broker sends out an ARP message using the virtual MAC address, establishing that MAC on another physical port within the Ethernet switch.

A MAC address is a hardware address that uniquely identifies Oracle Enterprise Communications Broker components. Given that, the virtual MAC address you configure allows the HA node to appear as a single system from the perspective of other network devices. To the upstream router, the MAC and IP are still alive, meaning that existing sessions continue uninterrupted through the standby Oracle Enterprise Communications Broker.

To configure a virtual MAC, enter the virtual MAC address in the **`Interface virtual MAC`** field.

SIP Interface Settings

A SIP Interface is an application layer interface logically residing "over" a network interface. The SIP interface defines the transport addresses (IP address and port) upon which the Oracle Enterprise Communications Broker receives and sends SIP messages. You can define a SIP interface for each network to which the Oracle Enterprise Communications Broker is connected. Note that these networks must be within the Oracle Enterprise Communications Broker's Network Interface subnet. SIP interfaces support UDP, TCP and TLS transport.

In addition to defining a SIP interface's network participation (**Port**), you can also define forking and other functionality (**Interface settings**).

SIP Interface Configuration

The Oracle Enterprise Communications Broker setup program allows you to configure a SIP interface address. You should find that address listed when you open the SIP Interface icon.

1. Maximum SIP message length—The system can constrain outgoing SIP messages to a maximum size in bytes in order to support fraud prevention techniques. If a message does exceed the configured size, it is dropped. Set the maximum SIP message length from 0 to 65535 bytes, with a default value of 4096 bytes.
2. SIP options—The system supports a wide range of optional configuration settings you would enter here. Simply click the Add link, enter the option syntax into the dialog and click the OK or, if you wish to configure multiple options, the Apply/Add Another button.
3. Enable Parallel Forking—Check the checkbox to cause the system to fork all sessions to all of an AOR's contacts.
4. Default source context—Set the default source context for this Oracle Enterprise Communications Broker. This is the context the system uses as source context for a given call if it cannot identify source context via any other method.
5. Click the **Port** link on the left control bar to display the **SIP Ports** list.
6. From the SIP Port list, click the Add link. The system displays the **Add SIP Port Settings** dialog.
7. IP address—Enter the IP address of the host associated with the sip-port entry on which to listen.

8. port—Enter the port number you want to use for this sip-port. The default is 5060. The valid range is:
   - Minimum: 0
   - Maximum: 65535
9. Transport Protocol—Indicate the transport protocol you want to associate with the SIP interface. The default is UDP. The valid values are:
   - TCP— Provides a reliable stream delivery and virtual connection service to applications through the use of sequenced acknowledgment with the retransmission of packets when necessary.
   - UDP—Provides a simple message service for transaction-oriented services. Each UDP header carries both a source port identifier and destination port identifier, allowing high-level protocols to target specific applications and services among hosts.
   - TLS—Provides a reliable and encrypted stream delivery.
10. TLS Profile—Select a pre-configured TLS profile from the drop-down list.
11. Save and activate you configuration.

Accounting Settings

The Oracle Enterprise Communications Broker offers support for RADIUS, an accounting, authentication, and authorization (AAA) system. In general, RADIUS servers are responsible for receiving user connection requests, authenticating users, and returning all configuration information necessary for the client to deliver service to the user.

You can configure your Oracle Enterprise Communications Broker to send call accounting information to one or more RADIUS servers. This information can help you to see usage and QoS metrics, monitor traffic, and even troubleshoot your system.

Configuring Accounting

Set the Accounting Configuration parameters in this dialog to indicate where and when you want the system to produce accounting messages.

1. Click the accounting icon. The system displays the Modify Accounting Settings dialog.
2. Enabled—Enable the generation of accounting records by clicking the checkbox or retain the default of disabled.
   - **`enabled | disabled`**
3. Generate Start—Retain the default value ok if you want the CDR Start record to be generated once the system receives an OK message in response to an INVITE. (A CDR Start record informs the accounting server that a SIP session has started.) Other values include:
   - None—Start message should not be generated.
   - Invite—Start message should be generated once the Oracle Enterprise Communications Broker receives a SIP session INVITE.
4. Generate Interim—Retain the default value, Re-invite Response, to cause the Oracle Enterprise Communications Broker to transmit an Interim message. (An Interim message indicates to the accounting server that the SIP session parameters have changed.) Other values include:
   - OK—Start message is generated when the Oracle Enterprise Communications Broker receives an OK message in response to an INVITE.
   - Re-invite—Interim message is generated when the Oracle Enterprise Communications Broker receives a SIP session reINVITE message.
   - Re-invite Cancel—Interim message is generated when the Oracle Enterprise Communications Broker receives a SIP session reINVITE, and the Reinvite is cancelled before the Oracle Enterprise Communications Broker responds to it.
   - Unsuccessful-Attempt—Interim message is generated when a SIP session set-up attempt from a preference-ordered list of next-hop destinations is unsuccessful. The interim message contains: the

destination IP address, the disconnect reason, a timestamp for the failure, and the number that was called.

5. Enable file output—Enable the system to generate local files containing accounting records by clicking the checkbox or retain the default of disabled.
   - **enabled | disabled**
6. File Path—Specify where, on the system, you want the system to store accounting record files by typing in a valid path.
7. File rotate time—Set how often in minutes you want to rotate the stored files; the Oracle Enterprise Communications Broker overwrites the oldest file first. The minimum rotation time is 2 minutes; the default is 60 minutes. This parameter defaults to 0, and leaving it set to the default means that the Oracle Enterprise Communications Broker does not rotate (or push) the files.
8. Max files—Set the maximum number of files to be stored on the Oracle Enterprise Communications Broker at one time. You can configure the Oracle Enterprise Communications Broker to store as few as one file or as many as 4096. The default is 5.

Configure a RADIUS server to send accounting records (optional).

FTP Push

In addition to local and RADIUS server storage, the Oracle Enterprise Communications Broker provides you with the ability to send accounting files to an FTP server. The information sent to the FTP server is the same as is stored locally.

The FTP push feature is used to copy local CDR files to a remote FTP server on a periodic basis. This feature is configured by defining push receivers which contain standard login and FTP server credentials of the remote machine. At the time interval (file rotate time), the Oracle Enterprise Communications Broker closes the current file and pushes the files that are complete and have not yet been pushed, including the just-closed fille to the FTP server.

Push receiver configurations must include:

- The server's IP address and port
- Remote path of where to upload the accounting files
- Account login credentials

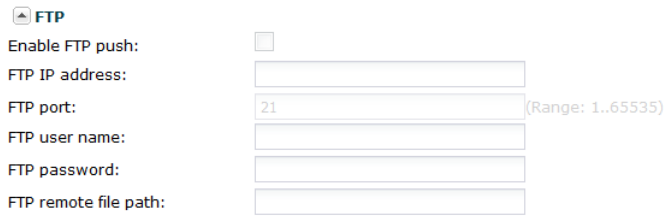
The FTP push configuration creates and pushes accounting files using the following criteria:

- The maximum accounting file size, after which the system creates a new file, is 1000000 bytes.
- The number of files the system creates before it begins to overwrite files (oldest file first) is 5.
- The amount of time between system file push to the FTP server is 60 minutes.

FTP Push Configuration

This configuration assumes a reachable, operating FTP server.

A push receiver configuration includes all the credentials that the Oracle Enterprise Communications Broker needs to log into an FTP server and upload any recent local CDR files. To configure an FTP push server, click the FTP arrow on the Accounting configuration dialog to display the FTP push fields.



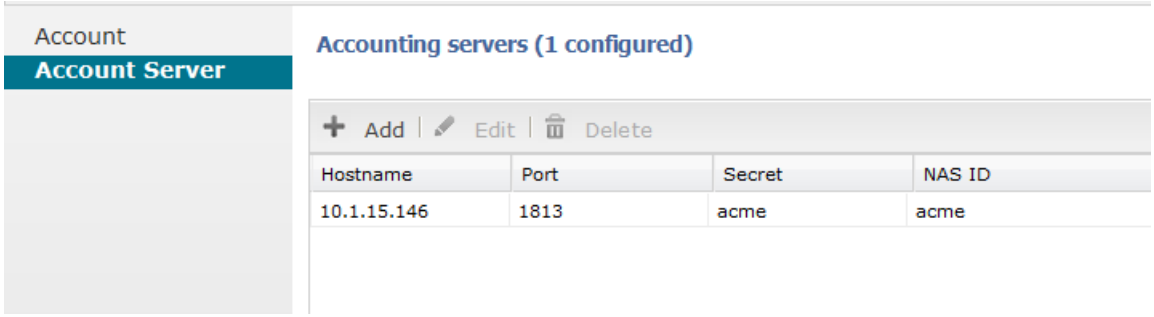
1. Enable FTP push —Check the checkbox to enable FTP push.

2. FTP-address—Set the IP address of this STP server.
3. FTP-port—Set the port of this service:
   - Minimum: 0
   - Maximum: 65535
   - Default: 21
4. FTP-user—Set the username you must use to login to this FTP server.
5. FTP-password—Set the password you must use to login to this FTP server.
6. FTP-remote-path—Set the path on this FTP server on which you want to save your accounting files.

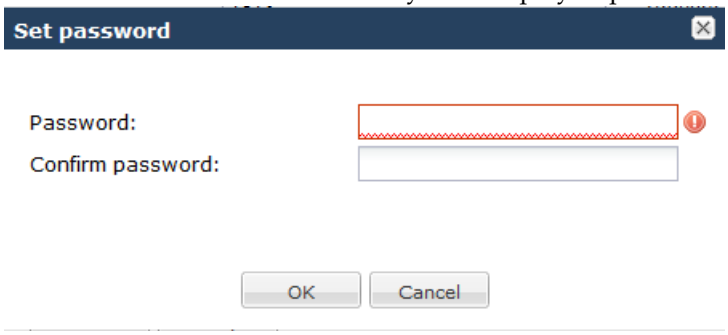
Configuring a RADIUS Account Server

The following procedure is required to provide accounting detail to a RADIUS server.

1. Click the Accounting tab, followed by the Account Server link. The system displays the Add Accounting Server Settings dialog, shown below.



2. Click the Add link to add a new server to your list. You can also edit and delete existing servers from links on this dialog.
3. Hostname—Name of the host associated with the account server in hostname format (FQDN) or as an IP address.
4. Port—Retain the default 1813 or enter the number of the UDP port associated with the account server to which RADIUS messages are sent.
   - Minimum: 1025
   - Maximum: 65535
5. Secret—Click the set button. The system displays a password entry and confirm dialog, shown below.



   Enter and then confirm the secret passed from the account server to the client in text format. Transactions between the client and the RADIUS server are authenticated by the shared secret; which is determined by the source IPv4 address of the received packet. You can set or cancel this setting from this dialog using the OK and Cancel buttons respectively.
6. NAS ID—Enter the NAS ID in text format (FQDN allowed). The account server uses this value to identify the Oracle Enterprise Communications Broker for the transmittal of accounting messages. (Optional)

The remote server to which the account configuration sends messages uses at least one of two potential pieces of information for purposes of identification. The Oracle Enterprise Communications Broker accounting messages always includes in the first of these:

- Network Access Server (NAS) IP address (the IP address of the Oracle Enterprise Communications Broker's SIP proxy
- NAS ID (the second piece of information) provided by this value. If you enter a value here, the NAS ID is sent to the remote server.

If you have more than one Oracle Enterprise Communications Broker pointing to the same account server, the NAS ID can be used to identify which Oracle Enterprise Communications Broker generated the record.

Security Settings

Security configuration from the GUI consists of creating the building blocks you can use to establish TLS-secured paths for your signaling traffic. The overall process includes generating certificate requests and certificate import.

The TLS configuration procedures that you can perform from the GUI includes:

- Configure Certificate Records.
- Generate Certificate Request for your CA.
- Import Certificates.
- Upload certificate files.
- Download certificate files.
- Configure TLS Profiles, which utilize your certificate records.
- Apply TLS Profiles to SIP Interfaces, agents and the web-server-config.

The dialogs available from the Security icon allow you to perform all procedures with the exception of applying a TLS profile to a configuration element. You apply TLS profiles to configuration elements using controls within their respective dialogs.

Certificate Record Configuration

A certificate record configuration represents either the end-entity or the Certificate Authority (CA) certificate on the Oracle Enterprise Communications Broker. If it is used to present an end-entity certificate, a private key should be associated with this certificate record configuration using a certificate request. No private key should be associated with the certificate record configuration if it was issued to hold a CA certificate.

A certificate can be imported to a certificate record configuration using the GUI as described below.

Note: There is no need to create a certificate record when importing a CA certificate or certificate in pkcs12 format.

Follow the steps below to create a certificate record.

1. Access certificate configuration controls via the Security link.
2. Click the link indicating **Certificate** configuration. The system displays the list of certificate records already configured on this system.
3. Click the **Add** link. The system displays the Add Certificates dialog. Note that this dialog is truncated for presentation purposes here.
4. name—Enter the name of the certificate record. This parameter is required; you cannot leave it empty.

   In the case of establishing a certificate for the Oracle Enterprise Communications Broker, this name must be the same as the name you use to generate a certificate request.

If configuring for an end stations CA certificate (mutual authentication), this name must be the same name used during the import procedure. When performing an import procedure that creates the record automatically, this name will be derived from the certificate itself.

5. country—Enter the name of the country. The default is US.
6. state—Enter the name of the state. The default is MA.
7. locality—Enter the name of the locality for the state. The default is Burlington.
8. organization—Enter the name of the organization holding the certificate. The default is engineering.
9. unit—Enter the name of the unit within the organization holding the certificate.
10. common-name—Enter the common name for the certificate record.
11. key-size—Enter the size of the key for the certificate. Use the default of 1024, or change it to one of the other supported values: 512, 2048, or 4096.
12. alternate-name—Enter the alternate name of the certificate holder.
13. key-usage-list—Enter the usage extensions you want to use with this certificate record. This parameter can be configured with multiple values, and it defaults to the combination of digitalSignature and keyEncipherment. For a list of possible values and their descriptions, see the section "Key Usage Control" in the *Oracle Communications Session Border Controller Configuration Guide*.
14. extended-key-usage-list—Enter the extended key usage extensions you want to use with this certificate record. The default is serverAuth. For a list of possible values and their descriptions, see the section "Key Usage Control" in the *Oracle Communications Session Border Controller Configuration Guide*.

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

TLS Profile Configuration

Certificate records must exist prior to this configuration.

Configure a TLS profile to further define the encryption behavior you want between these systems and to establish an entity that you can apply to SIP Interfaces. Steps required follow.

1. Click the TLS Profile link. The system displays the TLS profile list.
2. Click the Add link. The system displays the dialog below, which is truncated for the purpose of presentation here.
3. Name—Enter the name of the TLS profile. This parameter is required.
4. end-entity-certificate—Enter the name of the Certificate Record for the applicable entity.
5. trusted-ca-certificates—Enter the names of the trusted CA certificate records.
6. cipher-list—The following cipher-lists are supported for the GUI only:
   - AES256-SHA (TLS_RSA_WITH_AES_256_CBC_SHA) - Firefox (version 12) and Chrome (version 19.0.1084.46m)
   - AES128-SHA (TLS_RSA_WITH_AES_128_CBC_SHA) - Firefox (version 12) and Chrome (version 19.0.1084.46m)
   - DES-CBC-SHA (SSL_RSA_WITH_DES_CBC_SHA or TLS_RSA_WITH_DES_CBC_SHA) - Internet Explorer (Version 9)
7. verify-depth—Specify the maximum depth of the certificate chain that will be verified. The default value is 10. The valid range is:
   - Minimum-0
   - Maximum-10
8. mutual-authenticate—Define whether or not you want the Oracle Enterprise Communications Broker to mutually authenticate the client. The default value is disabled. The valid values are:
   - enabled-disabled (default)

9. tls-version—Enter the TLS version you want to use with this TLS profile. Default is compatibility. Valid values are:
   - TLSv1
   - SSLv3
   - compatibility (default)
10. cert-status-check—Enables OCSP in conjunction with an existing TLS profile.
11. cert-status-profile-list—Assigns one or more cert-status-profiles to the current TLS profile. Each assigned cert-status-profile provides the information needed to access a single OCSP responder.
12. ignore-dead-responder—Enables your device to establish a client connection even if the OCSP responder is unavailable, assuming the associated certificate was signed by a trusted certificate authority.
    - enabled-disabled (default)
13. allow-self-signed-cert—Enables your device to establish client connections to clients that present self-signed certificates.
    - enabled-disabled (default)

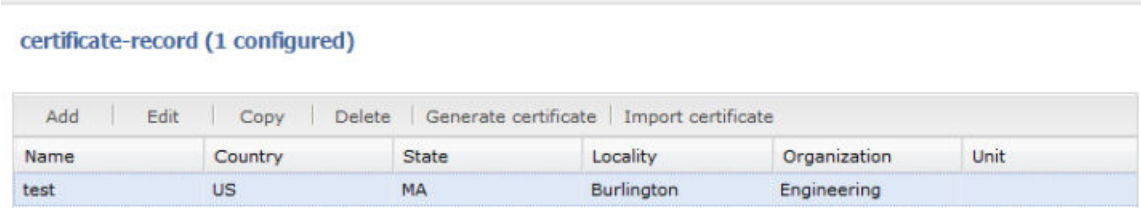
Apply your TLS profile to a SIP Interface by selecting if from the SIP Interface's TLS Profile drop-down.

Generating a Certificate Request from the GUI

To operate with a certificate authorized by a CA, you provide a certificate request to that CA. To do this, you create a certificate record and generate the request from this record.

You can generate a certificate request using the ACLI or the GUI. This procedure provides the steps you use on the GUI.

1. Highlight the certificate record you created for the purposes of containing your device's certificate.



2. Click the Generate certificate link.
   The system creates the request and presents it to you in a dialog.

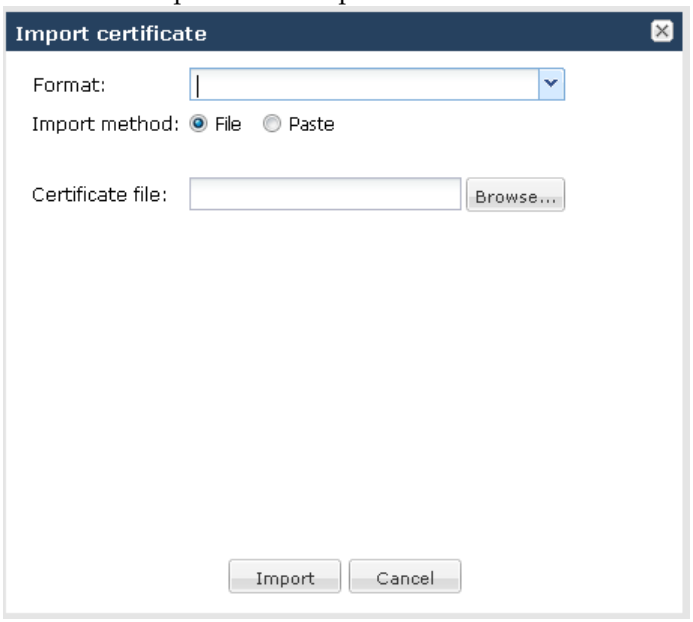
3. Copy the information from the dialog and send to your CA as a text file.

When the CA replies with the certificate for your device, import this certificate to the device against the same certificate record. This allows end stations to establish TLS paths within either server or mutual authentication scenarios.

Importing Certificates

Use this procedure to import both your device certificate and end station CA certificates for mutual authentication scenarios. Recall that you must import your Oracle Enterprise Communications Broker certificate against the certificate record you created for your Oracle Enterprise Communications Broker. End station CA certificates may or may not need to be imported against a pre-configured certificate record.

1. If applicable, highlight the certificate record for which this certificate applies.
2. Click the Import certificate link.
   The system responds with a dialog from which you can either import the certificate file directly or paste the contents of the certificate.
3. Select the Format of the certificate from the drop down list. Options include:
   - pkcs7
   - x509
   - Try-all, which attempts to import via all possible formats until it is able to import the certificate.
4. Either browse to and select the certificate file, or click the paste button to change the dialog to its "paste format". This "paste format" provides a text field into which you paste your certificate information



5. Click the Import button.
   The system completes the procedure by importing the certificate.

Apply the operational certificate record to the intended SIP interface.

SNMP

This section explains how to configure Simple Network Management Protocol (SNMP) communities and trap receivers. These features are not essential for baseline Oracle Enterprise Communications Broker service, but they are necessary to use an element management system to manage Oracle Enterprise Communications Brokers. They provide important monitoring and system health information that contribute to a robust deployment of the Oracle Enterprise Communications Broker.

Overview

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

Basic SNMP Parameters

The Oracle Enterprise Communications Broker includes several parameters that control basic SNMP functionality. The MIB-related elements are for informational purposes, and are helpful if set. The remainder of the parameters determines if certain Oracle Enterprise Communications Broker events are reported to the SNMP system.

SNMP Community

An SNMP community is a grouping of network devices and management stations used to define where information is sent and accepted. An SNMP device or agent might belong to more than one SNMP community. SNMP communities provide a type of password protection for viewing and setting management information within a community.

SNMP communities also include access level settings. They are used to define the access rights associated with a specific SNMP community. The Oracle Enterprise Communications Broker lets you define two types of access levels: read-only and read-write. You can define multiple SNMP communities on a Oracle Enterprise Communications Broker to segregate access modes per community and NMS host.

Trap Receivers

A trap receiver is an application used to receive, log, and view SNMP traps for monitoring the Oracle Enterprise Communications Broker. An SNMP trap is the notification sent from a network device, the Oracle Enterprise Communications Broker in this case, that declares a change in service. Multiple trap receivers can be defined on a Oracle Enterprise Communications Broker either for redundancy or to segregate alarms with different severity levels to individual trap receivers.

Each server that an element management system is installed on should be configured as a trap receiver on all Oracle Enterprise Communications Broker's managed by that element management system.

SNMP Community Settings

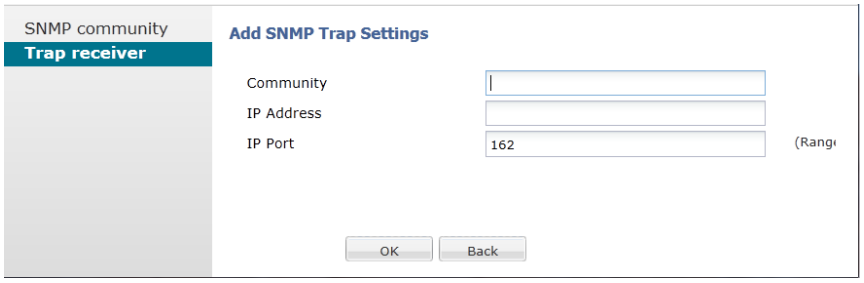
Follow the steps below to configure an SNMP community on your device.

1. Community name—Enter an SNMP community name of an active community where this Oracle Enterprise Communications Broker can send or receive SNMP information. A community name value can also be used as a password to provide authentication, thereby limiting the NMSs that have access to this Oracle Enterprise Communications Broker. With this field, the SNMP agent provides trivial authentication based on the community name that is exchanged in plain text SNMP messages. For example, public. Valid values are alpha-numeric characters. Default is blank.
2. From the SNMP community list, click the Add link. The system displays the Add dialog.
3. IP addresses—Enter an IPv4 address that is valid within this SNMP community. This IPv4 address corresponds with the IPv4 address of the NMS application that monitors or configures this Oracle Enterprise Communications Broker. You can enter multiple addresses, if desired.
4. Click OK to close the Add dialog.

Trap Receiver Settings

Follow the steps below to configure trap receivers on your device.

1. From the Trap receiver list, click the Add link. The system displays the Add SNMP Trap Settings dialog.



2. Community name—Enter the SNMP community name to which this trap receiver belongs. For example, **`Public`**. Valid values are alpha-numeric characters. Default is blank.
3. IP address—Enter the IPv4 address of an authorized NMS. This value is the IPv4 address of an NMS where traps are sent. Enter the IP address in dotted decimal format.
4. IP Port—Enter the port number of an authorized NMS. If you do not specify a port number, the default SNMP trap port of 162 is used.

Web Server Settings

Configure your preferences for the Oracle Enterprise Communications Broker's web server using the Modify web-server-config dialog, available from the Web Server icon. Configuration field descriptions are provided below.

1. Inactivity timeout—Enter the amount of time, in minutes, that the Web GUI must have remained inactive before it ends the Web session. For example, if this timeout value is set as 5, after 5 minutes of no activity, the Web session disconnects. Default is 10. Valid values are 0 to 20. Zero (0) disables this parameter.

   Note: The following HTTP state and HTTPS state parameters may have already been set via the GUI installation wizard on your Oracle Enterprise Communications Broker. You can edit these parameters if required.
2. HTTP state—Specify whether or not to enable HTTP for accessing the Web server. Default is enabled. A check mark indicates enabled, and a blank box indicates disabled.
3. HTTPS state—Specify whether or not to enable HTTPS (secure connection) for accessing the Web server. Default is disabled. A check mark indicates enabled, and a blank box indicates disabled.
4. TLS profile—Enter the Transport Layer Security (TLS) Protocol profile name to use with HTTPS. Valid values are **`alpha-numeric characters.`** Default is blank.

   Note: If you specify a TLS profile, and HTTP is enabled, the Oracle Enterprise Communications Broker checks against the TLS profile table for a match. If there is no match, the applicable errors display during the verification of the configuration.
5. Click OK.

4

Maintenance and Debugging

Oracle Enterprise Communications Broker (ECB) software closely aligns with Oracle Session Border Controller (SBC) software. The vast majority of reference and debugging processes, procedures and information is common across Oracle SBC products.

Generic Maintenance and Debugging Documentation

The following table directs you to other Oracle documentation that provides generic monitoring and debugging information.

Information Type	Documentation
Log File Definition and Descriptions Fault Information Management Manual Configuration Management Process and Procedures	Oracle SBC Maintenance and Troubleshooting Guide
MIB Descriptions MIB Definition and Identification (OID Reference) SNMP GETs SNMP Trap Definition and Descriptions	Oracle SBC MIB Reference Guide
Manual HDR Management HDR Group Definition and Descriptions	Oracle SBC Historical Data Recording (HDR) Resource Guide

Your Oracle Enterprise Communications Broker Image

Your Oracle Enterprise Communications Broker arrives with the most recent, manufacturing-approved run-time image installed on the flash memory. If you want to use this image, you can install your Oracle Enterprise Communications Broker, establish a connection to the Oracle Enterprise Communications Broker, and then begin to configure it. On boot up, your system displays information about certain configurations not being present. You can dismiss these displays and begin configuring your Oracle Enterprise Communications Broker.

If you want to use an image other than the one installed on your Oracle Enterprise Communications Broker when it arrives, you can use the information in this section to obtain and install it.

Obtaining a New Image

You can download software images onto the platform of your Oracle Enterprise Communications Broker from various sources. You can take any one of the following actions:

- Obtain an image from where the Oracle Software Delivery Cloud.
- Obtain an image from your Oracle customer support representative, who will transfer it to your system.

Regardless of how you obtain the image, you need to use Secure File Transfer Protocol (SFTP) to copy it from its source to your Oracle Enterprise Communications Broker.

Upgrade Software - Web GUI System Tab

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

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

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