Oracle Communications Session Border Controller

Installation and Platform Preparation Guide
Release S-CZ7.3.0

September 2017

ORACLE®

Notices

Contents

Oracle Communications Session Border Controller

About this Guide

This Installation and Platform Preparation Guide addresses platform preparation of platforms that support Oracle Communications Session Border Controller version S-CZ7.3.0. This content bridges the information between physical installation and initial power on procedures. The guide takes into account the fact that a variety of platforms are supported, each one posing its own operational considerations, and presents information specific to each platform that enables proper product operation.

Whereas platform documentation for physical installation is provided by Oracle and the respective vendors, this guide addresses those details in between physical installation and service configuration. For service configuration, see the applicable Configuration Guide for your product. In addition, the information herein can help users after product deployment to, for example, identify physical interfaces.

Document Name	Document Description
Acme Packet 4500 Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 4500.
Acme Packet 4600 Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 4600.
Acme Packet 6100 Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 6100.
Acme Packet 6300 Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 6300.
Release Notes	Contains information about the current documentation set release, including new features and management changes.
ACLI Configuration Guide	Contains information about the administration and software configuration of the Service Provider 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.
Maintenance and Troubleshooting Guide	Contains information about Oracle Communications Session Border Controller logs, performance announcements, system management, inventory management, upgrades, working with configurations, and managing backups and archives.
MIB Reference Guide	Contains information about Management Information Base (MIBs), Oracle Communication's enterprise MIBs, general trap information, including specific details about standard traps and enterprise traps, Simple Network Management Protocol (SNMP) GET query information (including standard and enterprise SNMP GET query names, object identifier names and numbers, and descriptions), examples of scalar and table objects.
Accounting Guide	Contains information about the Oracle Communications Session Border Controller's accounting support, including details about RADIUS and Diameter accounting.
HDR Resource Guide	Contains information about the Oracle Communications Session Border Controller's Historical Data Recording

Document Name	Document Description
	(HDR) feature. This guide includes HDR configuration and system-wide statistical information.
Administrative Security Essentials	Contains information about the Oracle Communications Session Border Controller's support for its Administrative Security license.
Security Guide	Contains information about security considerations and best practices from a network and application security perspective for the Oracle Communications Session Border Controller family of products.
Installation and Platform Preparation Guide	Contains information about upgrading system images and any pre-boot system provisioning.
Call Traffic Monitoring Guide	Contains information about traffic monitoring and packet traces as collected on the system. This guide also includes WebGUI configuration used for the SIP Monitor and Trace application.

Revision History

Date	Description
January, 2016	Initial Release
June, 2016	Diameter and CDR in HA pair: upgrade of standby will not sync and thus will go out of service. Workaround available
September, 2017	• Adds 4600 to platforms not supporting VLANs on management interfaces

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Introduction

This publication explains system provisioning (where applicable) and software installations and upgrades. Continue reading for information about supported platforms for this Oracle Communications Session Border Controller release.

A list of supported platforms and their requirements is located in this documentation library's Release Notes document.

Acme Packet Engineered Platforms

Acme Packet engineered platforms are shipped with software pre-loaded on the system. When you power up the hardware for the first time, it will boot with a product image ready for configuration.

To install a newer patch release, or different version of software all together, continue to the Boot Management and Software Upgrade chapters in this guide for all considerations and procedures required to a system update.

Connecting to Your Oracle Communications Session Border Controller

Search title: Connecting to Your Net-Net SBC

You can connect to your Oracle Communications Session Border Controller either through a direct console connection, or by creating a remote Telnet or SSH session. Both of these access methods provide you with the full range of configuration, monitoring, and management options.

☞ **Note:** By default, Telnet and SFTP connections to your Oracle Communications Session Border Controller are enabled.

Create a Console Connection

Search title: Local Connections and Time-outs

Using a serial connection, you can connect your laptop or PC directly to the Acme Packet hardware. If you use a laptop, you must take appropriate steps to ensure grounding.

One end of the cable plugs into your terminal, and the other end plugs into the RJ-45 Console port on the NIU (or management ports area on the Acme Packet 6300).

To make a console connection to your hardware:

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. Connect a serial cable to between your PC and the hardware's console port.

3. Apply power to the hardware.

4. Enter the appropriate password information when prompted to log into User mode of the ACLI.

   You can set 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.

Incoming Telnet Connections and Time-outs

Search title: Telnet Remote Connections and Time-outs

You can Telnet to your Oracle Communications Session Border Controller. Using remote Telnet access, you can provision the Oracle Communications Session Border Controller remotely through the management IP interface.

The Oracle Communications Session Border Controller, when running on Acme Packet platforms can support up to 5 concurrent Telnet sessions. When running on other platform types, only 4 concurrent Telnet sessions are available. In both cases, only one Telnet session may be in configuration mode at a 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 Communications Session Border Controller, you need to know the IP address of its administrative interface (wancom0/eth0). The wancom0/eth0 IP address of your Oracle Communications Session Border Controller is found by checking the **inet on ethernet** value in the boot parameters or visible from the front panel display.

You can manage incoming Telnet connections from the ACLI:

- 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 ACLI **show users** command. 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 **kill user** command with the corresponding connection ID.
- From Superuser mode in the ACLI, you can globally enable and disable Telnet connections:

  - Telnet service is enabled by default unless explicitly disabled as shipped.
  - To disable Telnet, type the **management disable telnet** command at the Superuser prompt and reboot your system. The Oracle Communications Session Border Controller then refuses any attempts at Telnet connections. If you want to restart Telnet service, type **management enable telnet**.

- If you reboot your Oracle Communications Session Border Controller from a Telnet session, you lose IP access and therefore your connection.

SSH Remote Connections

Search title: SSH Remote Connections

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

The Oracle Communications Session Border Controller supports five concurrent SSH and/or SFTP sessions.

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

1. To initiate an SSH connection to the Oracle Communications Session Border Controller without specifying users and SSH user passwords:

   a) Open your SSH client (with an open source client, etc.).

   b) At the prompt in the SSH client, type the **ssh** command, a Space, the IPv4 address of your Oracle Communications Session Border Controller, and then press Enter.

   The SSH client prompts you for a password before connecting to the Oracle Communications Session Border Controller. Enter the Oracle Communications Session Border Controller'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.

   > **Note:** You can also create connections to the Oracle Communications Session Border Controller using additional username and password options.

2. To initiate an SSH connection to the Oracle Communications Session Border Controller with an SSH username and password:

   a) 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.

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

   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.

   b) Configure your SSH client to connect to your Oracle Communications Session Border Controller'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
   ```

   c) Enter the SSH password you set in the ACLI.

   ```
   MJones@10.0.2.54 password: 95X-SD
   ```

   d) Enter your User password to work in User mode on the Oracle Communications Session Border Controller. Enable Superuser mode and enter your password to work in Superuser mode.

   e) A Telnet session window opens and you can enter your password to use the ACLI.

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Boot Management

Boot Management includes the tasks needed to ensure the system is operating according to the users requirements as it starts up. Requirements met by properly managing system boot include defining management access IP, specifying the load to boot and specifying a system name. The user may set this information manually or configure the operational environment to provide it.

Boot management consists of tasks working with the following:

- Boot Loaders—The user needs to perform file management tasks to ensure that the software used to boot the system is compatible with the application system software itself. This typically includes verifying boot loader and application system software version for compatibility and placing the correct boot loader software in the correct location.
- Boot Parameters—The user sets boot parameters to specify their requirements for boot, including defining management access IP, specifying the load to boot and specifying a system name.
- Boot Flags—The user can, optionally, set special boot parameters called boot flags to further define how the system boots. The user may also set boot flags for diagnostic purposes under the guidance of Oracle support personnel.

For Acme Packet 3820 and 4500 users, skip directly to the *Boot Management for the Acme Packet 3820 and 4500* section of this chapter.

Boot Loader Overview

Boot loader software loads the application to run on a platform. As such, boot loader software must be correct before system startup. Oracle Communications Session Delivery product distributions include and install the correct boot loader during application installation, meaning the user need not consider boot loader version during first install procedures. Application software upgrades do not update boot loaders. For this reason, the user needs to verify this compatibility manually. This section provides information about identifying the need and performing these updates.

Stage1 and Stage2 Boot Loaders

Stage1 and Stage2 are only used with the Acme Packet 3820 and 4500 platforms. Refer to the *Boot Management for the Acme Packet 3820 and 4500* section for platform specific information.

Stage3 Boot Loader

Every new software release includes a system software image and a Stage3 boot loader. Oracle recommends you update this boot loader with every software upgrade, as described in the Software Upgrade section. Be sure to perform this update before booting the new system image.

The Stage3 boot loader is generally backward compatible with previous releases, but Oracle recommends that the Stage3 boot loader be installed from the same Major.Minor version as the system image. It is not normally necessary to update the boot loader when installing a maintenance or patch release when the Major.Minor release is the same.

For example, the same nnSCZ720.boot can be used with S-CZ720, S-CZ720m1, and so forth system software. But it should be upgraded when installing S-CZ730 system software to match that Major.Minor release.

The boot loader file name corresponds to the software image filename. For example, if the software image filename is nnECZ720.64.bz, the corresponding Stage3 boot loader filename is nnECZ720.boot. The Stage3 boot loader is compatible with previous releases.

Stage 3 boot loader upgrade procedure can be found in the *Update the Stage 3 Bootloader* section of this guide.

Boot Parameters

Boot parameters specify the information that your device uses at boot time when it prepares to run applications.

This section explains how to view, edit, and implement device's boot parameters, and boot flags. 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.
- Specify the software image to boot and from where the system boots that image.

Boot flags are arguments to a specific boot parameter, and allow functional settings, such as the use of DHCP for acquiring a management port address, as well as various diagnostic startup configurations.

Configuring boot parameters has repercussions on your system's physical and network interface configurations. When you configure these interfaces, you can set values that might override the boot parameters.

The bootparam configuration list is shown below.

```
[Acme Boot]: p
Boot File        : /boot/bzImage-bones64
IP Address       : 172.44.12.89
VLAN             :
Netmask          : 255.255.0.0
Gateway          : 172.44.0.1
IPv6 Address     :
IPv6 Gateway     :
Host IP          :
FTP username     :
FTP password     :
Flags            : 0x00000030
Target Name      : ACMEPACKET
Console Device   : COM1
Console Baudrate : 115200
Other            :


[Acme Boot]: ?
```

```
?                          - print this list
@                          - boot (load and go)
p                          - print boot params
c                          - change boot params
v                          - print boot logo with version
r                          - reboot
s                          - show license information
```

Boot Parameter Definitions

The system displays all boot parameters when the user configures them after a boot interrupt. The system hides some boot parameters from the ACLI because the user should not configure them. If changed improperly, these parameters can cause the system to fail.

The following table defines each of the parameters that are visible when the user configures after a boot interrupt.

Boot Parameter	Description
Boot File	The name and path of the software image you are booting. Include the absolute path for a local boot from the local /boot volume and for a net boot when a path on the FTP server is needed.
IP Address	IP address of wancom0.
VLAN	VLAN of management network over which this address is accessed. Note: VLANs over management interfaces are not supported on the Acme Packet 4600 And Acme Packet 6xxx.
Netmask	Netmask portion of the wancom0 IP Address.
Gateway	Network gateway that this wancom0 interface uses.
IPv6 address	Version 6 IP address/mask of wancom0. Configure the mask as a forslash (/) after the address followed by the mask in number of bits.
IPv6 Gateway	Version 6 network gateway that this wancom0 interface uses.
Host IP	IP Address of FTP server from which to download and execute a software image.
FTP Username	FTP server username
FTP password	FTP server password
Flags	Codes that signal the system from where to boot. Also signals the system about which file to use in the booting process. This sequence always starts with 0x (these flags are hexadecimal).
Target Name	Name of the Oracle Communications Session Border Controller as it appears in the system prompt. For example, ORACLE> or ORACLE#. You need to know the target name if you are setting up an HA node. This name is required to be unique among Oracle Communications Session Border Controllers in your network. This name can be 63 characters or less.
Console Device	Serial output device type, dependent on platform. COM1 applies to virtual serial consoles, VGA to virtual video console. VGA is the default on VMware and KVM. COM1 is the default on OVM .

Boot Parameter	Description
Console Baud Rate	The speed in bits per second which the console port operates at. It operates at 115200 BPS, 8 data bits, no stop bit, parity NONE.
Other	Allows miscellaneous and deployment-specific boot settings.

Boot Flags

Boot flags enable system boot behavior(s). The user can set a single flag, or add hex digits to set multiple flags.

The following boot flags, configured in the boot parameter's **flags** parameter are for use on systems running on all platforms except the Acme Packet 3820 and 4500:

- 0x00000008 Bootloader ~7 seconds countdown
- 0x00000040 Autoconfigure wancom0 via DHCP enable - VM platforms only
- 0x00000080 Use TFTP protocol (instead of FTP) enable - VM platforms only
- 0x00000100 Bootloader ~1 seconds quick countdown - VM platforms only

The following boot flags should only be used as directed by Oracle support:

- 0x00000001 acme.ko network module security override
- 0x00000002 Kernel debug enable
- 0x00000004 Crashdump disable
- 0x00000010 Debug sshd enable
- 0x00000020 Debug console enable getty
- 0x00001000 Userspace debug enable
- 0x00100000 Uniprocessor enable (SMP disable)
- 0x20000000 Fail-safe boot enable
- 0x40000000 Process startup disable (flatspin mode)

Never enter any other values without the direction of Oracle support. Some diagnostic flags are not intended for normal system operation.

Changing Boot Parameters

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 system.

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

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.bz /boot/nnPCz200.bz
```

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 system 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 system 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 system 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 system 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.

```
'.' = clear field;  '-' = go to previous field;  ^D = quit
boot device      : wancom0
processor number      : 0
host name      : goose
file name      : /code/nnPCz100.gz /code/nnPCz200.gz
```

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 system 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 system 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.

Boot Management for the Acme Packet 3820 and 4500

Boot management for the Acme Packet 3820 and 4500 differs from other platforms and is, therefore, covered separately in this section. The following sections discuss boot management on the Acme Packet 3820 and 4500 in detail. Boot Management includes the tasks needed to ensure the system is operating according to the users requirements after it starts up. Requirements met by properly managing system boot include defining management access IP, specifying the load to boot and specifying a system name.

Boot management consists of tasks working with the following:

- Boot Loaders—The user needs to perform file management tasks to ensure that the software used to boot the system is compatible with the application system software itself. This typically includes verifying boot loader and application system software version for compatibility and placing the correct boot loader software in the correct location.
- Boot Parameters—The user sets boot parameters to specify their requirements for boot, inlcuding defining management access IP, specifying the load to boot and specifying a system name.
- Boot Flags—The user can, optionally, set special boot parameters called boot flags to further define how the system boots. The user may also set boot flags for diagnostic purposes under the guidance of Oracle support personnel.

Acme Packet 4500 and Acme Packet 3820 Boot Loaders

Boot loader software loads the application to run on a platform. As such, boot loader software must be correct before system startup. Oracle Communications Session Delivery product distributions include and install the correct boot loader during application installation, meaning the user need not consider boot loader version during first install procedures. Application software upgrades do not update boot loaders. For this reason, the user needs to verify this compatibility manually. This section provides information about identifying the need and performing these updates.

Boot loaders handling on the Acme Packet 4500 and Acme Packet 3820 differs from all other platforms. Important differences between the Acme Packet 4500 and 3820 platform's boot loaders include:

- The Stage1 and Stage2 boot loaders reside in the **/boot** directory.
- The Stage1 boot loader is named **bootrom.sys** when it is deployed properly.

- The means of transferring boot loader files requires that the user execute system level commands after new file transfer is complete to perform the update.
- The **show version boot** command displays the Stage1 and Stage2 file creation date, which can be understood as the files' versions.
- When upgrading the Acme Packet 4500 and 3820 to S-CZ7.1.2 or above, make sure the stage2.gz file (or any file named stage2.gz) is not in the **/code** directory.

Stage1 and Stage2 Boot Loaders

Stage1 and Stage2 boot loader upgrade is not required for every software upgrade. For this reason, these boot loaders are not provided along with every software distribution. Oracle provides version change information, when necessary, based on application release version.

Stage3 Boot Loader

Every new software release includes a system software image and a Stage3 boot loader. Oracle recommends you update this boot loader with every software upgrade, as described in the Software Upgrade section. Be sure to perform this update before booting the new system image.

The Stage3 boot loader is generally backward compatible with previous releases, but Oracle recommends that the Stage3 boot loader be installed from the same Major.Minor version as the system image. It is not normally necessary to update the boot loader when installing a maintenance or patch release when the Major.Minor release is the same.

For example, the same nnECZ720.boot can be used with ECZ720, ECZ720m1, and so forth system software. But it should be upgraded when installing ECZ730 system software to match that Major.Minor release.

The boot loader file name corresponds to the software image filename. For example, if the software image filename is nnECZ720.64.bz, the corresponding Stage3 boot loader filename is nnECZ720.boot. The Stage3 boot loader is compatible with previous releases.

Acme Packet 3820 and 4500 Bootloader Prerequisites

Customers planning to upgrade to Oracle Session Deliver software version 7 and beyond on Acme Packet 3820 and 4500 hardware must first upgrade their boot loader to the image dated July 03, 2013 or later.

This boot loader upgrade includes applying the following two files:

- bootrom.gz
- stage2.gz

You must verify that your Acme Packet 3820 and/or 4500 has been upgraded to the July 03, 2013 boot loader with the show version boot ACLI command.

```
ORACLE# show version boot
Bootloader Info

Stage 1: Jul 3 2013 13:16:30
Stage 2: Jul 3 2013 13:16:30
```

If the above information is not printed on your terminal, do NOT proceed with your upgrade. Contact TAC for instructions on how to continue.

☞ **Note:** As you upgrade your boot loader in preparation to run version 7 and later software, NEVER place the stage2.gz file (or any file named stage2.gz) into the **/code** directory.

Acme Packet 3820 and 4500 Boot Parameters

Boot parameters specify the information that your device uses at boot time when it prepares to run applications.

This section explains how to view, edit, and implement device's boot parameters, and boot flags. 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.
- Specify 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.

Boot flags are arguments to a specific boot parameter, and allow functional settings, such as the use of DHCP for acquiring a management port address, as well as various diagnostic startup configurations.

The full set of Acme Packet 4500 boot parameters differs from those on other platforms, and appear as below:

```
ORACLE(configure)# bootparam
'.' = clear field;  '-' = go to previous field;  ^D = quit
boot device            : eth0
processor number       : 0
host name              : acmepacket8
file name          : /boot/nnSC600.gz
inet on ethernet (e)   : 10.0.1.57:ffff0000
inet on backplane (b)  : 0.0.0.0
host inet (h)          : 10.0.1.5
gateway inet (g)       : 10.0.0.1
user (u)               : user
ftp password (pw)      : password
flags (f)              : 0x08
target name (tn)       : acmesystem
startup script (s)     : 0
other (o)              :
NOTE: These changed parameters will not go into effect until reboot. Also, be
aware that some boot parameters may also be changed through the PHY and
Network Interface Configurations.
```

Notes:

- boot device—The boot device should be **eth0**.
- file name—The file name should start with **/boot/**.

Acme Packet 3820 and 4500 Boot Parameter Definitions

The Acme Packet 3820 and 4500 series displays boot parameters when the user configures them after a boot interrupt. The system masks these additional parameters within the ACLI because the user should not configure them. If changed improperly, these parameters can cause the system to fail.

The following table defines each of the Acme Packet 3820 and 4500 boot parameters that are visible when the user configures after a boot interrupt.

Boot Parameter	Description
boot device	Management interface name and port number of the device from which an image is downloaded (e.g., wancom0 or eth0) from an external device.
processor number	Processor number on the backplane.
host name	Name of the boot host used when booting from an external device.
file name	Name of the image file to be booted; can be entered with the filename path. If you are booting from the flash memory, this filename must always match the filename that you designate when you FTP the image from the source to the system.

Boot Parameter	Description
	When booting from internal flash memory, this filename must start with /boot); for example, /boot/nnECZ710.bz.
inet on ethernet (e)	Internet address of the system.
	This field can have an optional subnet mask in the form inet_adrs:subnet_mask. If DHCP is used to obtain the parameters, lease timing information may also be present. This information takes the form of lease_duration:lease_origin and is appended to the end of the field.
	In this parameter, the subnet mask ffff0000 = 255.255.0.0.
	When you use the ACLI acquire-config command, this is the IPv4 address of the system from which you will copy a configuration.
inet on backplane (b)	Internet address of the backplane interface, eth0.
	This parameter can have an optional subnet mask and/or lease timing information, such as e (inet on ethernet) does.
host inet (h)	Internet address of the boot host used when booting from an external device.
gateway inet (g)	Internet address of the gateway to the boot host.
	Leave this parameter blank if the host is on the same network.
user (u)	FTP username on the boot host.
ftp password (pw)	FTP password for the FTP user on the boot host.
flags (f)	Codes that signal the system from where to boot. Also signals the system about which file to use in the booting process. This sequence always starts with 0x (these flags are hexadecimal).
target name (tn)	Name of the system as it appears in the system prompt. For example, ORACLE> or ORACLE#. You need to know the target name if you are setting up an HA node.
	This name is required to be unique among systems in your network. This name can be 64 characters or less.
startup script (s)	For Oracle use only.
other (o)	For Oracle use only.

Acme Packet 3820 and 4500 Boot flags

The following boot flags, configured in the boot parameter's flags parameter are for use on systems running on the Acme Packet 3800 and 4500 platforms.

- 0x00000008 Bootloader ~7 seconds countdown

The following boot flags should only be used as directed by Oracle support:

- 0x00000002 Kernel debug enable
- 0x00000004 No auto boot
- 0x00000010 Debug sshd enable
- 0x00000020 Debug console enable
- 0x00001000 Userspace debug enable

- 0x00002000 acme.ko network module security override
- 0x00004000 Crashdump disable
- 0x00100000 Uniprocessor enable (SMP disable)
- 0x20000000 Fail-safe boot enable
- 0x40000000 Process startup disable (flatspin mode)

Changing Boot Parameters

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 system.

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

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.bz /boot/nnPCz200.bz
   ```

   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 system 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 system 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 system 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 system 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.

```
'.' = clear field;  '-' = go to previous field;  ^D = quit
boot device      : wancom0
processor number     : 0
host name      : goose
file name      : /code/nnPCz100.gz /code/nnPCz200.gz
```

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 system 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 system 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.

Software Upgrade

This section provides information about how to upgrade your Oracle Communications Session Border Controller software image. Note that proprietary Acme Packet hardware is normally delivered with an operational image ready to run. Your deployment, however, may require a different version that what was delivered, making software upgrade a required step in platform preparation.

Upgrade Checklist

Before upgrading the Oracle Communications Session Border Controller software:

1. Obtain the name and location of the target software image file from either Oracle Software Delivery Cloud, https://edelivery.oracle.com/, or My Oracle Support, https://support.oracle.com, as applicable.

2. The Acme Packet 3820 should be provisioned with a 32-bit Oracle Communications Session Border Controller image file in the boot parameters. 32-bit image files are recognized by the "32" between the image revision and file extension. e.g., nnSCZ720.32.bz. Provision all other platforms with the 64-bit Oracle Communications Session Border Controller image file in the boot parameters. 64-bit image files are recognized by the "64" between the image revision and file extension. e.g., nnSCZ720.64.bz .

3. Verify the integrity of your configuration using the ACLI `verify-config` command.

4. Back up a well-working configuration. Name the file descriptively so you can fall back to this configuration easily.

5. If your hardware is either the Acme Packet 3820 or 4500, verify the version you need for the stage 1 and stage 2 bootloaders via Oracle support. Use the `show version boot` ACLI command for this query. Stage 1 and stage 2 bootloaders are available from My Oracle Support, https://support.oracle.com, under their respective hardware listing.

6. Refer to the Oracle Communications Session Border Controller Release Notes for any caveats involving software upgrades.

Stand-alone Upgrade

Search title: Stand-alone Upgrade

This process incurs system downtime; your Oracle Communications Session Border Controller stops passing traffic for a period of time. Please plan for your standalone upgrade accordingly.

Check /boot for free space

On the SBC, check for adequate space in the /boot volume to upload the new boot image and bootloader. Use the **show space boot** command.

```
SBC# show space boot
boot: 24759488/25760512 bytes (99%) remaining
```

You may delete files from an SFTP client if you need to free space.

The command **check-space-remaining boot** performs the same function as **show space boot**.

Upload the Stage 3 Boot Loader and System Image

Whenever you upgrade the software image, upload the stage 3 boot loader and the new system image file to the system. The stage 3 boot loader is backward compatible with application software.

The Stage3 boot loader is generally backward compatible with previous releases, but Oracle recommends that the Stage3 boot loader be installed from the same Major.Minor version as the system image. It is not normally necessary to update the boot loader when installing a maintenance or patch release when the Major.Minor release is the same.

System upgrades typically consist of transferring the new system image and stage3 boot loader to the system and setting boot parameters to the new system software. To ensure compatibility, copy the stage 3 boot loader to /boot/bootloader before you update the boot parameters to use the new software image file. The boot loader file must be renamed to /boot/bootloader on the target system with no file extension. When upgrading an HA pair, you must perform the upgrade procedure on each HA node.

Follow the steps below to upload the Stage3 boot loader and system image.

1. Obtain the stage 3 boot loader image file (*.boot).
2. Upload the stage 3 boot loader image file (*.boot) as /boot/bootloader to your system using an SSH File Transfer Protocol (SFTP) client.
3. Upload the new system software image (*.bz) to /boot/.

```
[Downloads]$ ls -la
total 148820
drwxr-xr-x  2 bob src     4096 Jun 17 15:16 .
drwxr-xr-x 28 bob src     4096 May 21 14:17 ..
-rw-r--r--  1 bob src 10164527 Jun 17 15:15 nnSCZ720.64.boot
-rw-r--r--  1 bob src 73849839 Jun 17 15:15 nnSCZ720.64.bz
[Downloads]$ sftp admin@172.30.46.20
admin@172.30.46.20's password:
Connected to 172.30.46.20.
sftp> cd /boot
sftp> put nnSCZ720.64.boot
Uploading nnSCZ720.64.boot to /boot/nnSCZ720.64.boot
nnSCZ720.64.boot                               100% 9926KB   9.7MB/
s   00:01
sftp> rm /boot/bootloader
sftp> rename nnSCZ720.64.boot /boot/bootloader
sftp> put nnSCZ720.64.bz
Uploading nnSCZ720.64.bz to /boot/nnSCZ720.64.bz
nnSCZ720.64.bz                                 100%   70MB  14.1MB/
s   00:05
sftp> bye
Received disconnect from 172.30.46.20: 11: Logged out.
[Downloads]$
```

The Stage3 boot loader is ready for operation after upload and filename change.

Software Upgrade Procedure

The following procedure describes how to upgrade a Oracle Communications Session Border Controller with a new software image. In this procedure, the image file is located on the Oracle Communications Session Border Controller's local file system in /boot.

To upgrade a software image on a stand-alone system:

1. Change the boot configuration parameters to use the new image.

   In the ACLI configure terminal menu, type **bootparam** and press <Enter> to display the list of boot parameters. Scroll through the boot parameters by pressing Enter. Stop when you reach the **file name** boot parameter and type the appropriate file name next to the previous file name. Press <Enter> to continue scrolling through the boot parameters.

   The following example uses the filenames /boot/nnSCZ720m5.64.bz and /boot/ nnSCZ730.64.bz.

```
SBC1# configure terminal
SBC1(configure)# bootparam
'.' = clear field;  '-' = go to previous field;  ^D = quit
boot device         : eth0
processor number    : 0
host name           : boothost
file name           : /boot/nnSCZ720m5.64.bz /boot/nnSCZ730.64.bz
```

2. Reboot the Oracle Communications Session Border Controller using the **reboot** command.

   The Oracle Communications Session Border Controller should now be successfully running the new release.

HA Upgrade

In the descriptions and processes outlined below, ORACLE-1 is initially the active system and ORACLE-2 is initially the standby system. Please read the following procedures carefully before beginning the upgrade. If necessary, you can back out of the upgrade once during the upgrade procedure and once after you have completed the upgrade procedure.

☞ **Note:** If you plan to upgrade from a release prior to S-CZ7.2.0 to S-CZ7.2.0 or later and you use CDR for Accounting, you must set the **cdr-output-redundancy** parameter to **enabled** for the Standby to upgrade and sync properly. You can then change the parameter to **disabled** afterwards, if needed.

☞ **Note:** See the diagram below, which addresses how the HA Upgrade procedures' sequence includes rebooting the standby system first to avoid service interruption.

ORACLE-1
Initial Active

ORACLE-2
Initial Standby

HA Backout procedure assumes
Initial Active has become Standby

HA Upgrade procedure
reboots Initial Standby first
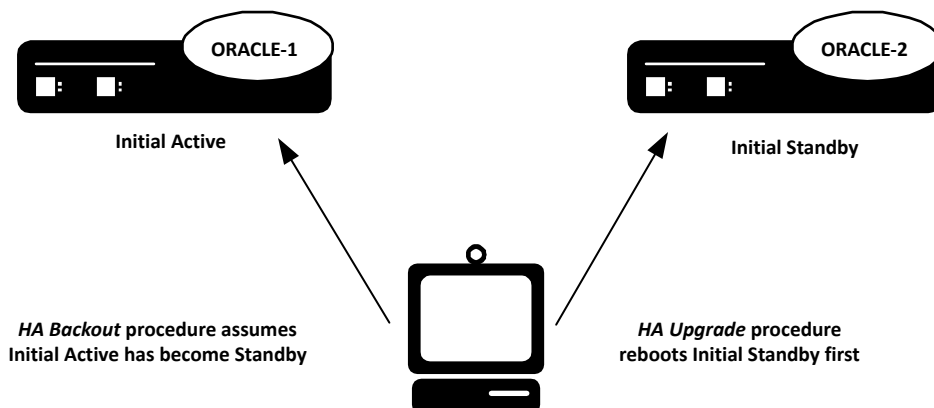
HA Upgrade Procedure

This procedure upgrades HA deployments.

> ☞ **Note:** In the procedure below, ORACLE-1 is the active system and ORACLE-2 is the standby system. The standby system should be rebooted first.

1. Confirm that ORACLE-1 and ORACLE-2 start up and are synchronized.

   Ensure that the running and current configurations on ORACLE-1 and ORACLE-2 have the same number. In the following examples, all of the configuration versions are 5.

   On ORACLE-1 and ORACLE-2, use the **show health** command to ensure all processes are synchronized.

   On ORACLE-1, show the current configuration version by using the ACLI **display-current-cfg-version** command. Then use the same command on ORACLE-2 and be sure that its current configuration version is the same as the one on ORACLE-1.

   ```
   ORACLE-1# display-current-cfg-version
   Current configuration version is 5
   ORACLE-1#
   ORACLE-2# display-current-cfg-version
   Current configuration version is 5
   ORACLE-2#
   ```

   On ORACLE-1, show the running configuration version by using the ACLI **display-running-cfg-version** command. Then use the same command on ORACLE-2 and be sure that its running configuration version is the same as the one on ORACLE-1.

   ```
   ORACLE-1# display-running-cfg-version
   Running configuration version is 5
   ORACLE-1#
   ORACLE-2# display-running-cfg-version
   Running configuration version is 5
   ORACLE-2#
   ```

2. On ORACLE-2, before loading the software image to the flash, check the remaining space in the /boot directory using the ACLI **show space boot** command.

   ```
   ORACLE-2# show space boot
   boot: 24759488/25760512 bytes (99%) remaining
   ORACLE-2#
   ```

   If you see less than 50% of the space remaining, delete older stored firmware images to make space.

   At a minimum, we recommend that you leave the diags.gz file and the currently running release on the flash memory (in the event that a rollback is required).

3. Upload the SBC software image file and stage three bootloader to the /boot directory using an SFTP client. (See the instructions on updating the Stage 3 Bootloader.)

4. Change the boot configuration parameters on ORACLE-2 to use the appropriate new release software image.

   > ☞ **Note:** From the point that you upgrade the image file, do not make any configuration changes. Likewise, do not use the **save-config** or **activate-config** commands. Once you execute the **save-config** command, the configuration can not be guaranteed to be backward compatible should you have to back out of the upgrade.

   Access the boot parameters on ORACLE-2:

- In the ACLI configure terminal menu, type **bootparam** and press <Enter> to being displaying the list of boot parameters.

  Scroll through the boot parameters by pressing <Enter>. Stop when you reach the file name boot parameter.

The following example uses the filenames `/boot/nnSCZ720m5.64.bz` and `/boot/nnSCZ730.64.bz`.

```
ORACLE-2# configure terminal
ORACLE-2(configure)# bootparam
'.' = clear field;  '-' = go to previous field;  ^D = quit
boot device         : eth0
processor number    : 0
host name           : boothost
file name           : /boot/nnSCZ720m5.64.bz /boot/nnSCZ730.64.bz
```

As shown above, type the new Release file name next to the previous one, including the path. Press <Enter> to continue scrolling through the boot parameters.

Reboot ORACLE-2.

5. After ORACLE-2 has completed the boot process, use the **verify-config** command to confirm that the configuration has been upgraded properly.

```
ORACLE-2# verify-config
```

6. Confirm the ORACLE-2 is running the new boot image using the **show version** command.

```
ORACLE-2# show version
Acme Packet 4600 SCZ7.3.0
Build Date=09/09/15
```

7. Use the **show health** command to confirm that ORACLE-2 is the standby system.

8. As you did for ORACLE-2, upload the SBC software image file and stage three bootloader to the /boot directory using an SFTP client. (See the instructions on updating the Stage 3 Bootloader.)

9. As you did for ORACLE-2, configure the boot parameters on ORACLE-1 to boot from the new software image. Then reboot ORACLE-1.

```
ORACLE-1# reboot
--------------------------------------------------------
WARNING: you are about to reboot this SD!
--------------------------------------------------------
Reboot this SD [y/n]?: y
```

Rebooting ORACLE-1 causes ORACLE-2 to become the active system in the HA node.

10. When ORACLE-1 is finished rebooting, use the **show health** command to confirm that it is in the standby state.

☞ **Note:** If you need to revert to the older image, use the HA Backout Procedure.

HA Backout Procedure

If you reach the point in your upgrade procedure where you have upgraded both Oracle Communications Session Border Controllers in the HA pair to a later release that you decide you no longer want to use, you can fall back to a previous release. This section shows you how to fall back to an older image with both systems in your HA node upgraded.

☞ **Note:** In the procedure below, ORACLE-2 is the active system and ORACLE-1 is the standby system. The procedure uses these designations because the prior procedure results in ORACLE-2 as the active system. The standby system should be rebooted first.

To backout to a previous (older) release with the both SBCs in the HA node upgraded:

1. Change the boot parameters on ORACLE-1 to use the appropriate Release S-CZ7.2.0 software image.

Using one of these methods, access the boot parameters on ORACLE-1:

• Reboot ORACLE-1 using any of the ACLI **reboot** commands. Stop the booting process by hitting the Space bar on your keyboard to halt boot-up when you see this message: Press any key to stop auto-boot.... Type a **c** and press Enter to begin displaying the boot parameters.

- In the ACLI configure terminal menu, type **bootparam** and press Enter to being displaying the list of boot parameters.

  Scroll through the boot parameters by pressing Enter. Stop when you reach the file name boot parameter.

  The following example uses the filenames `/boot/nnSCZ730.64.bz` and `/boot/nnSCZ720.64.bz`.

  ```
  ORACLE-1# configure terminal
  SBC1(configure)# bootparam
  '.' = clear field;  '-' = go to previous field;  ^D = quit
  boot device         : eth0
  processor number    : 0
  host name           : boothost
  file name           : /boot/nnSCZ730.64.bz /boot/nnSCZ720.64.bz
  ```

  In the example above, type the appropriate Release S-CZ7.2.0 file name next to the Release S-CZ7.3.0 file name. Press <Enter> to continue scrolling through the boot parameters.

  Exit to the main Superuser prompt.

  ```
  ORACLE-1(configure)# exit
  ```

2. Reboot ORACLE-1.

3. Using the ACLI **show version** command to confirm that you are using the appropriate release.

   ```
   ORACLE-1# show version
   Acme Packet 4600 SCZ7.2.0
   Build Date=01/09/15
   ```

4. Initiate a switchover on ORACLE-1.

   ```
   ORACLE-1# notify berpd force
   ```

   At this point, ORACLE-1 becomes the active system running Release S-CZ7.2.0. ORACLE-2 is now the standby system running Release S-CZ7.3.0.

5. On ORACLE-2, change the boot parameters as you did in Step 1 of this procedure.

6. Reboot ORACLE-2.

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Physical Interfaces on Acme Packet Platforms

Acme Packet platforms are prepared for operation, including having the software pre-installed, prior to shipment. Refer to each product's hardware installation document for physical chassis installation. The following sections provide technicians with physical interface information that is useful for post-installation cabling.

The Network Interface Units (NIUs) installed on Acme Packet proprietary hardware define the number of interfaces, hardware protocol, and connection speed available for media and signaling traffic. Global operational information on this information is presented immediately below. Platform-specific physical information is presented in the subsequent sections. Use this information to understand these interfaces at a high level and to physically identify them for verification and troubleshooting procedures.

There are two types of physical interfaces on Acme Packet hardware NIUs:

- Media interfaces are on the network interface unit (NIU); they are also referred to as network media ports.
- Management interfaces are also on the NIU; they are also referred to as network management ports.

The first management interface, referred to as wancom0 or eth0, handles device management traffic including:

- SNMP
- Telnet
- SSH
- SFTP
- ACP/XML
- Logs sent from the Oracle Communications Session Border Controller
- The boot file used to boot the Oracle Communications Session Border Controller from a remote file server

The wancom0 interface does not require that the user perform physical or network interface branch configuration procedures within the ACLI. Instead, users configure its address and mask in the platform's boot parameters. Note that wancom0 uses the boot parameter's default gateway setting unless the system-config's default gateway is configured.

Users configure the wancom1 and wancom2 management interfaces for high availability (HA) state replication. For HA, these interfaces are often directly connected by a crossover cable.

Media interfaces handle session signaling and/or session media traffic. Users must perform all media, wancom1 and wancom2 interface configuration at the ACLI.


The table below summarizes the physical interface configuration parameters, which interface they are applicable to, and whether they are required.

Parameter	Network Media Interface	Wancom1 and wancom2 Network Management Interfaces
name	R	R
operation-type	R	R
port	R	R
slot	R	R
virtual-mac	O	I
admin-state	R	I
auto-negotiation	R	I
duplex-mode	R	I
speed	R	I
wancom-health-score	I	O
R = Required, O = Optional, I = Invalid		

Acme Packet 3820 and 4500 Physical Interfaces

The Acme Packet 3820 and 4500 support a single network interface unit (NIU) that contains all external interfaces, including console, alarm, network management and media interfaces. There are multiple NIU types available, which define the supported cabling, speed and operational features, such as transcoding and/or encryption. The NIUs used on the Acme Packet 3820 and Acme Packet 4500 differ in terms of speed and operational features.

The graphic below shows the location and labeling of the Acme Packet 3820 and 4500 media and network management ports. This labeling is an important point of reference when you set up the **phy-interface** configuration element.
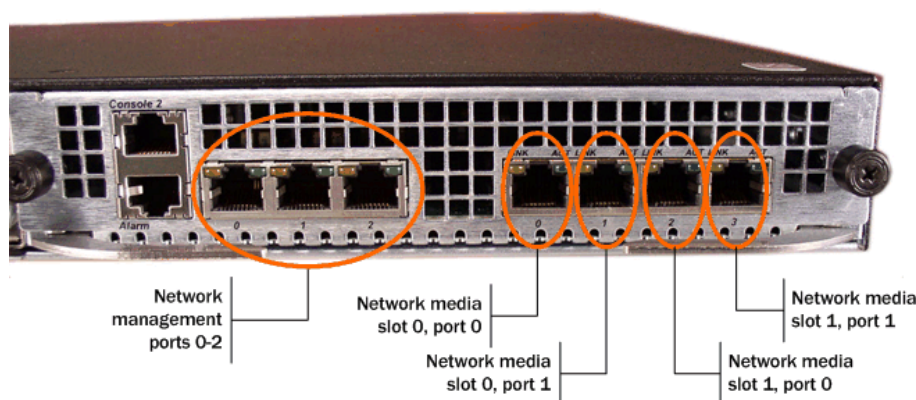
The Acme Packet 3820 and 4500 NIU includes the following ports (from left to right).

- Console—Provides serial access for administrative and maintenance purposes.
- Alarm—Dry contact alarm port.
- Mgmt0 to Mgmt2—The system uses these 10/100/1000 Base-T Ethernet ports for device management functions.
- P0,0 to P1,1—The system uses these 4 x GbE ports for signaling and media traffic.

The table below lists the labeling of each interface on the NIU, as well as the applicable **operation-type** and **port** parameters in the **phy-interface** configuration element. Note that the slot parameter for network management ports is always zero (0). The operation-type parameter distinguishes between otherwise overlapping slot/port configuration.

| NIU Label	operation-type	slot	port
Mgmt 0	maintenance	0	0
Mgmt 1	maintenance	0	1
Mgmt 2	maintenance	0	2
P0	media	0	0
P1	media	0	1
P2	media	1	0
P3	media	1	1

The Acme Packet 3820 and 4500 NIU supports six kinds of NIUs. Your NIU may support copper, single mode or multimode fiber with an LC connector.

- 4-port GigE copper (RJ45)
- 4-port GigE SFP (LX, SX, or Copper)
- 4-port GigE SFP with QoS and IPSec (LX, SX, or Copper)
- 4-port GigE SFP with IPSec (LX, SX, or Copper)
- 4-port GigE SFP with QoS (LX, SX, or Copper)
- 4-port GigE SFP ETC NIU (LX, SX, or Copper)

Acme Packet 4600 Physical Interfaces

The Acme Packet 4600 supports a single network interface unit (NIU) that contains all external interfaces, including console, alarm, network management and media interfaces. There is currently one type of NIU available, which defines the supported cabling and speed.

The graphic below shows the Acme Packet 4600 NIU ports with labeling. This labeling is an important point of reference when you set up the **phy-interface** configuration element.
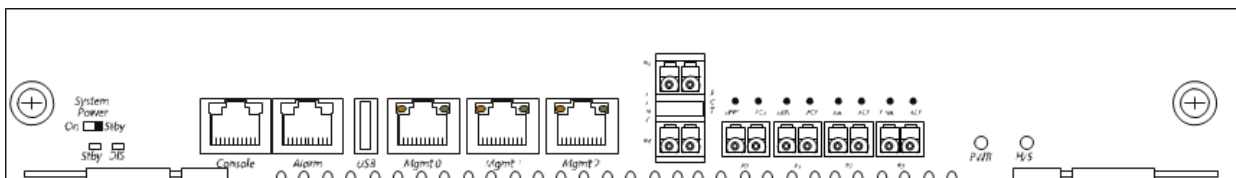
The Acme Packet 4600 NIU includes the following ports (from left to right).

- Console—Provides serial access for administrative and maintenance purposes.
- Alarm—Dry contact alarm port.
- USB—The USB port is reserved for use by Oracle support employees only.
- Mgmt 0–Mgmt 2—The system uses these 10/100/1000 Base-T Ethernet ports are used for device management functions. The first interface, Mgmt 0, is for telnet or ssh access to the ACLI. The other two interfaces are used for state replication for High Availability (HA). For HA, connect these interfaces directly using a crossover cable.
- P4–P5—The system uses these 2 x 10GbE ports for signaling and media traffic.
- P0–P3—The system uses these 4 x GbE ports for signaling and media traffic.

⚠️ **Warning:** Customers may use either the 2 x 10GbE ports or the 4 x GbE media ports. Using both P4-P5 and P0-P3 is not supported.

The table below lists the labeling of each interface on the NIU, as well as the applicable **operation-type** and **port** parameters in the **phy-interface** configuration element. The **slot** parameter for this platform is always set to 0. The operation-type parameter distinguishes between otherwise overlapping slot/port configuration.

NIU Label	operation-type	slot	port
Mgmt 0	maintenance	0	0
Mgmt 1	maintenance	0	1
Mgmt 2	maintenance	0	2
P0	media	0	0
P1	media	0	1
P2	media	0	2
P3	media	0	3
P4	media	0	4
P5	media	0	5

Acme Packet 6100 Physical Interfaces

The Acme Packet 6100 supports a single network interface unit (NIU) that contains all external interfaces, including console, alarm, network management and media interfaces. There is currently one type of NIU available, which defines the supported cabling and speed.

The graphic below shows the NIU front panel, which includes all ports and their labeling. This labeling is an important point of reference when you set up the **phy-interface** configuration element.

Console Port   Network Management Ports   Signaling/Media Interfaces
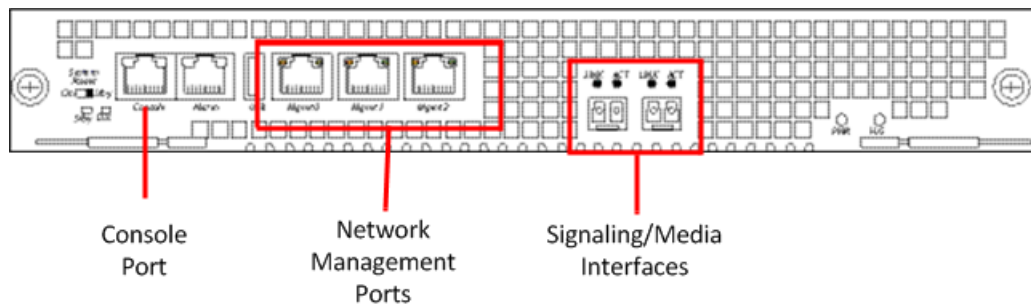
The Acme Packet 6100 NIU includes the following ports (from left to right).

- Console—Provides serial access for administrative and maintenance purposes.
- Alarm—Dry contact alarm port.
- USB—For use only by Oracle personnel.
- Mgmt0 to Mgmt2—The system uses these 10/100/1000 Base-T Ethernet ports for device management functions. The first interface, Mgmt 0, is for telnet or ssh access to the ACLI. The other two interfaces are used for state replication for High Availability (HA). For HA, connect these interfaces directly using a crossover cable.
- SFP+ ports—The system uses these 2 x 10GbE ports for signaling and media traffic.

The table below lists the labeling of each interface on the NIU, as well as the applicable **operation-type** and **port** parameters in the **phy-interface** configuration element. Note that the media interfaces are not

uniquely labeled with the chassis silkscreen. The table distinguishes between these using "left" and "right", with the perspective being the user looking at the NIU panel.

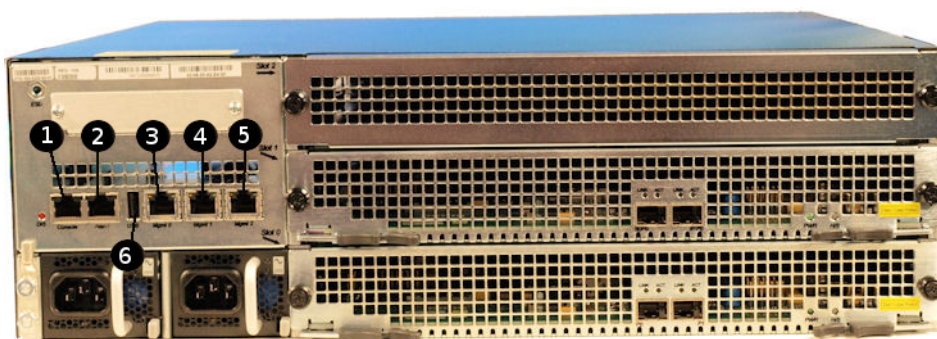| NIU Label	operation-type	slot	port
Mgmt 0	maintenance	0	0
Mgmt 1	maintenance	0	1
Mgmt 2	maintenance	0	2
USB	NA	NA	NA
NA (left)	media	0	0
NA (right)	media	0	1

Acme Packet 6300 Physical Interfaces

The Acme Packet 6300 comes with management interfaces, including console, alarm, USB and network management integrated into the rear of the chassis, above the power supplies. It also supports a two network interface units (NIUs) that contain media interfaces. There is currently one type of media NIU available, which defines the supported cabling and speed.

Acme Packet 6300 Management Interfaces

Management interfaces include 3 x 10/100/1000 Ethernet interfaces and are labeled Mgmt 0, 1 and 2. (These interfaces are often referred to as wancom0, 1 and 2.) The first interface, Mgmt 0, is for telnet or ssh access to the ACLI. The other two interfaces are used for state replication for High Availability (HA). For HA, connect these interfaces directly using a crossover cable.

The console port is serial and the alarm is "dry contact".

The USB port is reserved for use by Oracle personnel only. There is no front facing console port. The graphic below uses numbers to label the ports.

The table below maps the graphic's reference numbers and the labeling on the management interfaces. It also, when applicable, lists the **operation-type**, **slot** and **port** parameters in the **phy-interface** configuration element for the management interfaces.

Graphic Label	Port Label	operation-type	slot	port
1	Console	NA	NA	NA
2	Alarm	NA	NA	NA
3	Mgmt 0	maintenance	0	0
4	Mgmt 1	maintenance	0	1

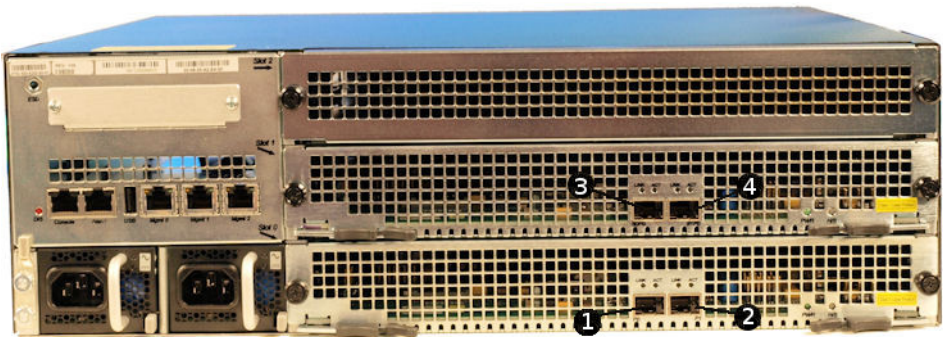| Graphic Label	Port Label	operation-type	slot	port
5	Mgmt 2	maintenance	0	2
6	USB	NA	NA	NA

Acme Packet 6300 Media Interfaces

The Acme Packet 6300 has 3 PHY card slots. The bottom slot, slot0, and the middle slot, slot1, support network-facing media interface cards. The top slot, slot2, supports feature-based hardware, such as transcoding, and is referred to as the "resource" slot. Standard Acme Packet 6300 PHY cards contain 2 x 10-gigabit Ethernet ports.

Ensure that the first 2x10Gig NIU in your system populates slot0. If you are use a second 2x10Gig NIU, insert it into slot1.

👉 **Note:** Do not insert any 2x10Gig NIU in the resource slot (slot2).

The Acme Packet 6300 supports up to 4 x 10 gigabit media ports each running at full duplex line rate for all packet sizes. The graphic below labels the media ports using numbers.

The table below maps the graphic's reference numbers and the labeling on the media interfaces. It also lists the **operation-type**, **slot** and **port** parameters in the **phy-interface** configuration element for the applicable interfaces. Note that the media interfaces are not uniquely labeled with the NIU silkscreen. The table distinguishes between these using "left" and "right", with the perspective being the user looking at the NIU panel.

Graphic Label	Port Label	operation-type	slot	port
1	NA (left)	media	0	0
2	NA (right)	media	0	1
3	NA (left)	media	1	0
4	NA (right)	media	1	1