

**Oracle® Communications
Policy Management**

Platform Configuration User's Guide

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Chapter 1

About This Guide

Topics:

- *How This Guide is Organized.....9*
- *Intended Audience.....9*
- *Documentation Admonishments.....9*
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This chapter describes the organization of the document and provides other information that could be useful to the reader.

How This Guide is Organized

The information in this guide is presented in the following order:

- [About This Guide](#) contains general information about this guide, the organization of this guide, and how to get technical assistance.
- [Introduction](#) describes how to access the Platcfg utility, how to use the utility interface in a Policy Management environment, and troubleshooting.
- [Performing Initial Server Configuration](#) describes how to access the Platcfg utility and configure your application's initial configuration, and then how to verify the configuration.
- [Managing Certificates](#) describes how to access the Platcfg utility to manage SSL security certificates, which allow two systems to interact with a high level of security.
- [Synchronizing Files](#) describes how and when to synchronize files in clusters.
- [Custom Ethtool Options](#) describes how to manually configure Ethtool options.
- [Performing System and Server Backups and Restores](#) describes how to perform system and server backups and restores.
- Glossary



Intended Audience



This guide is intended for service personnel who are responsible for operating Policy Management systems.

Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 1: Admonishments

Icon	Description
 DANGER	Danger: (This icon and text indicate the possibility of <i>personal injury</i> .)
 WARNING	Warning: (This icon and text indicate the possibility of <i>equipment damage</i> .)

Icon	Description
 CAUTION	Caution: (This icon and text indicate the possibility of <i>service interruption</i> .)
 TOPPLE	Topple: (This icon and text indicate the possibility of <i>personal injury and equipment damage</i> .)

Related Specifications

For information about additional publications that are related to this document, refer to the Oracle Help Center site. See [Locate Product Documentation on the Oracle Help Center Site](#) for more information on related product publications.

Locate Product Documentation on the Oracle Help Center Site

Oracle Communications customer documentation is available on the web at the Oracle Help Center (OHC) site, <http://docs.oracle.com>. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at <http://www.adobe.com>.

1. Access the Oracle Help Center site at <http://docs.oracle.com>.
2. Click **Industries**.
3. Under the Oracle Communications subheading, click the **Oracle Communications documentation** link.
The Communications Documentation page appears. Most products covered by these documentation sets will appear under the headings “Network Session Delivery and Control Infrastructure” or “Platforms.”
4. Click on your Product and then the Release Number.
A list of the entire documentation set for the selected product and release appears.
5. To download a file to your location, right-click the **PDF** link, select **Save target as** (or similar command based on your browser), and save to a local folder.

Customer Training

Oracle University offers training for service providers and enterprises. Visit our web site to view, and register for, Oracle Communications training:

<http://education.oracle.com/communication>

To obtain contact phone numbers for countries or regions, visit the Oracle University Education web site:

www.oracle.com/education/contacts

My Oracle Support (MOS)

MOS (<https://support.oracle.com>) is your initial point of contact for all product support and training needs. A representative at Customer Access Support (CAS) can assist you with MOS registration.

Call the CAS main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select **2** for New Service Request
2. Select **3** for Hardware, Networking and Solaris Operating System Support
3. Select one of the following options:
 - For Technical issues such as creating a new Service Request (SR), Select **1**
 - For Non-technical issues such as registration or assistance with MOS, Select **2**

You will be connected to a live agent who can assist you with MOS registration and opening a support ticket.

MOS is available 24 hours a day, 7 days a week, 365 days a year.

Emergency Response

In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at 1-800-223-1711 (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.

Chapter 2

Introduction

Topics:

- [Platcfg Overview.....13](#)
- [Accessing Platcfg.....13](#)
- [Keyboard Actions in the Platcfg Utility.....13](#)
- [Using the Save Platform Debug Logs Menu to Troubleshoot.....13](#)

This chapter describes how to use the Oracle Communications Policy Management Platform Configuration utility (Platcfg) to configure Oracle Communications Policy Management (Policy Management) on Policy Management Configuration Management Platform (CMP) servers and Policy Management servers.

The reference to Policy Management servers will be used throughout this document to mean the Policy Management Multimedia Policy Engine (MPE) device, Policy Management Multi-Protocol Routing Agent (MRA) device, Policy Management Bandwidth on Demand (BoD) server, Policy Management Message Distribution Function (MDF) server, and Policy Management Management Agent (MA) server, collectively. Each server is described individually in detail in their respective manuals.

The pages, tabs, fields, menu items, and functions that you see in the utility depend on your configuration, application, or mode.

Platcfg Overview

The `platcfg` utility is a Command Line Interface (CLI) tool that simplifies the execution of tasks that cannot be included in the application software. These tasks include those that affect operating system operations or platform services that are invisible to an application or that are not accessible from the application management controls.

The `platcfg` utility simplifies task execution and reduces the chance of user errors through the use of wizard-like menu options and forms.

You access `platcfg` menus by logging in from a console or logging in remotely. The `platcfg` security actions are centralized at the active CMP server, with all functions propagated automatically to all connected servers.

Accessing Platcfg

- To access `platcfg` from the system console:
 - Log on as **root**.
 - Then enter `su - platcfg`.
- To access `platcfg` through an SSH remote session:
 - Log on as **admusr**.
 - Then enter `sudo su - platcfg`.

Keyboard Actions in the Platcfg Utility

Use the following keyboard actions to move and enter information within the `platcfg` utility:

- Up and down arrows—Moves the action up or down.
- Left and right arrows—Moves the action sideways.
- Enter key—Enters the selected item and moves to the next menu or feature screen.
- First letter—Select the first letter of a menu item to move to that item.

Using the Save Platform Debug Logs Menu to Troubleshoot

If a system failure occurs, use the **Save Platform Debug Logs** option on the **Policy Configuration Menu** to help troubleshoot the issue.

Note: The CMP Save Log function includes CMP Audit logs, (as displayed under **System Administration > Audit Logs**) for the previous two months.

Saving Platform Debug Logs

The **Save Platform Debug Logs** menu is used to help troubleshoot a system failure. This action provides two settings that allow you to limit the size of the saved log files.

Information saved in the logs includes the current state of all logs, all the configuration files, all the system proc entries, and several miscellaneous files. Output from this process is a single tar/gzip file.

To access this utility:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Save Platform Debug Logs** from the **Policy Configuration Menu** and press **Enter**.
6. In the screen that opens, enter values, where:
 - **Record limit for qptrace**—Specifies the maximum number of qptrace messages to save. Do not change this setting when generating a save log to debug a problem; only reduce the default number messages when instructed to do so by Customer Support.
 - **Record limit for AppEventLog**—Specifies the maximum number of AppEventLog records to save. Do not change this setting when generating a save log to debug a problem; only reduce the default number records when instructed to do so by Customer Support.
 - **Remember count limit settings**—Specifies whether or not to retain limit setting from previous log.
 - **Include trace/subact/sync log**—Indicates whether to include the extra trace/subact/sync debug records.
 - **Save as**—Lists the path and filename of the file being saved.

Note: **Include trace/subact/sync log** should be left set to **No** unless directed to be set to **Yes** by [My Oracle Support \(MOS\)](#).

7. Select **OK** and press **Enter** to save variable changes and generate the tar/gzip file. The file is generated and saved in the specified location.

Chapter 3

Performing Initial Server Configuration

Topics:

- *Setting the Policy Management Mode.....16*
- *Setting Up the Initial Configuration.....17*
- *Verifying the Initial Configuration.....21*
- *Verifying the Server Status.....21*
- *Cleaning Up the Cluster Configuration.....22*
- *Managing Routes on Your Server.....22*
- *Restarting the Application.....26*
- *Configuring Firewall Settings.....27*
- *Displaying Firewall Settings.....29*
- *Managing DSCP Configurations.....30*

This chapter describes how to set the Policy Management configuration mode, configure the initial configuration, verify the configuration, manage routes, configure firewall settings, and DSCP Marking configuration.

Setting the Policy Management Mode

To select the Policy Management mode:

1. Access `platcfg`.
See [Accessing Platcfg](#) for details.
2. Select **Policy Configuration** from the **Main Menu** screen and press **Enter**.
The **Policy Configuration Menu** appears.
3. Select **Set Policy Mode** from the **Policy Configuration Menu** screen and press **Enter**.
4. Select the appropriate mode for your system and select **OK** and press **Enter**.

Available modes include:

- Cable
 - Wireline
 - Wireless
5. If the **Select Network Layout** screen opens, you will need to select the appropriate **Network layout profile**.

Refer to [Table 2: Server Network Layouts](#) for information about the network layout choices.

- a) If you have an Ethernet Mezzanine card installed, select a **Network layout profile** from the **Select Network Layout** screen, select **OK** and press **Enter**.

Note: To enable traffic segregation in a system, an Ethernet Mezzanine card is required and the selection of a **Network layout profile** other than **common** from the **Select Network Layout** screen is required.

Note: If the system does not have an Ethernet Mezzanine card, the **Select Network Layout** screen does not appear and the **Network layout profile** of **common** is applied automatically.

- b) If you have an MRA device and you are using Hewlett Packard (HP) c-Class hardware to provide separate external SCTP multi-homing and internal traffic by using an additional signaling interface, select **common_with_sigc** from the **Select Network Layout** screen, select **OK** and press **Enter**.

Table 2: Server Network Layouts

Network Layout Profile	Network Layout Detail	Description
common	PMAC=bond0 OAM=bond0.<VLAN> SIGA=bond0.<VLAN> SIGB=bond0.<VLAN>	This is the default layout after policy product is installed. With this layout, the mezzanine cards are not used. The product behaves exactly like an ordinary c-Class server.
segregated	PMAC=bond0 OAM=bond0.<VLAN> SIGA=bond1.<VLAN>	This mode is used by MPE and MRA devices for traffic segregation.

Network Layout Profile	Network Layout Detail	Description
	SIGB=bond1.<VLAN>	If the server is upgraded from an earlier release with traffic segregation enabled, this layout is automatically selected.
bkup	PMAC=bond0 OAM=bond0.<VLAN> SIGA=bond0.<VLAN> SIGB=bond0.<VLAN> BKUP=bond2	This mode is used by CMP server where an extra BKUP interface is used. If the server is a CMP upgraded from an earlier release with segregation turned off, this layout is automatically selected.
segregated_with_bkup	PMAC=bond0 OAM=bond0.<VLAN> SIGA=bond1.<VLAN> SIGB=bond1.<VLAN> BKUP=bond2	This mode is used by CMP server where an extra BKUP interface is used. If the server is a CMP upgraded from an earlier release with segregation turned on, this layout is automatically selected.
common_with_sigc	OAM=bond0.<VLAN> PMAC=bond0 SIGA=bond0.<VLAN> SIGB=bond0.<VLAN> SIGC=bond0.<VLAN>	This mode is used by a customer using the Wireless mode to provide separate external SCTP multi-homing and internal traffic by using an additional signaling interface.

Setting Up the Initial Configuration

This section describes how to perform the initial configuration on the CMP servers in your system.

To perform the initial configuration of the system:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:

```
su - platcfg
```
3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.

5. Select **Perform Initial Configuration** from the **Policy Configuration Menu** and press **Enter**.

The **Initial Configuration** screen opens.

6. Enter the configuration values:

- **HostName**—The unique name of the host for the device being configured.
- **OAM Real IP Address**—The IP address that is permanently assigned to this device.
- **OAM Real IPv4 Address**—The IPv4 address that is permanently assigned to this device.
- **OAM Default Route**—The default route of the OAM network.
- **OAM IPv4 Default Route**—The IPv4 default route of the OAM network.
- **OAM Real IPv6 Address**—The IPv6 address that is permanently assigned to this device.
- **OAM IPv6 Default Route**—The IPv6 default route of the OAM network.
- **NTP Server** (required)—A reachable NTP server on the OAM network.
- **DNS Server A** (optional)—A reachable DNS server on the OAM network.
- **DNS Server B** (optional)—A second reachable DNS server on the OAM network.
- **DNS Search**—A directive to a DNS resolver (client) to append the specified domain name (suffix) before sending out a DNS query.
- **Device**—The bond interface of the OAM device. Note that the default value should be used, as changing this value is not supported.
- **OAM VLAN**—The OAM network VLAN Id (only applies to c-Class servers or X5-2 RMS; field does not display otherwise).
- **SIG A VLAN Id**—The Signaling-A network VLAN Id (only applies to c-Class servers or X5-2 RMS; field does not display otherwise).
- **SIG B VLAN Id**—The Signaling-B network VLAN Id (only applies to c-Class servers or X5-2 RMS; field does not display otherwise).
- **SIG C VLAN Id**—The Signaling-C network VLAN Id (applies to c-Class servers, X5-2 RMS, VM; field does not display otherwise).
- **BackplaneDevice**—The backplane bond interface of the OAM device.
- **BackplaneIpPrefix**—The backplane bond interface IP Prefix of the OAM device.

Note: All of the fields listed above are required, except for fields **DNS Server** and **DNS Search**, which are optional but recommended.

Note: If traffic segregation is available and is defined, the SIG-A and SIG-B interfaces will be segregated onto the optional second pair of 6120XG/6125XLG enclosure switches. Do not enable traffic segregation if a second pair of 6120XG/6125XLG enclosure switches are not available. Traffic separation information is set in the **Set Policy Mode** activities.

Note: Every network service and IP flow that is supported by IPv4 is also supported by IPv6. Either interface or a combination of the two can be configured.

7. When finished, select **OK** to save and apply the configuration.

At this point the screen pauses for approximately 1 minute. This is normal behavior.

You have successfully set up the initial configuration.

If SIG-C is selected, proceed to the **Add Route** screen.

Changing an NTP Server on an MPE/MRA Device

To change an NTP server on an MPE/MRA device:

1. From the CMP server:
 - a) Set the MPE/MRA device to **forced standby**.
 - b) **SSH** to the **standby server**.
 - c) Become the **root** user by using `su` or `sudo`.
 - d) Enter `su - platcfg`.
2. In `platcfg`:
 - a) Select **policy configuration**.
 - b) Select **routing configuration**.
 - c) Select **display routes**.
 - d) Write down the routes.
3. In `platcfg`:
 - a) Select **policy configuration**.
 - b) Select **initial configuration**.
 - c) Modify the **NTP Server Value** to the correct **value**.
 - d) Click **OK**.
4. Click **Save**.
5. At the menu prompt:
 - a) Select **routing config**.
 - b) Select **display routes**.

Note: Make sure the route is the one you wrote down in *Substep d*. If it is not the same, you will need to use **Add Route** and **Delete Route** to make the route the same as the one you wrote down in *Substep d*.
6. To generate the NTP health report, use **Platcfg > Policy Configuration > Verify Initial Configuration**.
7. In the command line interface, use `# ntpq -pn` to ensure that the server is reaching the new NTP server.

For example:

```
[root@mpe230002~]# ntpq -pn
remote refid st t when poll reach delay offset jitter
=====
*144.2..102.525 .GPS 1u 145 1024 377 250.602 0.802 3.222
```

Where `*` indicates the connection to the NTP server is correct.

Note: If the offset is very large, you might have to execute the steps at the end of this doc to manually adjust it. If not, just continue to perform below steps.

8. Check that `>prod.state` is:

```
...prod.state (RUNID=00)...
...getting current state...
```

Where:

Current state: A product under `procmgr` in a `START` state. If the current state is not `Active`, stop executing this procedure and call Oracle Support.

9. In the current active server, enter `# netstat -nap | grep 3868 | wc` to obtain a count of diameter connections.
10. In the CMP server, select the cluster and use **switch force standby** to failover the MPE/MRA device.
11. In the new active MPE/MRA device:
 - a) Use `# netstat -nap | grep 3868 | wc` to determine if the diameter connections have been re-established.
Note: If not, use the CMP interface to **switch force standby** again and call Oracle Support.
 - b) If Diameter link has been re-established and the modified server with the new NTP is working properly, log into Linux as **root** on the current standby server.
 - c) Enter `su - platcfg`.
12. In platcfg, select **Policy Configuration**, then enter **initial configuration**:
 - a) Modify the NTP server value and click **OK**.
 - b) Click **Save**.
13. When the platcfg menu returns, select **routing config**.
14. Select **Display routes**.
Note: Make sure it is the same with the routes written down in step [Substep d](#). If it is not the same, you need to use **Add Route** and **Delete Route** to make it the same.
15. Exit platcfg and wait two minutes before proceeding to next step.
16. Use the command: `#ntpq -pn` to ensure that the server is reaching the new NTP server.
Note: If the offset is very large, you also need to execute extra steps. See [Process for Very Large NTP Offset](#) for more information.
17. Execute `prod.state` to ensure that the **Current state** is **Active**.
Note: If the current state is not **Active**, stop executing this procedure and call Oracle Support.
Note: If you cancel the forced standby for the server in CMP interface, there might be some alarms raised, but they should be automatically cleared.

Process for Very Large NTP Offset

If the NTP offset is very large:

1. To verify the NTP server is configured correctly and works on the MPE/MRA device, use `ntpq-pn`.
2. If the MPE device has the active role in the cluster, please run a switch over of this cluster to make this device use standby role.
3. Perform these commands in order:
 - a) `service qp_procmgr stop`
 - b) `service comcol stop`
 - c) `service ntpd stop`
 - d) `service ntpdate restart`
 - e) Wait one minute for the sync between device and the NTP server to complete.
 - f) `service ntpd start`
 - g) `date`

- h) `wclock`
 - i) `ntpq -pn`
 - j) Check `sync` is done and the time is accurate for the server time and BIOS clock.
 - k) `service comcol start`
 - l) `service qp_procmgr start`
4. Monitor the system for several minutes and then verify the system status is functioning normally, and that all the alarms are cleared.

Verifying the Initial Configuration

This section describes how to verify the initial configuration on the CMP servers in your system after you have completed the initial configuration.

To verify the initial configuration of the system:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Verify Initial Configuration** from the **Policy Configuration Menu** and press **Enter**.
Your initial configuration settings are displayed.
5. Select **Exit** and press **Enter** to return to the menu.

Verifying the Server Status

After you have made and verified your initial configuration settings, to verify the server status:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Verify Server Status** from the **Policy Configuration Menu** and press **Enter**.

Once fully configured, a server will show the server role as **Active** or **Standby** (or **Spare**, if this is a Policy Management server configured for georedundancy). **Unknown** is a valid state during

initial configuration because the cluster has not been formed. **Policy Process Management Status** should always be **Running**.

Cleaning Up the Cluster Configuration

After removing a server from a cluster and before adding the server to another cluster, clean up the cluster:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Cluster Configuration Removal** from the **Policy Configuration Menu** screen and press **Enter**.
5. Select **Cluster Information Cleanup** from the **Cleanup Configuration Menu** screen and press **Enter**.
6. Select **Yes** or **No** from the **Cleaning up cluster information** screen and press **Enter**.

The cluster configuration is cleaned up.

Managing Routes on Your Server

This section describes how to manage routes on your server:

- [Configuring a Route](#)
- [Deleting a Route](#)
- [Displaying Routes](#)
- [Exporting a Route](#)
- [Importing a Route](#)

Configuring a Route

To configure a route:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Routing Config** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Add Route** from the **Route Configuration Menu** and press **Enter**.

The **Add Route** configuration screen appears.

7. Edit the information displayed on the **Add Route** screen:
 - a) Select the **IP Type**.

Determines whether this will be an **IPv4** or **IPv6** route.
 - b) Select the **Route Type**.

Determines whether this route will be for a specific destination (**host**), a specific network segment (**net**), or a **default** route.

Note: This option is provided to allow the default route to be moved to a different interface; only one default route per address family (IPv4 or IPv6) should exist on a system at one time.
 - c) Select the **Network**.

Indicates whether this route will be created on the OAM, REP (replication), SIGA, SIGB, SIGC interface. Note that the BKUP network is available on CMP servers with the optional mezzanine card installed and also on all Oracle RMS including X5-2 for all products including CMP server, MPE device, and MRA device.

Note: When creating routes for an interface that does not have an active IP address, such as the SIG-A interface on the standby server you receive a warning stating that the route cannot be applied at this time but it will be saved. These routes show as **INACT** on the display routes section.
 - d) Select the **Preferred Source Addr**.

Indicates the source address selection for outgoing traffic. Options include:

 - **NONE** refers to no VIP or STATIC IP assignment.
 - **VIP** is the virtual IP configured in the CMP GUI.
 - **STATIC** includes:
 - OAM IP address configured in Policy Initial Configuration
 - Static IP configured in the CMP **Topology** action.
 - An IP address assigned by netAdm or ifconfig or **ip addr add**
 - An IP address added by manual editing of the ifcfg file

Note: See [Table 3: Detailed Behavior of Preferred Source Addr](#) for details about the behavior of **Preferred Source Addr**.
 - e) Enter the **Destination** IP address.
 - f) Enter the **Gateway Address**.

Table 3: Detailed Behavior of Preferred Source Addr

Preference/status	Prefer None	Prefer VIP	Prefer STATIC
No VIP, no static IP	Not applied. On Active server, alarm 70015 is raised. On Standby or Spare server, this error is ignored.	Not applied. If VIP is not configured, Alarm 70016 is raised. On Active server, alarm 70015 is also raised.	Not applied. Alarm 70017 is raised.
No VIP, one or more static IP	Applied without "src" option specified to kernel. Kernel will use the first static IP as source address automatically.	Not applied. If VIP is not configured, Alarm 70016 is raised. On Active server, alarm 70015 is also raised.	Applied to the first static IP
One VIP, no static IP	Applied without "src" option specified to kernel. Kernel will use the VIP as source address automatically.	Applied to VIP	Not applied. Alarm 70017 is raised.
One VIP, one or more static IP	Applied without "src" option specified to kernel. Kernel will use the VIP as source address automatically.	Applied to VIP	Applied to first static IP
Two or more VIPs, no static IP	Applied without "src" option specified to kernel. Kernel will use the first VIP as source address automatically.	Applied to first VIP	Not applied. Alarm 70017 is raised.
Two or more VIPs, one or more static IP	Applied without "src" option specified to kernel. Kernel will use the first static IP as source address automatically.	Applied to first VIP	Applied to first static IP

8. When finished editing, select **OK** and press **Enter**.
9. Press **Enter** again to save changes.

Deleting a Route

To delete an existing route:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:


```
su - platcfg
```

3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Routing Config** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Delete Route** from the **Route Configuration Menu** and press **Enter**.
7. Select the route to delete by pressing the space bar, select **OK** and press **Enter**.

Use the **Top**, **Bottom**, **Prev**, and **Next** buttons to scroll through the list.

Note: More than one route can be deleted at a time.

Note: The route is deleted without confirmation.

Displaying Routes

To display configured routes:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.

2. If at the **root** prompt, enter:

```
su - platcfg
```

3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Routing Config** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Display Routes** from the **Route Configuration Menu** and press **Enter**.

The status of each route displays as either **ACT** or **INACT**. **ACT** means the route is active and currently running. **INACT** means that the route is saved in configuration, but cannot be activated at this time. An inactive route may mean that an interface for which the route is configured does not currently have an IP address; for example, a standby server on an interface that only has a VIP. An inactive route may also mean that a route has been configured incorrectly, with the gateway IP address not on the same subnet as the interface IP address.

Exporting a Route

Routes can be exported from one server and imported into another or exported and modified with a text editor before importing.

To export all existing routes in a route list:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.

2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Routing Config** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Export Route** from the **Route Configuration Menu** and press **Enter**.
7. Specify the location and filename of the routes in a route list that are to be exported, select **OK** and press **Enter**.
Routes in a route list are exported to the specified directory and filename.

Importing a Route

Note: Exported routes can be modified with a text editor before importing.

To import all existing routes within a route list into the routing configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Routing Config** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Import Routes** from the **Routing Configuration Menu** and press **Enter**.
7. Specify the location and filename of the routes in a route list that are to be imported, select **OK** and press **Enter**.
Routes in a route list are imported into the routing configuration from the specified directory and filename.

Restarting the Application

Note: Restarting the application will interrupt service on a server if it is in an active role. However, restarting the application does not log out users.

To restart the application:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:

```
su - platcfg
```

3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**
5. Select **Restart Application** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Yes** and press **Enter** to restart `qp_procmgr`.



Figure 1: Restart `qp_procmgr`

Note: Following this procedure restarts `qp_procmgr`, which controls all Policy Management specific processes, and the entire application is restarted. It does not restart High Availability (HA) or database software, although the failure of the application on the active server will trigger an HA failover.

Configuring Firewall Settings

Note: During the editing of firewall configuration settings, if an attempt is made to leave the **Firewall Configuration Menu** with unsaved changes, you are presented with the options to save changes and exit, exit without saving changes, or to return to the **Firewall Configuration Menu** to continue.

Note: When all firewall configuration setting changes are completed, be sure to use **Save and Apply Configuration** from the **Firewall Configuration Menu** to commit the changes made to the firewall configuration files and restart the firewall.

Note: In the procedure, the term **All** indicates open access to any interface, for example: PMAC, REP, OAM, SIG-A, SIG-B, and SIG-C.

To configure firewall settings on the server to restrict access to non-standard ports:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Firewall** from the **Policy Configuration Menu**, and press **Enter**.
6. To enable the firewall, select **Enable/Disable Firewall** from the **Firewall Configuration Menu** and press **Enter**.
7. Select **Edit** from the **Firewall Status** screen and press **Enter**.
8. To define which IPv4 and IPv6 firewall to enable or disable, select from the list of interfaces on the **Enable/Disable Firewall Features Menu** and press **Enter**.
9. When prompted to continue, select **Yes** from the **Enable iptables?** or other appropriate dialog screen that appears and press **Enter**.
10. To open additional ports in the firewall, select **Enable Custom Rules** from the **Enable/Disable Firewall Features Menu**.
11. Select **Yes** from the **Enable custom rules?** screen to confirm that custom rules are to be enabled or select **No** to cancel.
12. To set custom rules to be used instead of default firewall rules, select **Enable custom prefer** from the **Enable/Disable Firewall Features Menu**.
If a custom rule conflicts with a default rule, the default rule is used, but the default rule can be overridden if the custom prefer option is enabled. Rules conflict if they have matching protocols (TCP, UDP) and ports (80, 443, etc.).
13. Select **Yes** from the **Enable custom prefer feature?** screen to confirm custom rules are to be preferred over default rules or select **No** to cancel.
14. To add, edit or delete custom firewall rules, select **Customize Firewall** from the **Firewall Configuration Menu** and press **Enter**.
15. Select **Edit** from the **Firewall Custom Rules** screen and press **Enter**.
16. To add a new rule or edit an existing rule, select **Add Rule** or **Edit Rule** from the **Connection Action Menu** and press **Enter**.
17. Enter information to customize the firewall rule, then select **OK** and press **Enter**.
Note: Use this screen to customize firewall when using a SIG-C interface in a Wireless mode MRA server with c-Class hardware.
18. Enter field values, select **OK** and press **Enter**.
Note: If configuring a CMP server with the optional Ethernet mezzanine card 2, an additional interface appears called **BKUP**. This interface is dedicated to perform remote archive activities for CMP backup operations. **BKUP** is included if **ALL** is selected for **Interface** on the **Customize Firewall** screen.

Note: The **REP** network selection will appear in the **Interface** screen only for c-Class MPE and MRA devices if a static IP is set in the topology for MPE and MRA devices. The **REP** selection will not appear for a CMP server or any other Policy Management server.

19. To delete an existing custom rule, select **Delete Rule** from the **Connection Action Menu** and press **Enter**.
20. Select the rule to be deleted from the **Select Rule Menu** and press **Enter**.
21. When all editing is complete, save and apply the changes to the system:
 - a) If not at the **Firewall Configuration Menu**, select **Exit** to return to the **Firewall Configuration Menu**.
 - b) Select **Save and Apply Configuration** from the **Firewall Configuration Menu** and press **Enter** to save all changes.
A dialog box will appear to confirm that the request to apply the changes is successful.

Note: During the editing of firewall configuration settings, if an attempt is made to leave the **Firewall Configuration Menu** with unsaved changes, you are presented with the options to save changes and exit, exit without saving changes, and to return to the **Firewall Configuration Menu** to continue.

Note: When all firewall configuration setting changes are completed, be sure to use menu item **Save and Apply Configuration** from the **Firewall Configuration Menu** to commit the changes made to the firewall configuration files and restart the firewall.

Note: In the preceding process, the term **All** indicates open access to any interface, for example: PMAC, REP, OAM, SIG-A, and SIG-B.

Displaying Firewall Settings

To display current firewall settings:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
 2. If at the **root** prompt, enter:
`su - platcfg`
 3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
- Note:** The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
 5. Select **Firewall** from the **Policy Configuration Menu** and press **Enter**.
 6. Select **Display Firewall** from the **Firewall Configuration Menu** and press **Enter**.
 7. Select the firewall settings to view from the **Display Firewall Menu** and press **Enter**.

The **Display Firewall Status** screen appears.

The **Display Factory Rules** screen appears.

The **Display Custom Rules** screen appears.

Managing DSCP Configurations

Use the options on the DSCP (Differentiated Services Code Point) Configuration menu to manage DSCP configurations. These configurations allow you to operate DSCP on network interfaces (SIG-A, SIG-B, and SIG-C) for MPE or MRA devices. The configurations are persistent during system power off, reboot, and upgrade. Configurations can also synchronize to other servers within a cluster.

Menu options include:

- [Adding a DSCP Configuration](#)
- [Viewing a DSCP Configuration](#)
- [Editing a DSCP Configuration](#)
- [Deleting a DSCP Configuration](#)
- [Syncing a DSCP Configuration](#)

Adding a DSCP Configuration

Use **Add New DSCP Configuration** to add a new DSCP configuration on the network interface and begin DSCP marking of specified packets.

Note: Each DSCP configuration is saved to the configuration file in the order in which it is added.

To add a new DSCP configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **DSCP Config** from the **Policy Configuration Menu** and press **Enter**.
5. Select **Add New DSCP Configuration** from the **DSCP Configuration Menu** and press **Enter**.
6. Select the desired interface for the new configuration from the **Select Interface** screen, select **OK** and press **Enter**.

Note: In the Policy Management architecture, network interfaces are segregated into SIG-A, SIG-B, SIG-C, and OAM. The interface SIG-A is used to connect to the customer signaling A network; SIG-B is used to connect to the customer signaling B network; SIG-C is used to connect to the customer signaling C network and is used to internally connect to either MRA or MPE devices when both SIG-A and SIG-B are used for SCTP multi-homing; and OAM is used to connect to the customer management network and for internal connection between the cluster and site. The Configuration includes interface SIG-A, SIG-B, and SIG-C but does not include OAM. Select either SIG-A or SIG-B for the current DSCP configuration.

Note: If more than one DSCP configuration is added on the same network interface (for example, SIG-A), the output packets sent from this interface are from the latest DSCP configuration added.

The new DSCP configuration (with the same or greater scope in output packets of this network interface) takes precedence over any previous DSCP configurations.

Note: If one interface has both VIP and IP and associates DSCP only with VIP, the packets sent from this interface may not be marked with DSCP as expected because the application may send packets from the server IP instead of the VIP.

7. Specify the **IP Protocol Version**, **Source IP Address**, and **Destination IP Address** to associate with the new configuration on the **Input Source IP and Destination IP** screen.

Note: If settings are not specified, default settings are used.

8. Select **OK** and press **Enter** to save setting selections.
The **Code Point selection** screen appears.
9. Select the **Code Point** to use with this configuration from the **Code Point selection** screen, select **OK** and press **Enter**.

Viewing a DSCP Configuration

To view a DSCP configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **DSCP Config** from the **Policy Configuration Menu** and press **Enter**.
5. Select **View DSCP Configuration** from the **DSCP Configuration Menu** and press **Enter**.

Editing a DSCP Configuration

To edit an existing DSCP configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **DSCP Config** from the **Policy Configuration Menu** and press **Enter**.
5. Select **Edit DSCP Configuration** from the **DSCP Configuration Menu** and press **Enter**.
6. Select the configuration to change from the **Edit DSCP Configuraton Menu** and press **Enter**.

7. Select the interface to use for the configuration from the **Select Interface** screen, select **OK** and press **Enter**.
8. Enter the **IP Protocol Version**, **Source IP Address**, and **Destination IP Address** on the **Input Source IP and Destination IP** screen, select **OK** and press **Enter**.
Note: If settings are not specified, the previous settings are used.
9. Select the **Code Point** to use with this configuration on the **Code Point selection** screen, select **OK** and press **Enter**.

Deleting a DSCP Configuration

To delete an existing DSCP configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **DSCP Config** from the **Policy Configuration Menu** and press **Enter**.
5. Select **Edit DSCP Configuration** from the **DSCP Configuration Menu** and press **Enter**.

All existing DSCP configurations are displayed.

6. Select the configuration you want to delete by pressing the space bar (more than one configuration can be deleted at a time), select **OK** and press **Enter**.
The selected configurations are deleted.

Note: When a configuration is deleted for a network interface that has more than one configuration defined, priority is given to the most current remaining DSCP configuration regarding output packet processing.

Syncing a DSCP Configuration

DSCP configurations on one server can be synced with other servers in the same cluster. It is recommended the sync be performed from the active server to all other servers (standby or standby and spare) in a one site or two site cluster.

To sync a DSCP configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Performing Initial Server Configuration

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **DSCP Config** from the **Policy Configuration Menu** and press **Enter**.
5. Select **Sync DSCP Configuration** from the **DSCP Configuration Menu** and press **Enter**.

All existing DSCP configurations are displayed.

Note: If the sync is performed from a server that is not the Active server, a warning message appears, giving you the option to abort the sync process.

6. Select **Yes** to continue the sync process.
Once the process is complete, a confirmation message screen appears.

The configurations are copied to the other servers and take effect. The sync status is displayed for each remote server.

Managing Certificates

Topics:

- *About Security Certificates.....35*
- *Managing SSL Security Certificates.....35*
- *Using a Local Certificate to Establish a Secure HTTPS Web-Browser Session.....39*
- *About Establishing a Secure Connection Between a CMP System and an MPE Device.....40*
- *About Creating a CA Third-party Signed Certificates.....44*

This chapter describes how to access the Platcfg utility to manage SSL security certificates, which allow two systems to interact with a high level of security.

About Security Certificates

There are two types of security certificates used in a system:

- Self-signed certificates are created locally on each server in `platcfg`, then synchronized throughout the system to allow encrypted communications between servers. Self-signed certificates are inherently less secure than third-party signed certificates, so they are not recommended for use in a production environment. Additionally, some external systems may not allow the use of self-signed certificates, which may necessitate the use of third-party certificates.
- A Certificate Signature Request (CSR) is created locally in the `platcfg` utility, then is sent to a third-party signing authority who generates a signed certificate based on your request. You then synchronize this certificate throughout the system.

The following terms are related to the management of certificates:

Certificate	Used by SSL to verify a trusted server, also known as a Key.
CN (Common Name)	CN is the primary ID inside of a certificate. The Keytool allows you to set this value. The Keytool refers to the CN as First and Last Name.
First and Last Name	First and Last Name is the primary ID inside of a certificate, also known as the CN. First and Last Name is the way the Keytool refers to this ID.
Key	Used by SSL to verify a trusted server, also known as a Certificate.

Managing SSL Security Certificates

This section describes how to create and verify self-signed certificates for secure communications between servers and systems.

Creating a Self-Signed Certificate

A Certificate, commonly known as a Key, is used by SSL to verify a trusted server. Certificate creation is performed on the active server in each MPE/MRA cluster in the topology. This local certificate acts as a Private key for the local server and enables encrypted information to be transferred through a secure connection.

Note: Common Name (CN) is the primary ID inside of a certificate. The Keytool allows you to set this; however, the Keytool refers to the CN as **First and Last Name**.

To create a self-signed key:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.

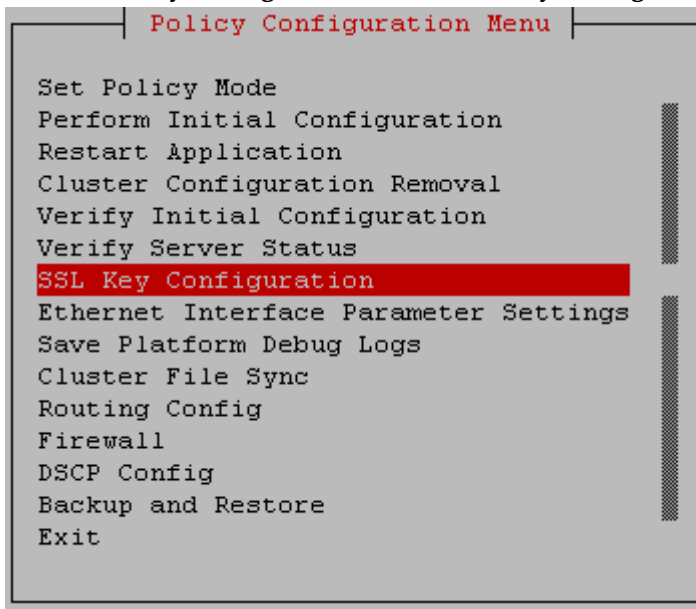


Figure 2: Policy Configuration Menu—SSL Key Configuration

6. Select **Configure keystore** from the **Configure SSL keys Menu** and press **Enter**.

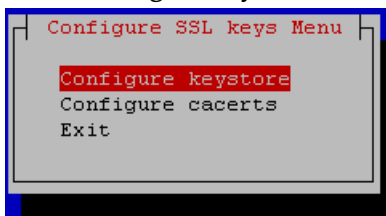


Figure 3: Configure SSL keys Menu—Configure keystore

7. Select **Create Self-Signed Key** from the **Operate keystore Menu** and press **Enter**.

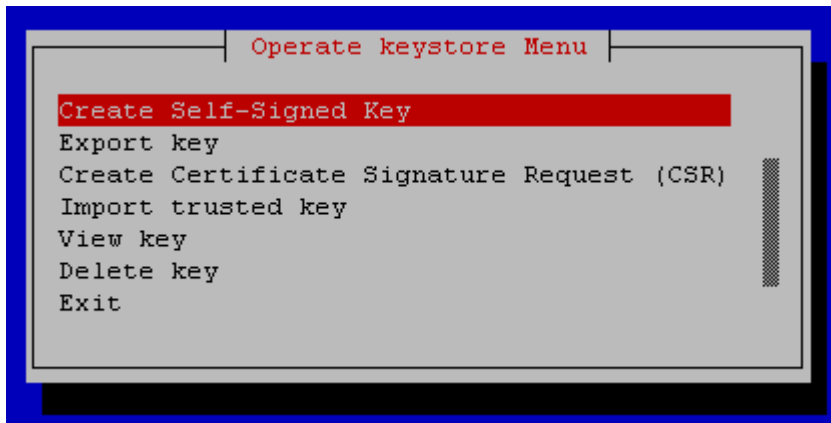


Figure 4: Operate keystore Menu

8. Enter information on the **Keystore Parameters** screen.

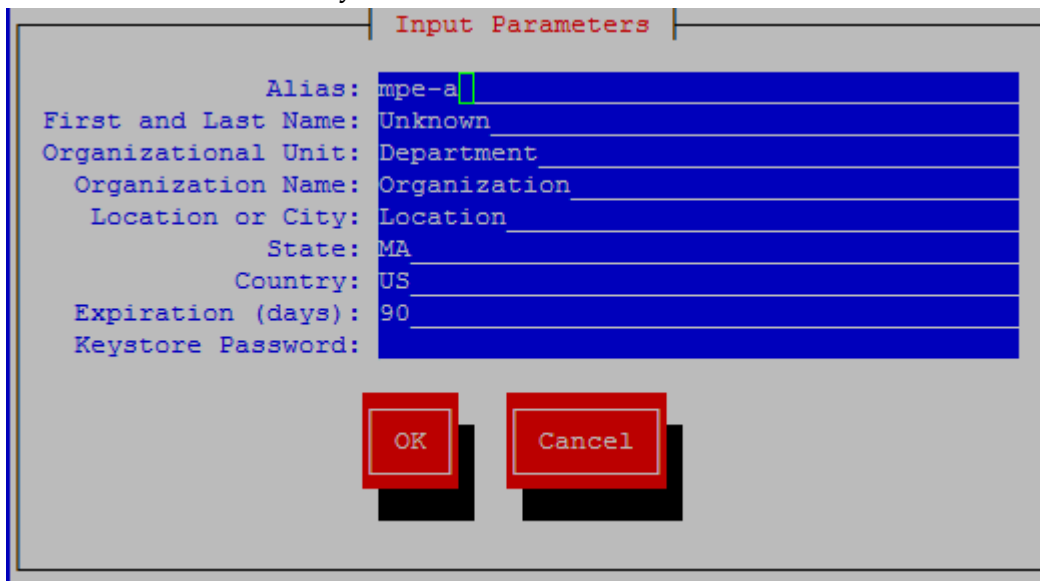


Figure 5: Input Parameters

Note: For the **Alias** field, create a unique name for each cluster.

Note: For the **First and Last Name** field (the CN value), create a unique cluster ID name.

Note: The **Keystore Password** is **changeit**

9. When finished entering values, select **OK** and press **Enter**.
10. If there is an existing SSL with the same **Alias** name, the following screen opens.



Figure 6: Delete existing certificate

Select **Yes** to remove the old SSL and replace it with a new one with the same name.

11. The following screen opens when the SSL creation is successful.

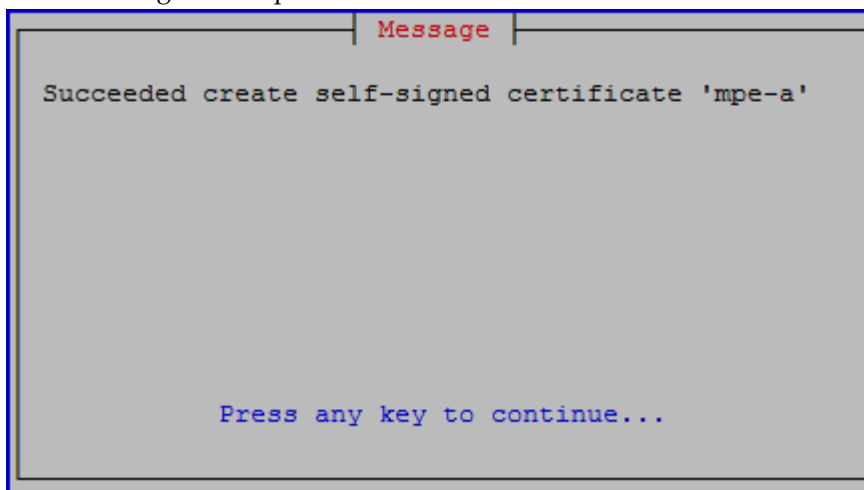


Figure 7: Message

Verifying a Self-Signed Certificate

Once an SSL certificate has been created, verify a certificate's attributes before attempting to import or export the certificate to create your secure connection. If the certificate on the host is not the same after it is imported into its peer, the secure connection will not be allowed.

To verify a self-signed certificate:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Configure keystore** from the **Configure SSL keys Menu** and press **Enter**.
7. Select **View key** and press **Enter**.
8. Enter the password, select **OK** and press **Enter**.
9. Select the certificate and press **Enter**.
The certificate appears.
10. Verify the certificate information in the **Verify Self-Signed Certificate** confirmation screen.

The key portions of the certificate are the **Alias name**, **Owner**, and **Issuer**. These attributes are exported and imported to the other server to establish the secure HTTP session.

11. Select **Exit** and press **Enter**.

Using a Local Certificate to Establish a Secure HTTPS Web-Browser Session

To ensure a safe and secure TCP connection between an end-user (web-browser) and the CMP system, an HTTPS session can be created between the two by passing a predefined certificate to the end-user. Once the end-user accepts the certificate, the HTTPS session is created.

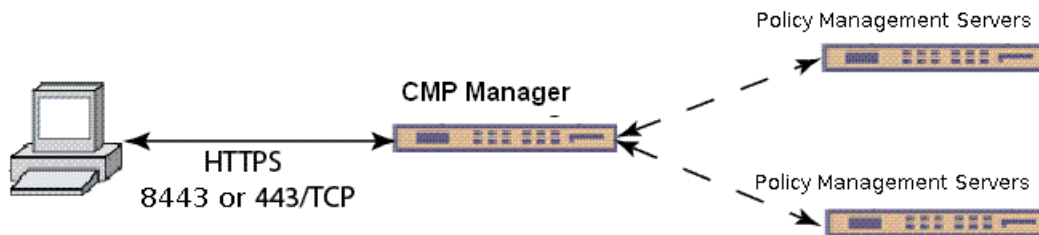


Figure 8: Establishing a Secure Session

Note: Web browsers function differently based on their configuration. Review your browser settings before using SSL certificates.

Note: For more information, refer to [Creating a Self-Signed Certificate](#) and [Configuring Firewall Settings](#).

To force end-users to establish an HTTPS session with the CMP system:

1. Exchange and import SSL keys between the CMP server and the workstation.
2. Enable the firewall on the CMP server.
3. Enable prefer custom.
4. Create two customized firewall rules (one for port 80 and one for port 8080) where the allowed host is 0.0.0.0/32.

Note: Because the ports 80 and 8080 conflict with the factory rule that allows anyone access to these ports, using the prefer custom option will discard this rule, and instead use the custom rule which will allow only 0.0.0.0 to connect via 80 or 8080, which locks down the unencrypted HTTP ports.

About Establishing a Secure Connection Between a CMP System and an MPE Device

To establish a secure connection between a CMP system and an MPE device, both the CMP system and the MPE device must exchange certificates.



Figure 9: Exchanging Certificates

The figure shows the SSL Certificate is shared within the cluster and the following certificate exchange is done:

1. The CMP system creates a local certificate and exports the certificate to the MPE device.
2. The MPE device imports the peer certificate (local certificate created by the CMP system) into its trust store.
3. The MPE device creates a local certificate and exports the certificate to the CMP system.
4. The CMP system imports the peer certificate (local certificate created by the MPE device) into its trust store.

Note: Procedures used in this chapter may require the rebooting of one or more servers. Subsequently, for HA to operate correctly in a clustered system, the active server of the cluster must not be rebooted unless the cluster is in the **online** state. Before rebooting any server, check cluster status using the CMP interface. If a cluster is labeled **Degraded**, but the server detail does not show any failed or disconnected equipment, the server is performing a database synchronization operation and until the synchronization process has completed, the standby server cannot perform as the active server.

When a new certificate is configured, the synchronization will cause HA on the standby server to restart.

SSL certificates are created on a per-cluster basis, and to ensure that the cluster has the same certificate installed, you should force a system synchronization.

Exporting a Certificate Signed Request to the Policy Management Servers

Ensure that the local certificate signed request has been created on each server or cluster, as described in [Creating a Self-Signed Certificate](#).

To export a certificate signed request, establish a secure connection between the CMP system and a Policy Management server:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:


```
su - platcfg
```

3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Configure Keystore** from the **Configure SSL keys Menu** and press **Enter**.
7. Select **Export key** from the **Operate keystore Menu** and press **Enter**.
8. Enter the **Keystore Password**, select **OK** and press **Enter**.
9. Press **Enter** to accept the alias `tomcat` or enter the alias previously created for the certificate.
10. Select a certificate type of **binary** or **ascii** from the **Export Certificate** screen, select **OK** and press **Enter**.

Importing a Peer Certificate

Note: This procedure is used to import a certificate to the peer machine. This includes certificates generated by other servers including certificates signed by a third party or similar.

Once you have exported the local certificate, import the peer certificate (this is the certificate that was exported from the other system):

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.

2. If at the **root** prompt, enter:

```
su - platcfg
```

3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Configure cacerts** from the **Configure SSL keys Menu** and press **Enter**.
7. Select **Import trusted key** from the **Operate keystore Menu** and press **Enter**.
8. Enter the **Keystore Password**, select **OK** and press **Enter**.
9. Enter the import location and **Alias** for the certificate, as set previously for the CN name, select **OK** and press **Enter**.

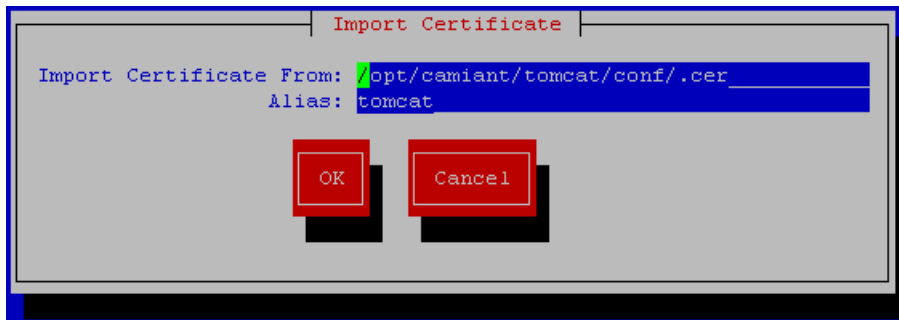


Figure 10: Import Certificate

You are then presented with the certificate data for verification. Ensure that the **CN** name, **Owner**, and **Issuer** names of the input file name match that of the previous export file.

10. If the certificate data is correct, select **OK** and press **Enter**.
11. Log in to the CMP server, select the Policy Management server, and select the **Secure Connections** check box, located on the **Policy Server** tab.

Refer to the *CMP User's Guide* that corresponds to the mode of the system for more information.

Changing an NTP Server on an MPE/MRA Device

To change an NTP server on an MPE/MRA device:

1. From the CMP server:
 - a) Set the MPE/MRA device to **forced standby**.
 - b) **SSH** to the **standby server**.
 - c) Become the **root** user by using **su** or **sudo**.
 - d) Enter `su - platcfg`.
2. In `platcfg`:
 - a) Select **policy configuration**.
 - b) Select **routing configuration**.
 - c) Select **display routes**.
 - d) Write down the routes.
3. In `platcfg`:
 - a) Select **policy configuration**.
 - b) Select **initial configuration**.
 - c) Modify the **NTP Server Value** to the correct **value**.
 - d) Click **OK**.
4. Click **Save**.
5. At the menu prompt:
 - a) Select **routing config**.
 - b) Select **display routes**.

Note: Make sure the route is the one you wrote down in *Substep d*. If it is not the same, you will need to use **Add Route** and **Delete Route** to make the route the same as the one you wrote down in *Substep d*.

6. To generate the NTP health report, use **Platcfg > Policy Configuration > Verify Initial Configuration**.
7. In the command line interface, use `# ntpq -pn` to ensure that the server is reaching the new NTP server.

For example:

```
[root@mpe230002~]# ntpq -pn
remote refid st t when poll reach delay offset jitter
=====
*144.2..102.525 .GPS 1u 145 1024 377 250.602 0.802 3.222
```

Where * indicates the connection to the NTP server is correct.

Note: If the offset is very large, you might have to execute the steps at the end of this doc to manually adjust it. If not, just continue to perform below steps.

8. Check that `>prod.state` is:

```
...prod.state (RUNID=00)...
...getting current state...
```

Where:

Current state: A product under `procmgr` in a **START** state. If the current state is not **Active**, stop executing this procedure and call Oracle Support.

9. In the current active server, enter `# netstat -nap | grep 3868 | wc` to obtain a count of diameter connections.
10. In the CMP server, select the cluster and use **switch force standby** to failover the MPE/MRA device.
11. In the new active MPE/MRA device:
 - a) Use `# netstat -nap | grep 3868 | wc` to determine if the diameter connections have been re-established.

Note: If not, use the CMP interface to **switch force standby** again and call Oracle Support.

 - b) If Diameter link has been re-established and the modified server with the new NTP is working properly, log into Linux as **root** on the current standby server.
 - c) Enter `su - platcfg`.
12. In `platcfg`, select **Policy Configuration**, then enter **initial configuration**:
 - a) Modify the NTP server value and click **OK**.
 - b) Click **Save**.

13. When the `platcfg` menu returns, select **routing config**.

14. Select **Display routes**.

Note: Make sure it is the same with the routes written down in step [Substep d](#). If it is not the same, you need to use **Add Route** and **Delete Route** to make it the same.

15. Exit `platcfg` and wait two minutes before proceeding to next step.
16. Use the command: `#ntpq -pn` to ensure that the server is reaching the new NTP server.

Note: If the offset is very large, you also need to execute extra steps. See [Process for Very Large NTP Offset](#) for more information.

17. Execute `prod.state` to ensure that the **Current state** is **Active**.

Note: If the current state is not **Active**, stop executing this procedure and call Oracle Support.

Note: If you cancel the forced standby for the server in CMP interface, there might be some alarms raised, but they should be automatically cleared.

About Creating a CA Third-party Signed Certificates

Note: This section assumes that no SSL certificates have previously been generated on or imported into the servers. If there are pre-existing certificates on the system (besides the default `tomcat` certificate), please contact [My Oracle Support \(MOS\)](#) to determine their purpose and importance. Read this method in its entirety before starting the operations.

To create CA third-party certificates:

1. [Deleting an SSL Certificate](#)
2. [Generating a Certificate Signature Request](#)
3. [Exporting the Certificate Signature Request from the System](#)
4. Provide the Certificate Signature Request to the third party who signs and returns the certificate request.
5. [Importing the Third-party Peer Certificates](#)
6. [Importing the Third-party Signed Certificates](#)
7. [Synchronize and Reboot the Cluster](#)

Deleting an SSL Certificate

Note: Also use these steps to delete an expired SSL certificate.

Before continuing with any of the other required certificate generation or import/export functions, delete any user created pre-existing certificates. On most Policy Management servers, there is a default certificate in the store that has the alias `tomcat`; the `tomcat` certificate should not be deleted.

To delete a SSL certificate:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Configure Keystore** from the **Configure SSL keys Menu** and press **Enter**.
7. Select **Delete key** from the **Operate keystore Menu** and press **Enter**.

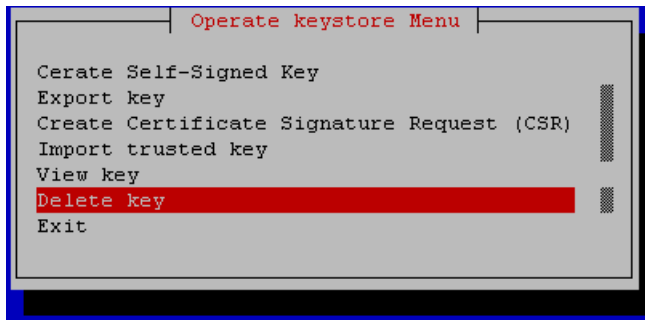


Figure 11: Operate keystore Menu

8. Enter the **Keystore Password**, select **OK**, and press **Enter**.
9. Select the certificate to be deleted (not **tomcat**) and press **Enter**.

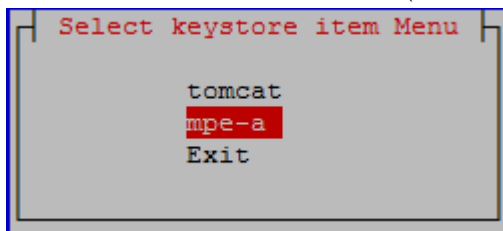


Figure 12: Select keystore item Menu

10. You are prompted to delete the selected certificate.

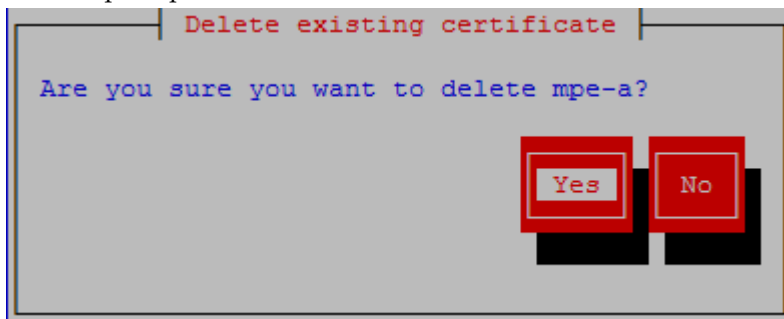


Figure 13: Delete existing certificate

Select **Yes** to delete the certificate or **No** to leave it as is, then press **Enter**.

You are now ready to generate the local certificate, export it for signing, and then re-import it.

About Generating a Certificate Signature Request

To generate the third-party signed local certificate:

1. [Generating a Certificate Signature Request](#)
2. [Exporting the Certificate Signature Request from the System](#)
3. Send the Certificate Signature Request to a third-party certifying authority for signing
4. Receive the signed Certificate Signature Request

5. [Importing the Third-party Signed Certificates](#)
6. [Verifying a Self-Signed Certificate](#)

Generating a Certificate Signature Request

To generate a certificate signature request:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Configure keystore** from the **Configure SSL keys Menu** and press **Enter**.
7. Select **Create Certificate Signature Request (CSR)** from the **Operate keystore Menu** and press **Enter**.
8. Enter the **Keystore Password**, select **OK** and press **Enter**.
9. Select the desired certificate (tomcat, in this example) from the **Create CSR** screen to export for signature and press **Enter**.

Note: The alias of the certificate is used later for re-importing the certificate after signing by a third party. Use an alias that allows the certificate to be identified with a specific system. Also of importance is the **Expiration** attribute, which should be set to a sufficiently large value so that the certificate does not expire before any peer certificates. A value preventing expiration before 2019 is recommended.

10. Select **OK** to accept the keystore destination, and press **Enter**.

Exporting the Certificate Signature Request from the System

To export a locally generated certificate signature request:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Configure keystore** from the **Configure SSL keys Menu** and press **Enter**.

7. From the **Policy Configuration Menu**, select **SSL Key Configuration** and press **Enter**.
8. Select **Export key** from the **Operate keystore Menu** and press **Enter**.
9. Enter the **Keystore Password**, select **OK** and press **Enter**.
10. Select the desired certificate (tomcat, in this example) to export for signature and press **Enter**.
11. Select to export a **binary** or **ascii** certificate.
12. Enter the export location for the certificate, select **OK** and press **Enter**.
The certificate is exported.

After the certificate file is exported, send it to the third party who signs and returns the certificate request.

Preparing to Import a Third-Party Certificate

After the certificate has been signed by the third party certifying authority, two certificate files are returned by them for importing into the Policy Management servers:

- a signed local client certificate
- a certificate authority (CA), peer certificate

Both certificates must be imported into the system for proper SSL communication.

Note: It may necessary to edit the returned files to remove extraneous debugging information in the certificate. You must use a Linux-based editor to preserve line termination style.

The only contents that should be in the files are the blocks of data headlined by:

```
-----BEGIN CERTIFICATE-----
```

and concluded by:

```
-----END CERTIFICATE-----
```

All other text above or below these blocks should be removed.

A further modification needs to be made to the signed local client certificate.

For the Policy Management servers to be able to import the local certificate successfully, the CA peer certificate must be merged into this file as well. To do this, copy the BEGIN/END certificate text block from the CA peer certificate and then paste the blocks into the local client certificate below the BEGIN/END certificate text block. The final result is the original local client certificate text block immediately followed by the certificate text block of the CA peer certificate that was provided by the third-party signer. An example of what this should look like is as follows:

```
-----BEGIN CERTIFICATE-----
MIIC7zCCAligAwIBAgIBBTANBgkqhkiG9w0BAQUFADCBjDELMAkGA1UEBhMVCVVMx
<text removed>
gJeTRnZwMJEXv71V85NGobVGqb1uR94kIQazFP5HC2b2C0Q=
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIDjTCCAvagAwIBAgIJAJCKgXrXbhQ/MA0GCSqGSIb3DQEBBQUAMIGMMQswCQYD
<text removed>
YVPOATiFnrt1B9Qb1P8kW81wPmG88Gg6nqtto1hAnIi/lWBcp+QzfJMxPBcMkH2k7A==
-----END CERTIFICATE-----
```

Either copy these certificate files to the Policy Management server in advance, or store them somewhere on the network accessible via SCP. They can be imported back into the system to secure the communication channel with the third-party system.

Importing the Third-party Signed Certificates

Before performing this procedure, you must prepare the certificate as described in [Preparing to Import a Third-Party Certificate](#).

To import the certificates:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Configure keystore** from the **Configure SSL keys Menu** and press **Enter**.
7. To import the local signed certificate, select **Import trusted key** from the **Operate keystore Menu** and press **Enter**
8. Enter the **Keystore Password**, select **OK** and press **Enter**.
 You are prompted for the location of the certificate to be imported.
9. Select or enter the location where the certificate is located and the certificate alias name, select **OK** and press **Enter**.

The certificate data displays for verification. To avoid confusion, though they may be different, ensure that the **Owner** and **Issuer** names used for the certificate match the host name of the server the certificate is being created on.

If all certificate information is correct, the next operation is to import the CA certificate as a peer certificate.

Note: The alias entered **MUST** match the alias originally used to create the certificate request.

10. To import the CA signed certificate, select **Import trusted key** from the **Operate cacerts Menu** and press **Enter**.
11. Enter the **Keystore Password** (`changeit`), select **OK** and press **Enter**.
 You are prompted for the location of the certificate to be imported.
12. Select or enter the location where the certificate is located and the certificate alias name, select **OK** and press **Enter**.

The certificate data displays for verification. To avoid confusion, though they may be different, ensure that the **Owner** and **Issuer** names used for the certificate match the host name of the server the certificate is being created on. If all certificate information is correct, the next operation is to import the CA certificate as a peer certificate.

Note: The alias entered **MUST** match the alias originally used to create the Certificate Request.

Proceed with [Importing the Third-party Peer Certificates](#).

Preparing to Import a Third-Party Peer Certificate

In addition to the certificates that were imported in section [Importing the Third-party Signed Certificates](#), you must also import a pair of peer certificates from the third party to connect to and communicate with their server (versus their client communicating with the Policy Management servers).

The third party will provide a set of new client and CA certificate files, both of which will be imported to the Policy Management servers as peer certificates.

Note: It may be necessary to edit the returned files to remove extraneous debugging-type information in the certificate. The only contents that should be in the files, are the blocks of data headlined by:

- -----BEGIN CERTIFICATE-----

and concluded by:

- -----END CERTIFICATE-----

All other text above or below these blocks should be removed.

To import the peer certificates, either copy these certificate files to the Policy Management servers in advance, or store them somewhere on the network accessible via SCP.

Importing the Third-party Peer Certificates

To import the peer certificate:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
su - platcfg
3. If at the **admusr** prompt, enter:
sudo su - platcfg

Note: The dash (-) is required in the su - platcfg or the sudo su - platcfg command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **SSL Key Configuration** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Configure keystore** from the **Configure SSL keys Menu** and press **Enter**.
7. Select **Import trusted key** from the **Operate keystore Menu** and press **Enter**.
8. Enter the **Keystore Password**, select **OK** and press **Enter**.
You are prompted for the location of the certificate to be imported.
9. Select or enter the location where the certificate is located and the certificate alias name, select **OK** and press **Enter**.

Note: The alias entered here **MUST** match the alias originally used to create the Certificate Request.

Synchronize and Reboot the Cluster

All cluster servers must be synchronized and rebooted for the certificates to take effect on the CMP system.

- To synchronize, refer to [Synchronizing Files](#) .

- To reboot, refer to the *CMP User's Guide* corresponding to the system mode.

Chapter 5

Synchronizing Files

Topics:

- *Managing Cluster Sync Configurations.....52*
- *Displaying a Sync Configuration.....53*
- *Displaying a Sync Destination.....54*
- *Displaying a Sync Status.....54*
- *Synchronizing Files55*

This chapter describes how and when to synchronize files in clusters.

Files should be synchronized after either of the following items are configured:

- Routes (Routing Config)
- Firewall (Firewall)

Managing Cluster Sync Configurations

Use the **Cluster Sync Config** menu to manage cluster sync configurations:

- [Reading Destination from COMCOL](#)
- [Adding a Sync File](#)
- [Deleting a Sync File](#)

Reading Destination from COMCOL

To read the cluster sync destination from COMCOL:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Cluster File Sync** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Cluster Sync Config** from the **Cluster Configuration Sync Menu** and press **Enter**.
7. Select **Read Destination from Comcol** from the **Config the Destination of Cluster Sync Menu** and press **Enter**.

Adding a Sync File

To add a new cluster sync configuration file:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Cluster File Sync** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Cluster Sync Config** from the **Cluster Configuration Sync Menu** and press **Enter**.
7. Select **Add Sync File** from the **Config the Destination of Cluster Sync Menu** and press **Enter**.
8. Enter data into the fields:

- **filename**—The name of the sync file.
 - **remote file**—The name of the sync file if different at the remote site.
 - **scope (cluster/site/clusterGroup)**—Lists where each file is to be synced:
 - **cluster**—Indicates access to all servers at all sites. Files that need to be in sync at all sites (such as certificates) should be listed as Cluster.
 - **site**—Indicates access to servers at the local site. IP-related files that may not be valid at other sites (such as firewall and static routes) should be listed as Site.
 - **clusterGroup**—Indicates access to all servers only in multiple CMP, MPE, or MRA clusters.
 - **post script**— Indicates a note or description of the scope (cluster/site/clusterGroup).
9. Select **OK** and press **Enter**.
The new cluster sync configuration is saved.

Deleting a Sync File

To delete an existing cluster sync configuration file:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Cluster File Sync** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Cluster Sync Config** from the **Cluster Configuration Sync Menu** and press **Enter**.
7. Select **Delete Sync File** from the **Config the Destination of Cluster Sync Menu** and press **Enter**.
8. Select the cluster sync configuration file to delete from the list, select **OK** and press **Enter**.

Displaying a Sync Configuration

Use this option to display the location of a sync configuration; this is useful when georedundancy is implemented. The Scope column lists where each file is being synced:

- **Site** indicates that the file is synced to servers at the local site
- **Cluster** indicates that the file is synced to all servers at all sites

Note: Files that must be in sync at all sites (like certificates) are listed as **Cluster**; IP-related files that are not valid at other sites (like firewall and static routes) are listed as **Site**.

To display a sync configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.

2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Cluster File Sync** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Show Sync Config** from the **Cluster Configuration Sync Menu** and press **Enter**.

Displaying a Sync Destination

To display a sync destination (for example, hostname, IP address, and location):

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Cluster File Sync** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Show Sync Destination** from the **Cluster Configuration Sync Menu** and press **Enter**.

Displaying a Sync Status

To display a cluster sync status:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Cluster File Sync** from the **Policy Configuration Menu** and press **Enter**.

6. Select **Show Sync Status** from the **Cluster Configuration Sync Menu** and press **Enter**.

Synchronizing Files

Note: File synchronization (or cluster sync) copies configuration files from the target server to the remaining servers in the cluster. Performing a cluster sync restarts `qp_procmgr` on the target servers, so this action should only be performed from the Active server, otherwise a failover will occur. A warning displays on the screen before continuing with the sync, to help prevent this issue from occurring.

To synchronize the cluster files:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Cluster File Sync** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Start Synchronizing** from the **Cluster Configuration Sync Menu** and press **Enter**.

Note: A warning message is displayed, indicating that a cluster sync restarts `qp_procmgr` on the target servers.



Warning: This action should only be performed from the Active server, otherwise a failover will occur.

7. Select **OK** and press **Enter**.
Configuration files are synced to the other servers in the cluster, and `qp_procmgr` is restarted on the target servers.

Chapter 6

Custom Ethtool Options

Topics:

- [About Settings Link Options.....57](#)
- [Editing Network Interface Ethernet Parameters \(Policy Configuration Method\).....57](#)
- [Editing Network Interface Ethernet Parameters \(TPD Method\).....58](#)

This chapter describes how to manually customize Ethtool options, including auto-negotiation, speed, and duplex transmission parameters, on the interface controller for a wireline network installation.

Configuration settings are persistent over system upgrades and reboots.

About Settings Link Options

Keep the following information in mind when configuring link options:

- The **Speed** is configurable only when the device supports **100baseT/Full**. HP ProLiant BL* (C-Class) eth01/eth02 does not support **100baseT/Full**, so the speed is not configurable for c-Class bond0.
- The physical device might support several **Speed** modes, but **100baseT/Full** is the only candidate in the Platcfg interface.
- If the interface is a bond device, then the **Speed** and duplex settings for the active secondary device is fetched from kernel and displayed on the Platcfg interface. If any secondary device of the bond interface is not linked, the bond interface is not configurable.
- If the interface is a bond device, then primary_reselect is configurable.
- If the two secondary devices in a bond device are running in different modes, a warning message is displayed before the window is updated.
- It is strongly recommended that the auto-negotiation option is set to **autoneg on** at both ends. If it is set to **autoneg off**, a warning message is displayed when **OK** is selected.
- The link behavior is undefined if one end has **autoneg on** while the other end has **autoneg off**.
- When **OK** is selected, the setting is applied to the interface immediately. For a bond device, the setting is applied to both of the secondary devices.
- If the applied mode is not compatible with the switch, it is possible that the link may go down. This utility does not try to detect or correct this situation.

Table 4: Ethtool speed compatibility matrix

Speed Setting: server/switch	Default (autoneg on)	100baseT/Full, Autoneg on	100baseT/Full, Autoneg off
Default (autoneg on)	OK (case 1)	OK (case 2)	Undefined
100baseT/Full, Autoneg on	OK (case 2)	OK (case 3)	Undefined
100baseT/Full, Autoneg off	Undefined	Undefined	OK (case 4)

Editing Network Interface Ethernet Parameters (Policy Configuration Method)

This section describes how to edit Network Interface Ethernet parameter settings using the Policy Configuration method. See [About Settings Link Options](#) for additional information.

To edit network interface ethernet parameter settings:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:

```
su - platcfg
```

3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Network Interfaces ETHTOOL_OPTS** from the **Policy Configuration Menu** and press **Enter**.
6. Select a network from the list on the **Network Interfaces List Menu** and press **Enter**.
 Each line in this display represents a physical interface (OAM, SIGA or SIGB) using logical names instead of physical names. If multiple logical interfaces share a physical interface, those interfaces are grouped on a single line.
7. Select **Set EthTool Options of <linkname>** from the **Interface <linkname> Menu** and press **Enter**.
8. Select from the options on the **Edit <linkname> Link Options** screen, select **OK** and press **Enter**. Selection changes are made on both devices of a bond interface at the same time.

Editing Network Interface Ethernet Parameters (TPD Method)

This section describes how to edit network interface ethernet parameter settings using the TPD platform method. If none of the options are specified, auto-negotiation is assumed.

To edit network interface ethernet parameter settings:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Network Configuration** from the **Main Menu - Network Configuration** and press **Enter**.
5. Select **Network Interfaces** from the **Network Configuration Menu** and press **Enter**.
6. Select **Edit an Interface** from the **Network Interfaces Menu** and press **Enter**.
7. Select a Network Interface name from the **Connection to edit Menu** choices.
8. To continue to the network **Interface Options** menu, select **Edit** from the **Options** menu on the screen. Otherwise, select **Exit** to return to the previous menu.
9. Select the required speed and duplex options from the **Interface Options** menu, select **OK** and press **Enter**.

Performing System and Server Backups and Restores

Topics:

- *Backing Up a Server.....60*
- *Backing Up the System60*
- *Displaying Backup Files.....61*
- *Configuring Local Archive Settings.....62*
- *Configuring Remote Archive Settings.....62*
- *Scheduling Backups.....64*
- *Performing a System Restore.....67*
- *Performing a Server Restore.....68*

This chapter describes how to perform system and server backups and restores.

Backing Up a Server

The server backup file contains OS-level information that is configured in the platcfg utility such as IP, NTP, and DNS addresses. This type of backup is unique to a server and should be created for every server within a cluster.

To back up a server:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select the **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
System Backup and **System Restore** actions are only allowed on a CMP server or MA Server, so these options do not appear on the menu for other types of servers.
6. Select **Server Backup** from the **Backup and Restore Menu** and press **Enter**.
7. Accept the default backup directory or enter the ISO path to save the backup file.

The file naming convention used for the backup file is:

`<hostname>-camiant-<release>-serverbackup-<datetime>.iso`

8. Select **OK** and press **Enter**.

Backing Up the System

The system backup file contains application-level information such as Topology, Network Element, and Policy Management configurations that are configured in the CMP system. This backup file saves the information for an entire deployment and should be created on the active server of the Primary CMP cluster.

When the backup file is created, the file contains a specific name and is located in a specific directory. Transfer this backup to the FTP server and the PMAC server.

To back up the system:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
6. Select **System Backup** from the **Backup and Restore Menu** and press **Enter**.
7. Enter the tar.gz path to save the backup file.
8. Accept the default backup directory or enter a desired directory.

The file naming convention used for the backup file is:

```
<hostname>-camiant-<release>-systembackup-<datetime>.tar.gz
```

9. When you are done, select **OK** and press **Enter**.

Displaying Backup Files

To display current local archive and remote archive backup files:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
 2. If at the **root** prompt, enter:

```
su - platcfg
```
 3. If at the **admusr** prompt, enter:

```
sudo su - platcfg
```
- Note:** The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select the **Policy Configuration** from the **Main Menu** and press **Enter**.
 5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
 6. Select **Display Backup Files** from the **Backup and Restore Menu** and press **Enter**.
 7. From the **Display Backup Files Menu**, select to display either the local archive or the remote archive:

- Select **Display Local Archive** and press **Enter**.
The **Local Archives** screen is displayed.
- Select **Display Remote Archive** and press **Enter**.
The **Remote Archives** screen is displayed.

Configuring Local Archive Settings

You can store up to three archives for both the server and system backup files. To configure local archive settings:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Local Archive Settings** from the **Backup and Restore Menu** and press **Enter**.
7. Specify the number of archives for the server and system backups.
8. When finished, select **OK** and press **Enter**.
 The archive settings are configured.

Configuring Remote Archive Settings

You can store system and server archives remotely. These archives have separate directories for each host. This section describes how to manage remotely stored systems and server archives.

Configuring a Remote Archive

To configure a remote archive:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Remote Archive Settings** from the **Backup and Restore Menu** and press **Enter**.

7. Select **Remote Archive for Server Backups** or **Remote Archive for System Backups** from the **Remote Archive Settings Menu** and press **Enter**.
Note: The server backups option only appears on a CMP system or MA Server.
8. Select **Add Remote Archive** or **Remote Archive Settings Menu** from the second **Remote Archive Settings Menu** and press **Enter**.
9. Enter the remote access information.
Settings include:
 - **user** and **password**—Valid SSH login credentials for the target server.
 - **host**—A reachable IP address or a resolvable hostname.
 - **folder**—A directory on the target server where the Policy Management server will attempt to copy backups. The directory must already exist; it will not be created on demand.
 - **comment**—The name of the remote archive when viewed in the platcfg utility.
10. When you are done, select **OK** and press **Enter**.
The remote archive is configured.

Editing a Remote Archive Configuration

To edit a remote archive configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select either **Remote Archive for Server Backups** or **Remote Archive for System Backups** from the **Remote Archive Settings Menu** and press **Enter**.
5. Select **Edit Remote Archive** from the **Remote Archive Settings Menu** and press **Enter**.
6. Select the remote archive to edit from the **Remote Archives Menu** and press **Enter**.
7. Enter all remote archive information, select **OK** and press **Enter**.

Deleting a Remote Archive Configuration

To delete a remote archive configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select either **Remote Archive for Server Backups** or **Remote Archive for System Backups** from the **Remote Archive Settings Menu** and press **Enter**.
5. Select **Delete Remote Archive** and press **Enter**.
6. Select the remote archive to delete from the **Remote Archives Menu** and press **Enter**.
7. Select **Yes** or **No** from the **Confirm deletion** dialog box and press **Enter**.

Displaying a Remote Archive Configuration

To display a remote archive configuration:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select either **Remote Archive for Server Backups** or **Remote Archive for System Backups** from the **Remote Archive Settings Menu** and press **Enter**.
5. Select **Display Remote Archive** from the second **Remote Archive Settings Menu** and press **Enter**.

Scheduling Backups

You can configure your system or server to conduct backups on a scheduled basis. This section describes how to manage backup schedules.

Scheduling a Backup

To schedule a backup:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select the **Policy Configuration** from the **Main Menu** and press **Enter**.

5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
 6. Select **Scheduled Backup Settings** from the **Backup and Restore Menu** and press **Enter**.
 7. Select either **Scheduled Backup for Server Backups** or **Scheduled Backup for System Backups** from the **Scheduled Backup Settings Menu** and press **Enter**.
 8. Select **Add Schedule** from the **Scheduled Backup for server backups Menu** and press **Enter**.
 9. Enter the following information:
 - **Name**—A unique name identifying the scheduled backup.
 - **Min**—Minute to perform backup. Valid values are 0 to 59, with a default of 0.
 - **Hour**—Hour to perform backup. Valid values are 0 to 23, with a default of 0.
 - **Weekly**—Select to have the backup performed weekly. When **Weekly** is selected, the **Days of the Month** value is ignored. The default backup is performed weekly.
 - **Days of Week**—Specifies that the backup is performed on specific days. Valid values are sun, mon, tue, wed, thu, fri, and sat.
 - **Monthly**—Select to have the backup performed monthly. When **Monthly** is selected, the **Days of the Week** value is ignored.
 - **Days of the Month**—Day to perform backup. Valid values include 1 and 15.
- Note:** When **Weekly** is selected, the **Days of the Month** field is ignored, and when **Monthly** is selected, the **Days of the Week** field is ignored.
10. When you have finished, select **OK** and press **Enter**.
The backup is scheduled.

Editing a Backup Schedule

To edit a backup schedule:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
 2. If at the **root** prompt, enter:
`su - platcfg`
 3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
- Note:** The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select the **Policy Configuration** from the **Main Menu** and press **Enter**.
 5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
 6. Select **Scheduled Backup Settings** from the **Backup and Restore Menu** and press **Enter**.
 7. Select either **Scheduled Backup for Server Backups** or **Scheduled Backup for System Backups** from the **Scheduled Backup Settings Menu** and press **Enter**.
 8. Select **Edit Schedule** from the **Scheduled Backup for server backups Menu** or from the **Scheduled Backup for system backups Menu** and press **Enter**.
 9. Edit the following Information:
 - **Name**—A unique name identifying the scheduled backup.
 - **Min**—Minute to perform backup. Valid values are 0 to 59, with a default of 0.

- **Hour**—Hour to perform backup. Valid values are 0 to 23, with a default of 0.
- **Weekly**—Select to have the backup performed weekly. When **Weekly** is selected, the **Days of the Month** value is ignored. The default backup is performed weekly.
- **Days of Week**—Specifies that the backup is performed on specific days. Valid values are sun, mon, tue, wed, thu, fri, and sat.
- **Monthly**—Select to have the backup performed monthly. When **Monthly** is selected, the **Days of the Week** value is ignored.
- **Days of the Month**—Day to perform backup. Valid values include 1 and 15.

Note: When **Weekly** is selected, the **Days of the Month** field is ignored, and when **Monthly** is selected, the **Days of the Week** field is ignored.

10. When you have finished, select **OK** and press **Enter**.

Deleting a Backup Schedule

To delete a backup schedule:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select the **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
7. Select **Scheduled Backup Settings** from the **Backup and Restore Menu** and press **Enter**.
8. Select either **Scheduled Backup for Server Backups** or **Scheduled Backup for System Backups** from the **Scheduled Backup Settings Menu** and press **Enter**.
9. Select **Delete Schedule** from the **Scheduled Backup for server backups Menu** or from the **Scheduled Backup for system backups Menu** and press **Enter**.
10. When you have finished, select **OK** and press **Enter**.
The schedule is deleted.

Displaying a Backup Schedule

To a display a backup schedule:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select the **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
7. Select **Scheduled Backup Settings** from the **Backup and Restore Menu** and press **Enter**.
8. Select **Display Scheduled Backups** from the **Scheduled Backup Settings Menu** and press **Enter**.

Performing a System Restore

The system restore option restores the Policy Management information that is unique to this system, including topology, policies, and feature configuration.

To perform a system restore:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`

Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.

4. Select the **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
6. Select **System Restore** from the **Backup and Restore Menu** and press **Enter**.
7. Select the file or to manually input the path that contains the backup file and select either **Application** or **Full** for the type of restore.
8. When you are finished, select **OK** and press **Enter**.

The system restores to the backup version specified.

Note: If a failover occurs during a system restore on the active server, the restored data will be replaced by replication. To avoid this unintended overwriting, before conducting the restore on the active server, stop QP and COMCOL on the standby server using the CMP interface, then perform the system restore using the Platcfg Utility, and finally, restart QP and COMCOL on the standby server using the CMP interface. The following commands from the CMP interface stop QP and COMCOL on the standby server:

Note: The following commands from the CMP interface stop QP and COMCOL on the standby server:

```
service qp_procmgr stop
service comcol stop
```

Note: The following commands from the CMP interface start COMCOL and QP on the standby server:

```
service comcol start
service qp_procmgr start
```

Note: For more information about how to use the CMP interface, refer to the *CMP User's Guide* that corresponds to the mode of the system.

Performing a Server Restore

The server restore restores the OS information unique to the server. This operation applies the data from a previously saved server configuration backup file.

To perform a server restore:

1. Log in to your system as **root** if logging in from the system console. Otherwise, use SSH to access your system remotely as **admusr**.
2. If at the **root** prompt, enter:
`su - platcfg`
3. If at the **admusr** prompt, enter:
`sudo su - platcfg`
Note: The dash (-) is required in the `su - platcfg` or the `sudo su - platcfg` command to ensure proper permissions.
4. Select the **Policy Configuration** from the **Main Menu** and press **Enter**.
5. Select **Backup and Restore** from the **Policy Configuration Menu** and press **Enter**.
6. Select **Server Restore** from the **Backup and Restore Menu** and press **Enter**.
7. Enter the path to the backup file, select **OK**, and press **Enter**.

B

BoD	<p>Bandwidth on Demand</p> <p>An application that provides dynamic allocation of bandwidth; for example, a broadband speed promotion.</p>
-----	---

C

CA	<p>Certificate Authority: An entity that issues digital certificates</p>
CMP	<p>Configuration Management Platform</p> <p>A centralized management interface to create policies, maintain policy libraries, configure, provision, and manage multiple distributed MPE policy server devices, and deploy policy rules to MPE devices. The CMP has a web-based interface.</p>

D

DNS	<p>Domain Name System</p> <p>A system for converting Internet host and domain names into IP addresses.</p>
DSCP	<p>Differentiated Services Code Point</p> <p>Provides a framework and building blocks to enable deployment of scalable service discrimination in the internet. The differentiated services are realized by mapping the code point contained in a field in the IP packet header to a</p>

D

particular forwarding treatment or per-hop behavior (PHB).
Differentiated services or DiffServ is a computer networking architecture that specifies a simple, scalable and coarse-grained mechanism for classifying and managing network traffic and providing quality of service (QoS) on modern IP networks.

H

HA

High Availability
High Availability refers to a system or component that operates on a continuous basis by utilizing redundant connectivity, thereby circumventing unplanned outages.

HTTP

Hypertext Transfer Protocol

I

IP

Intelligent Peripheral
Internet Protocol - IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.

ISO

International Standards Organization

M

MA

Management Agent

M

MDF Message Distribution Function. A standalone hardware system, situated between a Mediation Gateway and an Oracle Communications subscriber profile repository (SPR), that exchanges messages between a Mediation Gateway and SPR systems

MPE Multimedia Policy Engine

A high-performance, high-availability platform for operators to deliver and manage differentiated services over high-speed data networks. The MPE includes a protocol-independent policy rules engine that provides authorization for services based on policy conditions such as subscriber information, application information, time of day, and edge resource utilization.

MRA Multi-Protocol Routing Agent - Scales the Policy Management infrastructure by distributing the PCRF load across multiple Policy Server devices.

N

NTP Network Time Protocol

O

OAM Operations, Administration, and Maintenance. These functions are generally managed by individual applications and not managed by a platform management application, such as PM&C.

Operations – Monitoring the environment, detecting and

O

determining faults, and alerting administrators.

Administration – Typically involves collecting performance statistics, accounting data for the purpose of billing, capacity planning, using usage data, and maintaining system reliability.

Maintenance – Provides such functions as upgrades, fixes, new feature enablement, backup and restore tasks, and monitoring media health (for example, diagnostics).

P

PMAC

Platform Management & Configuration (also referred to as PM&C)

Provides hardware and platform management capabilities at the site level for the Tekelec Platform. The PMAC application manages and monitors the platform and installs the TPD operating system from a single interface.

T

TCP

Transfer-Cluster-Prohibited
Transfer Control Protocol

Transmission Control Protocol

A connection-oriented protocol used by applications on networked hosts to connect to one another and to exchange streams of data in a reliable and in-order manner.

V

VIP

Virtual IP Address

Virtual IP is a layer-3 concept employed to provide HA at a host

V

level. A VIP enables two or more IP hosts to operate in an active/standby HA manner. From the perspective of the IP network, these IP hosts appear as a single host.

VLAN

Virtual Local Area Network

A logically independent network. A VLAN consists of a network of computers that function as though they were connected to the same wire when in fact they may be physically connected to different segments of a LAN. VLANs are configured through software rather than hardware. Several VLANs can co-exist on a single physical switch.