

Oracle® Communications

Policy Management

Configuring Lawful Intercept Application Note

Release 12.6

F47286-01

September 2021

Copyright © 2013, 2021, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

This documentation is in preproduction status and is intended for demonstration and preliminary use only. It may not be specific to the hardware on which you are using the software. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to this documentation and will not be responsible for any loss, costs, or damages incurred due to the use of this documentation.

The information contained in this document is for informational sharing purposes only and should be considered in your capacity as a customer advisory board member or pursuant to your beta trial agreement only. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described in this document remains at the sole discretion of Oracle.

This document in any form, software or printed matter, contains proprietary information that is the exclusive property of Oracle. Your access to and use of this confidential material is subject to the terms and conditions of your Oracle Master Agreement, Oracle License and Services Agreement, Oracle PartnerNetwork Agreement, Oracle distribution agreement, or other license agreement which has been executed by you and Oracle and with which you agree to comply. This document and information contained herein may not be disclosed, copied, reproduced, or distributed to anyone outside Oracle without prior written consent of Oracle. This document is not part of your license agreement nor can it be incorporated into any contractual agreement with Oracle or its subsidiaries or affiliates.

Contents

About This User's Guide.....	v
Introduction	v
How This Application Note Is Organized	v
Scope and Audience	v
Documentation Admonishments	v
Related Publications	vi
Locate Product Documentation on the Oracle Help Center Site	vi
Customer Training	vii
My Oracle Support	vii
Emergency Response.....	vii
 1 Setting Up Lawful Intercept	
Overview	1-1
Enabling Lawful Intercept	1-3
Configuring Lawful Intercept	1-5
Configuring LI on an MPE Device	1-8
Configuring a Static IP Address on an MPE Device.....	1-9

About This User's Guide

This chapter describes the content and structure of the user's guide, indicates how to obtain help, details where to find related documentation, and provides other general information.

Introduction

This application note describes how to set up Oracle Communication Policy Management Lawful Intercept (LI) in the Oracle Communications Policy Management Configuration Management Platform (CMP) product.

Conventions

The following conventions are used throughout this application note:

- **Bold text** in procedures indicates icons, buttons, links, or menu items that you click on.
- *Italic text* indicates variables.
- `Monospace text` indicates text displayed on screen.
- **Monospace bold text** indicates text that you enter exactly as shown.

How This Application Note Is Organized

The information in this application note to set up LI is presented in one chapter, [Setting Up Lawful Intercept](#).





Scope and Audience

This guide is intended for trained and qualified system administrators who are responsible for performing LI in a Policy Management network.

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> .)
 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 Publications

For information about additional publications 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

My Oracle Support is your initial point of contact for all product support and training needs. A representative at Customer Care Center can assist you with My Oracle Support registration.

Call the My Oracle Support 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 are connected to a live agent who can assist you with My Oracle Support registration and opening a support ticket.

My Oracle Support 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 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.

List of Figures

1-1	Lawful Intercept Architecture.....	1-2
1-2	Mode Settings screen.....	1-4
1-3	Policy Management main screen.....	1-5
1-4	LI-Mediation Function Administration screen.....	1-6
1-5	New LI-Mediation Function Administration Configuration screen.....	1-7
1-6	Policy Server Administration screen.....	1-8
1-7	Secondary Site Settings screen.....	1-10
1-8	New Path window.....	1-10

List of Tables

1	Admonishments.....	vi
---	--------------------	----

Setting Up Lawful Intercept

This application note provides an overview of Oracle Communications Policy Management Lawful Intercept (LI) and also describes how to set up LI by enabling the LI software and configuring the LI devices and connections.

Overview

The Communications Assistance for Law Enforcement Act (CALEA) enhances the ability of law enforcement and intelligence agencies to conduct electronic surveillance of telecom equipment and carriers through the use of LI.

This application note describes the configuration of Oracle Communications LI. Specifically, this document describes the internal network interface towards intercept access points in an IP multimedia subsystem packet data network. It specifies information relating to the provisioning of LI in an Intercept Access Point, the reporting of intercept identifying information by an intercept access point to the mediation function (MF), and describes other data necessary to satisfy LI requirements for IP multimedia subsystem packet data applications.

The LI 3GPP interface includes the following:

LI:

Lawful intercept. A mechanism that passes information between a network operator, access provider, or service provider and a handover interface; also, information passed between the handover interface and an internal network.

MF:

Mediation function. The LI handover interface device.

Handover Interface:

A physical and logical interface across which interception measures are requested from a network operator, access provider, or service provider. The results of interception are delivered to a law enforcement monitoring facility.

X1:

The X1 interface manages the provisioning, re-provisioning, de-provisioning, and querying of LI targets and modifies how and when the target activities on the network are monitored. You can determine which targets are to be provisioned or re-provisioned at a given time or have existing targets queried or de-provisioned.

X2:

The X2 interface receives the notification when the target's state changes.

X3:

The X3 interface delivers bulk content to the MF.

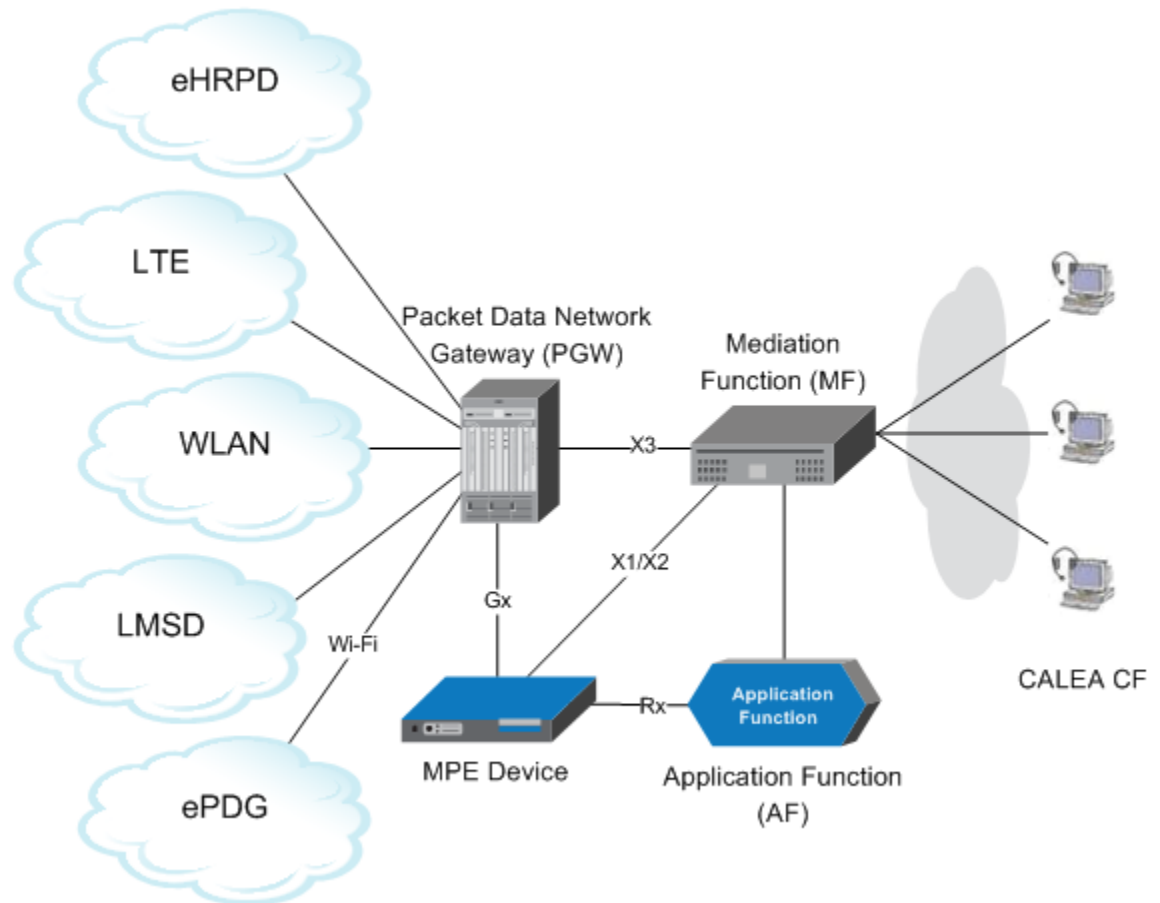
[Figure 1-1](#) shows the architecture for LI within the IMS packet data network.

All of the Multimedia Policy Engine (MPE) devices making up a cluster must use the primary site virtual IP (VIP) address for generating the correlation ID, which is based on the policy server ID. The single MPE server in the secondary site must be configured with a static IPv4 or IPv6 address, as described in [Configuring a Static IP Address on an MPE Device](#). This IP address must be used for generating the correlation ID if the MPE device in the secondary site becomes active. Because the MPE device is a client to the X2 interface, only the active server initiates the X2 connections to the MF. If the server is reduced from active status, it disconnects from the MF.

You must synchronize the SSL certificates between the primary and secondary sites.

If georedundancy with state replication is enabled, the IPv4 or IPv6 address must also be configured on the X1 interfaces on the MF devices to allow them to connect to the MPE device in the secondary site through the X1 interface. When the MPE device in the secondary site is inactive, it uses its static IP address to indicate to the MF via X1 that it is not active and not servicing requests. Georedundancy and state replication are described in *CMP Wireless User's Guide*.

Figure 1-1 Lawful Intercept Architecture



To provide LI, the following occurs:

1. The MPE device receives information about an LI target that is to be provisioned on the network. The MPE device can process information sent from either of two sources:
 - an X1 message sent from an MF using HTTP 1.1

- an Rx message sent from an application function (AF) containing an encrypted LI-indicator attribute-value pair (AVP)
2. The MPE device forwards the information about the target from either source to the policy and charging enforcement point (PCEF), in this example a packet data network gateway (PGW), using Diameter Gx, which provisions the target on the network and responds back to the MPE device with a Diameter Gx message.
 3. The MPE device stores all the information about the provisioned target and sends an X2 message to the MF with the provisioned target information and status (active/inactive).

Note: Intercept target messages sent over X2 only pertain to targets provisioned over X1. It does not apply to targets identified for intercept over Rx.

4. After the target is de-provisioned, the MPE device removes all the information about the target.

After an LI target is provisioned into the MPE device, and the intercepted subscriber establishes a data session, the MPE device provisions the PGW during real-time signaling interaction that occurs between these two nodes. Within this architecture, the MPE device is responsible for intercepting the packet data event (data session connected or disconnected, for example) and informing the MF.

The MPE device serves as the internet access point for the packet data event, but it is not received from the MF. It is received from the PGW and is triggered by the subscriber action (for example, call setup or termination). Information received from an AF is decrypted, translated into Gx protocol, reencrypted, and passed on to the PGW. The underlying PGW serves as the internet access point for data content. The MF directs, and interacts with, these network elements to obtain the necessary surveillance information and deliver the information to law enforcement CALEA collection functions (CF). All data-related information is delivered over a data channel, and data content is delivered over a data-content channel.

To obscure when a subscriber is being targeted, when the LI functionality is configured the MPE device randomly sends LI-indicator-Gx AVPs with phantom data on the Gx interface.

Note: If the Policy Management software is rolled back to an earlier version while an LI target is being actively monitored, target data is not preserved. A subsequent audit can identify and correct any inconsistencies between the MF and the MPE device. Performing the audit is outside the scope of this document.

Enabling Lawful Intercept

Note: The procedures that follow assume that the CMP product and the LI software have been installed and are fully operational and that no one has yet logged on to the CMP system.

LI is enabled and configured using a dedicated administrative account, LIadmin. LI is only visible to, and can only be configured or modified by, the LIadmin user. LI user access cannot be added to another account.

To enable LI:

1. Open a web browser and enter the IP address or name assigned to the CMP system that contains the LI software.
2. Go to the Mode Settings page.

Figure 1-2 Mode Settings screen

Mode Settings

Important: Options marked as **Restricted** are for use within specific environments and should not be enabled without authorization.

Mode

Cable	
PCMM	<input type="checkbox"/>
DQOS (Restricted)	<input type="checkbox"/>
Diameter AF	<input type="checkbox"/>
Wireless	
Diameter 3GPP	<input checked="" type="checkbox"/>
Diameter 3GPP2 (Restricted)	<input type="checkbox"/>
PCC Extensions (Restricted)	<input type="checkbox"/>
Quotas Gx	<input checked="" type="checkbox"/>
Quotas Gy (Restricted)	<input checked="" type="checkbox"/>
LI (Restricted)	<input type="checkbox"/>
SCE-Gx (Restricted)	<input type="checkbox"/>
Gx-Lite (Restricted)	<input checked="" type="checkbox"/>
Cisco Gx (Restricted)	<input type="checkbox"/>
DSR (Restricted)	<input type="checkbox"/>
Wireless-C (Restricted)	<input type="checkbox"/>
SMS	
SMPP	<input checked="" type="checkbox"/>
CMPP (Restricted)	<input type="checkbox"/>
XML (Restricted)	<input type="checkbox"/>
SPR	
Subscriber Profiles (Restricted)	<input type="checkbox"/>
Quota (Restricted)	<input type="checkbox"/>
Wireline (Restricted)	<input type="checkbox"/>
SPC (Restricted)	<input type="checkbox"/>
RADIUS (Restricted)	<input checked="" type="checkbox"/>
BoD	
PCMM	<input type="checkbox"/>
Diameter (Restricted)	<input type="checkbox"/>
RDR (Restricted)	<input type="checkbox"/>
Manage Policy Servers	<input checked="" type="checkbox"/>
Manage MA Servers	<input type="checkbox"/>
Manage Policies	<input checked="" type="checkbox"/>
Manage MRAs	<input checked="" type="checkbox"/>
Manage BoDs	<input type="checkbox"/>
Manage Mediation Servers	<input type="checkbox"/>
Manage SPR Subscriber Data	<input checked="" type="checkbox"/>
Manage Geo-Redundant MPE/MRA/BoD/MDF	<input type="checkbox"/>
Manager is HA (clustered)	<input checked="" type="checkbox"/>
Manage Analytic Data	<input checked="" type="checkbox"/>
Manage Direct Link	<input type="checkbox"/>
Manager is NW-CMP (Restricted)	<input type="checkbox"/>
Manage Segment Management Servers (Restricted)	<input type="checkbox"/>

OK

3. Under **Wireless**, select **LI** and **Diameter 3GPP** and click **OK**.

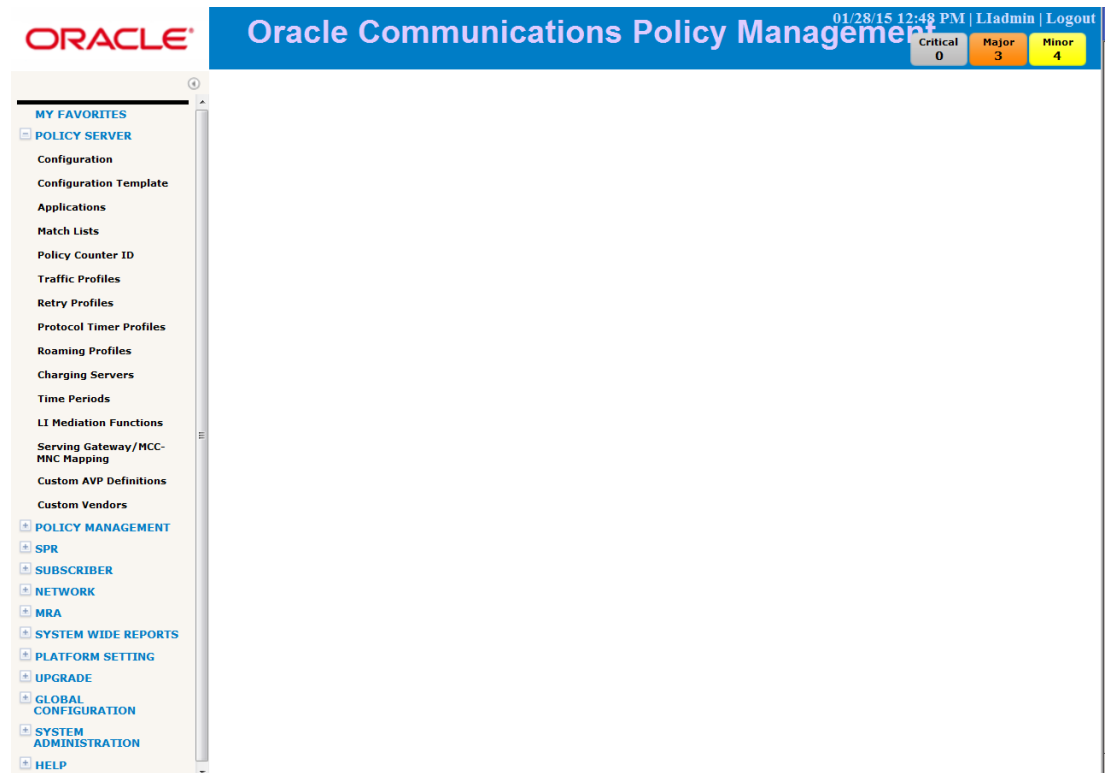
You are logged out, and the login screen is displayed.

4. Enter **LIadmin** for the user name, **policies** for the password, and click **Login**.

You are prompted to change the password.

5. Change the default password, confirm the password, and click **Change Password**.

The **Policy Management** main page opens.

Figure 1-3 Policy Management main screen

Configuring Lawful Intercept

Note: Configuring LI is possible in the CMP or Network Configuration Management Platform (NW-CMP) and is not enabled in the System Configuration Management Platform (S-CMP). The **Create LI-Mediation Function** option does not appear in the S-CMP, although LI that has been configured can be viewed in the S-CMP.

To configure LI:

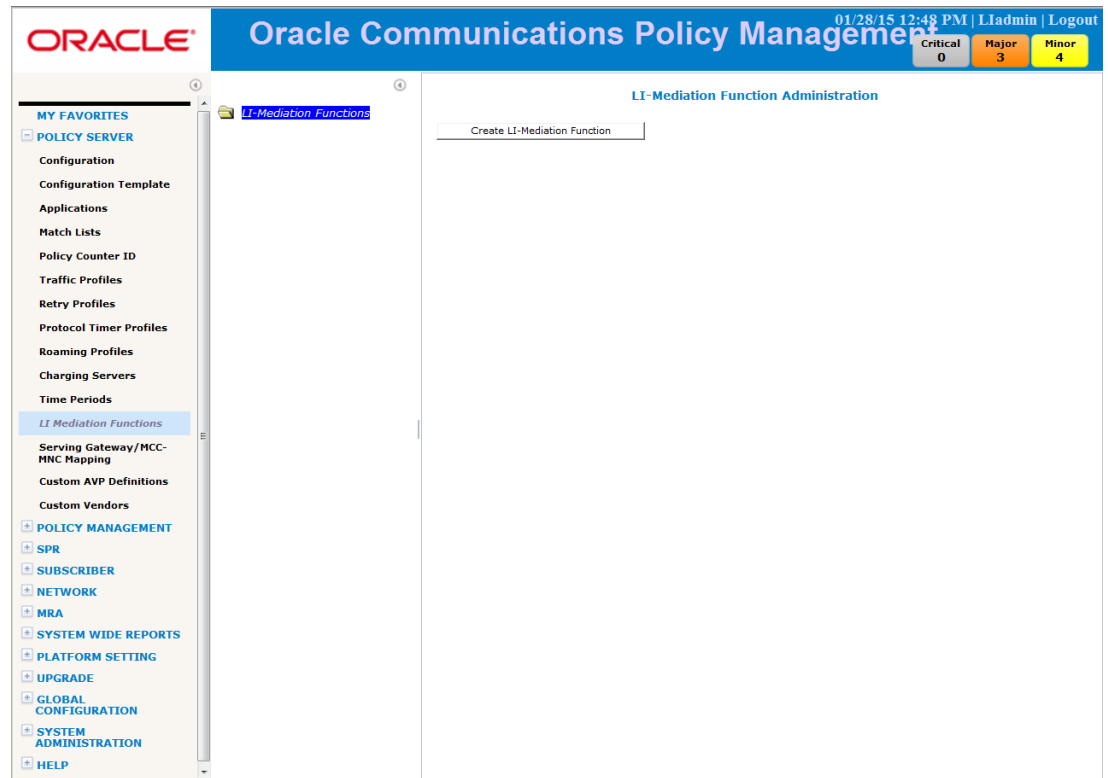
1. From the **Policy Server** section of the navigation pane, select **LI-Mediation Functions**.

The content tree displays the **LI-Mediation Functions** group.

2. From the content tree, select the **LI-Mediation Functions** group.

The LI-Mediation Function Administration screen opens in the work area:

Figure 1-4 LI-Mediation Function Administration screen



3. In the work area, click **Create LI-Mediation Function**.

The New LI-Mediation Function Administration Configuration screen opens:

Figure 1-5 New LI-Mediation Function Administration Configuration screen

The screenshot shows the Oracle Communications Policy Management web interface. The top header includes the Oracle logo, the product name 'Oracle Communications Policy Management', the date and time '01/28/15 12:48 PM', the user name 'LIadmin', and a 'Logout' link. A status bar on the right shows 'Critical 0', 'Major 3', and 'Minor 4'. The left-hand navigation menu is expanded, showing 'LI-Mediation Functions' under the 'POLICY SERVER' category. The main content area is titled 'LI-Mediation Function Administration' and contains a 'New LI-Mediation Function' section. This section has a 'Configuration' tab with the following fields: 'Name', 'Description / Location', 'X2 Address', 'X1 Address', and 'URL Absolute Path'. There are 'Save' and 'Cancel' buttons at the bottom of the configuration section.

Note: Either IPv4 or IPv6 addresses can be used to configure the X2 interface of each MF on the LI-Mediation Function Administration screen.

Note: The MPE device can support more than one MF.

4. Configure the following fields:

- a. **Name**—Name of the MF.
- b. **Description / Location** (optional)—Provides a description of the MF.
- c. **X2 Address**—IP address or FQDN of the MF that receives messages over X2 interfaces about changes in the states of provisioned targets.
- d. **X1 Address**—IP address or FQDN of the MF that sends requests over X1 interface for managing the life cycles of targets of lawful intercept.
- e. **URL Absolute Path** (optional)—Absolute URL for the MF X2 interface. This field is only required if the MF requires a specific URL path for processing X2 messages. For example, if the MF IP address is 11.xx.xx.xx, and the URL for processing X2 messages is https://11.xx.xx.xx/X2, the URL absolute path should be /X2.

5. When you finish, click **Save**.

The MF definition is added to the CMP database.

You are now ready to associate the MF with an MPE device.

Configuring LI on an MPE Device

You must configure MPE devices before you can associate MF devices with them. For information, see *CMP Wireless User's Guide*.

To configure LI on an MPE device:

1. From the **Policy Server** section of the navigation pane, click **Configuration**.

The content tree displays a list of policy server groups; the initial group is **All**.

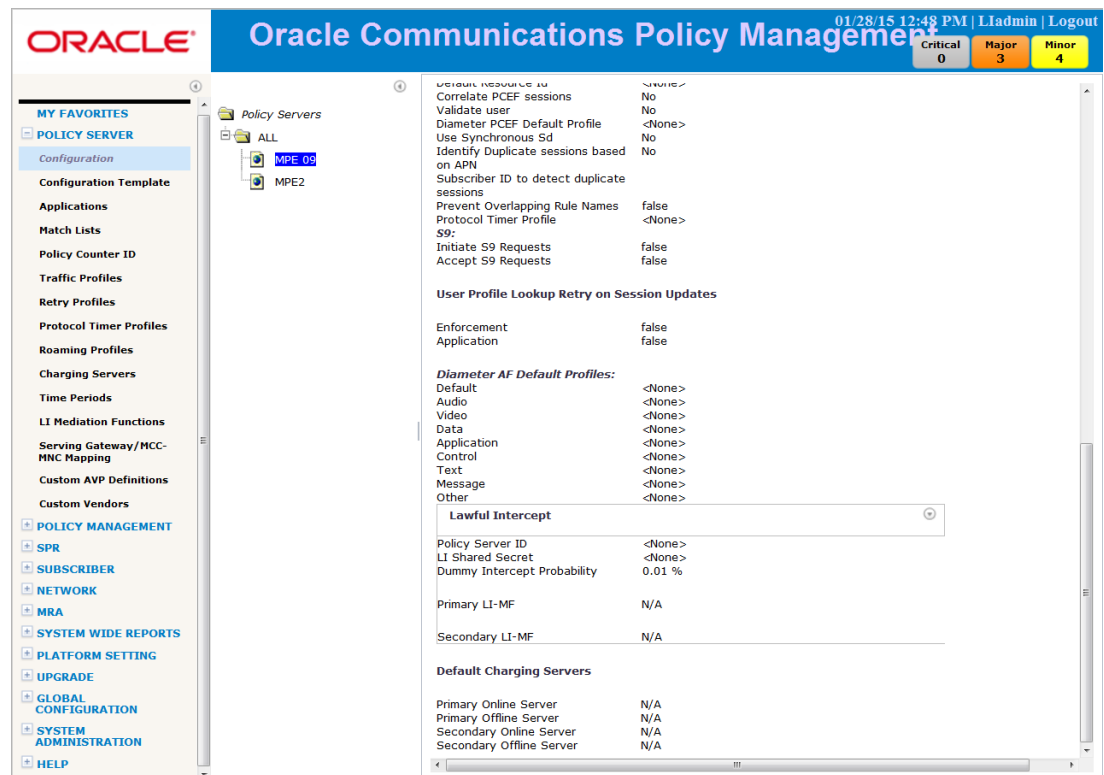
2. From the content tree, select the MPE device where LI is to be configured .

The Policy Server Administration screen opens.

3. Click the **Policy Server** tab.

The current configuration options are displayed:

Figure 1-6 Policy Server Administration screen



4. Click **Modify**.

The configuration fields become editable.

5. Scroll down to the Lawful Intercept section of the work area and expand it.

6. Enter the following:

- **Policy Server ID**—Enter a unique 24-bit identifier for each PCRF cluster within a given CMP cluster. Initially input as a number less than 8388608, the MPE then internally sets the two most significant bytes to make the identifier 32 bit,

resulting in a number less than 2147483648. This identifier is used to generate the appropriate 64-bit correlation identifier for each target MF.

- **LI Shared Secret**—Enter the LI shared secret used for encrypting/decrypting LI-related AVPs over the Gx and Rx interfaces.
- **Dummy Intercept Probability**—Enter the probability, expressed as a percentage, of injecting dummy LI AVPs into the Gx messages sent from the MPE device to the PCEF to mask real LI provisioning from users who might be monitoring traffic between the MPE device and the PCEF. The default is 0.01%.
- **Primary LI-MF**—Select the primary MF device that the MPE device communicates with from the pulldown list.
- **Secondary LI-MF (optional)**—Select the secondary MF device that the MPE device communicates with from the pulldown list.

7. Click **Save**.

The MPE device is now configured for LI.

Configuring a Static IP Address on an MPE Device

You must configure the static IP address, which is used only by the single MPE server at the secondary site before the server can communicate with an MF device. For more information, see *CMP Wireless User's Guide*.

To configure a static IP address on an MPE device:

1. From the **Platform Setting** section of the navigation pane, click **Topology Settings**.

The content tree displays the Topology Settings group.

2. From the content tree, click the **All Clusters** group.

The Cluster Configuration screen opens, displaying information about clusters.

3. Click the **View** link to the right of the MPE cluster you want to modify.

The Topology Configuration screen opens, displaying information about the cluster.

4. On the Topology Configuration screen, click **Modify Secondary Site**.

The Secondary Site Settings section (at the bottom of the work area) become editable; for example:

Figure 1-7 Secondary Site Settings screen

Secondary Site Settings

General Settings

Site Name: Secondary Site

HW Type: C-Class

OAM VIP: [Mask]

Signaling VIPs: <Signaling VIP1><10.15.244.245/23><SIG-A>
<Signaling VIP2><FC00:0:0:0:0:0:0:0:0A0F:F4F5/119><SIG-B>

[Add New VIP] [Edit] [Delete]

Network Configuration

General Network

VLAN ID: [246]

OAM: [246]

SIG-A: [244]

SIG-B: [248]

User Defined Network

VLAN ID: [REP]

Server-C

General Settings

IP: 10.15.247.245

HostName: MPE1-36-C

Forced Standby: []

Status: Spare

Path Configuration

Static IP: [Add New] [Edit] [Delete]

5. Scroll down to the Server-C section of the work area; in the **Path Configuration** element, click **Add New**.

The New Path window opens:

Figure 1-8 New Path window

New Path

Static IP: []

Mask: []

Interface: SIG-A

[Save] [Cancel]

6. Enter the following:
 - **Static IP**— The IPv4 or IPv6 address for the spare MPE device.
 - **Mask** — Subnet mask, in CIDR notation: from 0 to 32 for an IPv4 address, from 0 to 128 for an IPv6 address.
 - **Interface** — Select the signaling interface in use from the list.
7. Click **Save**.
8. From the **Policy Server** section of the navigation pane, select **Configuration**.
The content tree displays a list of policy server groups; the initial group is **All**.
9. From the content tree, select the same MPE device.
The Policy Server Administration screen opens.
10. On the Policy Server Administration screen, click the **Policy Server** tab.
The current configuration options are displayed.
11. Click **Reapply Configuration**.

An in-progress message displays. When the operation is complete you are prompted, "The configuration was applied successfully."

The MPE device is configured with a static IP address.