

**Oracle® Communications  
Convergent Charging Controller**

Location Capabilities Pack User's Guide

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# About This Document

## Scope

The scope of this document includes all functionality a user must know in order to effectively operate the Oracle Communications Convergent Charging Controller Location Capabilities Pack (LCP) application. It does not include detailed design of the service.

## Audience

This guide is written primarily for LCP administrators. However, the overview sections of the document are useful to anyone requiring an introduction.

## Prerequisites

Although it is not a prerequisite to using this guide, familiarity with the target platform would be an advantage.

This manual describes system tasks that should only be carried out by suitably trained operators.

## Related Documents

The following document is related to this document:

- Number Portability Service Pack
- *Location Capabilities Pack Technical Guide*

# Document Conventions

## Typographical Conventions

The following terms and typographical conventions are used in the Oracle Communications Convergent Charging Controller documentation.

Formatting Convention	Type of Information
<b>Special Bold</b>	Items you must select, such as names of tabs. Names of database tables and fields.
<i>Italics</i>	Name of a document, chapter, topic or other publication. Emphasis within text.
<b>Button</b>	The name of a button to click or a key to press. <b>Example:</b> To close the window, either click <b>Close</b> , or press <b>Esc</b> .
<b>Key+Key</b>	Key combinations for which the user must press and hold down one key and then press another. Example: <b>Ctrl+P</b> or <b>Alt+F4</b> .
Monospace	Examples of code or standard output.
<b>Monospace Bold</b>	Text that you must enter.
<i>variable</i>	Used to indicate variables or text that should be replaced with an actual value.
<b>menu option &gt; menu option &gt;</b>	Used to indicate the cascading menu option to be selected. Example: <b>Operator Functions &gt; Report Functions</b>
<a href="#">hypertext link</a>	Used to indicate a hypertext link.

Specialized terms and acronyms are defined in the glossary at the end of this guide.

# System Overview

## Overview

### Introduction

This chapter provides a high-level overview of the application. It explains the basic functionality of the system and lists the main components.

It is not intended to advise on any specific Oracle Communications Convergent Charging Controller network or service implications of the product.

### In this Chapter

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This chapter contains the following topics.

What is Location Capabilities Pack? ..... 1

## What is Location Capabilities Pack?

### Introduction

The Oracle Communications Convergent Charging Controller Location Capabilities Pack (LCP) is a set of software components used by other applications to look up the location of mobile devices.

### Usage Scenarios

There are several current and future scenarios for using LCP.

#### Location-Based Billing

Through location-based billing, a subscriber can establish zones with special billing rates for different zones. Typical example zones are “home” or “work”.

A user or subscriber can set further zones to cover a subscriber’s particular preferences.

Differential billing can be the result of one of the following:

- A call made by a subscriber located in one of their zones
- A call made between subscribers when both are located in one of their zones

#### Emergency Services

With location-enhanced emergency services, the location information can be used in two different ways:

- To dispatch the closest appropriate authorities
- To relay accurate location information to emergency services

Both help with the speedy arrival to an accurate location.

## Tracking

Tracking enables fleet applications (and service companies) to track vehicles so the owning company knows the location of a vehicle or operator.

**Note:** To provide this service, the operator must offer real-time and accurate tracking functionality.

## Callback and Collect Call Locations

You can use LCP to locate a subscriber who is outside of the network. This enables a subscriber who is visiting a foreign network to use callback functionality to establish a roaming call.

To implement this feature, the LCP Store My Location node is used before the final billing node performs the charge.

For more information about callback and collect call features, see *USSD GW Technical Guide*.

## Other Possible Scenarios

You can also use LCP for:

- Mobile blind dating (for example, two subscribers who have signed up for this service and are in the same area can arrange to meet up).
- Looking up the nearest service facility (for example, a pharmacy or restaurant).

## Definitions

This table describes some important terms used by the LCP:

Button	Function
<b>Zone</b>	A zone is collection of zone shapes. Currently it is used for billing purposes.
<b>Zone Shape</b>	A zone shape is an area of a certain shape (for example: circular, rectangular, etc.). Currently, as these are defined by radius, they can only be circular. <b>Example:</b> A work zone could contain three shapes representing three separate offices or three zone shapes representing one single office with a more complex overall shape.
<b>Zone Type</b>	What the zone represents (for example: home, work).
<b>Location</b>	Position of a subscriber.
<b>Location Server</b>	A location server is the entity that the location services clients query to obtain location information (for example: HLR, GMLC).

## Components

The LCP consists of these components:

- Location Module (locApp)
- MAP ATI plug-in
- IS-41 POSREQ plug-in
- SRI-MSRN plug-in
- SRI-IMSI plug-in
- LCP ACS components (four feature nodes and one action handler)
- Database tables
- Management screens



## Location Module

The key component of the LCP is the Location Module. The calling application passes the MSISDN of a mobile device to the Location Module. The Location Module looks up the current location of the mobile device and returns its locational reference to the calling application as a Cell ID/ Area ID or as a circle of uncertainty.

## Plug-Ins

The Location Module uses modular communication plug-ins to communicate with Location Servers on customer networks. It provides the following plug-ins:

- MAP ATI
- IS-41 POSREQ
- SRI-MSRN
- SRI-IMSI

## Provisioning and Management

Additional SMS management screens are delivered as part of the LCP to allow the provisioning and management of locational entities in the database (for example: converting data from Cell ID to circles of uncertainty in X,Y,R format).

## Feature Nodes

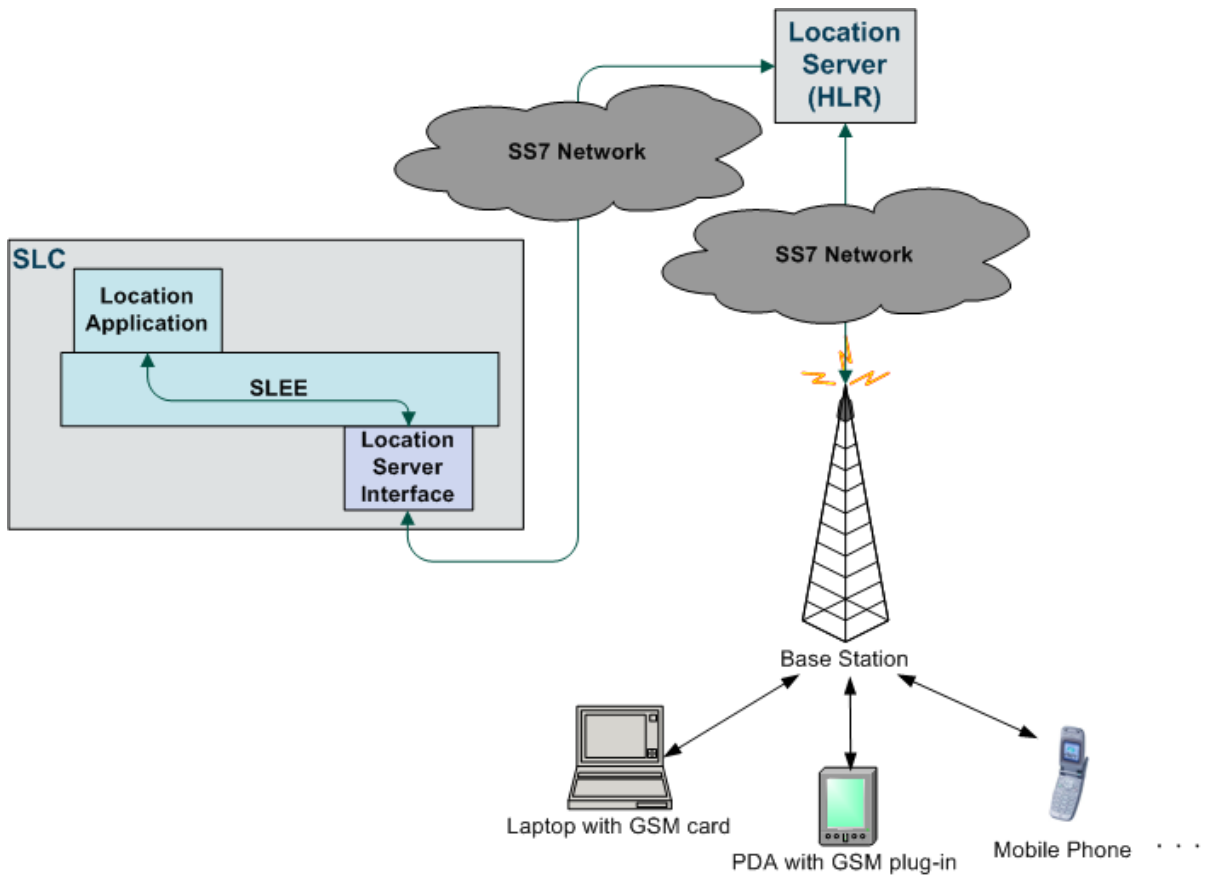
The LCP also enables you to use the Location Module from ACS-based customer applications by providing the following additional feature nodes:

- Set My Zone sets a subscriber's Home and Work zones.
- In The Zone checks if a mobile device is currently in a pre-defined zone.
- Store My Location stores locational data for use by other nodes.
- Store My Network ID stores the IMSI retrieved for a supplied MSISDN.

For more information, see *Feature Nodes Reference Guide*.

## Overview Diagram

Here is an overview of how the LCP functions (interaction with the HLR). The Location Application sends location queries to the HLR.



# LCP Administration Screens and Tasks

## Overview

### Introduction

This chapter explains the functionality on the Oracle Communications Convergent Charging Controller Location Capabilities Pack screen and other administrative tasks.

### In this chapter

This chapter contains the following topics.

Getting Started .....	5
Plug-Ins.....	8
Mappings .....	10
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## Getting Started

### Accessing LCP

Follow these steps to access the Location Capabilities Pack.

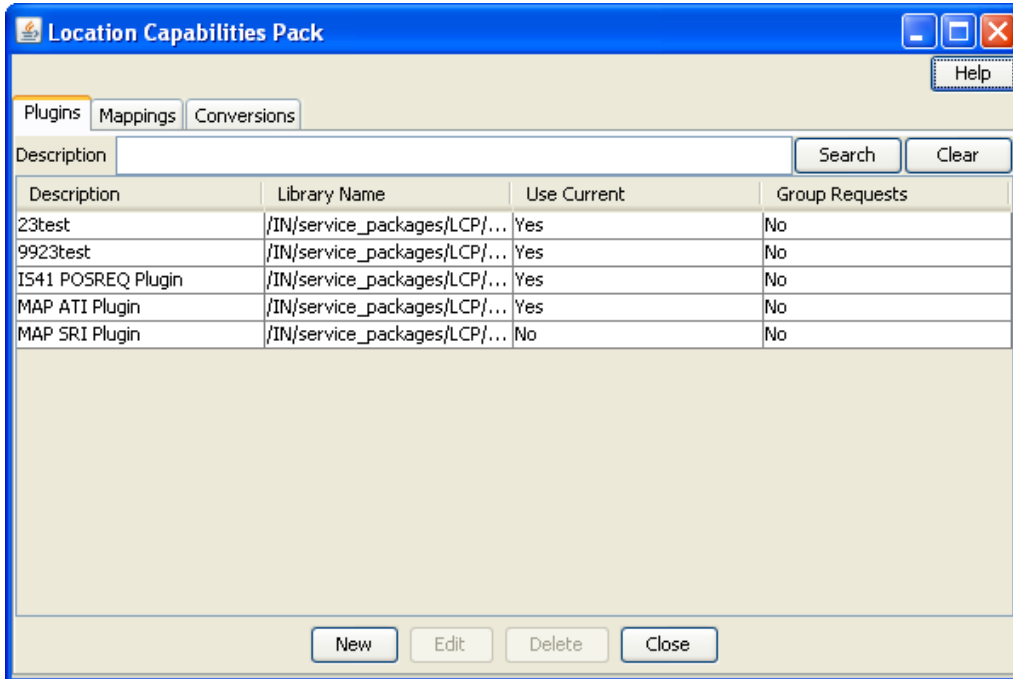
Step	Action
1	From the SMS <b>Services</b> menu, select LCP.



**Result:** You see the Location Capabilities Pack screen.

## Location Capabilities Pack Screen

Here is an example Location Capabilities Pack screen.



### Tabs

The Location Capabilities Pack screen contains the following tabs:

- *Plug-Ins* (on page 8)
- *Mappings* (on page 10)
- *Conversions* (on page 12)

See *What is Location Capabilities Pack?* (on page 1) for an overview of how these tabs are used in LCP.

### Selecting Tabs

Follow these steps to navigate between tabs on a screen.

To...	Press the...
Select a tab title using the mouse	Left mouse button with the cursor placed over the tab title
Navigate across the tab titles	Left or right arrow key (if a tab is already selected)

### Navigating between fields and buttons

Follow these steps to navigate between fields and buttons on a tab or screen.

To...	Click...
Navigate to the next field or button	<b>Tab</b>
Save screen changes or activate the selected button	<b>Enter</b>

## Deleting a Record

Follow these steps to delete a record from the database.

Step	Action
1	From the table on the tab, select the record to delete. Click <b>Delete</b> . <b>Result:</b> You see the Confirm Deletion dialog.
2	Click <b>Yes</b> to delete the record.

## Searching for Records

Each tab on the Location Capabilities Pack screen contains a search area. The search area consists of fields in which you can enter search criteria, which returns records matching the criteria in the grid.

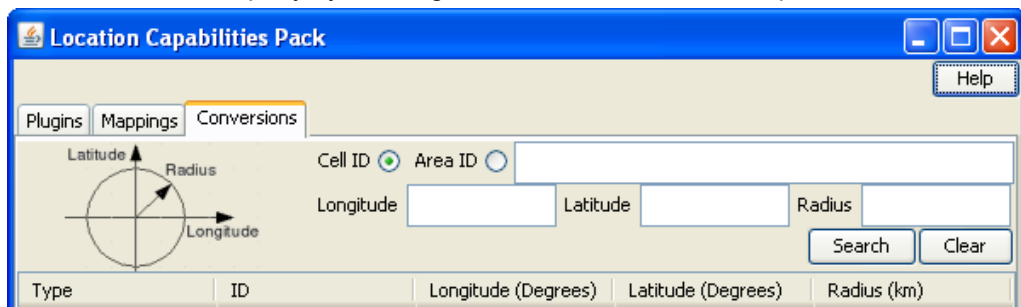
The search facility supports the Oracle wildcard characters:

- % (any character)
- \_ (one character)

## Search Example

Here is an example search procedure for conversions on the **Conversions** tab.

Step	Action
1	Construct a search query by entering criteria in the fields at the top of the <b>Conversions</b> tab.

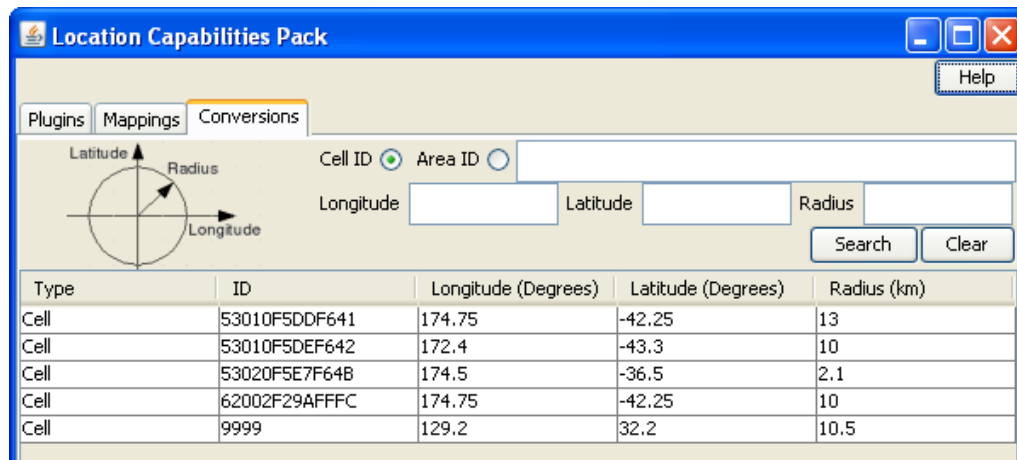


- In the top field, enter either the **Cell ID** or **Area ID**, depending on which option you have selected to the left of the field.
- **Longitude:** The longitude coordinate to search for.
- **Latitude:** The latitude coordinate to search for.
- **Radius:** The radius to search for.

Step	Action
------	--------

2	To execute the search, click <b>Search</b> .
---	--

**Result:** Searching for a blank Cell ID returns all of the records in the database.



**Note:** You can remove all search criteria by clicking **Clear**.

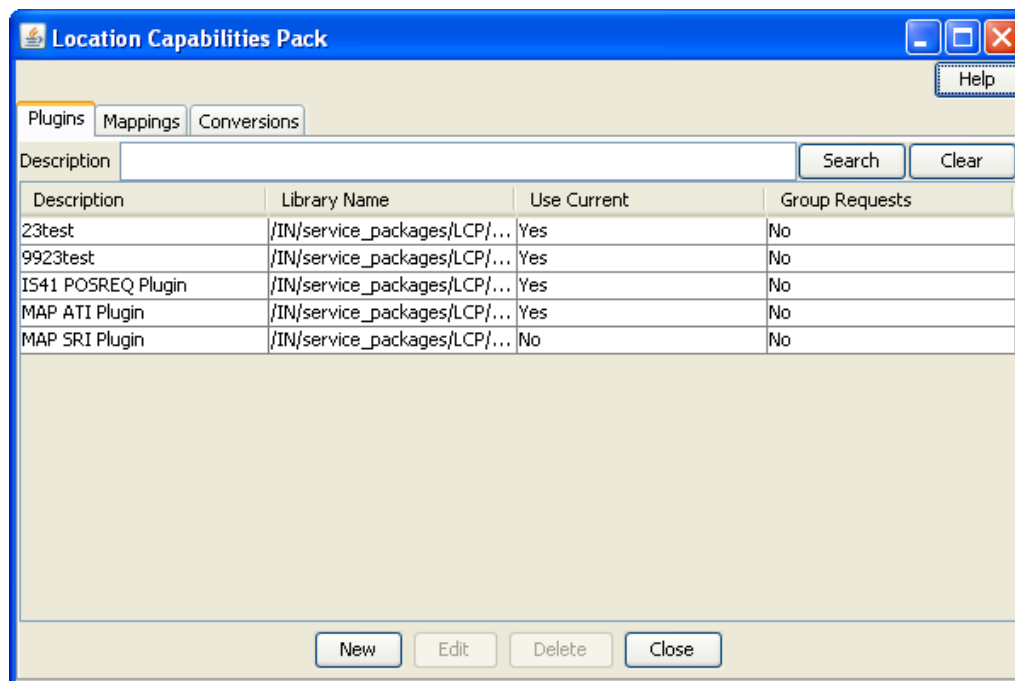
## Plug-Ins

### Introduction

This **Plugins** tab of the Location Capabilities Pack screen displays the list of existing plug-ins. The table allows a maximum of 10 entries.

### Plugins Tab

Here is an example **Plugins** tab.



## Plugins Tab Fields

This table describes the function of each field.

Field	Description
Description	Description of this plug-in. This field holds a maximum of 2000 characters.
Library Name	<p>The name of the shared library that contains the location plug-in functionality.</p> <p><b>Warning:</b> This string must match the filename of the library and that file must be in the LCP's library directory on the SLCs. (The default location is: <code>/IN/service_packages/LCP/lib</code>).</p> <p>This field can hold a maximum of 1024 characters.</p> <p>For more information about the available libraries, see <i>Location Capabilities Pack Technical Guide</i>.</p>
Use Current	Defines whether to use the current location (MAP Cell ID, MAP Geographical Information, or INAP Location Number).
Group Requests	<p>Defines whether to send Grouped Requests.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>This is only relevant where there is a supported plug-in. Setting to yes, group requests from a macro node to a plug-in to save bandwidth. This functionality is not currently supported in either the macro nodes or the plug-ins, so this field should be set to <b>No</b>.</li> <li>After you save this record, you cannot change this setting.</li> </ul>

## Plugin Definition Screen

Here is an example Plugin Definition screen.

## Adding a Plug-In Definition

Follow these steps to create a plug-in definition.

Step	Action
1	On the <b>Plugins</b> tab of the Locations Capabilities Pack screen, click <b>New</b> . <b>Result:</b> You see the New <i>Plugin Definition</i> screen (See example on page 9).
2	Configure this record by entering data in the fields on this screen. For more information about the fields in this screen, see <i>Plugins Tab Fields</i> (on page 9).

Step	Action
------	--------

3 Click **Save**.

## Editing a Plug-In Definition

Follow these steps to edit a plug-in definition.

Step	Action
------	--------

1 From the table on the **Plugins** tab of the Location Capabilities Pack screen, select the record. Click **Edit**.

**Result:** You see the Edit *Plugin Definition screen* (See example on page 9).

2 Edit the fields to reflect the changes you need to make.

For more information about the fields on this screen, see *Plugins Tab Fields* (on page 9).

**Note:** You cannot change the group requests option.

3 Click **Save**.

## Mappings

### Introduction

This **Mappings** tab of the Location Capabilities Pack screen displays the list of existing MSISDN mappings.

There are two ways a plug-in is chosen. It is either specified by the LSP client, or if one is not specified, the MSISDN of the mobile station is used to select a plug-in.

The MSISDN or plug-in selection is determined by using MSISDN ranges. This means that, if the MSISDN of interest falls within the range of a plug-in, the plug-in is used. The MSISDN ranges must be non-overlapping, that is, no part of the range overlaps with any other MSISDN ranges.

The table allows a maximum of 100 entries.



## Mappings Tab

Here is an example **Mappings** tab.

Start MSISDN	End MSISDN	Plugin Type
9393000	9393999	MAP ATI Plugin

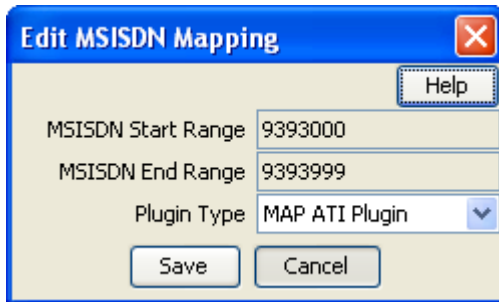
## Mappings Fields

This table describes the function of each field.

Field	Description
MSISDN Start Range	Type a start value for the range of MSISDNs that map to the plug-in. <b>Notes:</b> <ul style="list-style-type: none"> <li>• Ranges must not overlap with an existing range.</li> <li>• After you save the record, the range cannot be modified.</li> </ul>
MSISDN End Range	Type an end value for the range of MSISDNs that map to the plug-in. <b>Notes:</b> <ul style="list-style-type: none"> <li>• Ranges must not overlap with an existing range.</li> <li>• After you save the record, the range cannot be modified.</li> </ul>
Plugin Type	Select the plug-in type from the drop-down menu.

## MSISDN Mapping Screen

Here is an example MSISDN Mapping screen.



## Adding an MSISDN Mapping

Follow these steps to add an MSISDN mapping for a selected plug-in.

Step	Action
1	On the <b>Mappings</b> tab of the Locations Capabilities Pack screen, click <b>New</b> . <b>Result:</b> You see the New <i>MSISDN Mapping</i> screen (See example on page 11).
2	Configure this record by entering data in the fields on this screen. For more information about the fields in this screen, see <i>Mappings Fields</i> (on page 11).
3	Click <b>Save</b> . <b>Result:</b> The record is added to the database.

## Editing an MSISDN Mapping

Follow these steps to edit an MSISDN mapping.

Step	Action
1	From the table on the <b>Mappings</b> tab of the Location Capabilities Pack screen, select the record. Click <b>Edit</b> . <b>Result:</b> You see the Edit <i>MSISDN Mapping</i> screen (See example on page 11).
2	The only field you can modify is the <b>Plugin Type</b> . For more information about the fields on this screen, see <i>Mappings Fields</i> (on page 11).
3	Click <b>Save</b> .

# Conversions

## Introduction

The **Conversions** tab displays the list of existing conversions that match the search criteria. If the search criteria fields are empty, the entire list of conversions is displayed. A circle showing the meaning of the coordinates is shown. The table allows a maximum of 1 million entries.

## Conversion Bulk Loader

The Conversion Bulk Loader enables you to load conversion data from text files. Files can contain data for updating by area ID or by cell ID, but not both.

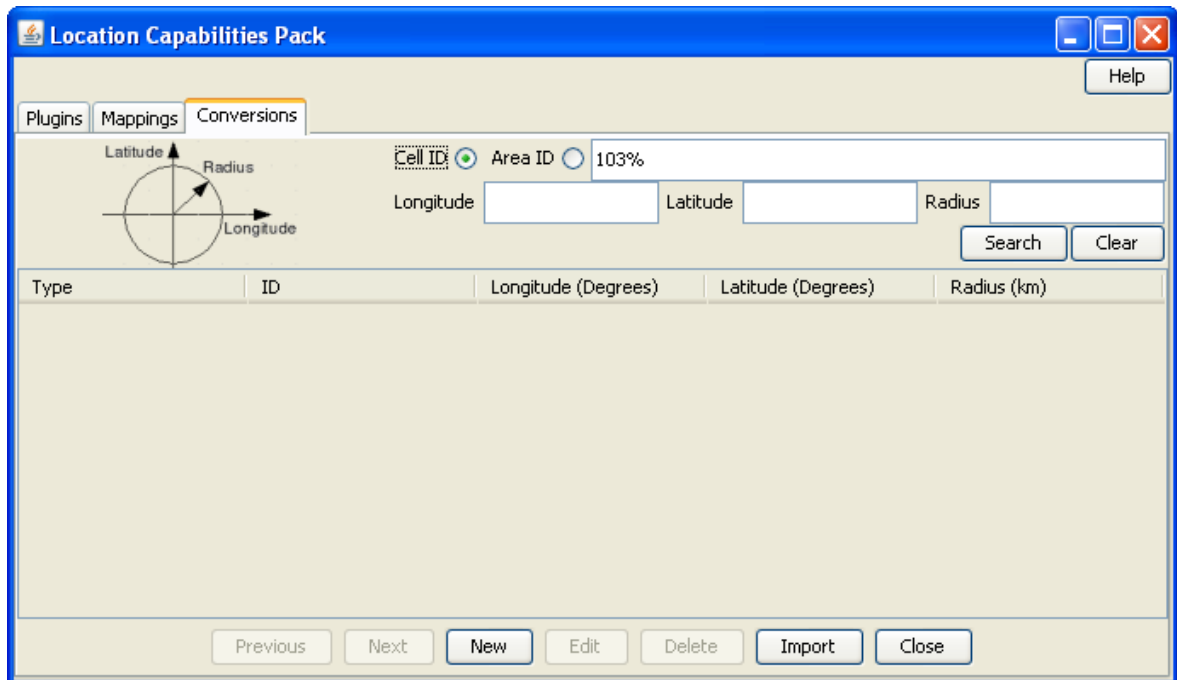
The files can be imported by using one of the following:

- **Conversions** tab of the Location Capabilities Pack screen
- Command line

For details about using the command line and the file format of the text files, see *Location Capabilities Pack Technical Guide*.

## Conversions Tab

Here is an example **Conversions** tab.



## Conversion Fields

This table describes the function of each field.

Field	Description
Cell ID	The ID of the Cell. <b>Note:</b> This field cannot be changed after it is first saved.
Area ID	The ID of the Area. <b>Note:</b> This field cannot be changed after it is first saved.
Longitude (Degrees)	The longitude coordinate. Restricted to between -179.99999 (W) to 180.00000 (E) degrees (5 decimal places throughout).
Latitude (Degrees)	The latitude coordinate. Restricted to between -90.00000 to 90.00000 degrees (5 decimal places throughout).
Radius (km)	The radius. Restricted to between 0.0000000 and 99999999.9999999 kilometers (7 decimal places throughout).

## Conversion Screen

Here is an example Conversion screen.

## Adding Conversions

Follow these steps to create a conversion.

Step	Action
1	On the <b>Conversions</b> tab of the Locations Capabilities Pack screen, click <b>New</b> . <b>Result:</b> You see the <i>New Conversion screen</i> (See example on page 13).
2	Click either the <b>Cell ID</b> or <b>Area ID</b> and type the ID in the field beside the selection. <b>Note:</b> After you save this record, you cannot change this setting.
3	Fill in the coordinates. For more information about these fields, see <i>Conversion Fields</i> (on page 13).
4	Click <b>Save</b> .

## Editing a Conversion

Follow these steps to edit a conversion.

Step	Action
1	From the table on the <b>Conversions</b> tab of the Location Capabilities Pack screen, select the record. Click <b>Edit</b> . <b>Result:</b> You see the <i>Edit Conversion screen</i> (See example on page 13).
2	Edit the fields to reflect the changes you need to make. For more information about the fields in this screen, see <i>Conversion Fields</i> (on page 13).
3	Click <b>Save</b> .

## Importing Conversions

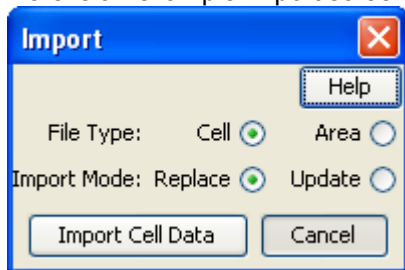
Follow these steps to import conversions.

Step	Action
1	On the <b>Conversions</b> tab of the Location Capabilities Pack screen, click <b>Import</b> . <b>Result:</b> The <i>Import screen</i> (See example on page 15) is displayed.
2	Specify the file type to import. Select one of the following: <ul style="list-style-type: none"> <li>• <b>Cell</b></li> <li>• <b>Area</b></li> </ul>

Step	Action
3	Specify the import mode. Select one of the following: <ul style="list-style-type: none"> <li>• <b>Replace</b> – Insert into an empty database or replace all existing data</li> <li>• <b>Update</b> – Update the existing data</li> </ul>
4	Select one of the following: <ul style="list-style-type: none"> <li>• <b>Import Cell Data</b></li> <li>• <b>Import Area Data</b></li> </ul> <p><b>Result:</b> The Import screen reflects your selection of options.</p>
5	Browse to the file to import. Click the import button, for example, <b>Import Cell Data (Replace)</b> . <p><b>Result:</b> If successful, you see a dialog displaying the location of log files to check and delete after inspection.</p>
6	Click <b>OK</b> . <p><b>Result:</b> The database is updated.</p>

## Import Screen

Here is an example Import screen.



## Zones

### Introduction

Zones can be used to determine the location of a Subscriber for the purpose of differential billing and/or providing location-based services.

The Location Capabilities Pack uses ZONE profile tags configured in ACS to define a set of zones. These profile tags are defined on the **Profile Tag Details** tab on the ACS Configuration screen.

### Configuring Zone Profile Tags

You can define a set of zones that can be used to determine the location of a subscriber.

To define a zone, you must first define the zone profile group field using a ZONE profile tag.

ZONE profile tags are configured in ACS. The LCP ZONE profile tags, Home and Work, are all configured at installation. All other zone profile tags are user defined and must conform to the configuration shown in this table.

Profile Tag Name	Profile Tag Type	Profile Tag	Parent Profile Tag	Comment
LCP ZONES	Profile Block	4128769		Configured during installation.

Profile Tag Name	Profile Tag Type	Profile Tag	Parent Profile Tag	Comment
Home	ZONE	4128770	4128769	Configured during installation.
Work	ZONE	4128771	4128769	Configured during installation.
<i>ZoneName</i>	ZONE	An integer value in the range: 4128772 to 4194305	4128769	User defined. <b>Warning:</b> The parent profile tag must be set to 4128769 (the profile tag value for LCP ZONES).

For more information about profile tags, see *ACS User's Guide*.

## Using Zone Profile Tags

The LCP ZONE profile tags defined on the ACS Configuration screen are used by the LCP In The Zone feature node and Set My Zone feature node to access or update zone type values from within a control plan.

For more information about:

- LCP feature nodes, see *Feature Nodes Reference Guide*
- A specific node, click the **Help** button in the feature node's configuration window

# Glossary of Terms

## ACS

Advanced Control Services configuration platform.

## ATI

Any Time Interrogation - this process is used on a GSM network to interrogate the HLR for location and or subscriber information.

## CC

Country Code. Prefix identifying the country for a numeric international address.

## Convergent

Also “convergent billing”. Describes the scenario where post-paid and pre-paid calls are handed by the same service platform and the same billing system. Under strict converged billing, post-paid subscribers are essentially treated as “limited credit pre-paid”.

## FDA

First Delivery Attempt - the delivery of a short message directly to the SME rather than relaying it through the MC.

## GMLC

The Gateway Mobile Location Centre contains functionality required to support LCS (LoCation Services).

## GPRS

General Packet Radio Service - employed to connect mobile cellular users to PDN (Public Data Network- for example the Internet).

## GSM

Global System for Mobile communication.

It is a second generation cellular telecommunication system. Unlike first generation systems, GSM is digital and thus introduced greater enhancements such as security, capacity, quality and the ability to support integrated services.

## HLR

The Home Location Register is a database within the HPLMN (Home Public Land Mobile Network). It provides routing information for MT calls and SMS. It is also responsible for the maintenance of user subscription information. This is distributed to the relevant VLR, or SGSN (Serving GPRS Support Node) through the attach process and mobility management procedures such as Location Area and Routing Area updates.

## HPLMN

Home PLMN

## **IMSI**

International Mobile Subscriber Identifier. A unique identifier allocated to each mobile subscriber in a GSM and UMTS network. It consists of a MCC (Mobile Country Code), a MNC (Mobile Network Code) and a MSIN (Mobile Station Identification Number).

The IMSI is returned by the HLR query (SRI-SM) when doing FDA. This tells the MSC exactly who the subscriber is that the message is to be sent to.

## **IN**

Intelligent Network

## **INAP**

Intelligent Network Application Part - a protocol offering real time communication between IN elements.

## **IS-41**

Interim Standard 41 is a signaling protocol used in cellular telecommunications systems. It deals with the signalling between the MSC and other network elements for the purpose of handovers and roaming etc.

## **ISDN**

Integrated Services Digital Network - set of protocols for connecting ISDN stations.

## **ITU**

International Telecommunication Union

## **LCP**

Location Capabilities Pack - set of software components used by other applications to look up the location of mobile devices.

## **MAP**

Mobile Application Part - a protocol which enables real time communication between nodes in a mobile cellular network. A typical usage of the protocol would be for the transfer of location information from the VLR to the HLR.

## **MC**

Message Centre. Also known as SMSC.

## **MCC**

Mobile Country Code. In the location information context, this is padded to three digits with leading zeros. Refer to ITU E.212 ("Land Mobile Numbering Plan") documentation for a list of codes.

## **MNC**

Mobile Network Code. The part of an international address following the mobile country code (MCC), or at the start of a national format address. This specifies the mobile network code, that is, the operator owning the address. In the location information context, this is padded to two digits with a leading zero. Refer to ITU E.212 ("Land Mobile Numbering Plan") documentation for a list of codes.



## **MSC**

Mobile Switching Centre. Also known as a switch.

## **MSIN**

Mobile Station Identification Number.

## **MSISDN**

Mobile Station ISDN number. Uniquely defines the mobile station as an ISDN terminal. It consists of three parts; the country code (CC), the national destination code (NDC) and the subscriber number (SN).

## **MSRN**

Mobile Station Roaming Number

## **MT**

Mobile Terminated

## **PLMN**

Public Land Mobile Network

## **POSREQ**

IS-41 Position Request - process used in the IS-41 network to interrogate the HLR for location and subscriber information.

## **SGSN**

Serving GPRS Support Node

## **SME**

Short Message Entity - This is an entity which may send or receive short messages. It may be located in a fixed network, a mobile, or an SMSC.

## **SMS**

Depending on context, can be:

- Service Management System hardware platform
- Short Message Service
- Service Management System platform
- Convergent Charging Controller Service Management System application

## **SN**

Service Number

## **SRI**

Send Routing Information - This process is used on a GSM network to interrogate the HLR for subscriber routing information.

## **USSD**

Unstructured Supplementary Service Data - a feature in the GSM MAP protocol that can be used to provide subscriber functions such as Balance Query.

## **VLR**

Visitor Location Register - contains all subscriber data required for call handling and mobility management for mobile subscribers currently located in the area controlled by the VLR.

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