

**Oracle® Communications  
Convergent Charging Controller**

XML TCAP Interface Technical Guide

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# About This Document

## Scope

The scope of this document includes all the information required to install, configure and administer the XML TCAP Interface.

## Audience

This guide was written primarily for system administrators and persons installing and administering the TCAP Interfaces application. The documentation assumes that the person using this guide has a good technical knowledge of the system.

## Prerequisites

Although there are no prerequisites for using this guide, familiarity with the target platform would be an advantage.

A solid understanding of Unix and a familiarity with IN concepts are an essential prerequisite for safely using the information contained in this technical guide. Attempting to install, remove, configure or otherwise alter the described system without the appropriate background skills, could cause damage to the system; including temporary or permanent incorrect operation, loss of service, and may render your system beyond recovery.

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

## Related Documents

The following documents are related to this document:

- *Service Management System 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.

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## Introduction to SLEE XML TCAP Interface

### Component descriptions

This table describes the main components in the XML TCAP Interface.

Process	Role	Further information
xmlTcapInterface	The interface converts XML messages arriving from smsTrigDaemon into SLEE events. Similarly, the interface converts events arriving from the SLEE into XML messages that smsTrigDaemon understands.	XML/TCAP Interface Configuration
smsTrigDaemon	Accepts control plan execution requests from either a remote PI client or the Java management screens and forwards request to smsTcapInterface.	<i>Service Management System Technical Guide</i>

## About installing XML TCAP Interface

### Installing the interface

This interface is installed through the `xmlTclf` package. See *Installation Guide* for both automatic and manual installation details.





# Configuration

## Overview

### Introduction

This chapter explains how to configure the Oracle Communications Convergent Charging Controller application.

### In this chapter

---

This chapter contains the following topics.

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## XML/TCAP Interface Configuration

### Introduction

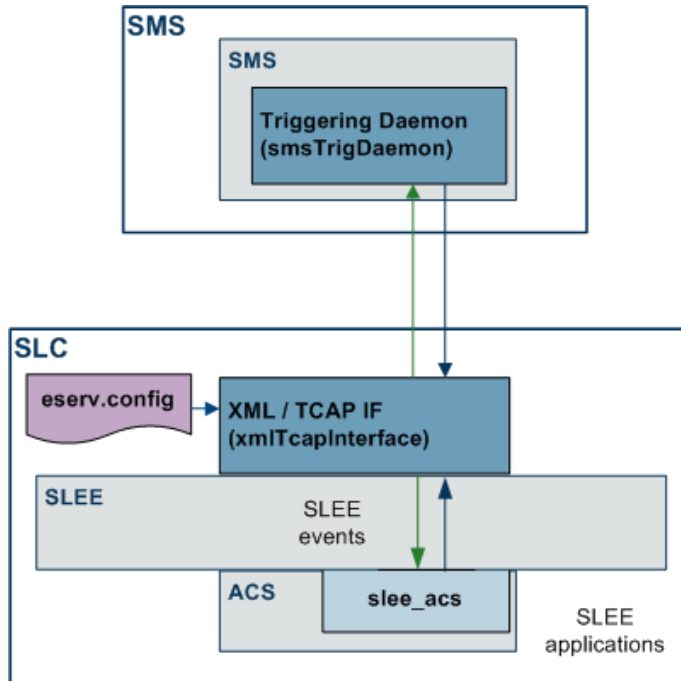
The xmlTcapInterface receives BPL requests from the smsTrigDaemon or from a third party. Each request is used to construct an InitialDP which is sent to ACS through the SLEE. The xmlTcapInterface returns an indication of whether or not the request was successful through an HTTP response.

The InitialDP contains the following information:

- Calling party number (from the xml request)
- Called party number (from the xml request)
- PIN digits
- Extension fields (from the xml request)
- Service key for the application required

## XML/TCAP Interface diagram

This diagram shows the XML/TCAP interface on an SLC.



## Configuration components - XML/TCAP Interface

The XML/TCP Interface is configured by the following components:

Component	Locations	Description	Further Information
eserv.config	SLC and SMS	This file configures the XML/TCAP Interface.	<b>eserv.config configuration</b> (on page 4).
SLEE.cfg	SLC	This file defines the XML/TCAP interface and the BPL service on the SLEE.	<i>Start up</i> (on page 6).

**Note:** xmlTcapInterface has a hard-coded timeout waiting for a response over the SLEE of 10 seconds.

## eserv.config configuration

xmlTcapInterface supports the following parameters at the root level of **eserv.config**.

```
triggering = {
  listenPort = 3072
  idp_sk = 10
  retryDelay = 1
  maxNotReadyRetries = 3
  connectionTimeout = 90
  requestTimeout = 10
}
```

## Parameters

`listenPort`

**Syntax:** `listenPort = value`  
**Description:** The port on which the `xmlTcapInterface` should listen for incoming requests.  
**Type:** Integer  
**Optionality:** Optional (default used if not set).  
**Allowed:**  
**Default:** 3072  
**Notes:**  
**Example:** `listenPort = 3070`

`idp_sk`

**Syntax:** `idp_sk = value`  
**Description:** The **service key** parameter of outgoing InitialDP components.  
**Type:** Integer  
**Optionality:** Optional (default used if not set).  
**Allowed:**  
**Default:** 10  
**Notes:**  
**Example:** `idp_sk = 12`

`retryDelay`

**Syntax:** `retryDelay = value`  
**Description:** The number of seconds to wait before retrying an operation.  
**Type:** Integer  
**Optionality:** Optional (default used if not set).  
**Allowed:**  
**Default:** 1  
**Notes:**  
**Example:** `retryDelay = 2`

`maxNotReadyRetries`

**Syntax:** `maxNotReadyRetries = value`  
**Description:** The number of times to retry the operation before abandoning the attempt.  
**Type:** Integer  
**Optionality:** Optional (default used if not set).  
**Allowed:**  
**Default:** 3  
**Notes:**  
**Example:** `maxNotReadyRetries = 5`

`connectionTimeout`

**Syntax:** `connectionTimeout = value`  
**Description:** The number of seconds before closing a stale connection.

## Chapter 2

**Type:** Integer  
**Optionality:** Optional (default used if not set).  
**Allowed:** 0 = no time out  
**Default:** 90  
**Notes:**  
**Example:** `connectionTimeout = 70`

`requestTimeout`

**Syntax:** `requestTimeout = value`  
**Description:** The number of seconds before an IN request times out.  
**Type:** Integer  
**Optionality:** Optional (default used if not set).  
**Allowed:**  
**Default:** 10  
**Notes:**  
**Example:** `requestTimeout = 15`

### Start up

The following entries must be included in the **SLEE.cfg** configuration file for the `xmlTcapInterface` to work:

```
SERVICE=CCS_BPL 1 slee_acs CCS_BPL  
SERVICEKEY=INTEGER 50 CCS_BPL
```

```
INTERFACE=xmlTcIf xmlTcapInterfaceStartup.sh /IN/service_packages/SLEE/bin UDG
```

**Note:** For further information on configuring the SLEE, see *Convergent Charging Controller SLEE Technical Guide*.

# Troubleshooting

## Overview

### Introduction

This chapter explains the important processes on each of the server components in Convergent Charging Controller, and describes a number of example troubleshooting methods that can help aid the troubleshooting process before you raise a support ticket.

### In this chapter

---

This chapter contains the following topics.

Common Troubleshooting Procedures..... 7

## Common Troubleshooting Procedures

### Introduction

Refer to *System Administrator's Guide* for troubleshooting procedures common to all Convergent Charging Controller components.

### Checking current processes

You can check which processes are running using the standard UNIX command: `ps`. To find processes being run by Oracle software, you can `grep` for the string 'oper', which will display all processes being run by the application operator accounts (for example, `acs_oper`, `ccs_oper` and `smf_oper`).

**Note:** Some processes which are required for proper functioning may be run by other users, including root or the user which runs the webserver.

**Example command:** `ps -ef | grep oper`

For more information about the `ps` command, see the system documentation for the `ps` command.

You can also check how much of the processor a process is using by running the standard UNIX tool: `top`. If you have some baseline measurements, you will be able to compare it with the current load.

**Example command:** `top`

**Tip:** Some processes should only have one instance. If there are two or more instances, this may indicate a problem. For example, there will usually only be one `timerIF` running on each SLC.

For more information about which processes should be running on each node, check the Process List for each node in *Installation Guide*.

### Process failure

You can check whether a process is restarting using the SMS Alarms subsystem.

Processes raise alarms when they are stopped or started. The alarms include:

- Their name
- The time the alarm was logged
- Some other information about why the event may have occurred

Further information about the specific alarm can be found in the application's alarms guide.

Alarms can be accessed from the:

- Syslog on the local machine and the SMS(s). For more information, see *SMS Technical Guide*.
- **Alarms** tab in the SMS Alarms Management screen. For more information, see *SMS User's Guide*.

### Checking installed packages

To check the details of an installed package, use the `pkginfo` command.

**Example command:** `pkginfo -l smsSms`

**Example output:** This is an example of the output of the example command above.

```
PKGINST: smsSms
NAME: Oracle smsSms
CATEGORY: application
ARCH: sun4u
VERSION: 3.1.0
VENDOR: Oracle
PSTAMP: smsNode20041020104925
INSTDATE: Oct 20 2004 13:15
EMAIL: support@oracle.com
STATUS: completely installed
FILES:      348 installed pathnames
          39 directories
          89 executables
          152448 blocks used (approx)
```

For more information about the `pkginfo` utility, see the system documentation.

### Checking network connectivity

Network connectivity will affect any process which requires communication between two different network addresses.

Network connectivity should support ssh sessions between the two machines experiencing the problem.

If you can open an ssh session between the two machines, check the following before contacting Level 1 support with details:

- If the address of either of the machines specified in the Node Management screens is a hostname, check that the hostnames used in the ssh sessions are the hostnames specified in the Node Management screen.

If you cannot ssh, check the following before contacting Level 1 support with details:

- Check that the hostname is resolving correctly in the DNS.
- Check that the physical network connection is working correctly.
- Check that the `inetd` and `sshd` are running.
- Check that `sshd` is listening on the expected port.
- Check that the `smf_oper` and `acs_oper` accounts are not locked, and that the username and password combinations being used are correct.

## Checking configuration files

One of the significant areas where faults can occur and be remedied is in the configuration of processes. Configuration files can be edited by any standard text editor. A backup of the existing configuration file should always be taken before editing a configuration file.

For more information about the configuration files used in this application, see *Configuration User's Guide*.

For more information about the configuration file for a specific program or tool, see the section named after the binary in question.





# Glossary of Terms

## **ACS**

Advanced Control Services configuration platform.

## **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”.

## **GUI**

Graphical User Interface

## **HTML**

HyperText Markup Language, a small application of SGML used on the World Wide Web.

It defines a very simple class of report-style documents, with section headings, paragraphs, lists, tables, and illustrations, with a few informational and presentational items, and some hypertext and multimedia.

## **HTTP**

Hypertext Transport Protocol is the standard protocol for the carriage of data around the Internet.

## **IN**

Intelligent Network

## **PI**

Provisioning Interface - used for bulk database updates/configuration instead of GUI based configuration.

## **PIN**

Personal Identification Number

## **SGML**

Standard Generalized Markup Language. The international standard for defining descriptions of the structure of different types of electronic document.

## **SLC**

Service Logic Controller (formerly UAS).

## **SLEE**

Service Logic Execution Environment

## **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

## **System Administrator**

The person(s) responsible for the overall set-up and maintenance of the IN.

## **TCAP**

Transaction Capabilities Application Part – layer in protocol stack, message protocol.

## **TCP**

Transmission Control Protocol. This is a reliable octet streaming protocol used by the majority of applications on the Internet. It provides a connection-oriented, full-duplex, point to point service between hosts.

## **XML**

eXtensible Markup Language. It is designed to improve the functionality of the Web by providing more flexible and adaptable information identification.

It is called extensible because it is not a fixed format like HTML. XML is a 'metalanguage' — a language for describing other languages—which lets you design your own customized markup languages for limitless different types of documents. XML can do this because it's written in SGML.

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