

Oracle® Communications Network Charging and Control Roaming Technical Guide



Release 15.0.0

October 2023

The Oracle logo, consisting of the word "ORACLE" in white, uppercase, sans-serif font, centered within a solid red square.

Copyright

Copyright © 2023, Oracle and/or its affiliates.

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 embedded, installed or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software" or "commercial computer software documentation" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. 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 Inside 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, Epyc, and the AMD 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.

Contents

About This Document	v
Document Conventions	vi
Chapter 1	
System Overview	1
Overview	1
Introduction to the Roaming Applications	1
Chapter 2	
Configuration.....	3
Overview	3
RAP Configuration	3
TRANS Configuration	5
USSD Configuration	5
Chapter 3	
Background Processes	11
Overview	11
USSD	11
RAP	16
TRANS	18
Chapter 4	
The USSD Configuration Screens.....	19
Overview	19
Barred Numbers	19
IMSI to MSISDN mapping	20
Statistic Reporting	21
Chapter 5	
About Installation and Removal	23
Overview	23
Installation and Removal Overview	23

About This Document

Scope

The scope of this document includes all the information required to install, configure and administer the Roaming applications. This covers the services:

- RAP (Reoriginating Application)
- Trans (Transferring Application)
- USSD (USSD Callback, Balance Query and Voucher Recharge)

Audience

This guide was written primarily for system administrators and persons installing, configuring and administering the Roaming Applications. However, sections of the document may be useful to anyone requiring an introduction to the application.

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 Logic Execution Environment Technical Guide*
- *Service Management System Technical Guide*

Document Conventions

Typographical Conventions

The following terms and typographical conventions are used in the Oracle Communications Network Charging and Control (NCC) documentation.

Formatting Convention	Type of Information
Special Bold	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.
Button	The name of a button to click or a key to press. Example: To close the window, either click Close , or press Esc .
Key+Key	Key combinations for which the user must press and hold down one key and then press another. Example: Ctrl+P or Alt+F4 .
Monospace	Examples of code or standard output.
Monospace Bold	Text that you must enter.
<i>variable</i>	Used to indicate variables or text that should be replaced with an actual value.
menu option > menu option >	Used to indicate the cascading menu option to be selected. Example: Operator Functions > Report Functions
hypertext link	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 Network Charging and Control (NCC) network or service implications of the product.

In this Chapter

This chapter contains the following topics.

Introduction to the Roaming Applications..... 1

Introduction to the Roaming Applications

Introduction

The Roaming applications give subscribers the ability to make and receive calls whilst roaming. The following applications are provided:

- USSD
- RAP
- TRANS

USSD

USSD allows prepaid customers to perform USSD based services whilst roaming. Customers can:

- Initiate calls using the USSD call back facility
- Obtain their current balance using the USSD balance query facility
- Use a voucher to recharge their account using the USSD voucher recharge facility

RAP

The RAP application allows subscribers to perform voice calls whilst roaming using other operators not supporting CAMEL functionality. This includes the facility to use a predefined list of safe MSCs.

Defining a safe MSC means that roaming calls coming from the safe MSC do not need to be reconnected. For this type of call, the MSC address is used instead of the originator address in the idp message. Data from the originating idp is passed directly to CCS, through the outgoing idp, thus removing the need to reconnect. For more details, see *safe.cfg* (on page 4).

Roaming calls that do not match any of the defined safe MSCs are handled in the normal way.

TRANS

The TRANS application allows prepaid customers to be called whilst roaming.

Functionality Overview

The Roaming Applications provide the following functionality:

- *RAP Configuration* (on page 3)
- *TRANS Configuration* (on page 5)
- *USSD Configuration* (on page 5)
- SLEE configuration

Configuration

Overview

Introduction

This chapter explains the configuration details of the Roaming Applications software.

The Roaming Applications software will be in two directories:

- `/IN/service_packages/RAP` for the Rap and Trans applications and reports
- `/IN/service_packages/USSD` for the USSD application and reports

In this Chapter

This chapter contains the following topics.

RAP Configuration.....	3
TRANS Configuration.....	5
USSD Configuration	5

RAP Configuration

Introduction

The RAP installation package installs and modifies the configuration files it needs to run. This section is an overview of the required steps, and can be used as a reference to change the installed package configuration.

SLEE.cfg

The configuration file `/IN/service_packages/SLEE/etc/SLEE.cfg` is modified to accommodate the RAP service.

```
SERVICEKEY=INTEGER 700000 rap                                     #Added by roamingScp-Rap
SERVICE=rap 1 rap rap                                           #Added by roamingScp-Rap
APPLICATION=rap rap.sh /IN/service_packages/RAP/bin 1 1         #Added by roamingScp-Rap
```

rap.cfg

This is an example of a configured `/IN/service_packages/RAP/etc/rap.cfg` file:

```
TSAN_PREFIX=49709
TSAN_INTERNATIONAL_PREFIX=32
TSAN_RANGE=0000 9999
LOCAL_NUMBER_INDICATOR=032 3
ALLOCATED_TSAN_TIMEOUT=15
CANCELLED_TSAN_TIMEOUT=15
SERVICE_KEY=2
```

normalise.cfg

The sample normalisation file (`/IN/service_packages/RAP/etc/normalise.cfg`) does not include any entries. However this is described here to enable the administrator to create and maintain this file.

It is possible to re-read this file without interruption to the service by sending a SIGHUP to the rap process. This file uses a simple parser and does not allow comments.

```
gt nationalUnknownIndicator nationalUnknownCut pasteNationalUnknown
internationalUnknownIndicator internationalUnknownCut pasteInternationalUnknown
pasteNational pasteInternational
```

Based on the global title (gt) prefix match and the Nature of Address for the called party, the following actions are specified.

Nature Of Address	Action
National	The pasteNational string will be prepended to the called party.
International	The pasteInternational string will be prepended to the called party.
Unknown	- If the nature of address is unknown, the internationalUnknownIndicator is compared with the called number. - If this matches, internationalUnknownCut digits are stripped from the called number and pasteInternationalUnknown digits are prepended. - If this match fails, the nationalUnknownIndicator is compared with the called number. - If this matches, nationalUnknownCut digits are stripped from the called number and pasteNationalUnknown digits are prepended. - If this fails, the number is left unchanged.

safe.cfg

The sample safe file (`/IN/service_packages/RAP/etc/safe.cfg`) does not include any entries. However, it is described here to enable the administrator to create and maintain this file.

It is possible to re-read this file without interruption to the service by sending a SIGHUP to the rap process.

```
#This file contains a list of msc addresses which are judged to be safe.
#FORMAT
#<STRING>
0044
```

MSC Addresses

You define the safe MSC addresses in a single column in the safe file. Each MSC address consists of a digit string of up to 1023 characters in length. You do not need to specify the whole address.

Note: There is no limit to the number of MSC addresses you can define. However, performance may be affected if you define a very large number of them.

Matching MSC Addresses

An originating MSC address for a roaming call is considered to be safe if it matches any of the MSC addresses defined in the safe file. A match is made when the characters defined for an MSC address in the safe file match an equal number of characters (starting from the beginning) in the originating MSC address. The match will be with the first MSC in the safe file which matches, over its length, the originating MSC.

TRANS Configuration

Introduction

The TRANS installation package will install and modify the necessary configuration files it needs to run. TRANS has a single purpose and therefore requires no configuration at the application level.

SLEE.cfg

The configuration file `/IN/service_packages/SLEE/etc/SLEE.cfg` is modified to accommodate the TRANS service.

```
SERVICEKEY=INTEGER 700001 trans #Added by roamingScp-Trans
SERVICE=trans 1 trans trans #Added by roamingScp-Trans
APPLICATION=trans trans.sh /IN/service_packages/RAP/bin 1 1 #Added by roamingScp-Trans
```

USSD Configuration

Introduction

The USSD installation modifies and adds any new files needed to run the Roaming applications. The USSD uses a configuration file to specify the configurable parameters. These parameters are static (they are not re-readable).

The USSD also uses a database table to keep a list of globally barred numbers which are re-read at five minute (this is non-configurable) intervals.

Note: By default, no USSD services are configured. Therefore, you must add the explicit service keys to the configuration file for the USSD services you require. Each individual service can have multiple service keys.

SLEE.cfg

The configuration file `/IN/service_packages/SLEE/etc/SLEE.cfg` is modified to accommodate the USSD service.

```
SERVICEKEY=INTEGER 700002 ussd #Added by roamingScp-Ussd
SERVICE=ussd 1 ussd ussd #Added by roamingScp-Ussd
APPLICATION=ussd ussd.sh /IN/service_packages/USSD/bin 1 1 #Added by roamingScp-Ussd
```

ussd.cfg

The default parameter configuration file `/IN/service_packages/USSD/etc/ussd.cfg` is described in more detail:

```
# CONFIGURATION FILE FOR USSD APPLICATION (USSD)

# LANGUAGE TRANSLATION
# THE USSD APPLICATION SUPPORTS THE FOLLOWING LANGUAGES AND
# ASSUMES THE FOLLOWING DEFAULTS:
# ENGLISH_ID 1
# FRENCH_ID 2
# DUTCH_ID 3
# GERMAN_ID 4
# POLISH_ID 5
#
# THESE VALUES CAN BE OVERRIDDEN USING THE TOKEN STRING
# XXXXX_ID=<INTEGER>
# IF A VALUE IS OVERRIDDEN IT IS THE RESPONSIBILITY OF THE
# OPERATOR TO ENSURE THERE ARE NOT MULTIPLE DEFINITIONS OF AN ID.
```

Chapter 2

```
# EX: THE ENGLISH LANGUAGE ID IS SET TO 2 IN ACS
#   ENGLISH_ID=2
# YOU MUST THEN ALSO SET FRENCH TO AN ALTERNATE VALUE TO AVOID
# CONFLICTS, IE:
#   FRENCH_ID=1 OR FRENCH_ID=6

# AN EXAMPLE OF THE ICA NORMALISATION INVOLVES TURNING A FULLY
# INTERNATIONAL MSISDN NUMBER INTO A NATIONAL NUMBER.
# E.G MSISDN = 32123456789. TO TURN THIS INTO A NATIONAL NUMBER
# YOU WOULD CONFIGURE THE FOLLOWING:
#   ICA_CALLED_PARTY_STRIP=32
#   ICA_CALLED_PARTY_ADD=0
#   ICA_CALLED_PARTY_NOA=2
# THIS WOULD RESULT IN THE MSISDN=0123456789, WITH AN NOA OF 2.

# MSG_CREDIT_XXX=<STRING>
#   OUTPUT IN ALL CASES TO START MESSAGE

# MSG_END_XXX=<STRING>
#   OUTPUT IN ALL CASES TO TERMINATE MESSAGE

# WHERE XXX IS A 3 LETTER ABBREVIATION OF ANY OF THE FOLLOWING
# LANGUAGES:
#   FRE = FRENCH
#   DEF = DEFAULT
#   ENG = ENGLISH
#   DUT = DUTCH
#   GER = GERMAN
#   POL = POLISH
#
# BOTH MESSAGES ACT AS A WRAPPER TO THE DYNAMIC FORMATTING OF THE
# BALANCE TYPES REQUESTED. THE FORMAT OF THE BALANCE TYPES ARE
# DEFINED IN THE CCS SCREENS. SO THE BEHAVIOUR IS:
#
# <MSG_CREDIT_XXX> <%BALANCE_X_FROM_CCS%> <%BALANCE_Y_FROM_CCS%>
# <MSG_END_XXX>

# AS AN EXTENSION OF THIS IS THE ABILITY TO OVERRIDE THE CCS
# TEMPLATE OUTPUT WITH READABLE STRINGS FOR NO GENERAL CASH AND
# NO FREE SMS BALANCE TYPES. FIRST THE SHOW ZERO BALANCE MUST BE
# SPECIFIED FOR THE BALANCE TYPE AND SECONDLY THE SHOW_BALANCE_MSG
# MUST EXIST FOR THE SAME BALANCE TYPE.

# SHOW_BALANCE_MSG=<INTEGER>
#   BALANCE ID TO OVERRIDE ZERO BALANCE MESSAGE

# MSG_NO_CREDIT_XXX=<STRING>
#   ALTERNATIVE OF CCS TEMPLATE FOR NO GENERAL CASH CREDIT

# MSG_NO_FREE_SMS_XXX=<STRING>
#   ALTERNATIVE OF CCS TEMPLATE FOR NO FREE SMS CREDIT

# ALLOW_DORM=<INTEGER>
#   1 = ALLOW DORMANT ACCOUNTS TO MAKE OUTGOING CALLS.
#   0 = DENY DORMANT ACCOUNTS TO MAKE OUTGOING CALLS.

# ACS_CALLING_NOA=<INTEGER>
#   OVERRIDE THE DEFAULT (2) NOA OF THE CALLING PARTY THAT IS
#   PASSED TO ACS.

# ACS_CALLED_NOA=<INTEGER>
#   OVERRIDE THE DEFAULT (2) NOA OF THE CALLED PARTY THAT IS PASSED
#   TO ACS.

# CALLBACK_SK=<INTEGER>
#   USED TO IDENTIFY THE LEGACY CALLBACK SERVICE KEY IN THE USSD
#   DIALLED STRING. E.G. THE *123* PORTION.
#   CAN BE SPECIFIED ON MULTIPLE LINES TO INDICATE MULTIPLE KEYS.
#   THERE IS NO DEFAULT, IF NOT SPECIFIED CALLBACK IS TURNED OFF.

# CALLBACKALLOWQUERY
#   SETTING THIS TOKEN IN THE CONFIG FILE ALLOWS THE CALLBACK
```

```

# SERVICE TO BE USED FOR BALANCE QUERIES IF NO CALLED NUMBER
# IS SPECIFIED.

# BALANCE_QUERY_SK=<INTEGER>
# USED TO IDENTIFY THE BALANCE QUERY SERVICE KEY IN THE USSD
# DIALLED STRING. E.G. THE *124* PORTION.
# CAN BE SPECIFIED ON MULTIPLE LINES TO INDICATE MULTIPLE KEYS.
# THERE IS NO DEFAULT, IF NOT SPECIFIED BALANCE QUERY IS TURNED
# OFF.

# VOUCHER_RECHARGE_SK=<INTEGER>
# USED TO IDENTIFY THE VOUCHER RECHARGE SERVICE KEY IN THE USSD
# DIALLED STRING. E.G. THE *125* PORTION.
# CAN BE SPECIFIED ON MULTIPLE LINES TO INDICATE MULTIPLE KEYS.
# THERE IS NO DEFAULT, IF NOT SPECIFIED VOUCHER RECHARGE IS
# TURNED OFF.

# DIRECT_TRIGGER_SK=<INTEGER>
# USED TO IDENTIFY THE DIRECT TRIGGER SERVICE KEY IN THE USSD
# DIALLED STRING. E.G. THE *126* PORTION.
# CAN BE SPECIFIED ON MULTIPLE LINES TO INDICATE MULTIPLE KEYS.
# THERE IS NO DEFAULT, IF NOT SPECIFIED DIRECT TRIGGER IS
# TURNED OFF.

# DIRECT_BALANCE_QUERY_SK=<INTEGER>
# USED TO IDENTIFY THE DIRECT BALANCE QUERY SERVICE KEY IN THE
# USSD DIALLED STRING. E.G. THE *127* PORTION.
# CAN BE SPECIFIED ON MULTIPLE LINES TO INDICATE MULTIPLE KEYS.
# THERE IS NO DEFAULT, IF NOT SPECIFIED DIRECT BALANCE QUERY IS
# TURNED OFF.

# VOUCHER RECHARGE
# UPON A SUCCESSFUL RECHARGE THE RETURNED STRING IS CONFIGURABLE.
#
# VR_LEAD_IN_XXX=<STRING>
# OUTPUT IN ALL CASES TO START MESSAGE

# VR_LEAD_OUT_XXX=<STRING>
# OUTPUT IN ALL CASES TO TERMINATE MESSAGE

# WHERE XXX IS A 3 LETTER ABBREVIATION OF ANY OF THE FOLLOWING
# LANGUAGES:
# FRE = FRENCH
# DEF = DEFAULT
# ENG = ENGLISH
# DUT = DUTCH
# GER = GERMAN
# POL = POLISH
#
# BOTH MESSAGES ACT AS A WRAPPER TO THE DYNAMIC FORMATTING OF THE
# BALANCE TYPES REQUESTED. THE FORMAT OF THE BALANCE TYPES ARE
# DEFINED IN THE CCS SCREENS. SO THE BEHAVIOUR IS:
#
# <VR_LEAD_IN_XXX> <%BALANCE_FROM_CCS%> <VR_LEAD_OUT_XXX>

# UPON AN UNSUCCESSFUL RECHARGE ONLY 2 CONDITIONS ARE
# CONFIGURABLE.
#
# VR_NOT_FOUND_XXX=<STRING>
# VOUCHER NUMBER NOT FOUND

# VR_REDEEMED_XXX=<STRING>
# VOUCHER ALREADY REDEEMED

# ERROR STRINGS THAT ARE RETURNED TO THE CALLER ARE CONFIGURABLE.
# DEFAULTS ARE SUPPLIED FOR ALL STRINGS.
# WHERE XXX IS A 3 LETTER ABBREVIATION OF ANY OF THE FOLLOWING
# LANGUAGES:
# FRE = FRENCH
# DEF = DEFAULT
# ENG = ENGLISH

```

Chapter 2

```
#      DUT = DUTCH
#      GER = GERMAN
#      POL = POLISH

# MSG_OPERATOR_XXX=<STRING>
#      CALLBACK NUMBER DIALLED WAS THE OPERATOR

# MSG_BADNUMBER_XXX=<STRING>
#      CALLBACK NUMBER IS NOT A VALID NUMBER

# MSG_NONUMMAP_XXX=<STRING>
#      NO IMSI TO MSISDN MAPPING FOUND

# MSG_BLACKLISTED_XXX=<STRING>
#      CALLER IS BLACK LISTED (FOR VOUCHER RECHARGE ONLY)

# MSG_TECHPROBLEM_XXX=<STRING>
#      THERE IS A TECHNICAL PROBLEM

# MSG_ACCTPROBLEM_XXX=<STRING>
#      THERE IS AN ACCOUNT PROBLEM

# MSG_NOCALLCREDIT_XXX=<STRING>
#      INSUFFICIENT CALL CREDIT

# WEXP_MSG_XXX=<STRING>
#      YOUR WALLET EXPIRY IS %s

# VR_GENERAL_XXX=<STRING>
#      GENERAL VOUCHER RECHARGE ERROR

# MSG_BARREDNUMBER_XXX=<STRING>
#      CALLBACK NUMBER IS IN THE BARRED TABLE

# MSG_DIRECTTRIGGER_XXX=<STRING>
#      DIRECT TRIGGER HAS OCCURRED

#
#      FOR ALTERNATIVE VERSIONS UNCOMMENT (AND CHANGE IF NECESSARY)
#      THE LINES BELOW:
#
# MSG_OPERATOR_DEF = "Prosze poczekac na polaczenie z konsultantem..."
# MSG_OPERATOR_ENG = "Calling Operator..."
# MSG_OPERATOR_FRE = "J'appelle l'opérateur..."
# MSG_OPERATOR_DUT = "Operator wordt gebeld..."
# MSG_OPERATOR_GER = "Anrufen des Operators..."
# MSG_OPERATOR_POL = "Prosze poczekac na polaczenie z konsultantem..."
# MSG_BADNUMBER_DEF = "Ten numer jest nieprawidlowy"
# MSG_BADNUMBER_ENG = "Sorry, that doesn't appear to be a valid number"
# MSG_BADNUMBER_FRE = "Desole, ce numero ne semble pas correct"
# MSG_BADNUMBER_DUT = "Sorry, dit blijkt geen geldig nummer te zijn"
# MSG_BADNUMBER_GER = "Tut uns leid, diese Nummer ist offenbar nicht korrekt"
# MSG_BADNUMBER_POL = "Ten numer jest nieprawidlowy"
# MSG_NONUMMAP_DEF = "Przepraszamy, polaczenia z tym numerem sa zablokowane"
# MSG_NONUMMAP_ENG = "Sorry but calls to that number are not allowed"
# MSG_NONUMMAP_FRE = "Sorry but calls to that number are not allowed (in French)"
# MSG_NONUMMAP_DUT = "Sorry but calls to that number are not allowed (in Dutch)"
# MSG_NONUMMAP_GER = "Sorry but calls to that number are not allowed (in German)"
# MSG_NONUMMAP_POL = "Przepraszamy, polaczenia z tym numerem sa zablokowane"
# MSG_BLACKLISTED_DEF = "Sorry, there seems to be a problem. Please contact customer care services."
# MSG_BLACKLISTED_ENG = "Sorry, there seems to be a problem. Please contact customer care services."
# MSG_BLACKLISTED_FRE = "Sorry, there seems to be a problem. Please contact customer care services (but in French)."
# MSG_BLACKLISTED_DUT = "Sorry, there seems to be a problem. Please contact customer care services (but in Dutch)."
# MSG_BLACKLISTED_GER = "Sorry, there seems to be a problem. Please contact customer care services (but in German)."
# MSG_BLACKLISTED_POL = "Sorry, there seems to be a problem. Please contact customer care services (but in Polish)."
# MSG_TECHPROBLEM_DEF = "Przepraszamy za problemy o technicznym charakterze"
```

```

# MSG_TECHPROBLEM_ENG = "Sorry, there seems to be a technical problem. Please call later"
# MSG_TECHPROBLEM_FRE = "Desole, il y a un probleme technique. Veuillez telephoner plus
tard"
# MSG_TECHPROBLEM_DUT = "Sorry, er doet zich blijkbaar een technisch probleem voor. Gelieve
later terug te bellen"
# MSG_TECHPROBLEM_GER = "Leider gibt's ein technisches Problem. Bitte rufen sie uns spaeter
nochmal an. Danke"
# MSG_TECHPROBLEM_POL = "Przepraszamy za problemy o technicznym charakterze"
# MSG_ACCTPROBLEM_DEF = "Przepraszamy, twoje konto jest zablokowane. Spróbuj później"
# MSG_ACCTPROBLEM_ENG = "Sorry, your account is currently frozen. Please call later"
# MSG_ACCTPROBLEM_FRE = "Desole, votre compte est actuellement gele. Veuillez telephoner plus
tard"
# MSG_ACCTPROBLEM_DUT = "Sorry, uw rekening is momenteel geblokkeerd. Gelieve later terug te
bellen"
# MSG_ACCTPROBLEM_GER = "Leider ist Ihr Guthaben zur Zeit gesperrt . Bitte rufen sie uns
später nochmal an. Danke"
# MSG_ACCTPROBLEM_POL = "Przepraszamy, twoje konto jest zablokowane. Spróbuj później"
# MSG_NOCALLCREDIT_DEF = "Na twoim koncie jest za malo srodkow by zrealizowac to polaczenie.
Stan Konta: "
# MSG_NOCALLCREDIT_ENG = "Sorry, you have insufficient credit to call this number. Balance: "
# MSG_NOCALLCREDIT_FRE = "Desole, le solde de votre credit d'appel est insuffisant pour
appelerce numero. Balance: "
# MSG_NOCALLCREDIT_DUT = "Sorry, uw krediet is ontoereikend om dit nummer te bellen. Balance:
"
# MSG_NOCALLCREDIT_GER = "Tut uns leid, Ihre Geschprachsguthaben reicht leider nicht aus,
umdiese Nummer anzurufen. Balance: "
# MSG_NOCALLCREDIT_POL = "Na twoim koncie jest za malo srodkow by zrealizowac to polaczenie.
Stan Konta: "
# VR_GENERAL_DEF = "Sorry, that voucher could not be redeemed. Please try again or contact
customer care services"
# VR_GENERAL_ENG = "Sorry, that voucher could not be redeemed. Please try again or contact
customer care services"
# VR_GENERAL_FRE = "Sorry, that voucher could not be redeemed. Please try again or contact
customer care services (in French)."
# VR_GENERAL_DUT = "Sorry, that voucher could not be redeemed. Please try again or contact
customer care services (in Dutch)."
# VR_GENERAL_GER = "Sorry, that voucher could not be redeemed. Please try again or contact
customer care services (in German)."
# VR_GENERAL_POL = "Sorry, that voucher could not be redeemed. Please try again or contact
customer care services (in Polish)."
# MSG_BARREDNUMBER_DEF = "Przepraszamy, polaczenia z tym numerem sa zablokowane"
# MSG_BARREDNUMBER_ENG = "Sorry but calls to that number are not allowed"
# MSG_BARREDNUMBER_FRE = "Desole, appels a ce numero sont interdits"
# MSG_BARREDNUMBER_DUT = "Sorry, het is niet toegestaan om dat nummer te bellen"
# MSG_BARREDNUMBER_GER = "Tut uns leid, diese Nummer ist leider nicht erlaubt"
# MSG_BARREDNUMBER_POL = "Przepraszamy, polaczenia z tym numerem sa zablokowane"
# MSG_DIRECTTRIGGER_DEF = "Thank you for your request."
# MSG_DIRECTTRIGGER_ENG = "Thank you for your request."
# MSG_DIRECTTRIGGER_FRE = "Thank you for your request. (in French)"
# MSG_DIRECTTRIGGER_DUT = "Thank you for your request. (in Dutch)"
# MSG_DIRECTTRIGGER_GER = "Thank you for your request. (in German)"
# MSG_DIRECTTRIGGER_POL = "Thank you for your request. (in Polish)"
TIMERIF=Timer
IMSIISMSISDN

```


Background Processes

Overview

Introduction

This chapter describes processes that run the Roaming applications.

In this Chapter

This chapter contains the following topics.

USSD	11
RAP	16
TRANS	18

USSD

Purpose

USSD allows prepaid customers to perform the following USSD based services whilst roaming:

- Initiate a call using USSD Call Back
- Obtain the current balance for the customer account using USSD Balance Query
- Use a voucher to recharge the customer account, using USSD Voucher Recharge

Startup

USSD is a SLEE application that is started by the SLEE. You must declare ussd in the SLEE configuration file (**SLEE.cfg**) as follows:

```
SERVICEKEY=INTEGER 700002 ussd
SERVICE=ussd 1 ussd ussd
APPLICATION=ussd ussd.sh /IN/service_packages/USSD/bin 1 1
```

Parameters

USSD accepts the following parameters from **ussd.cfg**.

Note: If a parameter is not defined in **ussd.cfg**, then its default value is automatically used.

Parameter	Default	Description
ALLOW_PREU= <i>int</i>	0	Outgoing calls switch for pre-use accounts. Valid values are: • 1= allow outgoing calls • 0= do not allow outgoing calls
ALLOW_DORM	0	Outgoing calls switch for dormant accounts. Valid values are: • 1= allow outgoing call

Parameter	Default	Description
		0= do not allow outgoing calls
ACS_CALLING_NOA	2	Override the default NOA of the calling party that is passed to ACS.
ACS_CALLED_NOA	2	Override the default NOA of the called party that is passed to ACS.
CALLBACK_SK		Specifies the legacy callback service key. Use multiple lines to specify multiple keys.
BALANCE_QUERY_SK		Identifies the balance query service key. Use multiple lines to specify multiple keys.
CALLBACKALLOWQUERY	FALSE	When present, the call back service can return the balance for a balance query even when no call back number is specified.
CALLING_NUMBER= <i>string</i>	0123456789	Defines the calling number to send in the initial call attempt sent to the VSSP. This number is set to nature of address unknown, presentation restricted. This number should be used in the IN call model configuration file so that when calls are routed back to the SLC by the HLR, the IDP is sent back to ussd.
DIRECT_BALANCE_QUERY_SK		Identifies the direct balance query service key in the USSD dialed string. Use multiple lines to specify multiple keys.
DIRECT_TRIGGER_SK		Identifies the direct trigger service key in the USSD dialed string. Use multiple lines to specify multiple keys.
DIRECT_TIMEOUT= <i>secs</i>	15	Specifies the amount of time the application (ACS/CCS) has to respond to a Direct Trigger request.
ICA_CALLED_PARTY_STRIP= <i>string</i>	NULL	Used for pattern matching the country code for the MSISDN of the roaming subscriber. This country code value is stripped from the front of the MSISDN and the new national format number is sent as the called party number in the ICA message. This may need to be configured for switches that filter international numbers. for calls originating within the network.
ICA_CALLED_PARTY_ADD= <i>string</i>		Prefix added to the stripped MSISDN string to create the called party number for the ICA/IAM operation sent out to the local SSP. It can contain a country code or an escape code such as an international escape sequence of 2 zeros..
ICA_CALLED_PARTY_NOA= <i>int</i>	2	Configures the NOA for the called party number that is send out in the ICA/IAM operation.
ICA_CALLING_NOA= <i>int</i>	2	ICA calling value used to set the NOA for the calling party in the outgoing ICA.
IMSIISMSISDN	not present	When present, ussd assumes the map phase 1 begin subscriber activity - IMSI MAP_OPEN user information destination reference contains the subscriber MSISDN and will not attempt to perform IMSI to MSISDN translation.
LEG_A_TIMEOUT= <i>secs</i>	15	Defines the timeout value for a ring tone no reply BCSM event.
MIN_BALANCE= <i>int</i>	1	Defines the minimum balance for a subscriber before call back will be allowed.

Parameter	Default	Description
MSG_ACCTPROBLEM_XXX	DEF	String to be returned when a problem with a Caller's account has occurred. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Przepraszamy, twoje konto jest zablokowane. Spróbuj później" or in the language denoted by XXX.
MSG_BADNUMBER_XXX	DEF	String to be returned when the callback number is not a valid number. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Ten numer jest nieprawidłowy" or in the language denoted by XXX
MSG_BARREDNUMBER_XXX	DEF	String to be returned when the callback number exists in the 'Barred Number List'. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Przepraszamy, połączenia z tym numerem są zablokowane" or in the language denoted by XXX.
MSG_BLACKLISTED_XX X	DEF	String to be returned as the Voucher Recharge message when the caller has been black listed. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Sorry, there seems to be a problem. Please contact customer care services." or in the language denoted by XXX.
MSG_CREDIT_XXX	DEF	String to be prefixed to the Balance Query response. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Credit: " or in the language denoted by XXX.
MSG_DIRECTTRIGGER_XXX	DEF	String to be returned for a Direct Trigger USSD request. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Thank you for your request." or in the language denoted by XXX.
MSG_END_XXX	DEF	String to be appended to the end of the Balance Query response. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: ". "
MSG_NO_CREDIT_XXX	DEF	String to be returned for non-template Balance Query responses where the balance is zero/negative. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Sorry, you have no more credit" or in the language denoted by XXX.
MSG_NO_FREE_SMS_XX	DEF	String to be returned for non-template Balance Query responses where the Free SMS balance is zero/negative.

Parameter	Default	Description
		See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Sorry, you have no free SMS left" or in the language denoted by XXX.
MSG_NOCALLCREDIT_XX	DEF	String to be prefixed to the balance amount when a caller does not have enough balance to make the call. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Na twoim koncie jest za malo srodkow by zrealizowac to polaczenie. Stan Konta: " or in the language denoted by XXX.
MSG_NONUMMAP_XXX		String to be returned when no IMSI to MSISDN mapping found. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Przepraszamy, polaczenia z tym numerem sa zablockowane" or in the language denoted by XXX
MSG_OPERATOR_XXX		String to be returned when the callback number was the Operator. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Prosze poczekac na polaczenie z konsultantem..." or in the language denoted by XXX.
MSG_TECHPROBLEM_XX		String to be returned when a technical problem has occurred. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Przepraszamy za prolemy o technicznym charakterze" or in the language denoted by XXX.
MSRN_NAT_PREFIX= <i>string</i>		Local country code to use when matching the MSISDN in the roaming MTC trigger.
NAP_TIMEOUT= <i>secs</i>	15	Defines the timeout value for unbarring an incoming call.
NOKIAEXT	not present	If this token is present in the file, USSD will run in Nokia mode.
OPERATOR= <i>string</i>		Allows calls to be connected with unchecked balances, where the called number in the ussd string matches this number. Normal CCS route/charging is still used after connection.
ORACLE_USER_PASS= <i>usr/pwd</i>		Defines the oracle username and password to use when connecting to SCP database.

Parameter	Default	Description
QUERY_ALLOWED_STATES= <i>string</i>	ADP	A list of states which a wallet must be in for a query to be completed. Single uppercase character per state. Valid values are: • A - Active • P - Pre-Use • D - Dormant • S - Suspended • F - Frozen • T - Terminated
SERVICE_KEY= <i>int</i>	0	Defines the service key used to transfer the dialog to the application (ACS/CCS) within the SLEE. Its value must match the setting in the SLEE.cfg
SHOW_BALANCE= <i>int</i>		The Balance IDs to include in the Balance Query response.
SHOW_BALANCE_MSG		Specifies the Balance IDs that will NOT use the standard CCS Balance Query response when the balance is zero/negative.
SHOW_ZERO_BALANCE= <i>int</i>		Specifies the Balance IDs to include in the Balance Query response when the balance is zero/negative.
TIMERIF= <i>string</i>	Timer	Defines the timer interface name.
TRANSLATE= <i>string1 string2</i>		Translates configured SANS number (string1) into another destination number (string2). To maintain performance levels, the translatable numbers should be kept to a minimum.
USSD_CHARGING_ZONE= <i>string</i>	A32	Defines the calling number for the IDP created for CCS
USSD_MSIN_PREFIX= <i>string</i>	B32	The MSIN prefix for a subscriber, used when call back is initiated by a roaming subscriber. This enables CCS to charge a separate rate from roaming calls.
VOUCHER_RECHARGE_SK		Identifies the voucher recharge service key. Use multiple lines to specify multiple keys.
VR_GENERAL_XXX	DEF	String to be returned when a general voucher recharge error has occurred. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Sorry, that voucher could not be redeemed. Please try again or contact customer care services. " or in the language denoted by XXX.
VR_LEAD_IN_XXX	DEF	String to be prefixed to the successful Voucher Recharge response message. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Your account balance is now " or in the language denoted by XXX.

Parameter	Default	Description
VR_LEAD_OUT_XXX	DEF	String to be appended to the end of the successful Voucher Recharge response message. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: ". Thank you." or in the language denoted by XXX.
VR_NOT_FOUND_XXX	DEF	String to be returned when the voucher number is not found. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Sorry, that is not a valid voucher number." or in the language denoted by XXX.
VR_REDEEMED_XXX	DEF	String to be returned when a voucher has already been redeemed. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "Sorry, that voucher has already been redeemed." or in the language denoted by XXX.
WEXP_MSG_XXX	DEF	Sets the system default wallet expiry message. See the <i>Languages</i> (on page 16) definition for valid values of XXX. Default: "This wallet will expire on %s" or in the language denoted by XXX.

Languages

XXX denotes the language the string associated with a parameter is in:

- DEF - Default
- ENG - English
- FRE - French
- DUT - Dutch
- GER - German
- POL - Polish

Failure

If the USSD application fails, then no USSD service will be available.

Output

The USSD application writes error messages to the system log file.

RAP

Purpose

RAP allows prepaid customers to perform voice calls whilst roaming within other operators that support CAMEL functionality. This includes the facility to use a predefined list of safe MSCs.

Defining a safe MSC means that roaming calls coming from the safe MSC do not need to be reconnected. For this type of call, the MSC address is used instead of the originator address in the idp message. Data from the originating idp is passed directly to CCS, through the outgoing idp, thus removing the need to reconnect. For more details, see *safe.cfg* (on page 4).

Startup

RAP is a SLEE application that is started by the SLEE. You must declare RAP in the SLEE configuration file (*SLEE.cfg*) as follows:

```
SERVICEKEY=INTEGER 700000
SERVICE=rap 1 rap
APPLICATION=rap rap.sh /IN/service_packages/RAP/bin 1
```

Parameters

RAP accepts the following parameters from *rap.cfg*.

For more information see *RAP Configuration* (on page 3).

Note: If a parameter is not defined in *rap.cfg*, then its default value is automatically used.

The available parameters are:

Parameter	Default	Description
ACS_CALLED_PARTY_NOA	2	The NOA value for the called party to be passed to ACS. Optional.
ACS_CALLING_PARTY_NOA= <i>int</i>	3	The NOA value for the calling party to be passed to ACS. Optional.
ADD_CALLING_PARTY_ZERO= <i>int</i>		Defines if a zero is to be added to the start of the calling party. Allowed values: 1= inserts an optional zero to the start of the calling party GT INAPNUMBER 0= suppresses the insertion of a zero. Optional.
ALLOCATED_TSAN_TIMEOUT= <i>seconds</i>	15	Period an allocated Temporary Service Access Number (TSAN) remains valid. Optional.
CANCELLED_TSAN_TIMEOUT= <i>seconds</i>	15	Period a canceled TSAN remains in a canceled state. Optional.
LOCAL_NUMBER_INDICATOR= <i>string int</i>		Used to strip digits from the called number, after the normal normalization process has been completed. <i>int</i> is the number of digits to strip from the front of the called number before it is matched to <i>string</i> to identify if the called number is a local number.
SERVICE_KEY= <i>int</i>		The service key used to transfer dialogs to CCS, and in the initial DP sent to CCS. This must be set in the <i>SLEE.cfg</i> .
TRANSLATE= <i>string1 string2 int</i>		Defines numbers to be translated by RAP. <i>string1</i> is translated to <i>string2</i> with the 'Nature of Address' set to <i>int</i> . There are a maximum of 10 definitions. Remove unused TRANSLATE definitions to improve performance.

Parameter	Default	Description
		Note: The CAMEL encoding for '*' comes as a 'A' not 'B' as in CS1. For example: short code *111 should be written as: TRANSLATE=A111 B111 2 Optional.
TSAN_INTERNATIONAL_PREFIX= <i>int</i>		The international prefix that will be added to the TSAN if it is a local number.
TSAN_PREFIX= <i>int</i>		The prefix for all temporary service access numbers.
TSAN_RANGE= <i>int int</i>		Defines the beginning and the end of the TSAN range when appended to the TSAN_PREFIX.

Failure

If the RAP application fails, then no calls can be made whilst roaming.

Output

The RAP application writes error messages to the system log file.

TRANS

Purpose

Trans allows prepaid customers to be called whilst roaming.

Startup

TRANS is a SLEE application that is started by the SLEE. You must declare TRANS in the SLEE configuration file (**SLEE.cfg**) as follows:

```
SERVICEKEY=INTEGER 700001 trans
SERVICE=trans 1 trans trans
APPLICATION=trans trans.sh /IN/service_packages/RAP/bin 1 1
```

Parameters

None.

Failure

If the TRANS application fails, then the no calls can be received whilst roaming.

Output

The TRANS application writes error messages to the system log file.

The USSD Configuration Screens

Overview

Introduction

This chapter explains how to use the USSD configuration screen.

Note: You can access the USSD configuration screen through the Service Management System Administration screens.

For more information on the functionality supported by the USSD screens, see *Service Management System User's Guide*.

In this Chapter

This chapter contains the following topics.

Barred Numbers	19
IMSI to MSISDN mapping	20
Statistic Reporting	21

Barred Numbers

Introduction

The **Barred Numbers** tab is used to maintain the list of globally barred numbers for the USSD application.

This information is stored in the table USSD_BARRED_NUMBERS, which must be replicated to each SLC on which the service is to run.

Barred Numbers Tab

Here is an example of the **Barred Numbers** tab.

The screenshot shows a window titled "SU - USSD Configuration" with standard Windows window controls (minimize, maximize, close). Below the title bar is a row of buttons: Find, Save, Delete, Clear, Close, and Help. Below these buttons is a tabbed interface with two tabs: "Map Entry" and "Barred Numbers". The "Barred Numbers" tab is currently selected. Inside this tab, there is a form with the following fields:

- A label "Barred Number" followed by a text input field.
- A label "Change User" followed by a text input field.
- A label "Change Date" followed by a text input field.
- A label "Change Term" followed by a text input field.

 The bottom of the window is a light-colored horizontal bar.

Editing Barred Numbers

Follow these steps to add, modify or delete numbers from the barred numbers list.

Step	Action
1	Open the USSD Configuration screen, and select the Barred Numbers tab.
2	In the Barred Number field, enter either the prefix of the numbers to bar or the full number to bar. The Barred Number must be a unique numeric string and less than 30 digits long. Note: Use the Find button to find an existing number, if you do not know the exact number.
3	Click one of: • Save to save the changes to the database • Delete to remove a barred number from the list • Close to close the screen without saving the changes

IMSI to MSISDN mapping

Introduction

The **Map Entry** tab allows you to configure the mappings between the International Mobile Subscriber Identifier (IMSI) and Mobile Station Integrated Services Digital Network (MSISDN).

It is only available on installations where the USSD_IMSI_X_MSISDN table for number translations is installed. The map information is stored in the USSD_IMSI_X_MSISDN table, and must be replicated to each SLC that USSD runs on.

Note: Entries in this table are ignored if the IMSIISMSISDN option has been set for the USSD application.

Map Entry tab

Here is an example **Map Entry** tab.

The screenshot shows a window titled "SU - USSD Configuration" with a blue title bar. Below the title bar are six buttons: "Find", "Save", "Delete", "Clear", "Close", and "Help". The "Map Entry" tab is selected, and the "Barred Numbers" sub-tab is also visible. The main area contains several input fields: "IMSI" (a long text box), "MSISDN" (a shorter text box), "Change User" (a text box), "Change Date" (a text box), and "Change Term" (a text box). The background of the main area is a light beige color.

Editing Map Entries

Follow these steps to add, modify or delete IMSI to MSISDN mapping entries.

Step	Action
1	Open the USSD Configuration screen and select the Map Entry tab.
2	In the IMSI field, enter the IMSI number. The IMSI number must be a unique numeric string, less than 40 digits long. It cannot be null. Note: Use the Find button to search for an existing map entry if you do not know the exact number.
3	In the MSISDN field enter the MSISDN number to map to. The MSISDN number must be a unique numeric string, less than 20 digits long. It cannot be null. Note: The MSISDN has a foreign key constraint on CCS_ACCT_REFERENCE.CLI.
4	Click one of: • Save to save the changes to the database • Delete to delete a map entry • Close to close the screen without saving the changes

Statistic Reporting

Introduction

There are several statistics recorded for the USSD application. They are displayed using the standard SMS Statistics Management screen. For more information, see *Service Management System User's Guide*.

Find Statistics Screen

Here is an example of the Find Statistics screen.

SU - Find Statistics

Search Clear Close Help

Statistic ID

Application

Statistic ID	Application	Description	Period
--------------	-------------	-------------	--------

About Installation and Removal

Overview

Introduction

This chapter provides information about the installed components for the Oracle Communications Network Charging and Control (NCC) application described in this guide. It also lists the files installed by the application that you can check for, to ensure that the application installed successfully.

In this Chapter

This chapter contains the following topics.

Installation and Removal Overview 23

Installation and Removal Overview

Introduction

For information about the following requirements and tasks, see *Installation Guide*:

- NCC system requirements
- Pre-installation tasks
- Installing and removing NCC packages

Roaming packages

An installation of Roaming includes the following packages, on the:

- SMS:
 - roamingSms
- SLC:
 - roamingScp