Oracle® Communications Convergent Charging Controller

Roaming Technical Guide

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Contents

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 Convergent Charging Controller documentation.

Formatting Convention	Type of Information
Special Bold	Items you must select, such as names of tabs. Names of database tables and fields.
Italics	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.
variable	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.

Chapter 1

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

This chapter contains the following topics.

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

Chapter 2

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

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 nationalUnknownIdicator nationalUnknownCut pasteNationalUnknown
internationalUnknownIndicator internationalUnknownCut pasteInternationalUnkown
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.
```

```
#    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
```

```
#       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'operateur..."
#    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. Sprobuj pozniej"
#    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
spater nochmal an.  Danke"
#    MSG_ACCTPROBLEM_POL = "Przepraszamy, twoje konto jest zablokowane. Sprobuj pozniej"
#    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
```

Chapter 3

Background Processes

Overview

Introduction

This chapter describes processes that run the Roaming applications.

In this Chapter

This chapter contains the following topics.

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=*int*	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 • 0= do not allow outgoing calls

Parameter	Default	Description
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=*string*	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=*secs*	15	Specifies the amount of time the application (ACS/CCS) has to respond to a Direct Trigger request.
ICA_CALLED_PARTY_STRIP=*string*	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=*string*		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=*int*	2	Configures the NOA for the called party number that is send out in the ICA/IAM operation.
ICA_CALLING_NOA=*int*	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=*secs*	15	Defines the timeout value for a ring tone no reply BCSM event.
MIN_BALANCE=*int*	1	Defines the minimum balance for a subscriber before call back will be allowed.
MSG_ACCTPROBLEM_*XXX*	DEF	String to be returned when a problem with a Caller's account has occurred.

Parameter	Default	Description
		See the *Languages* (on page 16) definition for valid values of *XXX*. **Default:** "Przepraszamy, twoje konto jest zablokowane. Sprobuj pozniej" 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 *Languages* (on page 16) definition for valid values of *XXX*. **Default:** "Ten numer jest nieprawidlowy" 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 *Languages* (on page 16) definition for valid values of *XXX*. **Default:** "Przepraszamy, polaczenia z tym numerem sa zablokowane" or in the language denoted by *XXX*.
MSG_BLACKLISTED_*XXX*	DEF	String to be returned as the Voucher Recharge message when the caller has been black listed. See the *Languages* (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 *Languages* (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 *Languages* (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 *Languages* (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 *Languages* (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_*XXX*	DEF	String to be returned for non-template Balance Query responses where the Free SMS balance is zero/negative. See the *Languages* (on page 16) definition for valid values of *XXX*. **Default:** "Sorry, you have no free SMS left" or in the language

Parameter	Default	Description
		denoted by *XXX*.
MSG_NOCALLCREDIT_*XXX*	DEF	String to be prefixed to the balance amount when a caller does not have enough balance to make the call. See the *Languages* (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 *Languages* (on page 16) definition for valid values of *XXX*. **Default:** "Prezepraszamy, polaczenia z tym numerem sa zablokowane" or in the language denoted by *XXX*
MSG_OPERATOR_*XXX*		String to be returned when the callback number was the Operator. See the *Languages* (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_*XXX*		String to be returned when a technical problem has occurred. See the *Languages* (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=*string*		Local country code to use when matching the MSISDN in the roaming MTC trigger.
NAP_TIMEOUT=*secs*	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=*string*		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=*usr*/*pwd*		Defines the oracle username and password to use when connecting to SCP database.
QUERY_ALLOWED_STATES=*string*	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

Parameter	Default	Description
SERVICE_KEY=*int*	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=*int*		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 =*int*		Specifies the Balance IDs to include in the Balance Query response when the balance is zero/negative.
TIMERIF=*string*	Timer	Defines the timer interface name.
TRANSLATE=*string1 string2*		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_ZON E=*string*	A32	Defines the calling number for the IDP created for CCS
USSD_MSRN_PREFIX=*st ring*	B32	The MSRN 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 *Languages* (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 *Languages* (on page 16) definition for valid values of *XXX.* **Default:** "Your account balance is now " or in the language denoted by *XXX*.
VR_LEAD_OUT_*XXX*	DEF	String to be appended to the end of the successful Voucher Recharge response message. See the *Languages* (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 *Languages* (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*.

Parameter	Default	Description
VR_REDEEMED_*XXX*	DEF	String to be returned when a voucher has already been redeemed. See the *Languages* (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 *Languages* (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=*int*	3	The NOA value for the calling party to be passed to ACS. Optional.
ADD_CALLING_PARTY_ZERO=*int*		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=*seconds*	15	Period an allocated Temporary Service Access Number (TSAN) remains valid. Optional.
CANCELLED_TSAN_TIMEOUT=*seconds*	15	Period a canceled TSAN remains in a canceled state. Optional.
LOCAL_NUMBER_INDICATOR=*string int*		Used to strip digits from the called number, after the normal normalization process has been completed. *int* is the number of digits to strip from the front of the called number before it is matched to *string* to identify if the called number is a local number.
SERVICE_KEY=*int*		The service key used to transfer dialogs to CCS, and in the initial DP sent to CCS. This must be set in the **SLEE.cfg**.
TRANSLATE=*string1 string2 int*		Defines numbers to be translated by RAP. *string1* is translated to *string2* with the 'Nature of Address' set to *int*. There are a maximum of 10 definitions. Remove unused TRANSLATE definitions to improve performance. **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=*int*		The international prefix that will be added to the TSAN if it is a local number.
TSAN_PREFIX=*int*		The prefix for all temporary service access numbers.
TSAN_RANGE=*int int*		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.

Chapter 4

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

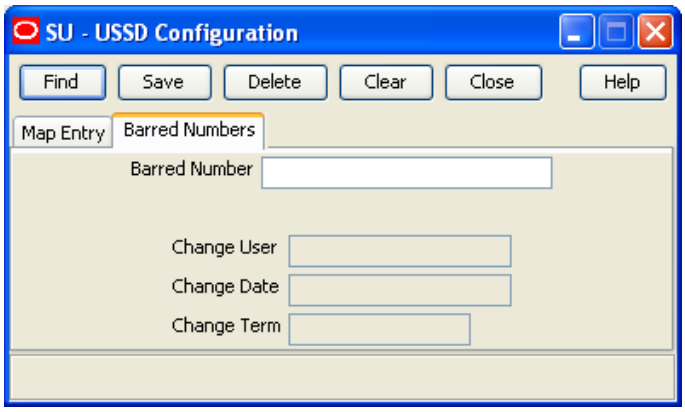
Introduction

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.



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

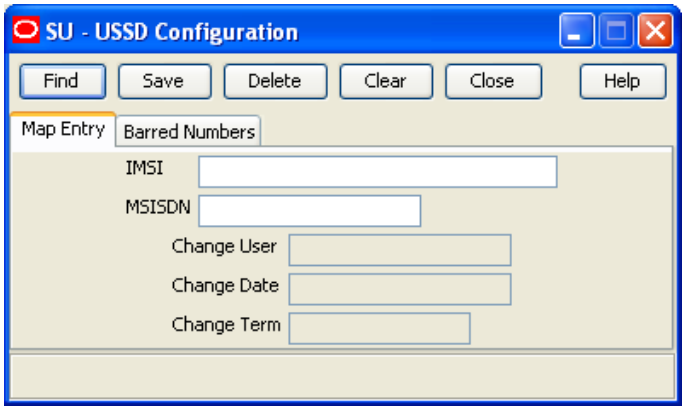
The **Map Entry** tab allows you to configure the mappings between the International Mobile Subscriber Identifier (IMSI) and Mobile Station Integrated Services Digital Network (MSISDN).

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.



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

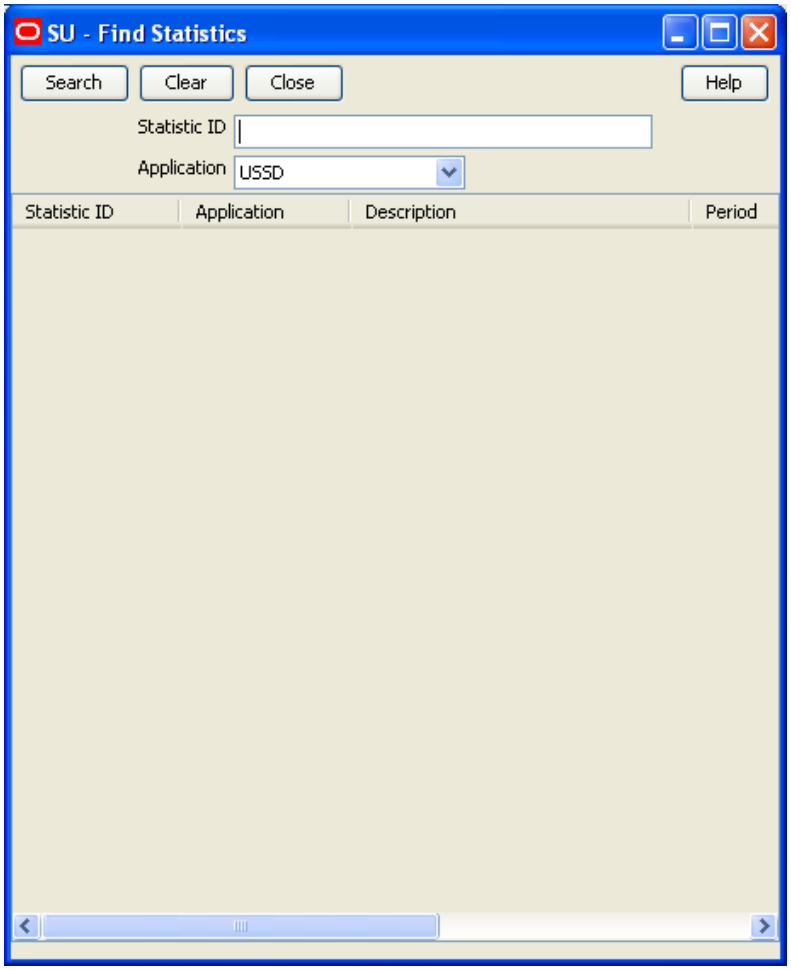
Statistic Reporting

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.



Chapter 5

About Installation and Removal

Overview

Introduction

This chapter provides information about the installed components for the Convergent Charging Controller 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

Introduction

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

- Convergent Charging Controller system requirements
- Pre-installation tasks
- Installing and removing Convergent Charging Controller packages

Roaming packages

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

- SMS:
  - roamingSms
- SLC:
  - roamingScp

Glossary of Terms

ACS

Advanced Control Services configuration platform.

ANI

Automatic Number Identification - Term used in the USA by long-distance carriers for CLI.

BCSM

Basic Call State Model - describes the basic processing steps that must be performed by a switch in order to establish and tear down a call.

C7

See SS7.

CAMEL

Customized Applications for Mobile network Enhanced Logic

This is a 3GPP (Third Generation Partnership Project) initiative to extend traditional IN services found in fixed networks into mobile networks. The architecture is similar to that of traditional IN, in that the control functions and switching functions are remote. Unlike the fixed IN environment, in mobile networks the subscriber may roam into another PLMN (Public Land Mobile Network), consequently the controlling function must interact with a switching function in a foreign network. CAMEL specifies the agreed information flows that may be passed between these networks.

CC

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

CCS

1) Charging Control Services component.

2) Common Channel Signalling. A signalling system used in telephone networks that separates signalling information from user data.

CLI

Calling Line Identification - the telephone number of the caller. Also referred to as ANI.

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”.

CS1

ETSI INAP Capability Set 1. An ITU standard.

DP

Detection Point

ETSI

European Telecommunications Standards Institute

FDA

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

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.

GT

Global Title.

The GT may be defined in any of the following formats:

- Type 1: String in the form "1,<noa>,<BCD address digits>"
- Type 2: String in the form "2,<trans type><BCD address digits>"
- Type 3: String in the form "3,<trans type>,<num plan>,<BCD address digits>"
- Type 4: String in the form "4,<trans type>,<num plan>,<noa>,<BCD address digits>"

The contents of the Global Title are defined in the Q713 specification, please refer to section 3.4.2.3 for further details on defining Global Title.

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

ICA

InitiateCallAttempt. A CAMEL/INAP operation sent by the SLC to an SSP request that a voice call is started.

IDP

INAP message: Initial DP (Initial Detection Point)

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.

Initial DP

Initial Detection Point - INAP Operation. This is the operation that is sent when the switch reaches a trigger detection point.

ISDN

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

ITU

International Telecommunication Union

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.

MIN

Mobile Identification Number, also known as an MSID.

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.

MSID

Mobile Subscriber Identification, also known as an MIN.

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

MTC

Mobile Terminated Call. The part of the call associated with a subscriber receiving an inbound call.

NOA

Nature Of Address - a classification to determine in what realm (Local, National or International) a given phone number resides, for the purposes of routing and billing.

PLMN

Public Land Mobile Network

SCP

Service Control Point. Also known as SLC.

SGSN

Serving GPRS Support Node

SK

Service Key

SLC

Service Logic Controller (formerly UAS).

SLEE

Service Logic Execution Environment

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.

SSP

Service Switching Point

Switching Point

Anything that can send and receive C7 messages.

TSAN

Temporary Service Access Number

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.

VSSP

Virtual SSP

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