

**Oracle® Communications
Convergent Charging Controller**

Messaging Manager Navigator Technical Guide

Release 6.0.1

April 2017

Copyright

Copyright © 2017, Oracle and/or its affiliates. All rights reserved.

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

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

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

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

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

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

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

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

Contents

About This Document	v
Document Conventions	vi
Chapter 1	
System Overview	1
Overview	1
What is Messaging Manager Navigator?	1
Chapter 2	
Configuration.....	3
Overview.....	3
RIMS Configuration File	3
MAP	5
IS41	8
Caching	11
Chassis Actions	13
Chapter 3	
Background Processes	17
Overview.....	17
Statistics	17
Chapter 4	
About Installation and Removal.....	19
Overview.....	19
Installation and Removal Overview	19
Checking the Installation	19
Glossary of Terms.....	21
Index	27

About This Document

Scope

The scope of this document includes all the information required to install, configure and administer the Messaging Manager Navigator application.

Audience

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

Prerequisites

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.

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

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

Related Documents

The following documents are related to this document:

- *MM Technical Guide*
- *MM User's 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.
<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 Convergent Charging Controller network or service implications of the product.

In this Chapter

This chapter contains the following topics.

What is Messaging Manager Navigator? 1

What is Messaging Manager Navigator?

Introduction

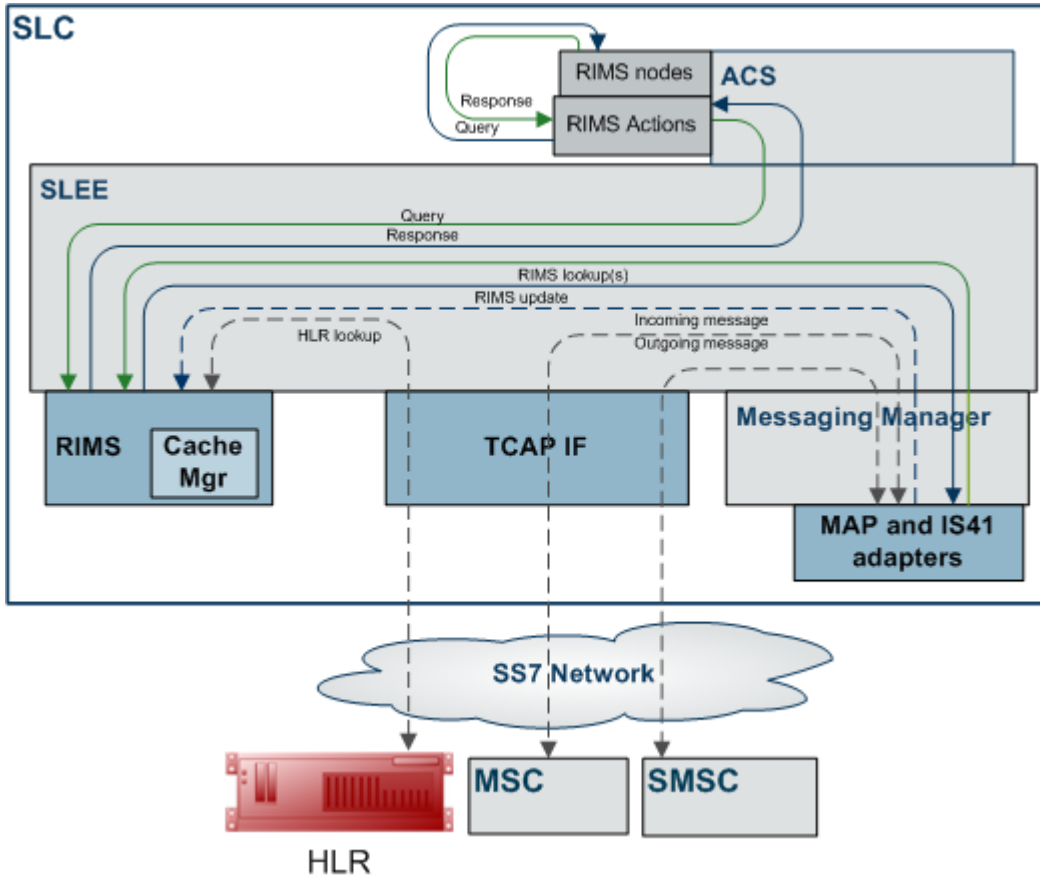
Messaging Manager Navigator is a SLEE interface which caches as much of the HLR lookup information as possible. This reduces the amount of network traffic, and makes the HLR information available to other applications.

Messaging Manager Navigator performs a protocol specific HLR dip. It supports both IS-41 CDMA and MAP (1,2,3) messages. It supports cache maintenance commands from other processes for functions such as clearing/invalidating cache entries and updating cache entries. The cached HLR information is required by Messaging Manager to perform FDA.

Note: Throughout this manual there are references to RIMS. This is the name of the Messaging Manager Navigator program.

SLC processes

Here is a diagram showing the Messaging Manager Navigator and HLR lookup processes on the SLC.



Configuration

Overview

Introduction

This chapter explains the configuration of the RIMS section of the `eserv.config` file.

In this chapter

This chapter contains the following topics.

RIMS Configuration File	3
MAP	5
IS41	8
Caching.....	11
Chassis Actions	13

RIMS Configuration File

Example config file

Here is an example of the Messaging Manager Navigator config section (known as RIMS) of the `eserv.config`.

```
RIMS = {

    tcapInterfaceServiceKey = 42

    sleepTime = 100000

    hlrTimeout = 3

    hlrErrorMap = [
        { error = 1, permanent = true }
        { error = 32, permanent = false }
    ]

    MAP = {
        defaultMapVersionHlr = 3
        hlrErrorMap = [
            { error = 1, permanent = true }
            { error = 32, permanent = false }
            { error = 73, permanent = true }
        ]

        GT = ""
        PC = 17
        SSN = 9

        checkCacheForTcap = false

        ignoreMwStatusMCEF = true
    }
}
```

```

    forwardInformSC = false
}

IS41 = {
    MdnMinTranslation = [
        { fromNoa=306, prefix="3", min=4, max=32, remove=2, prepend="1111" }
        { fromNoa=0, prefix="00", min=4, max=32, remove=0, prepend="" }
        { fromNoa=0, prefix="0", min=1, max=32, remove=1, prepend="0032" }
        { fromNoa=0, prefix="", min=1, max=6, remove=0, prepend="" }
        { fromNoa=0, prefix="", min=1, max=32, remove=0, prepend="0032" }
        { fromNoa=1, prefix="", min=1, max=32, remove=0, prepend="00" }
        { fromNoa=2, prefix="", min=1, max=32, remove=0, prepend="0032" }
    ]

    GT = ""
    PC = 17
    SSN = 8

    checkCacheForTcap = false

    supportIS841 = false

    minHLRTransType = 3
    mdnHLRTransType = 14
}

# Cache tuning options
cache = {
    size = 5000000

    defaultSuccessValidityPeriod = "01:00:00"
    defaultTransientFailureValidityPeriod = "00:30:00"
    defaultPermanentFailureValidityPeriod = "04:00:00"

    successValidityPeriods = {
        { prefix = "027", period = "01:30:00" }
        { prefix = "021", period = "00:45:00" }
    }
    transientFailureValidityPeriods = {
        { prefix = "027", period = "00:15:00" }
    }
    permanentFailureValidityPeriods = {
        { prefix = "027", period = "03:00:00" }
    }
}

ChassisActions = {
    RimsChassisAction = {
        rimsInterfaceName = "rimsIf"
        TON = "001"
        NPI = "001"
        allowGPRS = true
        timeout = 3
        timeoutTick = 3
        scaUseRedirect = false
    }
}
}

```

RIMS parameters

Here are the parameters for the main section of the RIMS config.

hlrTimeout

Syntax: hlrTimeout = *secs*
Description: Timeout period for queries to the HLR.
Allowed: seconds
Default:
Notes:
Example: hlrTimeout = 3

sleepTime

Syntax: sleepTime = *microseconds*
Description: Sleep time when there is no work to do.
Allowed: microseconds
Default:
Notes:
Example: sleepTime = 10000

tcapInterfaceServiceKey

Syntax: tcapInterfaceServiceKey = *num*
Description: SLEE service key of Hughes stack.
Allowed:
Default:
Notes:
Example: tcapInterfaceServiceKey = 42

MAP

Introduction

The RIMS config includes a sub-section for interacting with the MAP plug-in.

IMSI store location

Destination fields for data from RIMS for IMSI are in the callingImsi or calledImsi.

VMSC store location

Destination fields for data from RIMS for VMSC are in the locationNum or the calledLocationNum.

SGSN store location

Destination fields for data from RIMS for SGSN is in the callingSgsn or the calledSgsn.

Example MAP config

Here is an example configuration of the MAP subsection of the RIMS section.

```
MAP = {
    defaultMapVersionHlr = 3
```

Chapter 2

```
hlrErrorMap = [  
    { error = 1, permanent = true }  
    { error = 32, permanent = false }  
    { error = 73, permanent = true }  
]  
  
GT = ""  
PC = 17  
SSN = 9  
  
checkCacheForTcap = false  
  
ignoreMwStatusMCEF = true  
  
forwardInformSC = false  
}
```

MAP parameters

Here are the MAP configuration parameters.

Note: GT, PC and SSN form the source address used by Messaging Manager Navigator when consulting a MAP HLR.

checkCacheForTcap

Syntax: `checkCacheForTcap = true|false`
Description: Determines whether the RIMS cache will be checked for MAP SRISM messages.
Type: Boolean
Allowed: true, false
Default: false
Notes:
Example: `checkCacheForTcap = false`

defaultMapVersionHlr

Syntax: `defaultMapVersionHlr = num`
Description: MAP version used to query the HLR.
Allowed:
Default:
Notes:
Example: `defaultMapVersionHlr = 3`

forwardInformSC

Syntax: `forwardInformSC = true|false`
Description: Prevent RIMS sending InformServiceCentre message to XMS
Type: Boolean
Optionality: Optional (default used if not set).
Allowed:
Default: false
Notes:
Example: `forwardInformSC = false`

GT

Syntax: GT = *num*
Description: Originating Global Title used by the HLR to communicate back to Messaging Manager or Messaging Manager Navigator (RIMS).
Allowed: Valid global title number
Default:
Note: This parameter takes priority over PC or SSN match.
Example: GT = "62912425346"

hlrErrorMap

Syntax:

```
hlrErrorMap = [
  {
    error = int, permanent = true|false
  }
  ...
]
```

Description: Mapping of HLR responses to severity.
Type: Array
Allowed:
Default:
Notes:
Example:

```
hlrErrorMap = [
  { error = 1, permanent = true }
  ...
]
```

ignoreMwStatusMCEF

Syntax: ignoreMwStatusMCEF= *true|false*
Description: If true, SMSC will deliver the SMS even with MCEF flag set.
Type: Boolean
Optionality: Optional (default used if not set).
Allowed: true, false
Default: true
Notes:
Example: ignoreMwStatusMCEF= true

PC

Syntax: PC = *num*
Description: Originating Point Code array of messages used by the HLR to communicate back to Messaging Manager or Messaging Manager Navigator (RIMS).
Allowed: Defined by Network Administrator
Default: 0
Note:

- This parameter takes priority over SSN match.
- To remove the point code from outgoing requests, set the PC value to 65535.

Example: PC = 17

SSN

Syntax: SSN = *num*

Description: Originating Subsystem Number of the messages used by HLR to communicate back to Messaging Manager or Messaging Manager Navigator (RIMS).

Allowed: Valid sub system number.

Default:

Note:

Example: SSN = 9

IS41

Introduction

When Messaging Manager performs a RIMS query using the IS41 Protocol, RIMS uses a set of number rules to normalise the MDN to a MIN. The MIN is then sent to the HLR and used to locate the VMSC.

Note: This is the default action; however you can turn this off and allow RIMS to send the MDN to the HLR, rather than perform the conversion.

The RIMS config includes a sub-section for interacting with the IS-41 plug-in.

MIN store location

Destination fields for data from RIMS for MIN are in the callingImsi or calledImsi.

VMSC store location

Destination fields for data from RIMS for VMSC are in the locationNum or the calledLocationNum.

IS41 Errors

ACCESS_DENIED_REASON_Denied and ACCESS_DENIED_REASON_Invalid will generate permanent failures.

The presence of any other value in the SMS Access Denied field will generate a transient failure.

Example IS41 config

Here is an example configuration of the IS41 subsection of the RIMS section.

```
IS41 = {
  MdnMinTranslation = [
    { fromNoa=306, prefix="3", min=4, max=32, remove=2, prepend="1111" }
    { fromNoa=0, prefix="00", min=4, max=32, remove=0, prepend="" }
    { fromNoa=0, prefix="0", min=1, max=32, remove=1, prepend="0032" }
    { fromNoa=0, prefix="", min=1, max=6, remove=0, prepend="" }
    { fromNoa=0, prefix="", min=1, max=32, remove=0, prepend="0032" }
    { fromNoa=1, prefix="", min=1, max=32, remove=0, prepend="00" }
    { fromNoa=2, prefix="", min=1, max=32, remove=0, prepend="0032" }
  ]

  GT = ""
  PC = 17
  SSN = 8

  checkCacheForTcap = false
}
```

```

supportIS841 = false

minHLRTransType = 3
mdnHLRTransType = 14
}

```

IS41 parameters

Here are the IS41 configuration parameters.

Note: GT, PC and SSN form the address used by Messaging Manager Navigator when consulting IS41 HLR.

checkCacheForTcap

Syntax: `checkCacheForTcap = true|false`
Description: Determines whether the RIMS cache will be checked for IS41 SMSReq messages.
Type: Boolean
Allowed: true, false
Default: false
Notes:
Example: `checkCacheForTcap = false`

GT

Syntax: `GT = "num"`
Description: Originating Global Title used by the HLR to communicate back to Messaging Manager or Messaging Manager Navigator (RIMS).
Allowed: Valid global title number
Default:
Note: This parameter takes priority over PC or SSN match.
Example: `GT = "62912425346"`

mdnHLRTransType

Syntax: `mdnHLRTransType = num`
Description: The Global Title translation type to be used for lookups to the HLR when using an MDN.
Allowed:
Default: 14
Note:
Example: `mdnHLRTransType = 14`

MdnMinTranslation

Syntax:

```

MdnMinTranslation = [
  {
    Number_Normalization_Rules_Parameters
  }
  ...
]

```

Description: Translates an MDN to MIN.
Type: Array

Allowed:

Default:

Notes: This parameter uses Number Normalization rules to perform the translation. For information about the Number Normalization parameters shown in the example below, see *MM Technical Guide*.

Example:

```
MdnMinTranslation = [
  {
    fromNoa = 0,
    prefix = "3">,
    min = 4,
    max = 32,
    remove = 2,
    prepend = "0035"
  }
  ...
]
```

minHLRTransType

Syntax: minHLRTransType = num

Description: The Global Title translation type to be used for lookups to the HLR when using an MIN.

Allowed

Default: 3

Note:

Example: minHLRTransType = 3

PC

Syntax: PC = num

Description: Originating Point Code array of messages used by the HLR to communicate back to Messaging Manager or Messaging Manager Navigator (RIMS).

Allowed Defined by Network Administrator

Default: 0

Note:

- This parameter takes priority over SSN match.
- To remove the point code from outgoing requests, set the PC value to 65535.

Example: PC = 17

SSN

Syntax: SSN = num

Description: Originating Subsystem Number of the messages used by HLR to communicate back to Messaging Manager or Messaging Manager Navigator (RIMS).

Allowed Valid sub system number.

Default:

Note:

Example: SSN = 9

supportIS841

Syntax: supportIS841 = true|false

Description: Determines whether to send the MDN to the HLR, if there is an MDN available, rather than perform the conversion.

Type:	Boolean
Allowed:	true, false
Default:	false
Notes:	If set to true, HLR lookups will be used in preference to <code>MdnMinTranslation</code> .
Example:	<code>supportIS841 = false</code>

Caching

Introduction

Messaging Manager Navigator is a SLEE component which provides HLR lookup and caching. This component communicates with other SLEE components using the predefined RIMS protocol or MAP/IS-41 HLR lookups over TCAP.

Messaging Manager Navigator caches the results of the HLR queries. This information should be retained for different periods of time depending on its type (a real result, or a failure of some kind) and which network it belongs to.

The primary input of information to the RIMS cache is from the Messaging Manager Navigator HLR query responses, however it is possible to update the RIMS cache from other processes. This is useful for such things as invalidating any cached entry when a MAP-ALERT-SERVICECENTRE message is received, reinvigorating the cached entry when a delivery using that information works, or updating the VMSC based on incoming calls.

The RIMS cache has indexes over the MSISDN/MDN and IMSI/MIN for the same data, although both point to the same information.

Cache operations

There are a number of things that is done to the cache data.

- Look up existing entries
- Add new entries
- If the cache is full, expire the oldest entries
- Update existing entries

Note: When a new element is added to the cache, its validity period is set from the configuration. The configuration is only consulted when an item is added, not every time it is updated.

A validity period of 00:00:00 means that an entry should not be added to the cache. If an element is not added to the cache for this reason, the update function (used for both additions and updates) will return false as though it already contained more relevant data for that key.

Example caching config

Here is an example configuration of the `cache` section of RIMS.

```
RIMS = {
  cache = {
    size = 5000000

    defaultSuccessValidityPeriod = "01:00:00"
    defaultTransientFailureValidityPeriod = "00:30:00"
    defaultPermanentFailureValidityPeriod = "04:00:00"

    successValidityPeriods = {
```

Chapter 2

```
        { prefix = "027", period = "01:30:00" }
        { prefix = "021", period = "00:45:00" }
    }
    transientFailureValidityPeriods = {
        { prefix = "027", period = "00:15:00" }
    }
    permanentFailureValidityPeriods = {
        { prefix = "027", period = "03:00:00" }
    }
}
}
```

Cache parameters

Here are the Cache configuration parameters

`defaultPermanentFailureValidityPeriod`

Syntax: `defaultPermanentFailureValidityPeriod = "time"`
Description: Lifetime of permanent failure results not covered by a specific IMSI/MIN prefix.
Allowed HH:MM:SS
Default:
Note:
Example: `defaultPermanentFailureValidityPeriod = "00:00:30"`

`defaultSuccessValidityPeriod`

Syntax: `defaultSuccessValidityPeriod = "time"`
Description: Lifetime of successful results not covered by a specific IMSI/MIN prefix.
Allowed HH:MM:SS
Default:
Note:
Example: `defaultSuccessValidityPeriod = "00:01:00"`

`defaultTransientFailureValidityPeriod`

Syntax: `defaultTransientFailureValidityPeriod = "time"`
Description: Lifetime of transient failure results not covered by a specific IMSI/MIN prefix.
Allowed HH:MM:SS
Default:
Note:
Example: `defaultTransientFailureValidityPeriod = "00:00:10"`

`permanentFailureValidityPeriods`

Syntax: `permanentFailureValidityPeriods = "time"`
Description: Permanent failure validity period set per IMSI/MIN prefix.
Allowed HH:MM:SS
Default:
Note:
Example: `permanentFailureValidityPeriods = "00:00:30"`

size

Syntax: size = *int*
Description: Maximum number of HLR responses to cache at any one time
Allowed
Default:
Note: Value specified in bytes
Example: size = 100

successValidityPeriods

Syntax: successValidityPeriods = "*time*"
Description: Success validity period set per IMSI/MIN prefix.
Allowed HH:MM:SS
Default:
Note:
Example: successValidityPeriods = "00:00:30"

transientFailureValidityPeriods

Syntax: transientFailureValidityPeriods = "*time*"
Description: Transient failure validity period set per IMSI/MIN prefix.
Allowed HH:MM:SS
Default:
Note:
Example: transientFailureValidityPeriods = "00:00:30"

Chassis Actions

Introduction

The RIMS config includes a `ChassisActions` sub-section.

Example ChassisActions config

Here is an example configuration of the `ChassisActions` sub-section of the RIMS section.

```
ChassisActions = {
  RimsChassisAction = {
    rimsInterfaceName = "rimsIf"
    TON = "001"
    NPI = "001"
    allowGPRS = true
    timeout = 3
    timeoutTick = 3
    scaUseRedirect = false
  }
}
```

RimsChassisAction parameters

Here are the parameters in the `RimsChassisAction` array of the `ChassisActions` section of the `eserv.config`.

`allowGPRS`

Syntax:	<code>allowGPRS = true false</code>
Description:	Determines whether the network supports GPRS.
Type:	Boolean
Allowed:	true, false
Default:	true
Notes:	MAP node specific parameter
Example:	<code>allowGPRS = true</code>

`NPI`

Syntax:	<code>NPI = "value"</code>
Description:	Specifies the Number Plan Indicator value that will be filled into the query key value, in the case that the query key to be used in one of the extension digits fields.
Allowed	Values: <ul style="list-style-type: none"> • 000 = unknown • 001 = ISDN (E.163/E.164) • 003 = Data (X.121) • 004 = Telex (F.69) • 006 = Land mobile (E.212) • 008 = National • 009 = Private • 010 = ERMES • 013 = Point Code & subscriber number • 014 = Internet (IP) • 018 = WAP
Default:	"001"
Note:	The <code>NPI</code> should be set to the most likely <code>NPI</code> for an MSISDN or MDN, as it will be used as part of the query to Messaging Manager Navigator and the HLR.
Example:	<code>NPI = "001"</code>

`rimInterfaceName`

Syntax:	<code>rimInterfaceName = "name"</code>
Description:	Controls the interface that the chassis action creates a SLEE dialog to.
Allowed	string - valid name of interface
Default:	"rimIf"
Note:	
Example:	<code>rimInterfaceName = "rimIf"</code>

`scaUseRedirect`

Syntax:	<code>scaUseRedirect = true false</code>
Description:	Populate the SCA Address from the IDP Redirecting Party

Type: Boolean
Optionality: Optional (default used if not set).
Allowed: true, false
Default: false
Notes:
Example: `scaUseRedirect = false`

timeout

Syntax: `timeout = secs`
Description: Timeout if Messaging Manager Navigator does not reply.
Allowed: seconds
Default:
Notes:
Example: `timeout = 3`

timeoutTick

Syntax: `timeout = secs`
Description: The length of a timeout monitoring period.
Allowed: seconds. Minimum value is 1.
Default:
Notes: Changing this value will change the timeout for all SLEE based applications running on the same SLEE as Messaging Manager Navigator.
Example: `timeout = 3`

TON

Syntax: `TON = "value"`
Description: Specifies the Type of Number value that will be filled into the query key value, in the case that the query key to be used in one of the extension digits fields.
Allowed Values:

- 000 = unknown
- 001 = international
- 002 = national
- 003 = network_specific
- 004 = subscriber_number
- 005 = alphanumeric
- 006 = abbreviated

Default: "001"
Note: The TON should be set to the most likely TON for an MSISDN or MDN, as it will be used as part of the query to Messaging Manager Navigator and the HLR.
Example: `TON = "001"`

Background Processes

Overview

Introduction

This chapter explains the background processes that run for Messaging Manager Navigator.

In this chapter

This chapter contains the following topics.

Statistics 17

Statistics

Introduction

Messaging Manager Navigator gathers statistics when it receives queries, for example from MMX, and when it sends requests to the HLR.

When Messaging Manager Navigator can't respond to a query from its internal cache, it will ask the HLR for information using:

- in the case of GSM MAP, a `SendRoutingInfoForSM` request; or
- in the case of IS-41 and IS841, an `SMSequest`.

Messaging Manager Navigator statistics are generated by each SCP, and then transferred at periodic intervals to the Service Management Platform (SMP) for permanent storage and analysis.

An existing statistics system (`smsStats`) provides functions for the collection of basic statistical events. This is provided in the Oracle SMS application. Refer to the *SMS Technical Guide* for details.

Statistics gathered

The incidence of 12 separate events is counted, classified under the following names.

`SMS_SET_ROUTING_INFO`

Incremented when Messaging Manager Navigator receives a RIMS update request.

`SMS_GET_ROUTING_INFO`

Incremented when Messaging Manager Navigator receives a RIMS query request.

`SMS_GET_ROUTING_INFO_SUCCESS`

Incremented when Messaging Manager Navigator returns a RIMS response with the status of 'successful'.

`SMS_GET_ROUTING_INFO_FAIL`

Incremented when Messaging Manager Navigator returns a RIMS response with a status other than 'successful'.

Chapter 3

SMS_MAP_SRI_SM_ATTEMPT

Incremented whenever Messaging Manager Navigator attempts to send a MAP SendRoutingInfoForSM message to the HLR.

SMS_MAP_SRI_SM_TEMP_ERR

Incremented when Messaging Manager Navigator receives a transient error response to a MAP SendRoutingInfoForSM message.

SMS_MAP_SRI_SM_PERM_ERR

Incremented when Messaging Manager Navigator receives a permanent error response to a MAP SendRoutingInfoForSM message.

SMS_MAP_SRI_SM_TIMEOUT

Incremented whenever Messaging Manager Navigator waits too long for a response to a MAP SendRoutingInfoForSM message.

SMS_IS41_SMSREQ_ATTEMPT

Incremented whenever Messaging Manager Navigator attempts to send an IS-(8)41 SMSRequest message to the HLR.

SMS_IS41_SMSREQ_TEMP_ERR

Incremented whenever Messaging Manager Navigator receives a transient error response to an IS-(8)41 SMSRequest message.

SMS_IS41_SMSREQ_PERM_ERR

Incremented whenever Messaging Manager Navigator receives a permanent error response to an IS-(8)41 SMSRequest message.

SMS_IS41_SMSREQ_TIMEOUT

Incremented whenever Messaging Manager Navigator has to wait too long for a response to an IS-(8)41 SMSRequest message.

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	19
Checking the Installation	19

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

RIMS packages

An installation of Messaging Manager Navigator includes the following packages, on the:

- SMS:
 - rimsSms
- SLC:
 - rimsScp

Checking the Installation

rimsScp installation check

On successful installation the rimsScp package will have installed the following binaries:

```
IN/service_packages/RIMS/bin/RIMS
```

The following shared libraries will have been installed:

```
/IN/service_packages/RIMS/lib/librimsChassisActions.so
/IN/service_packages/RIMS/lib/librimsMacroNodes.so
```

Unclustered rimsSms installation check

On successful installation the rimsSms package on an unclustered SMS will have created the following directories:

```
/IN/service_packages/RIMS  
/IN/service_packages/RIMS/lib  
/IN/service_packages/RIMS/tmp  
/IN/service_packages/RIMS/db
```

Clustered rimsSms installation check

On successful installation the rimsSms package on a clustered SMS will have created the following directories:

```
/IN/service_packages/RIMS  
/IN/service_packages/RIMS/lib  
/IN/service_packages/RIMS/tmp
```

Glossary of Terms

CC

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

CDMA

Code Division Multiple Access is a method for describing physical radio channels. Data intended for a specific channel is modulated with that channel's code. These are typically pseudo-random in nature, and possess favourable correlation properties to ensure physical channels are not confused with one another.

Connection

Transport level link between two peers, providing for multiple sessions.

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".

Diameter

A feature rich AAA protocol. Utilises SCTP and TCP transports.

DP

Detection Point

DTMF

Dual Tone Multi-Frequency - system used by touch tone telephones where one high and one low frequency, or tone, is assigned to each touch tone button on the phone.

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

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.

IP

- 1) Internet Protocol
- 2) Intelligent Peripheral - This is a node in an Intelligent Network containing a Specialized Resource Function (SRF).

IS-41

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

ISDN

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

ITU

International Telecommunication Union

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.

MCEF

Mobile-Station-Memory-Capacity-Exceeded-Flag. A part of the MWI to be stored in the HLR. MCEF is a boolean parameter indicating if the address list of MWD contains one or more entries because an attempt to deliver a short message to an MS has failed with a cause of MS Memory Capacity Exceeded. [Refer to GSM 03.40 Version 5.3.0: July 1996]

MDN

Mobile Directory Number

Messaging Manager

The Messaging Manager service and the Short Message Service components of Oracle Communications Convergent Charging Controller product. Component acronym is MMX (formerly MMX).

MIN

Mobile Identification Number, also known as an MSID.

MM

Messaging Manager. Formerly MMX, see also *XMS* (on page 26) and *Messaging Manager* (on page 23).

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.

MS

Mobile Station

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).

MT

Mobile Terminated

PC

Point Code. The Point Code is the address of a switching point.

PLMN

Public Land Mobile Network

RIMS

Routing Information for Mobile Services. Used to cache HLR lookup information.

Note: Now known as "Messaging Manager Navigator".

SCA

- 1) Service Centre Address
- 2) Session Control Agent for Session Initiation Protocol (SIP)

SCCP

Signalling Connection Control Part (part of the SS7 protocol stack).

SCP

Service Control Point. Also known as SLC.

Session

Diameter exchange relating to a particular user or subscriber access to a provided service (for example, a telephone call).

SGSN

Serving GPRS Support Node

SIP

Session Initiation Protocol - a signaling protocol for Internet conferencing, telephony, event notification and instant messaging. (IETF)

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.

SMP

Service Management Platform (also referred to as SMS).

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

SMSC

Short Message Service Centre stores and forwards a short message to the indicated destination subscriber number.

SN

Service Number

SRF

Specialized Resource Function – This is a node on an IN which can connect to both the SSP and the SLC and delivers additional special resources into the call, mostly related to voice data, for example play voice announcements or collect DTMF tones from the user. Can be present on an SSP or an Intelligent Peripheral (IP).

SRI

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

SS7

A Common Channel Signalling system is used in many modern telecoms networks that provides a suite of protocols which enables circuit and non-circuit related information to be routed about and between networks. The main protocols include MTP, SCCP and ISUP.

SSN

Subsystem Number. An integer identifying applications on the SCCP layer.

For values, refer to *3GPP TS 23.003*.

SSP

Service Switching Point

TCAP

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

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.

VMSC

Visited Mobile Switching Centre

WAP

Wireless Application Protocol. A standard designed to allow the content of the Internet to be viewed on the screen of a mobile device such as mobile phones, personal organisers and pagers. It also overcomes the processing limitation of such devices. The information and services available are stripped down to their basic text format.

XMS

Three letter code used to designate some components and path locations used by the Oracle Communications Convergent Charging Controller *Messaging Manager* (on page 23) service and the Short Message Service. The published code is *MMX* (on page 23) (formerly *MMX*).

Index

A

About Installation and Removal • 19
About This Document • v
allowGPRS • 14
Audience • v

B

Background Processes • 17

C

Cache operations • 11
Cache parameters • 12
Caching • 11
CC • 21
CDMA • 21
Chassis Actions • 13
checkCacheForTcap • 6, 9
Checking the Installation • 19
Clustered rimsSms installation check • 20
Configuration • 3
Connection • 21
Convergent • 21
Copyright • ii

D

defaultMapVersionHlr • 6
defaultPermanentFailureValidityPeriod • 12
defaultSuccessValidityPeriod • 12
defaultTransientFailureValidityPeriod • 12
Diameter • 21
Document Conventions • vi
DP • 21
DTMF • 21

E

Example caching config • 11
Example ChassisActions config • 13
Example config file • 3
Example IS41 config • 8
Example MAP config • 5

F

FDA • 21
forwardInformSC • 6

G

GPRS • 21
GSM • 21
GT • 7, 9, 22

H

HLR • 22

hlrErrorMap • 7
hlrTimeout • 5
HPLMN • 22

I

IDP • 22
ignoreMwStatusMCEF • 7
IMSI • 22
IMSI store location • 5
IN • 22
INAP • 22
Initial DP • 22
Installation and Removal Overview • 19
Introduction • 1, 5, 8, 11, 13, 17, 19
IP • 22
IS41 • 8
IS-41 • 23
IS41 Errors • 8
IS41 parameters • 9
ISDN • 23
ITU • 23

M

MAP • 5, 23
MAP parameters • 6
MC • 23
MCC • 23
MCEF • 23
MDN • 23
mdnHLRTransType • 9
MdnMinTranslation • 9
Messaging Manager • 23, 26
MIN • 23
MIN store location • 8
minHLRTransType • 10
MM • 23, 26
MNC • 24
MS • 24
MSC • 24
MSID • 24
MSIN • 24
MSISDN • 24
MT • 24

N

NPI • 14

O

Overview • 1, 3, 17, 19

P

PC • 7, 10, 24
permanentFailureValidityPeriods • 12
PLMN • 24
Prerequisites • v

R

Related Documents • v
RIMS • 24
RIMS Configuration File • 3
RIMS packages • 19
RIMS parameters • 4
RimsChassisAction parameters • 14
rimsInterfaceName • 14
rimsScp installation check • 19

S

SCA • 24
scaUseRedirect • 14
SCCP • 24
Scope • v
SCP • 25
Session • 25
SGSN • 25
SGSN store location • 5
SIP • 25
size • 13
SLC • 25
SLC processes • 2
SLEE • 25
sleepTime • 5
SME • 25
SMP • 25
SMS • 25
SMS_GET_ROUTING_INFO • 17
SMS_GET_ROUTING_INFO_FAIL • 17
SMS_GET_ROUTING_INFO_SUCCESS • 17
SMS_IS41_SMSREQ_ATTEMPT • 18
SMS_IS41_SMSREQ_PERM_ERR • 18
SMS_IS41_SMSREQ_TEMP_ERR • 18
SMS_IS41_SMSREQ_TIMEOUT • 18
SMS_MAP_SRI_SM_ATTEMPT • 18
SMS_MAP_SRI_SM_PERM_ERR • 18
SMS_MAP_SRI_SM_TEMP_ERR • 18
SMS_MAP_SRI_SM_TIMEOUT • 18
SMS_SET_ROUTING_INFO • 17
SMSC • 25
SN • 25
SRF • 26
SRI • 26
SS7 • 26
SSN • 8, 10, 26
SSP • 26
Statistics • 17
Statistics gathered • 17
successValidityPeriods • 13
supportIS841 • 10
System Overview • 1

T

TCAP • 26
tcapInterfaceServiceKey • 5

timeout • 15
timeoutTick • 15
TON • 15
transientFailureValidityPeriods • 13
Typographical Conventions • vi

U

Unclustered rimsSms installation check • 20

V

VLR • 26
VMSC • 26
VMSC store location • 5, 8

W

WAP • 26
What is Messaging Manager Navigator? • 1

X

XMS • 23, 26