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About This Document

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

Audience
This guide was written primarily for system administrators and persons installing, configuring and administering the Messaging Manager application. 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:

- NCC Advanced Control Services Technical Guide
- NCC Event Detail Record Reference Guide
- Messaging Manager Navigator Technical Guide
- Messaging Manager User's Guide
- SCA Technical Guide
- SLEE Technical Guide
- NCC 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.

<table>
<thead>
<tr>
<th>Formatting convention</th>
<th>Type of information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Bold</td>
<td>Items you must select, such as names of tabs. Names of database tables and fields.</td>
</tr>
<tr>
<td>Italic</td>
<td>Name of a document, chapter, topic or other publication. Emphasis within text.</td>
</tr>
<tr>
<td>Button</td>
<td>The name of a button to click or a key to press. Example: To close the window, either click <strong>Close</strong>, or press <strong>Esc</strong>.</td>
</tr>
<tr>
<td>Key+Key</td>
<td>Key combinations for which the user must press and hold down one key and then press another. Example: Ctrl+P, or Alt+F4.</td>
</tr>
<tr>
<td>Monospace</td>
<td>Examples of code or standard output.</td>
</tr>
<tr>
<td>Monospace Bold</td>
<td>Text that you must enter.</td>
</tr>
<tr>
<td>Variable</td>
<td>Used to indicate variables or text that should be replaced.</td>
</tr>
<tr>
<td>menu option &gt; menu option &gt;</td>
<td>Used to indicate the cascading menu option to be selected, or the location path of a file. Example: <strong>Operator Functions &gt; Report Functions</strong> Example: /IN/html/SMS/Helptext/</td>
</tr>
<tr>
<td>hypertext link</td>
<td>Used to indicate a hypertext link on an HTML page.</td>
</tr>
</tbody>
</table>

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

What is Messaging Manager? 1
Messaging Manager Platform 5
Messaging Manager Multigate 6
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Message Processing 9
Mobile to Mobile Messaging 13
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What is Messaging Manager?

Introduction

Messaging Manager (MM) is a messaging system for mobile networks. It acts as a Virtual Message Point (VMP) for a variety of different messaging traffic (for example: SIP, email, MMS, and SMS). Depending upon the role that it is performing, the VMP can act as any of the following:

- Message Service Center (MSC)
- Short Message Entity (SME) that terminates and/or originates messaging traffic
- Multi-media Message Service Center (MMSC)
- Email host.

MM integrates advanced routing and protocol delivery options with extended service control, in order to support all forms of traditional MO SMS and MT SMS services while retaining flexible support for new types of messaging.

Processing model

Messaging Manager's architectural approach as a Virtual Message Point means that all messaging involves transactions that can combine real time charging with direct delivery to the destination. This is the "new messaging model" that is aligned with the Internet age, and replaces the previous "store-and-forward" model with higher value and lower cost infrastructure.
Chapter 1

The VMP processes all message services in real time, but it can integrate transparently with an existing SMSC for store-and-forward processing when real time delivery is not possible. It delivers:

- High capacity messaging on low cost infrastructure
- Very flexible switching and routing serving a multiple purposes
- Proven efficiencies using real time charging and delivery
- Enhanced message services using a service creation environment (SCE)
- Performance gains over existing SMSC infrastructure
- An enhanced customer experience

MM provides a broad range of message processing capabilities at both the network layer and at the service layer. To the network it presents standard signaling interfaces to act in the role of:

- SMS-IWMSC (SMS Inter-Working MSC)
- SMS-GMSC (SMS Gateway MSC)
- HLR (proxy and emulation services)
- Email host (with SEI)
- MMSC (with mbuni)

By performing multiple functions in one system, MM simplifies the messaging infrastructure and frees up resources.

MM components operating at the network layer can route traffic from one communication path to another and will automatically perform protocol translation based on the inbound and outbound communication paths. This can be statically configured through the management UI but can be dynamically overridden during transaction processing by the service control layers. Typically all message traffic arriving at the VMP is processed for charging (if necessary) then immediately directed to the destination. This process of delivering directly to a destination is known as First Delivery Attempt (or FDA).

When huge traffic spikes occur (such as during holiday peaks, or events such as televoting) MM can absorb the load and groom traffic to provide smooth processing and near real time delivery.
Deployment diagram

This diagram shows the Messaging Manager deployment architecture.

Messaging Manager features

Messaging Manager provides the following features:

- FDA (First Delivery Attempt). SMS are directly delivered (through SS7) without going through an SMSC.
- Overload protection from SMS traffic peaks, for example, special events (New Year) or application peaks time (televoting). MM, enables you to offload your SMSCs and protect them from traffic peaks. This enables you to extend your capability to handle extreme traffic peaks in an efficient way.
- Value-added SMS services. These include:
  - Flash messaging
  - Auto-reply
  - Anti-spam
  - SMS copy to mobile or email
  - SMS-MT forwarding
  - Voting campaigns
- Real-time charging
- The ability to provide SPOC (Single Point of Contact) to ASPs to attract more ASPs on your networks and to differentiate your offering on value-added interactive applications
Messaging Manager components

The major Messaging Manager components are:

- **Messaging Manager Multigate**: A multi-protocol gateway and multi-function router that can receive and send short messages. Its layered architecture allows all signaling and IP protocols to connect to a common set of service logic, maintaining independence between transport protocols and the user-defined routing scheme that defines the messaging model. For a full description of this component, refer to *Messaging Manager Multigate* (on page 6).

- **Messaging Manager Navigator**: A Mobile Station location service that can perform and/or emulate HLR lookups by other components or network elements, caching the results to optimize network signaling and direct SMS transmission toward service logic. For a full description of this component, refer to *Messaging Manager Navigator Technical Guide*.

- **Messaging Manager Director**: A set of service control feature nodes that execute as a message control plan and provide enhanced logic for message delivery, routing, and charging and offers extended message attribute controls. For a full description of this component, refer to *Messaging Manager Director* (on page 8).

- **Messaging Manager Manager**: A central UI for management of routing schemes and message control plans that are used to configure and control all service logic components. For a full description of this component, refer to *MM User's Guide*.

Virtual Message Point components

This diagram shows the service execution components of Messaging Manager that implement the VMP, along with other platform support components.

Protocols supported

This table describes the function of each field.

<table>
<thead>
<tr>
<th>Protocol</th>
<th>More Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMPP</td>
<td><em>Configuring the SMPP Adapter</em> (on page 92)</td>
</tr>
<tr>
<td>EMI</td>
<td><em>Configuring the EMI Adapter</em> (on page 86)</td>
</tr>
<tr>
<td>MAP</td>
<td><em>Configuring the MAP Adapter</em> (on page 67)</td>
</tr>
</tbody>
</table>
## Messaging Manager Platform

### Introduction

The Messaging Manager platform is required to provide basic transaction and switching functionality for the MM message service. It is a prerequisite to any additional MM components.

It provides the following functionality:

- SMS transaction management for end to end delivery
- Transaction throughput control
- Notification and status reports
- Real time convergent billing services
- Flexible multi-party billing
- Support for all standard SMS transport options
- Support for mapping between transport protocols
- Connection level load-balancing and redundancy
- Subscriber information partitioning
- Statistics generation
- Alarm generation
- CDR generation
- Provisioning and administration

**Note:** Collection of statistics requires the NCC Service Management System (SMS) application.

### Using the Messaging Manager platform

Messaging Manager provides a platform from which multiple advanced messaging services, including but not limited to SMS-MO and SMS-MT, may be designed and implemented.

This messaging platform leverages the NCC SLC Service Logic Execution Environment (SLEE). The SLEE manages each message event coming into and going from MM and provides control of these messages between the network layer and the applications. SLC is designed to maintain integrity, simplify management and ensure high performance when servicing massive messaging volumes from various underlying networks to multiple application services.
Data life cycle

The diagram below shows a time line (down the diagram) of activities that occur for the replication process.

Messaging Manager Multigate

Introduction

Multigate is the core VMP component that provides multi-protocol message handling. It employs a "message model" abstraction that gives enormous power to the service designer in classifying, filtering and routing message traffic. Multigate provides the message delivery and retry logic driven by the message model and dynamic changes made by Messaging Manager Director. The following features are provided:

- Routing for all types of SMS, including protocol translation
- High speed criteria-based classification/filtering/switching
- First Delivery Attempt (FDA) to a destination handset or ASP
- Alternate delivery options for conditional and/or optimal routing
- Forwarding to a specified SMSC or ASP through a load weighted group
- Service logic triggering for charging and enhanced message services
- Service level OA&M support (statistics and alarms) and EDR management
Diagram

Here is a diagram showing the Messaging Manager Multigate module.

Using Messaging Manager Multigate

The Messaging Manager SMS Multigate module provides:

- Standard SMS-MO service support
- Standard SMS-MT service support
- SMS-MO switching from MS to ASP with First Delivery Attempt
- SMS-MO switching from MS to MS with First Delivery Attempt
- SMS-MT switching from ASP to MS with First Delivery Attempt

Routing options

Using the Messaging Manager Multigate module, MM allows individual routing based on different criteria:

- Incoming protocol, message center, originating number, or originating domain
- Destination number or destination domain

Triggering

The Messaging Manager Multigate module allows triggering of service control logic based on the following criteria:

- Incoming protocol
- Originating number or originating domain
- Destination number or destination domain

ASP connection state management

MM maintains a state for each ASP. The state defines how MM will handle the data and command flow between MM and the ASP.
Note: When a TCP connection is dropped by the ASP, the ASP can not immediately reconnect because the TCP/IP stack is in a "cleaning up" state (TIME_WAIT).

**Messaging Manager Director**

**Introduction**

Messaging Manager Director provides complete control over all aspects of the VMP services. Its advanced service control facilities enable extended and customised SMS processing, including real-time billing interaction, by supporting user defined message control plans.

Message control plans can be triggered from Messaging Manager Multigate and include service logic based many properties, such as:

- Incoming path names (that is, protocols and connections)
- Transaction types, such as Submit, Deliver, Notify or Route Info messages
- Originating and/or destination address
- Location of originating and/or destination mobile station
- Message content
- Time of day.

A message can be triggered from Multigate to a specific message control plan to provide extended (customer specific) service logic. For example, Messaging Manager Director may modify any routing options before signalling to Multigate to continue delivery so that Multigate routes the message according to the new options.

Messaging Manager Director can ensure that delivery proceeds only if charging is satisfied, such that delivery and charging proceeds as a single transaction.

**Note:** To use the features provided by the Messaging Manager Director module, the NCC ACS and SMS applications must be installed.

**Diagram**

Here is a diagram showing the Messaging Manager Base, Messaging Manager Multigate and Messaging Manager Director modules.
Routing options

With the addition of the Messaging Manager Director module, MM allows individual routing based on the following criteria:

- Incoming protocol
- MO or MT
- Destination number
- Originating number
- Message content
- Time of day

Message Processing

Introduction

Messaging Manager processing falls into three logical parts. Understanding the different parts is important to understand how to configure an MM service. The three parts are:

1. **Incoming classification (addressing)** (on page 9)
2. **Message processing** (on page 10)
3. **Outbound routing** (on page 11)

Message flow

This diagram shows the flow of the message through Messaging Manager:

Incoming classification (addressing)

This table describes how Messaging Manager processes inbound messages.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Messages are received over a protocol-specific adapter.</td>
</tr>
</tbody>
</table>
1. Based on the criteria assigned by the classification rules, the message is checked by congestion control. This may result in transactions being throttled. For more information about throttling, see Congestion Control in *MM User's Guide*.

2. Based on the transaction type, messages are then directed to one of four sets of trigger rules, for Submit, Deliver, Notify or Route Info transactions. This may result in triggering to ACS to run a message control plan in order to control delivery processing options. Control plans can change message parameters. Having selected a best match trigger rule it is possible to modify the transaction’s routing class from its default value (assigned during incoming classification). A matching trigger rule may be one of the following:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Based on the criteria assigned by the classification rules, the message is checked by congestion control. This may result in transactions being throttled. For more information about throttling, see Congestion Control in <em>MM User's Guide</em>.</td>
</tr>
<tr>
<td>2</td>
<td>Based on the transaction type, messages are then directed to one of four sets of trigger rules, for Submit, Deliver, Notify or Route Info transactions. This may result in triggering to ACS to run a message control plan in order to control delivery processing options. Control plans can change message parameters. Having selected a best match trigger rule it is possible to modify the transaction's routing class from its default value (assigned during incoming classification). A matching trigger rule may be one of the following: Perform an action</td>
</tr>
</tbody>
</table>
Stage | Description
--- | ---
1 | Outbound routing takes place based on the routing class.
   When applying:
   - Submit routing, the key determinant of the outbound path is the message center name and the originating or domain address.
   - Deliver routing, the key determinant of the outbound path is the destination domain name or prefix, and/or originating domain name or prefix.
   - Locate routing, the key determinant of the outbound path is the destination domain name or prefix, and/or originating domain name or prefix.
   For more information about routing, see Routing (32806.htm) in MM User's Guide.
2 | One or more outbound paths may be selected by the routing rule. If there is more than one, then each is tried in turn, until "success" occurs or a permanent error is encountered.
3 | The adapter for each selected path will build the appropriate PDU, based on the path protocol, and select a connection within the path for transmission.
4 | If a message control plan is active, it will be notified of the outcome from outbound routing to complete any service logic, such as finalize charging, retry by switching to an alternate route.

**Outbound routing**

This table describes how Messaging Manager processes outbound message routing.

Stage | Description
--- | ---
1 | Outbound routing takes place based on the routing class.
   When applying:
   - Submit routing, the key determinant of the outbound path is the message center name and the originating or domain address.
   - Deliver routing, the key determinant of the outbound path is the destination domain name or prefix, and/or originating domain name or prefix.
   - Locate routing, the key determinant of the outbound path is the destination domain name or prefix, and/or originating domain name or prefix.
   For more information about routing, see Routing (32806.htm) in MM User's Guide.
2 | One or more outbound paths may be selected by the routing rule. If there is more than one, then each is tried in turn, until "success" occurs or a permanent error is encountered.
3 | The adapter for each selected path will build the appropriate PDU, based on the path protocol, and select a connection within the path for transmission.
4 | If a message control plan is active, it will be notified of the outcome from outbound routing to complete any service logic, such as finalize charging, retry by switching to an alternate route.

**Routing**

Messaging Manager routes all messages based on one of the following:

- Routing class
- Prefix and domain

**Triggering rules**

Messaging Manager allows rules to be determined that will trigger a message to ACS for further processing. These ACS Triggering Rules may be set so that the message is triggered to ACS using a match based on a prefix containing one of the following:

- The originating number, originating domain
- The terminating number of the message or terminating domain
This may result in the message being triggered to ACS twice.
Terminating triggering rules

By default, Messaging Manager will perform routing of deliver requests according to the following rules.

1. If no routing prefix was added by the service logic, the originating adapter ID will be used to determine the outgoing route.
2. If a routing prefix was added by the service logic, this will be used to find the outgoing route. If both the originating and terminating service plans add prefixes, the terminating value will be used.
3. If no route is matched then the deliver will fail.

Interfaces and nodes

Routing nodes can provide connections for one of the following:

- All IP connections of a routing scheme
- Connections only for certain ASPs

This means a connection does not need to support all the capabilities of its associated routing scheme in order to be a valid connection.

Routing schemes can be configured with interface records. An interface record is a virtual IP connection that may be supplied or instantiated by real IP addresses on one or more routing nodes. Each node can assign a different IP address to an interface record.

Routing nodes are configured with a list of real 'IP addresses’. When a routing scheme is assigned to a routing node, you can map any of the routing scheme interfaces to the node’s IP addresses. This defines what (if any) contribution that node makes to the scheme’s routing interface requirements.

When is a Delivery Report produced?

Delivery Reports are generated and sent as a completely separate transaction (like other SMSs that Messaging Manager handles). That means existing routing and retry functionality can be used to deliver the DR.

Messaging Manager generates a delivery report (DR) in the following conditions:

- An ‘early acknowledged’ message is subsequently unable to be delivered. Messaging Manager can be configured to generate a delivery report regardless of whether or not the originator requested it (through the alwaysProduceNonDeliveryReceipt parameter).
- If Messaging Manager successfully delivers a message by FDA and the originating party requested a delivery receipt, then a delivery report is generated and sent to the originator

Delivery Report failure

Under normal (default) configuration a DR send failure is resent, however setting the parameter singleShotDeliveryReport to true will prevent a retry to be attempted.

Statistics

Any statistics produced by a Delivery Report will have INTERNAL_DR in the detail field.

EDR fields

The following fields within a Delivery Report EDR will always be set to these values:

- IPRN = "Wrapper"
- OAID = "MMX_INTERNAL_DR_ADAPTER"
Mobile to Mobile Messaging

Description

Mobile to mobile messaging provides standard person to person short messages.

MO SMS diagram

Using only the Messaging Manager base module, MM can be configured to provide an MO SMS service. In this example we will receive mobile originating MAP messages and deliver to the SMSC over TCP/IP using the SMPP protocol. The following diagram shows the modules required.

Variations

Standard person to person messaging may be configured in several different ways using MM:

- No FDA (as shown at 1)
- With FDA (as shown at 2)
- With multiple alternate routing
Multiple alternate routing allows several routes to be tried to deliver a message. Routing attempts may be similar to below:

**Application to Mobile Messaging**

**Application to Mobile diagram**

Using only the Messaging Manager Base module, MM can be configured to provide an application to mobile service. In this example we will receive EMI protocol messages from ASPs and deliver them to an SMSC over SS7 using the IS-41 protocol.
The following diagram shows the modules required:

Variations

Application to Mobile messaging may be configured in several different ways using MM:

- No FDA
- With FDA only (as shown)
- With multiple alternate routing
Mobile to Application Messaging

Mobile to Application diagram

Using the Messaging Manager Multigate and the Messaging Manager Director modules, MM can be configured to provide a Mobile to Application service. In this example we will receive mobile originating IS-41 messages and deliver them to ASPs over EMI using FDA. This diagram shows the modules required.

Variations

Mobile to Application messaging may be configured in several different ways using MM:

- No FDA
- With FDA only (as shown)
- With multiple alternate routing; that is, with FDA using an SMSC as an alternative should FDA fail
Mobile to Mobile triggering to ACS

Diagram

Using the Messaging Manager Multigate and the Messaging Manager Director modules, MM can be configured to provide a Mobile to Mobile service, triggering to ACS. In this example we will receive mobile originating MAP messages and deliver them to SMSCs over MAP having triggered them to ACS to offload all large messages to a separate SMSC. The following diagram shows the modules required:

Variations

Using the Messaging Manager Director module, messages may be triggered to ACS for advanced message processing in any or both of the following ways:

1. Originating number - for example, SMS MO prepaid billing
2. Terminating number - for example, ASP specific processing such as context based routing
Instant Messaging

Scenario assumptions

This section describes scenarios that will be supported by the SCA adapter. Three scenarios are outlined and described below. In these scenarios it is assumed that two subscribers have access to SIP instant messaging user agents and also GSM handsets for sending short messages. It is assumed that have registered their SIP URIs with a registrar and that SCA is installed on the machine. (Note that SIP routing is handled by the SCA and not covered here). In addition, it assumes there exists a special domain (Oracle.com) that can forward an instant message to a handset using SMS.

<table>
<thead>
<tr>
<th>Subscriber</th>
<th>MSISDN</th>
<th>SIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tom</td>
<td>641233570</td>
<td><a href="mailto:Tom@imdomain.com">Tom@imdomain.com</a></td>
</tr>
<tr>
<td>Dick</td>
<td>641233402</td>
<td><a href="mailto:Dick@imdomain.com">Dick@imdomain.com</a></td>
</tr>
</tbody>
</table>

SMS forwarded to SIP

In this scenario, Tom sends a short message to Dick, who has enabled instant message forwarding using some mechanism not relevant to this design. This will forward a copy of the short messages to Dick’s SIP user agent.
This is accomplished by executing a control plan that contains the Send Short Message Notification node (SSMN), which allows sending instant messages. The node specifies the destination address in URI format (for example, Dick@imdomain.com). The content and other information about the message is contained in a GenericSM event. This event is sent through the SLEE to the SCA Adapter. The SCA Adapter converts the GenericSM event to a SipSleeEvent and forwards this event to the SCA.

### SMS to SIP

In this scenario, Tom sends a short message to a special short code (64121) that will forward the short message to Dick’s instant message user agent. This scenario is similar to the scenario described above, and the path is the same as shown in that diagram, except that the destination address is specified as part of the message content (for example, "Dick@imdomain.com Watson, come here." The SSMN (or other) node extracts the destination address from the content. The short message is swallowed by MM.

### SIP to SMS

In this scenario Tom sends an instant message to Dick, addressed to a handset (the E.164 telephone number - for example, 64123402). The SCA converts this message to a SipSleeEvent and passes this to the SCA Adapter. The SCA Adapter creates a GenericSM event and MM routes this to the MAP adapter. The MAP adapter sends a MAP MO-ForwardSM to the SMSC.
In this scenario, Tom uses his E.164 alias (for example, 64123570) as the originating address. This allows a reply through SMS.
Chapter 2

Configuration

Overview

Introduction

This chapter explains how to configure the Oracle Communications Network Charging and Control (NCC) application.

In this chapter

This chapter contains the following topics.

Configuration Overview
Configuring the Environment
eserv.config Configuration
Messaging Manager Configuration Sections in eserv.config
xmsAgent
xmsTrigger
Tracing SMSs
Configuring EDR Collection
Setting Early Acknowledgment
Setting Pstore
Collecting Statistics
Defining the Screen Language

MM and XMS naming conventions

Reading this manual and configuring Messaging Manager, you may notice that the terms MM and XMS are both used. These terms have been used interchangeably throughout the software development process as a result of software evolution. Many of the software processes and binaries use the term XMS, and in this case the documentation will continue the use of the term. The abbreviation for the Messaging Manager product is MM, and this will be used in all cases except where referring to specific software binaries and processes.

Configuration Overview

Introduction

This topic provides a high level overview of how the Messaging Manager application is configured. Configuration details for individual processes are located with the documentation for that process.

Configuration process overview

This table describes the steps involved in configuring Messaging Manager for the first time.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create the XMS section of the eserv.config file.</td>
<td>Messaging Manager Configuration Sections in eserv.config on page 37.</td>
</tr>
</tbody>
</table>
Stage | Description | Refer to.. |
--- | --- | --- |
2 | Configure the xmsTrigger section. | xmsTrigger (on page 151, on page 39) |
3 | Configure the tracing SMSs, if required. This section is required, but may be empty. | Tracing SMSs (on page 53) |
4 | Configure the CDR collection section. | Configuring CDR Collection (see “Configuring EDR Collection” on page 56) |
5 | Configure statistics collection. | Collecting Statistics (on page 62) |
6 | Set the early acknowledgement parameters. These can be done at Trigger and adapter level. | Setting Early Acknowledgement (see “Setting Early Acknowledgment” on page 58). |
7 | Configure the persistent storage. | Setting Pstore (on page 60). |
8 | Define the screen language for the GUI interface. | Defining the Screen Language (on page 62). |
9 | Configure Messaging Manager Multigate. | Configuring Messaging Manager Multigate (on page 63). |
10 | Configure Messaging Manager Director. | Configuring Messaging Manager Director (on page 123). |

### Configuring the Environment

#### Configuration components

MMX is configured by the following components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Locations</th>
<th>Description</th>
<th>Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>eserv.config</td>
<td>All</td>
<td>eserv.config holds most of the configuration for MM.</td>
<td>eserv.config Configuration (on page 25)</td>
</tr>
<tr>
<td>acs.conf</td>
<td>All SLCs</td>
<td>Configures slee_acs, the main call processor. acs.conf must include the MM plug-in libraries for slee_acs, and is also used for normalization and denormalization configuration.</td>
<td>Configuring acs.conf for the SLC</td>
</tr>
<tr>
<td>SLEE.cfg</td>
<td>All SLCs</td>
<td>Configures which MM processes are started by the SLEE, and provides some configuration for the environment in which those processes run.</td>
<td>SLEE.cfg (on page 23)</td>
</tr>
<tr>
<td>tdp.conf</td>
<td>All SLCs</td>
<td>The tdp.conf file is the configuration file that is used by the system to define the trigger tables used to determine when to trigger a call to the SCF.</td>
<td>tdp.conf (on page 24)</td>
</tr>
<tr>
<td>Component</td>
<td>Locations</td>
<td>Description</td>
<td>Further Information</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------</td>
<td>----------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>SMS User Interface</td>
<td>SMS</td>
<td>Provide a graphical interface for configuring many parts of SMS including:</td>
<td><em>SMS User's Guide</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replication</td>
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</tr>
<tr>
<td></td>
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<td>• Statistics</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alarm filtering</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reports</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Most of these files are at least partially configured when the xmsScp package is installed.

**acs.conf**

The `acs.conf` file is the configuration for the ACS application. For more information on the `acs.conf` file, see *ACS Technical Guide*.

The xmsScp package will have added the following lines to the `acsChassis` section of the `acs.conf` file. No manual modification is required.

```
ServiceEntry (SMS_Submit,xmsSvcLibrary.so)
ServiceEntry (SMS_Deliver,xmsSvcLibrary.so)
ChassisPlugin libxmsChassisActions.so
MacroNodePluginFile libxmsMacroNodes.so
```

The following lines will be present if the PME service is installed.

```
ServiceEntry (CCS_SM_MO,dD,cC,dD,E,ccsSvcLibrary.so)
ServiceEntry (CCS_SM_MT,cC,dD,ccsSvcLibrary.so)
```

**Note:** The service names (for example: “SMS_Submit”) match the services defined in the `SLEE.cfg` file (for details, see `SLEE.cfg` on page 23).

**Location**

The `acs.conf` file is located in `/IN/service_packages/ACS/etc/`.

**acs.conf settings**

Set the following in `acs.conf`:

```
UseContinueOperation 0
```

For more information about this parameter, see *ACS Technical Guide*.

**eserv.config**

The `eserv.config` file is a shared configuration file, from which many NCC applications read their configuration. For details, see the `eserv.config Configuration` (on page 25) topic.

The `eserv.config` file needs to contain a `SECURE section` (on page 50) within the `xmsTrigger` section. This includes the list of licenses, adapters and gateways for this installation of Messaging Manager. This section is provided by NCC.

**SLEE.cfg**

The `SLEE.cfg` file is the configuration file for the SLEE, see the *SLEE Technical Guide* for further details about this file.

On installation of xmsScp, some Messaging Manager-specific lines are added to the file.

**Warning:** Always make a backup copy of `SLEE.cfg` before making any modifications.
Editing the SLEE.cfg

The following lines must be present in SLEE.cfg:

```
SERVICEKEY=INTEGER 102 xmsAgent # xmsAgent inbound
SERVICEKEY=INTEGER 103 xmsAgent # xmsAgent outbound
INTERFACE= xmsAgent xmsAgent.sh /IN/service_packages/XMS/bin EVENT
```

```
SERVICEKEY=INTEGER 120 SMS_Submit # Added by xmsScp
SERVICEKEY=INTEGER 121 SMS_Deliver # Added by xmsScp
```

```
SERVICE=SMS_Submit 1 slee_acs SMS_Submit # Added by xmsScp
SERVICE=SMS_Deliver 1 slee_acs SMS_Deliver # Added by xmsScp
```

Note: The service names must be exactly SMS_Submit and SMS_Deliver for the Messaging Manager Director service to function correctly.

The service keys 102 and 103 are provided by a question during installation. These are the default values.

The service keys 120 and 121 must match the service keys defined in the tdp.conf file. For details on this see Editing tdp.conf (on page 24).

SLEE.cfg details for PME

The following lines are added if the PME service is installed.

```
SERVICEKEY=INTEGER 122 CCS_SM_MO # Added by xmsScp
SERVICEKEY=INTEGER 123 CCS_SM_MT # Added by xmsScp
```

```
SERVICE=CCS_SM_MO 1 slee_acs CCS_SM_MO # Added by xmsScp
SERVICE=CCS_SM_MT 1 slee_acs CCS_SM_MT # Added by xmsScp
```

tdp.conf

The tdp.conf file is the configuration file that is used by the system to define the trigger tables used to determine when to trigger a call to the SCF.

If it has been installed, the acsScp package will have created tdp.conf. If acsScp has not been installed it is necessary to take a copy of the tdp.conf.example file that is installed by Messaging Manager and rename it to tdp.conf.

No manual modification of this file is required, unless SLEE service keys different to the recommended 120 and 121 are used in the SLEE.cfg (see SLEE.cfg (on page 23)). Always make a backup copy of tdp.conf before making any modifications. Do not modify the file in any other way except as directly instructed by an Oracle technical engineer.

For further information on the IN Call Model and tdp.conf please refer to Configuring IN Call Model Triggers.

Location

The tdp.conf file is located in /IN/service_packages/XMS/etc/.

Example tdp.conf

This is an example of a tdp.conf file. The file must contain the following contents:

```
# This file is supplied with the XMS product installation and
# should not be changed except as directly instructed by an
# Oracle Technical Engineer
-1 121 3 R all all
1 120 3 R all all
```

The following lines will also be present if the PME service is installed.

```
# Trigger all Submit messages to the CCS_SM_MO service
1 122 3 R all all
```
Chapter 2

# Trigger all Deliver/Notify/RouteInfo messages to the CCS_SM_MT service
-1 123 3 R all all

Note: All lines starting with # are treated as comments.

The first line defines the terminating triggering rule. The second number on this line (121) must match the service key of the "SMS_Deliver" SLEE service.

The second line defines the originating triggering rule. The second number on this line (120) must match the service key of the "SMS_Submit" SLEE service.

eserv.config Configuration

Introduction

The eserv.config file is a shared configuration file, from which many NCC applications read their configuration. Each NCC machine (SMS, SLC, and VWS) has its own version of this configuration file, containing configuration relevant to that machine. The eserv.config file contains different sections; each application reads the sections of the file that contains data relevant to it.

The eserv.config file is located in the /IN/service_packages/ directory.

The eserv.config file format uses hierarchical groupings, and most applications make use of this to divide up the options into logical groupings.

Configuration file format

To organize the configuration data within the eserv.config file, some sections are nested within other sections. Configuration details are opened and closed using either {} or [].

- Groups of parameters are enclosed with curly brackets - {}
- An array of parameters is enclosed in square brackets - []
- Comments are prefaced with a # at the beginning of the line

To list things within a group or an array, elements must be separated by at least one comma or at least one line break. Any of the following formats may be used, as in this example:

{ name="route6", id = 3, prefixes = [ "00000048", "00000473"] }
{ name="route7", id = 4, prefixes = [ "000001049" ] }

or

{ name="route6"
  id = 3
  prefixes = [ "00000148"
               "0000473"
            ]
}
{ name="route7"
  id = 4
  prefixes = [ "000001049"
            ]
}

or

{ name="route6"
  id = 3
  prefixes = [ "00000148", "0000473" ]
}
{ name="route7", id = 4
prefixes = [ "000001049" ]
}

**eserv.config files delivered**

Most applications come with an example `eserv.config` configuration in a file called `eserv.config.example` in the root of the application directory, for example, `/IN/service_packages/eserv.config.example`.

**Editing the file**

Open the configuration file on your system using a standard text editor. Do not use text editors, such as Microsoft Word, that attach control characters. These can be, for example, Microsoft DOS or Windows line termination characters (for example: ^M), which are not visible to the user, at the end of each row. This will cause file errors when the application tries to read the configuration file.

Always keep a backup of your file before making any changes to it. This will ensure you have a working copy to which you can return.

**Loading eserv.config changes**

If you change the configuration file, then you must restart the appropriate parts of the service to enable the new options to take effect.

**Rereading the eserv.config file**

`xmsTrigger` re-reads the configuration from `eserv.config` on startup. It can also be told to re-read its configuration while running using the `xmsRereadConfig.sh` script:

```
/IN/service_packages/XMS/bin/xmsRereadConfig.sh usr
```

Run the `xmsRereadConfig.sh` script as the user who starts the `xmsTrigger` application from your console or telnet session on the SLC. In most cases the user who starts the `xmsTrigger` application is `acs_oper`.

`xmsRereadConfig.sh` supports the following parameter.

**usr**

**Syntax:** `usr`

**Description:** The unix user which is running the instance of `xmsTrigger` you want to update the configuration of.

**Type:** String

**Optionality:** Optional (default used if not set).

**Allowed:** Any valid unix userid.

**Default:** `root`

**Notes:** `xmsTrigger` is usually started by `acs_oper`, so `acs_oper` should usually be specified.

**Example:** `acs_oper`

**Example eserv.config**

Here is the example configuration, with comments removed.

```
xMS = {
  serviceLibrary = {
    validityTime = 5
    flushTime = 60
    maxAge = 3600
  }
}
```
DialledNumberAvailable = false

xmsUndoNumTranslation = false
}
xmsAgent = {
tcpWaitTimeMilliSec = 10
  rateLimitAlarmIntervalSec = 60
}
xmsStore = {
}
xmsTrigger = {
  SECURE = {
    limits = {
      maxConcurrentTransactions = 0
      warnConcurrentTransactionsPercentage = 70
      warnConcurrentTransactionsPeriod = 5
      clearConcurrentTransactionsPeriod = 5
      maxSmsPerSecond = 200
      warnSmsPerSecond = 180
    }
    options = ["MCC","SAS","EDR","MCP"]
    gateways = ["MO_SMS","MT_SMS","VAS_SMS"]
    adapters = ["MAP","CDMA","TDMA","EMI","SMPP","API"]
  }
  SECUREKey = 123456
  xmsAgentInboundServiceKey = 102
  xmsAgentOutboundServiceKey = 103
  pollTime = 100000
  loadReportingPeriod = 10
  routingScheme = {
    loadIntervalSeconds = 600
  }
  mtTransactionLifetimeSeconds = 30
  oracleusername = "scp"
  oracleepassword = "scp"
  oracledatabase = ""
  dialledStarEncoding = 'D'
  dialledHashEncoding = 'E'
  mmxIsdn = "0640041234567"
  mmxIsdnGprs = "0640041234568"
  deliveryReceiptId = "scp1:"
  desegmentation = false
  desegmentation_timeout = 0
  desegmentation_failure_code = 1
  desegmentation_failure_cause = 27
baseIDPSize = 200
allowConcatenatedFDA = true
everyAckMC = true
everyAckSME = true
alwaysProduceNonDeliveryReceipt = false
stopRoutingOnTransientFailure = false
stopRoutingOnPermanentFailure = false
processMsgSCI = true
successDeliveryReceiptText = "Your message to <destination> was delivered"
failureDeliveryReceiptText = "Your message to <destination> was NOT delivered"
cdr = {
    log = true
    filename = "xms_"
    tempdir = "/IN/service_packages/XMS/cdr/current/"
    maxno = 10000
    tim_out = 1800
    destdir = "/IN/service_packages/XMS/cdr/closed/"
    num_files = 64000
    num_files_leaf = 64
}
tracing = {
    enabled = true
    showPrivate = true
    outputFile = "/tmp/xmsTrigger.trc"
    outputFileCycle = 512
    maxFileSizeKB = 0
    maxNumFiles = 4
    shmKey = 92403
    shmSizeKb = 64
    callsPerMinute = 2
    origAddress = [
        "0064212",
        "0064213",
        "0064214"
    ]
    destAddress = [
        "0064213",
        "0064214"
    ]
    useTOMNIPI = true
}
pstore = {
    enable = true
    cache_size = 10000 # -1 mean no max size
    flush_period = 10
    interfaceName = "xmsStoreIf"
over_size_max_age_seconds = 60
max_age_seconds = 30
max_writes_per_flush = 10
defferred_delete = true
userpass = "scp/scp"
}

statistics = {
    enable = false
}

adapters = [
    # First adapter (MAP)
    {
        lib = "xmsiMap.so"
        adapterName = "MAP1"
        pointCodes = [1001, 1002]
        SSN = 8
        earlyAckMC = true
        earlyAckSME = true
        allowConcatenatedFDA = true
        alwaysProduceNonDeliveryReceipt = false

        config = {
            disableConcatenatedSegmentPad = false
            abortMessagesWithZeroLengthTPDA = true
            allowIncoming = true
            allowOutgoing = true
            allowDirectDelivery = true
            allowIncomingMap3 = true
            allowUserRequestedDeliveryReceipt = true
            lastSegmentDeliveryReceiptOnly = false
            tcapInterfaceServiceKey = 22
            originatingTimeout = 10
            smscTimeout = 8
            rimsTimeout = 3
            mscTimeout = 15
            rimsInterfaceName = "rimsIf"
            gprsSupport = "supported"
            nonGprsAdapter = "MAP2"
            sgsnPrefixes = [ "000" ]
            doProtocolIdMapping = false
            defaultProtocolId = 0
            protocolIdMap = [
        }
fallbackAlphabet = "UCS-2"
scheduledDeliveryTime = ""
defaultMessagePriority = "Normal"
PC = 55
SSN = 8
GT = "5114406267"
GTMap = [
    { prefix = "0010019198", value = "919827002402" }
]
#SCA = "5114406267"
natureOfAddress = 1  # international
numberPlan = 6  # E.212
defaultMapVersionSmisc = 3
defaultMapVersionMsc = 3
deliveryFailureStatusCode = 64
throttledDeliveryFailureCause = 4  # congestion
mscVersionCacheSize = 1000
hybridiseMapVersions = false
maxUnsegmentedLength = 120
splitLongMessages = true
alarmMask = 0
honourReplyPath = false
pathRetryRandomisation = 1
pathRetrySegmentOffset = 1
localTimeZone = "UTC"
defaultTransientFailureErrorCode = 32
defaultPermanentFailureErrorCode = 32
incomingOriginatingNumberRules = [
    { fromNoa=2, prefix="04", min=4, max=32, remove=1, prepend="0064", resultNoa=1 }
    { fromNoa=3, prefix="4", min=4, max=32, remove=0, prepend="0064", resultNoa=1 }
]
incomingDestinationNumberRules = [
]
# outgoingOriginatingNumberRules = [
# outgoingDestinationNumberRules = [

# privateExtensions = [}
# {extId="1,2,776,8,8,8,8,11", asn1Tags= [ 0xE0, 0x80], profileTagID=327814, name = "imei" }
# }

} # xmsiMap.so config

# Non-GPRS MAP adapter
#
lib = "xmsiMap.so"
adapterName = "MAP2"
pointCodes = [1003]
SSN = 8
config = {
    GT = "5114406268"
    TT = 0
    gprsSupport = "unsupported"
}

} # xmsiMap.so config

# second adapter (EMI)
#
lib = "mmxiEMI.so"
SSN = 8
adapterName = "EMI1"
earlyAckMC = true
earlyAckSME = true
allowConcatenatedFDA = true
config = {
    suppressPathInfoReport = true
    displayZeroPathReport = false
    PathReportingInterval = 60
    throttledErrorCode = 4
    transientFailureErrorCode = 4
    permanentFailureErrorCode = 3

    incomingOriginatingNumberRules = [
        { fromNoa=999, prefix="", min=1, max=32, remove=0, resultNoa=2 }
    ]
    incomingDestinationNumberRules = [
    ]
    outgoingOriginatingNumberRules = [
    ]
    outgoingDestinationNumberRules = [
    ]

    emiDefaults = {
        defaultMessagePriority = "Normal"
    }
    pstoreNumberRules = [
        { fromNoa=999, prefix="010", min=1, max=32, remove=3, prepend="7" }
{ fromNoa=999, prefix="091", min=1, max=32, remove=3, prepend="7" }

timestampAdvance = true
timestampBucketSize = 5000
timestampFlush = 2
} # emiDefaults
} # mmxiEMI.so config

# Third adapter (SMPP)
{
  lib = "mmxiSMPP.so"

  #pointCodes = [1003, 1004]

  SSN = 0

  adapterName = "SMPP1"

  earlyAckMC = false
  earlyAckSME = true
  allowConcatenatedFDA = true

  config = {
    suppressPathInfoReport = true
    displayZeroPathReport = false
    PathReportingInterval = 60
    fallbackAlphabet = "UCS-2"

    TLVs = [
      {tlvID=0x0030, tlvType=0x01, profileTagID=4532781,
        direction="inbound"}
      {tlvID=0x020b, tlvType=0x02, profileTagID=4532782,
        direction="outbound"}
      {tlvID=0x1382, tlvType=0x05, profileTagID=4532783,
        direction="both"}
    ]

    smppDefaults = {
      throttledCommandStatus = 88 # ESME_RTHROTTLED (88)

      teleserviceRoutingMap = [
        { serviceType = "", teleservice = 0,
          allowAlternateDelivery = true }
        { serviceType = "CMT", teleservice = 4098,
          allowAlternateDelivery = true }
        { serviceType = "EMS", teleservice = 4101,
          allowAlternateDelivery = true }
      ]

      dataCodingMap = [
        { data_coding = 0x08,
          alphabet = "UCS-2",
          messageClass = 1,
          messageWaitingGroup = 0,
          messageWaitingIndicator = 0,
          messageWaitingType = 0 }
        { data_coding = 0xF0,
          alphabet = "GSM8Bit",
          messageClass = 1,
          messageWaitingGroup = 0,
          messageWaitingIndicator = 0,
          messageWaitingType = 0 }
    ]
  }
}
includePayloadDRInfo = false
maxValidityPeriod = 0
scheduledDeliveryTime = ""
convertMessageIdToHex = false
fixedLengthMessageId = true
}

outgoingOriginatingNumberRules = [
  { fromNoa=2, prefix="04", min=4, max=32, remove=1, prepend="0064", resultNoa=1 }
  { fromNoa=3, prefix="4", min=4, max=32, remove=0, prepend="0064", resultNoa=1 }
]

outgoingDestinationNumberRules = []

# incomingOriginatingNumberRules = []
# incomingDestinationNumberRules = []

# mmxiSMPP.so config

# IS-41 CDMA adapter
{
  lib = "xmsiIS41.so"
  adapterName = "CDMA1"
  #pointCodes = [1005, 1006]
  SSN = 18
  earlyAckMC = false
  earlyAckSME = false
  allowConcatenatedFDA = true
  config = {
    allowIncoming = true
    allowOutgoing = true
    PC = 1005
    SSN = 6
    GT = ""
    originatingTimeout = 20
    smsreqTimeout = 10
    smdppTimeout = 10
    smdppTimeoutSME = 10
    fallbackAlphabet = "UCS-2"
    supportIS841 = true
    defaultMessagePriority = "Normal"
    defaultEndpointType = "SME"}
rimsInterfaceName = "rimsIf"

pathRetryRandomisation = 1
pathRetrySegmentOffset = 1

alarmMask = 0
relaySmsNotifications = false

minHLRTransType = 3
mdnHLRTransType = 14

defaultTransientFailureCauseCode = 33 # destination busy
defaultPermanentFailureCauseCode = 39 # other terminal problem

throttledFailureCauseCode = 35 # destination resource shortage
deliveryFailureErrorClass = 2
deliveryFailureStatusCode = 5

protocol = "CDMA"

allowFDAforWEMT = true
allowAlternateDeliveryForWEMT = true

tcapInterfaceServiceKey = 22

incomingOriginatingNumberRules = [
    { fromNoa=3, prefix="04", min=4, max=32, remove=1, prepend="0064", resultNoa=4 }
    { fromNoa=2, prefix="04", min=4, max=32, remove=0, prepend="0064", resultNoa=4 }
]

incomingDestinationNumberRules = []

# outgoingOriginatingNumberRules = []
# outgoingDestinationNumberRules = []

} # End IS-41 CDMA adapter config section.

# IS-41 TDMA adapter
{
    lib = "xmsiIS41.so"
    
    adapterName = "TDMA1"
    #pointCodes = [1005, 1006]
    SSN = 18
    earlyAckMC = false
    earlyAckSME = false

    allowConcatenatedFDA = true

    config = {
        allowIncoming = true
        allowOutgoing = true
        
        PC = 1005
        SSN = 6
        GT = ""

        originatingTimeout = 20
smsreqTimeout = 10
smdppTimeout = 10

defaultMessagePriority = "Normal"
supportIS841 = true
rimsInterfaceName = "rimsIf"
alarmMask = 0

releaseCauseMap = [
    { releaseCode = 31, SMS_CauseCode = 12 }
    { releaseCode = 16, SMS_CauseCode = 12 }
    { releaseCode = 17, SMS_CauseCode = 9 }
]
defaultTransientFailureCauseCode = 8
defaultPermanentFailureCauseCode = 7

causeCodeMap = [
    { SMS_CauseCode = 12, failureCode = 31, permanent = false }
    { SMS_CauseCode = 9, failureCode = 16, permanent = true }
]
defaultReleaseCause = 13
defaultReleaseCausePermanent = false
deliveryFailureErrorClass = 2
deliveryFailureStatusCode = 5

protocol = "TDMA"
tcapInterfaceServiceKey = 22

incomingOriginatingNumberRules = [
    { fromNoa=3, prefix="04", min=4, max=32, remove=1, prepend="0064", resultNoa=4 }
    { fromNoa=2, prefix="4", min=4, max=32, remove=0, prepend="0064", resultNoa=4 }
]
incomingDestinationNumberRules = [
]
# outgoingOriginatingNumberRules = [ ]
# outgoingDestinationNumberRules = [ ]

} # End IS-41 TDMA adapter config section.
} # End IS-41 TDMA adapter definition

# SCA (SIP) adapter
{
    disabled = False
    interfaceName = "xmsIf"
    lib = "mmxiSCA.so"
    adapterName = "SCA1"
    config = {
        sca = {
            serviceKey = 52
        }
    }

# interface = "sca"

pathReportingInterval = 60
inboundTimeout = 5
outboundTimeout = 5

# Internal adapter (The endpoint for the SSMN macro node)

lib = "xmsiWrapper.so"
SSN = 9
adapterName = "Wrapper"

config = {
xmsTimeout = 5
tcapTimeout = 10
xmsWrapper = {
    interface= "xmsIf"
    pc = 55
    ssn = 7
    type = "itu"
    gt = ""
}
xmsTrigger = {
    pc = 51
    ssn = 3
    type = "itu"
    gt = ""
}
}

ChassisActions = {

    SendGenericMessageAction = {
        interfaceName = "xmsIf"
        timeoutTick = 5
        tcapOrigAddr = { PC = 0, SSN = 0, type = "itu" }
        tcapDestAddr = { PC = 0, SSN = 0, type = "itu" }
    }

    ussdChassisAction = {
        tcapInterfaceName = "hssScIf"
        timeoutTick = 5
        recordResponseTimes = false
    }
}

macroNodes = {

    SendShortMessageNode = {
        xmsiWrapperIfName = "xmsIf"
        tcapOrigAddr = { PC = 0, SSN = 0, type = "itu" }
        tcapDestAddr = { PC = 0, SSN = 0, type = "itu" }
        dateFormat = "%A %d %B %Y"
        timeFormat = "%I:%M %p"
        time24Format = "%H:%M %Z"
    }
}
Messaging Manager Configuration Sections in \texttt{eserv.config}

Introduction

The \texttt{XMS} section of the \texttt{eserv.config} provides the configuration parameters for Messaging Manager. It includes three sections:

- \texttt{serviceLibrary} - for details, see \textit{Configuring Messaging Manager to load ACS Control Plans} (on page 136)
- \texttt{xmsTrigger} - for details, see \texttt{xmsTrigger} (on page 151, on page 39)
- \texttt{macroNodes} - for details, see \textit{Configuring Macro Nodes} (on page 126)

High level overview

Here is a high level overview of the \texttt{XMS} section of the \texttt{eserv.config}.

Ensure that your \texttt{eserv.config} has at least the following sections present in it. If a section is not present, use a text editor to create the section, for completion later.

\begin{verbatim}
XMS = {
  ServiceLibrary = {
    service_library_section_parameters
  }
  xmsTrigger = {
    SECURE = {
      secure_section_parameters
    }
    xmsTrigger_global_parameters
  }
  cdr = {
    CDR_section_parameters
  }
  tracing = {
    tracing_section_parameters
  }
  pstore = {

callTimeFormat = "%I:%M %p"
maximumDestinations = 1000
numberPlan = 1

SendUSSDNotificationNode = {
  MSISDNTranslationType = 2
destSSN = 6
}
} # macroNodes
} # XMS
\end{verbatim}
xmsAgent

xmsAgent configuration

Here is an example of the xmsAgent section of the eserv.config.

```
xmsAgent = {
    tcpWaitTimeMilliSec = 10
    rateLimitAlarmIntervalSec = 60
}
```

xmsAgent parameters

xmsAgent accepts the following parameters.

rateLimitAlarmIntervalSec

Syntax: \( \text{rateLimitAlarmIntervalSec} = \text{num} \)

Description: The number of seconds between rate limiting alarms on a connection (s).

Type: Integer

Optionality: Optional (default used if not set).

Allowed: 

Default: 60

Notes: 

Example: \( \text{rateLimitAlarmIntervalSec} = 60 \)

tcpWaitTimeMilliSec

Syntax: \( \text{tcpWaitTimeMilliSec} = \text{msec} \)

Description: The number of milliseconds that xmsAgent will wait on the socket for work.

Type: Integer
Optionality: Optional (default used if not set).
Allowed:
Default: 10
Notes:
Example: tcpWaitTimeMillisec = 10

**xmsTrigger**

**xmsTrigger configuration**

Here is a high level view of the xmsTrigger section of the eserv.config.

```java
xmsTrigger = {
    SECURE = {
        secure_section_parameters
    }
    SECUREKey = 123456
    xmsAgentInboundServiceKey = 102
    xmsAgentOutboundServiceKey = 103
    pollTime = 100000
    loadReportingPeriod = 10
    routingScheme = {
        loadIntervalSeconds = 600
    }
    mtTransactionLifetimeSeconds = 30
    oracleusername = "scp"
    oraclepassword = "scp"
    oracledatabase = ""
    dialledStarEncoding = 'D'
    dialledHashEncoding = 'E'
    mmxIsdn = "0640041234567"
    mmxIsdnGprs = "0640041234568"
    deliveryReceiptId = "scp1:"
    desegmentation = false
    desegmentation_timeout = 0
    desegmentation_failure_code = 1
    desegmentation_failure_cause = 27
    baseIDPSize = 200
    allowConcatenatedFDA = true
    earlyAckMC = true
    earlyAckSME = true
    alwaysProduceNonDeliveryReceipt = false
```
stopRoutingOnTransientFailure = false
stopRoutingOnPermanentFailure = false
processMsgSCI = true

successDeliveryReceiptText = "Your message to <destination> was delivered"
failureDeliveryReceiptText = "Your message to <destination> was NOT delivered"

cdr = {
    CDR_section_parameters
}

tracing = {
    tracing_section_parameters
}
pstore = {
    pstore_section_parameters
}

adapters = [
    {first_adapter_parameters
    }

    {second_adapter_parameters
    }

    {next_adapter_parameters...
    }
]

Note: The configuration of the adapters is described in Configuring Messaging Manager Multigate (on page 63).

High level parameters

XMS trigger application accepts the following global parameters.

adapters
Description: Array of adapters and their parameters within[]. See Configuring the Required adapters (on page 63).

allowConcatenatedFDA
Syntax: allowConcatenatedFDA = true|false
Description: Whether or not we are allowed to perform First Delivery Attempt for concatenated messages (Messages whose segment number is >= 1).
Type: boolean
Optionality: Allowed: true, false
Default: true
Notes: This can be overridden by each adapter. This option is consulted for each outbound route candidate because it is entirely likely one would want to enable it for IP but disable it for SS7.
Example: allowConcatenatedFDA = true
### alwaysProduceNonDeliveryReceipt

**Syntax:**
alwaysProduceNonDeliveryReceipt = true|false

**Description:**
Global Un-Solicited Non-Delivery Receipt Flag. Causes Messaging Manager to send an un-solicited non-delivery receipt in the event that:

a) Early ack was performed
b) The outgoing message could not be delivered via any route.

The default is false (no response required), however, setting the parameter to true (in the xmsTrigger section of either eserv.config or adapter config level) will mean a delivery receipt is sent for every delivery failure.

**Type:**
boolean

**Optionality:**
Allowed: true, false
Default: false

**Notes:**
This only applies when early ack is on.
See Setting Early Acknowledgement (see “Setting Early Acknowledgment” on page 58).

**Example:**
alwaysProduceNonDeliveryReceipt = false

### baseIDPSize

**Syntax:**
baseIDPSize = value

**Description:**
The base size (in octets) of the IDP without extensions.

**Type:**
Integer

**Optionality:**
Optional (default used if not set).

**Allowed:**

**Default:**
200

**Notes:**
The parameter is used to determine the size of slee events sent from XMS to ACS.
If errors similar to:
*SleeException: Overfill event detected (10000)*
are produced by xmsTrigger, then increasing the above parameter may resolve them.

**Warning:** This parameter should not be changed without the consultation of an eSG support engineer.

**Example:**
baseIDPSize = 300

### cdr

**Description:**
List of CDR setting and collecting parameters within {}. See Configuring EDR Collection (on page 56).

**Default:**
N/A

### convertMessageIdToHex

**Syntax:**
convertMessageIdToHex = true|false

**Description:**
Global option to work around a potentially troublesome feature in some SMSCs, where they return hex message ids in their submit_sm responses, but decimal message ids in the payload parts of their delivery receipts.
Type: Boolean
Optionality: Optional (default used if not set).
Allowed: true
false  no automatic adjustment of message IDs between decimal and hex
Default: false
Notes: Without this option, the behavior interferes with the MM pstore mapping of message IDs.
If this is set to true, then the deliveryReceiptId (on page 42) parameter must be hex value only, not ASCII.
Example: convertMessageIdToHex = true

dialledHashEncoding
Syntax: dialledHashEncoding = "encode"
Description: The value to use when a hash (#) is pressed.
Type: String
Optionality: Optional
Allowed:
Default: The default behaviour is to perform no special translation.
Notes: Because different protocols map asterisks and hashes to different BCD numbers (for example, MAP uses C, IS41 uses E) we cannot always rely on TC_PROTOS to get it right.
Warning Make sure these values match with the ones in acs.conf.
Example: dialledHashEncoding = "E"

dialledStarEncoding
Syntax: dialledStarEncoding = "encode"
Description: The value to use when an asterisk (*) is pressed.
Type: String
Optionality: Optional
Allowed:
Default: The default behaviour is to perform no special translation.
Notes: Because different protocols map asterisks to different BCD numbers (for example, MAP uses B, IS41 uses D) we cannot always rely on TC_PROTOS to get it right.
Warning Make sure these values match with the ones in acs.conf.
Example: dialledStarEncoding = "D"

deliveryReceiptId
Syntax: deliveryReceiptId = "ID"
Description: String prefixed to delivery receipt ID to ensure that internally generated IDs are unique.
Type: any string
Optionality: 
Allowed: 
Default: "" (blank)
Notes: Refer to Delivery Receipts (on page 164) for details. This must be hex value only (or blank) when convertMessageIdToHex (on page 41) is set to true in an adapter section.

Example: deliveryReceiptId = ""

desegmentation
Syntax: desegmentation = true|false
Description: Whether or not concatenated messages (with multiple segments) are desegmented into a single message for processing (true), or processed as individual messages (false).
Type: boolean
Optionality: Allowed: true, false
Default: false
Example: desegmentation = false

desegmentation_timeout
Syntax: desegmentation_timeout= time
Description: The timeout, for collecting the multiple segments of a concatenated message.
Type: in seconds
Optionality: Allowed: 0 or a positive integer
Default: 0
Notes: 0 means no timeout is applied.
Example: desegmentation= false

desegmentation_failure_code
Syntax: desegmentation_failure_code = n
Description: The value of the desegmentation failure code.
Type: Integer
Optionality: Mandatory
Allowed: The result code (error type) to use for desegmentation errors:
1 = transient failure
2 = permanent failure
3 = abort
Default: When the desegmentation process fails (for example, if an invalid segment number is received), an error will be sent for any received segments that haven't had a response yet. This does not apply if a segment fails to show up - in that case, a transient failure is returned for the other segments. The error to use is configured by the two desegmentation_failure parameters.
Example: desegmentation_failure_code = 1

desegmentation_failure_cause
Syntax: desegmentation_failure_cause = n
Description: The value of the release cause to use for desegmentation errors.
Type: Integer
Optionality: Mandatory
Allowed: 
Default: 
Notes: 
Example: desegmentation_failure_cause = 27

earlyAckMC
Syntax: earlyAckMC = true|false
Description: Determines whether early acknowledgement is enabled for messages that are to be sent to an MC. See Setting Early Acknowledgement (see "Setting Early Acknowledgment" on page 58).
Type: boolean
Optionality: 
Allowed: true, false
Default: false
Notes: 
Example: earlyAckMC = false

earlyAckSME
Syntax: earlyAckSME = true|false
Description: Determines whether early acknowledgement is enabled for messages that are to be sent to an SME. See Setting Early Acknowledgement (see "Setting Early Acknowledgment" on page 58).
Type: boolean
Optionality: 
Allowed: true, false
Default: false
Notes: 
Example: earlyAckSME = false

failureDeliveryReceiptText
Syntax: failureDeliveryReceiptText = "text"
Description: The text for an unsuccessful Delivery Receipt
Type: string
Optionality: 
Allowed: 
Default: "Your message to <destination> was NOT delivered"
Notes: where <destination> substitutes the destination number.
Example: failureDeliveryReceiptText = "Your message to <destination> was NOT delivered"

internalDRTTimeout
Syntax: internalDRTTimeout = seconds
Description: The timeout in seconds for processing and sending an internally generated delivery report.
Type: Integer
<table>
<thead>
<tr>
<th>Optionality:</th>
<th>Optional (default used if not set).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowed:</td>
<td>Optional (default used if not set).</td>
</tr>
<tr>
<td>Default:</td>
<td>5</td>
</tr>
<tr>
<td>Notes:</td>
<td>Optional (default used if not set).</td>
</tr>
<tr>
<td>Example:</td>
<td>internalDRTTimeout = 10</td>
</tr>
</tbody>
</table>

**loadIntervalSeconds**

<table>
<thead>
<tr>
<th>Syntax:</th>
<th>loadIntervalSeconds = seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>How often (in seconds) to check to see if we need to reload information from the database.</td>
</tr>
<tr>
<td>Type:</td>
<td>integer</td>
</tr>
<tr>
<td>Optionality:</td>
<td>Optional (default used if not set)</td>
</tr>
<tr>
<td>Allowed:</td>
<td>Allowed</td>
</tr>
<tr>
<td>Default:</td>
<td>600</td>
</tr>
<tr>
<td>Notes:</td>
<td>Reloads are always at intervals of this many seconds after midnight, for example, a value of 600 would cause reload checks at 12:00, 12:10, 12:20 and so on. If the database has not been changed through the screens, no reload is performed.</td>
</tr>
<tr>
<td>Example:</td>
<td>loadIntervalSeconds = 600</td>
</tr>
</tbody>
</table>

**loadReportingPeriod**

<table>
<thead>
<tr>
<th>Syntax:</th>
<th>loadReportingPeriod = seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>The maximum SMS rate (SMS per second) is reported in the syslog. The loadReportingPeriod sets the time between these reports.</td>
</tr>
<tr>
<td>Type:</td>
<td>integer</td>
</tr>
<tr>
<td>Optionality:</td>
<td>Optional (default used if not set)</td>
</tr>
<tr>
<td>Allowed:</td>
<td>Allowed</td>
</tr>
<tr>
<td>Default:</td>
<td>1</td>
</tr>
<tr>
<td>Notes:</td>
<td>Optional (default used if not set)</td>
</tr>
<tr>
<td>Example:</td>
<td>loadReportingPeriod = 10</td>
</tr>
</tbody>
</table>

**mmxIsdn**

<table>
<thead>
<tr>
<th>Syntax:</th>
<th>mmxIsdn = &quot;isdn&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>The Messaging Manager VMSC address that will be returned in the result of a RouteInfo message.</td>
</tr>
<tr>
<td>Type:</td>
<td>number string</td>
</tr>
<tr>
<td>Optionality:</td>
<td>Optional (default used if not set)</td>
</tr>
<tr>
<td>Allowed:</td>
<td>Allowed</td>
</tr>
<tr>
<td>Default:</td>
<td></td>
</tr>
<tr>
<td>Notes:</td>
<td>Optional (default used if not set)</td>
</tr>
<tr>
<td>Example:</td>
<td>mmxIsdn = &quot;0640041234567&quot;</td>
</tr>
</tbody>
</table>

**mmxIsdnGprs**

<table>
<thead>
<tr>
<th>Syntax:</th>
<th>mmxIsdnGprs = &quot;sgsn&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>MMX SGSN Address that will be returned in the result of a RouteInfo message, if GPRS support was specified.</td>
</tr>
</tbody>
</table>
Type: number string
Optionality: Allowed: valid ISDN
Default:
Notes:
Example: mmxIsdnGprs = "0640041234568"

mtTransactionLifetimeSeconds
Syntax: mtTransactionLifetimeSeconds = seconds
Description: How long correlation transactions between routInfos and delivers should exist before being removed.
Type: integer
Optionality: Allowed:
Default: 30
Notes: in seconds
Example: mtTransactionLifetimeSeconds = 30

oracledatabase
Syntax: oracledatabase = "db"
Description: The Oracle database
Type: String
Optionality: Optional
Allowed:
Default:
Notes:
Example: oracledatabase = ""

oraclepassword
Syntax: oraclepassword = "pw"
Description: The Oracle password
Type: String
Optionality: Mandatory
Allowed:
Default:
Notes:
Example: oraclepassword = "scp"

oracleusername
Syntax: oracleusername = "name"
Description: The Oracle user name
Type: String
Optionality: Mandatory
Allowed:
Default:
Notes:
Example: oracleusername = "scp"

pollTime
Syntax: pollTime = time
Description: Cycle period to check for activity for TCP/IP sockets.
Type: integer
Optionality: Allowed: Any positive, non zero integer.
Default: 100000
Notes: in milliseconds
Example: pollTime = 100000

processMsgSCI
Syntax: processMsgSCI = true|false
Description: Used to control SCI handling in xmsTrigger.
Type: boolean
Optionality: Allowed: true, false
Default: true
Notes: If set to true it invokes the SCI handler in xmsTrigger.
Example: processMsgSCI = true

pstore
Description: List of persistent storage parameters within {}. See Setting Pstore (on page 60).

result
Syntax: result = result
Description: Protocol specific result based on the cause value.
Type: Optionality: Allowed: 0 Success
1 Transient Failure
2 Permanent Failure
3 Abort
Default: 1
Notes:
Example: result = 1

routingScheme
Description: This sub-section supplies parameters for the routing scheme.
Example: routingScheme = {
    loadIntervalSeconds = 600}
SECUREKey

Syntax: \texttt{SECUREKey = key}

Description: Pre-defined security key.

Type: integer

Optionality: 

Allowed: Defined by Oracle

Default: 

Notes: 

Example: \texttt{SECUREKey = 123456}

singleShotDeliveryReport

Syntax: \texttt{singleShotDeliveryReport = true|false}

Description: Indicates if a Delivery Report failure should be retried or not.

Type: Boolean

Optionality: Optional (default used if not set).

Allowed: 

- true - use legacy behaviour for internally-generated delivery reports
- false - DR failure is retried

Default: false

Notes: Set true to use legacy behaviour for internally-generated delivery reports, that is, use a single delivery attempt through the inbound transaction. No other processing logic (for example, Trigger/Routing Rules) is applied.

Example: \texttt{singleShotDeliveryReport = true}

sleeEventSize

Syntax: \texttt{sleeEventSize = bytes}

Description: The number of bytes SLEE event should be. This sets both: 
- the size of events requested by \texttt{xmsTrigger}, and 
- the size \texttt{xmsTrigger} constructs SLEE events to be.

Type: Integer

Optionality: Optional (default used if not set).

Allowed: 

Default: 2048

Notes: This is the default size of SLEE event to construct.

You need to set a corresponding \texttt{EVENTSIZE} in SLEE.cfg. For more information about SLEE.cfg, see \textit{SLEE Technical Guide}.

Example: \texttt{sleeEventSize = 4096}

statistics

Description: List of statistics parameters within \{\}. See \textit{Collecting Statistics} (on page 62).

stopRoutingOnTransientFailure

Syntax: \texttt{stopRoutingOnTransientFailure = true|false}

Description: Used to control how \texttt{xmsTrigger} manages transient failure.

Type: boolean

Optionality: Optional (default used if not set).
Allowed: true  xmsTrigger will not attempt alternate routing of a message upon receipt of a transient failure.
false
Default: false
Notes: Refer to Setting ACS Cause to Result.
Example: stopRoutingOnTransientFailure = false

stopRoutingOnPermanentFailure

Syntax: stopRoutingOnPermanentFailure = true|false
Description: Used to control how xmsTrigger manages permanent failure.
Type: Boolean
Optionality: Optional (default used if not set).
Allowed: true  xmsTrigger will not attempt alternate routing of a message upon receipt of a permanent failure.
false
Default: true
Notes: Example: stopRoutingOnPermanentFailure = false

successDeliveryReceiptText

Syntax: successDeliveryReceiptText = "text"
Description: The text for the successful Delivery Receipt.
Type: string
Optionality: Allowed:
Default: "Your message to <destination> was delivered"
Notes: where <destination> substitutes the destination number.
Example: successDeliveryReceiptText = "Your message to <destination> was delivered"

tracing

Description: List of SMS tracing parameters within {}. See Tracing SMSs (on page 53).

xmsAgentInboundServiceKey

Syntax: xmsAgentInboundServiceKey = val
Description: Service key for the xmsAgent, used for inbound SMPP traffic.
Type: Integer
Optionality: Optional (default used if not set).
Allowed: The value must match the service key defined in the SLEE.cfg (on page 23) file.
Default: 102 (by install question)
Notes: Listen Socket = inbound.
Example: xmsAgentInboundServiceKey = 102
xmsAgentOutboundServiceKey

Syntax:  

```
xmsAgentOutboundServiceKey = val
```

Description: Service key for the xmsAgent, used for outbound SMPP traffic.

Type: Integer

Optionality: Optional (default used if not set).

Allowed: The value must match the service key defined in the `SLEE.cfg` (on page 23) file.

Default: 103 (by install question)

Notes: Connect Socket = outbound

Example: `xmsAgentOutboundServiceKey = 103`

SECURE section

Here is an example of the SECURE section configuration.

```
SECURE = {
  limits = {
    maxConcurrentTransactions = 0
    warnConcurrentTransactionsPercentage = 70
    warnConcurrentTransactionsPeriod = 5
    clearConcurrentTransactionsPeriod = 5
    maxSmsPerSecond = 200
    warnSmsPerSecond = 180
  }
  options = ["MCC","SAS","EDR","MCP"]
  gateways = ["MO_SMS","MT_SMS","VAS_SMS"]
  adapters = ["MAP","CDMA","TDMA","EMI","SMPP","API"]
}
```

adapters

Syntax:  

```
adapters = "a1","a2" ...
```

Description: Array listing the adapters supported for this installation of MM.

Type: 

Optionality: 

Allowed: 

- MAP
- CDMA
- TDMA
- EMI
- SMPP
- API

Default: "MAP","CDMA","TDMA","EMI","SMPP","API"

Notes: 

Example: `adapters = "MAP","CDMA","TDMA","EMI","SMPP","API"`

gateways

Syntax:  

```
gateways = "g1","g2" ...
```

Description: Array listing the adapters supported for this installation of MM.

Type: 

Optionality: 

**options**

**Syntax:**
```plaintext
options= "o1","o2" ...
```

**Description:** Array listing the licence options for this installation of MM.

**Type:**

**Optionality:**

**Allowed:**
- MCC - Message Charging Control (billing)
- SAS - SMS Anti-Spam Screening
- EDR - Express Delivery Routing (also known as FDA)
- MCP - Message Control Pack (also known as AMC, triggering to ACS)
- API - 'Internal' protocol, that is, wrapper adapter

**Default:** "MCC","SAS","EDR","MCP","API"

**Notes:** If the line is not present, all options are enabled, but maxConcurrentTransactions is limited to 5.

**Example:**
```plaintext
adapters = "MCC","SAS","EDR","MCP","API"
```

---

**limits**

The following parameters set the performance limits of the system. These are pre-defined by Oracle and should not be changed.

**clearConcurrentTransactionsPeriod**

**Syntax:**
```plaintext
clearConcurrentTransactionsPeriod = period
```

**Description:** How often to report that we are below warnConcurrentTransactionsPercentage concurrent transactions.

**Type:**

**Optionality:**

**Allowed:**

**Default:** 10

**Notes:** In seconds

**Example:**
```plaintext
clearConcurrentTransactionsPeriod = 10
```

**maxConcurrentTransactions**

**Syntax:**
```plaintext
maxConcurrentTransactions = period
```

**Description:** The maximum number of concurrent transactions that can be handled.

**Type:** integer

**Optionality:**

**Allowed:**

**Default:** 5

**Notes:**

**Example:**
```plaintext
maxConcurrentTransactions = 5
```
warnConcurrentTransactionsPercentage
Syntax: \( \text{warnConcurrentTransactionsPercentage} = \text{pc} \)
Description: Percentage of maxConcurrentTransactions at which to emit a warning.
Type: integer
Optionality: Allowed
Default: 90
Notes: Example: \( \text{warnConcurrentTransactionsPercentage} = 90 \)

warnConcurrentTransactionsPeriod
Syntax: \( \text{WARNConcurrentTransactionsPeriod} = \text{period} \)
Description: How often to report we are over warnConcurrentTransactionsPercentage concurrent transactions.
Type: Optionality: Allowed
Default: 5
Notes: In seconds
Example: \( \text{WARNConcurrentTransactionsPeriod} = 5 \)

maxSmsPerSecond
Syntax: \( \text{ArraySize} = \text{num} \)
Description: The maximum number of transactions per second we will accept before throttling.
Type: Integer
Optionality: Mandatory
Allowed:
Default: 1000
Notes:
Example: \( \text{maxSmsPerSecond} = 200 \)

warnSmsPerSecond
Syntax: \( \text{warnSmsPerSecond} = \text{num} \)
Description: The maximum number of transactions per second before warning that throttling is imminent.
Type: Integer
Optionality: Mandatory
Allowed:
Default: 80% of maxSmsPerSecond
Notes:
Example: \( \text{warnSmsPerSecond} = 180 \)
Tracing SMSs

How does tracing work?

The Messaging Manager tracing feature allows individual messages to be identified and traced.

To activate tracing, the tracing section of the xmsTrigger configuration must be set to enabled, and the prefixes to be traced must be defined. Tracing output is written to file at a specified interval.

The tracing section of the eserv.config file is required, but may be empty. In this case the tracing enabled parameter will be set to false by default. For further details on how tracing works, please refer to the Tracing (on page 161) section of the Messaging Manager Processes chapter.

Tracing configuration

The tracing section of the eserv.config determines the SMSs that are to be traced, if any.

```plaintext
tracing = {
    enabled = true
    showPrivate = true
    outputFileName = "/tmp/xmsTrigger.trc"
    outputFileCycle = 512
    maxFileSizeKB = 0
    maxNumFiles = 4
    shmKey = 92403
    shmSizeKb = 64
    callsPerMinute = 2
    origAddress = [
        "0064212",
        "0064213",
        "0064214"
    ]
    destAddress = [
        "0064213",
        "0064214"
    ]
    useTONNPI = true
}
```

Tracing parameters

Here are the tracing parameters.

callsPerMinute

**Syntax:**

```
callsPerMinute = num
```

**Description:**
The maximum number of calls per minute to trace.

**Type:**

Integer

**Optionality:**

Allowed:

**Default:**

2
Notes:
Example: \texttt{callsPerMinute = 2}

\textbf{destAddress}

\textbf{Syntax:} \texttt{destAddress = ["add1","add2"]}
\textbf{Description:} Array of destination addresses for which calls will be traced.
\textbf{Type:} Optionality: Allowed: Default: Refer to Prefix parameters.
You can specify "0" for all numbers.
\textbf{Notes:} Prefixes in this list (\textit{TonNpi} format) must be enclosed in double quotes; that is,"ttt\texttt{nnn}"
\textbf{Example:}
\begin{verbatim}
destAddress = [
    "0064213",
    "0064214"
]
\end{verbatim}

\textbf{enabled}

\textbf{Syntax:} \texttt{enabled = true|false}
\textbf{Description:} Determines whether Messaging Manager collects tracing details of numbers whose prefixes match those specified in the origAddress and destAddress parameter lists.
\textbf{Type:} Boolean
\textbf{Optionality:} Allowed: true, false
\textbf{Default:} false
\textbf{Notes:}
\textbf{Example:} \texttt{enabled = false}

\textbf{maxFileSizeKB}

\textbf{Syntax:} \texttt{maxFileSizeKB = size}
\textbf{Description:} The maximum file size, in KB.
\textbf{Type:} Integer
\textbf{Optionality:} Allowed: Default: 0 (unlimited)
\textbf{Notes:}
\textbf{Example:} \texttt{maxFileSizeKB = 0}
maxNumFiles
Maximum number of additional files.
Default: 4
Note:
- maxFileSizeKB is > 0 and
- maxNumFiles is > 0
then every outputFileCycle, a check to see if the outputFile size is > maxFileSizeKB is made.
If max file size is exceeded, the trace file is renamed to outputFile. \( N \) where \( N \) is 1 to maxNumFiles.
If all \( N \) files exist, then the oldest file is overwritten.

origAddress
Syntax: \( \text{origAddress} = ["add1","add2"] \)
Description: Array of originating addresses for which calls will be traced.
Type: Optionality: Allowed:
Default: Refer to Prefix parameters.
You can specify "0" for all numbers.
Notes: Prefixes in this list (\( \text{TonNpi} \) format) must be enclosed in double quotes; that is,"tttnnn"
Example: \( \text{origAddress} = [\)
\( \hspace{1em} "0064212",\)
\( \hspace{1em} "0064213",\)
\( \hspace{1em} "0064214" \)
\( ] \)

outputFile
Syntax: \( \text{outputFile} = "file" \)
Description: The file that all tracing details are to be written to. The primary output file. Refer to note on "maxNumFiles".
Type: Optionality: Allowed:
Default: "/tmp/smsTrace.trc"
Notes: Once established, Messaging Manager cannot remove or rename the tracing output file.
Example: \( \text{outputFile} = "/tmp/smsTrace.trc" \)

outputFileCycle
Syntax: \( \text{outputFileCycle} = \text{num} \)
Description: Close and re-open the file every \( N \) calls. Checks for file size exceeded at this time also.
Type: Optionality: Allowed:
Chapter 2

**Default:** 1024
**Notes:** Tracing buffered data is flushed to the output file before closing.
**Example:** `outputFileCycle = 1024`

`shmKey`
**Description:** Shared memory key.
**Note:** Not currently supported.

`shmSizeKb`
**Description:** Size of shared memory, in KB.
**Note:** Not currently supported.

**showPrivate**
**Syntax:** `showPrivate = true|false`
**Description:** Enables the viewing of the message payload in the tracing output.
**Type:** Boolean
**Optionality:** Optional
**Allowed:**
- true: Allows viewing of payload.
- false: Bars viewing of payload.
**Default:** false
**Notes:**
**Example:** `showPrivate = true`

**useTONNPI**
**Syntax:** `useTONNPI = true|false`
**Description:** Whether or not to include TON and NPI in the address for trace prefix matching.
**Type:** Boolean
**Optionality:** Optional
**Allowed:** true, false
**Default:**
**Notes:**
**Example:** `useTONNPI = true`

### Configuring EDR Collection

**Configuring EDR collection**

Messaging Manager will produce EDRs to be used in post processing as required. All EDR configuration is done in the `cdr` section of the `eserv.config` file. These EDRs will be saved to file in the location specified in the `eserv.config`.

EDRs are saved to file in tag/value pairs, separated by "|", in the following form:

```
tag1=value1|tag2=value2
```

Please note that there are some parameters that may not be changed after startup. These parameters are as follows:

- `destdir`
num_files
num_files_leaf

All other cdr parameters may be changed as required.

EDR configuration example

The following section sets the EDR collection and configuration for Messaging Manager. For further details on the generation and format of EDRs, please refer to the EDRs (on page 163) section of the Messaging Manager Processes chapter.

cdr = {
  log = true
  filename = "xms_"
  tempdir = "/IN/service_packages/XMS/cdr/current/"
  maxno = 10000
  time_out = 1800
  destdir = "/IN/service_packages/XMS/cdr/closed/"
  num_files = 64000
  num_files_leaf = 64
}

EDR parameters

Here are the EDR parameters.

destdir

Syntax: destdir = "dir"
Description: The base filestore directory for completed EDR log files.
Type: String
Optionality: Mandatory
Allowed: Valid directory path
Default: "/IN/service_packages/XMS/cdr/closed/"
Notes: This parameter may not be changed after installation and initial setup.
Example: destdir = "/IN/service_packages/XMS/cdr/closed/"

filename

Base filename used to create EDR log files.

Allowed: alphanumeric string
Note: The format log file name is filename + "YYYYMMDDHHMSS.cdr"

log

Turns EDR logging on or off.

Default: false
Allowed: true, false

maxno

Maximum number of EDRs per file.

Default: 10000
num_files
Number of expected EDR files.
Default: 64000
Note: This parameter may not be changed after installation and initial setup.

num_files_leaf
Number of EDR files per leaf directory.
Default: 64
Note: This parameter may not be changed after installation and initial setup.

tempdir
Syntax: tempdir = "dir"
Description: The temporary directory for the working EDR log file.
Type: String
Optionality: Mandatory
Allowed: Valid directory path
Default: "/IN/service_packages/XMS/cdr/current/"
Note: A side effect of the CDR processing code of MMX is to remove all files in the tempdir when MMX starts.
Example: tempdir = "/IN/service_packages/XMS/cdr/current/"

time_out
Close EDR file after time_out (in seconds).
Default: 1800

Setting Early Acknowledgment

What is early ack?
There are two ways in which a delivery acknowledgement can be sent in MMX.

- MMX does not acknowledge the sending party until the message has been successfully sent. However, this cannot work in all cases, because some networks have a normal HLR lookup time that exceeds 3 seconds, and an MSC response time that exceeds 2 seconds. Forcing the sending party to wait during an FDA attempt both causes excessive use of network resources and alters the user experience.
The alternative is to mimic the SMSC functionality and acknowledge the message the moment that the recipient appears valid. This is called an early ack. However this carries the risk that messages will be lost before they are delivered, as there is no persistence or replication.

![Diagram of message flow]

**Early ack configuration**

If desired, earlyAck parameters can be defined at trigger level, and/or adapter level. The values defined at adapter level will override those defined at Trigger Level.

**Note:** The earlyAck parameters at adapter level are read from the adapter section of the *eserv.config* file for the outbound adapter. (Not the inbound adapter).

Messaging Manager will produce an early ack when the message is accepted by the outbound adapter for delivery, where early ack is on for one of the following:

- SME – direct delivery
- MC – delivery to a Message Center

By default, if a Nack is received later then it will not be passed back to the sender and subsequent routing will also not send an Ack.

```plaintext
XMS = {
  xmsTrigger = {
    other_Messaging Manager_configuration_options
    earlyAckSME = false
    earlyAckMC = false
    alwaysProduceNonDeliveryReceipt = false
  }
}
```

**Early ack options**

This feature is configurable for each adapter instance to either be:

<table>
<thead>
<tr>
<th>Option</th>
<th>Parameter settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always on</td>
<td>earlyAckMC = True&lt;br&gt;earlyAckSME = True</td>
</tr>
<tr>
<td>Apply when a “send to SME (MS or ASP)” is first encountered</td>
<td>earlyAckMC = False&lt;br&gt;earlyAckSME = True</td>
</tr>
<tr>
<td>Always off</td>
<td>earlyAckMC = False&lt;br&gt;earlyAckSME = False</td>
</tr>
</tbody>
</table>
Early ack functionality support

The early ack functionality is supported under:

- MAP 1, 2 and 3
- SMPP 3.4 and 5.0
- EMI/UCP 4.0
- IS-41

Setting Pstore

Pstore configuration

Persistent storage is used for long term storage of information. Information stored using pstore will be stored for as many days as required; this is set using the `pstore` configuration in `eserv.config`.

Where both early ACK and a delivery receipt have been requested for EMI messages, pstore is used to store the message id that was sent by Messaging Manager. When the message is delivered by the SMSC, it returns to message id to Messaging Manager. pstore is used to translate the SMSC message_id to the Messaging Manager generated message_id and send on in the delivery receipt.

Changing the configuration

When the configuration is changed you need to send a SIGHUP to xmsTrigger with pstore to reread the configuration file.

- `enable = false` in `eserv.config`, disables pstore, flushes cache, deletes pstore, then removes the database connection.
- `enable = true` in `eserv.config`, causes xmsTrigger to reread the pstore config, updates oraPStore with the values, and re-establishes a database connection.

Pstore configuration example

Here is an example of the `pstore` sub-section of `xmsTrigger`.

```plaintext
pstore = {
    enable = true
    cache_size = 10000 # -1 mean no max size
    flush_period = 10
    interfaceName = "xmsStoreIf"
    over_size_max_age_seconds = 60
    max_age_seconds = 30
    maxWrites_per_flush = 10
    deferred_delete = true
    userpass = "scp/scp"
}
```

Pstore parameters

Here are the parameters in the `pstore` sub-section of `xmsTrigger`.

**cache_size**

Maximum number of elements in cache.

Default: 10000

Note: This value is only read on startup.
**deferred_delete**
If true, do not actually delete items from the database, just mark them as deleted.
Default: true  
Allowed: true, false

**enable**
Enable or disable persistent storage.
Default: false  
Allowed: true, false

**flush_period**
Time, in seconds, between flushing cache to DB.
Default: 300  
**Note:** This value is only read on startup.

**interfaceName**
Syntax:  
`interfaceName = "ifname"`
Description: The name of the SLEE interface providing xmsStore services.
Type: String  
Optionality: Optional (default used if not set).
Allowed:
Default: "xmsStoreIf"  
Notes:
Example:  
`interfaceName = "xmsStoreIf"`

**max_age_seconds**
Minimum time that the item may reside in the cache (in seconds) before it can be flushed to the database.
Default: 300

**max_writes_per_flush**
Maximum number of records to write per Oracle transaction when flushing. This stops the process blocking on Oracle writes (which can cause xmsTrigger to be killed by the watchdog).
Default: -1  
**Note:** -1 means no limit

**over_size_max_age_seconds**
Flush items older than this number of seconds when cache is overfull.
Default: 60

**userpass**
Username and password login to use to attach to the Oracle database if the host application is not already logged in.
Default: "/"  
**Note:** This value is only read on startup.
Collecting Statistics

Editing the statistics configuration

When configured MM will gather extensive operational statistics. Using the NCC SMS application, these statistics are stored in the database for subsequent reporting.

For a full list of the MM statistics that will be gathered please refer to the Statistics (on page 153) topic in the Background Processes chapter.

Statistics parameters

To collect statistics, there is a single parameter that must be set to true in the xmsTrigger section of the eserv.config file.

enable
Determines whether Messaging Manager collects operational statistics.
Default: false
Allowed: true, false

Defining the Screen Language

Introduction

The default language file sets the language which the Java administration screens will start in. The user can change to another language once they have logged in.

The default language can be changed by the system administrator.

By default, the language is set to English. If English is your preferred language, you can skip this step and proceed to the next configuration task: Defining the Help Screen Language.

Example screen language

If Dutch is the language you want to set as the default, create a soft-link from the Default.lang file to the Dutch.lang file.
Overview

Introduction

This chapter explains how to configure the adapters in Messaging Manager Multigate.

In this chapter

This chapter contains the following topics.

| Configuring the Required Adapters       | 63  |
| Configuring the MAP Adapter             | 67  |
| Configuring the EMI Adapter             | 86  |
| Configuring the SMPP Adapter            | 92  |
| Configuring the IS-41 CDMA Adapter      | 103 |
| Configuring the IS-41 TDMA Adapter      | 113 |
| Configuring the SCA Adapter             | 115 |
| Configuring the Wrapper Adapter         | 118 |

Configuring the Required Adapters

Limitation

All adapters have a section in this part of the configuration file. The array of adapters section starts as below, and is followed by a section for each available adapter.

```bash
# adapters = [adapter]
```

Note: This technical guide documents all adapters available from NCC. By documenting all available adapters, Oracle in no way commits to supplying the software thus described.

NCC will supply only the adapters purchased by the customer; thus configuration for each installation will differ.

Adapter overview

There are a number of interfaces that provide communication between the Messaging Manager platform and the ASPs and SMSCs. These interfaces are provided as adapter interfaces. Each of these interfaces performs several roles:

1. Receive message send requests from an ASP or MS
2. Deliver outbound short messages to an SMSC or MS, and return a delivery result to the application
3. Receive delivery notifications from an SMSC or MS, and forward to MM
4. Relay delivery notifications to an ASP or MS
MM may be configured to use as many adapters as required. Each adapter receives and transmits a different protocol.

**Which adapters do I need?**

This will have been determined at the time of purchasing Messaging Manager. There are several different adapters available:

- MAP - MAP adapter for GSM networks
- IS-41 CDMA - IS-41 adapter for CDMA networks
- IS-41 TDMA - IS-41 adapter for TDMA networks
- SCA - SCA adapter for support of SIP instant messaging
- SMPP - SMPP adapter for ASP/SMSC proxy connections
- EMI - UCP/EMI adapter for ASP/SMSC proxy connections

Additional adapters may be purchased at a later date as required to accommodate your changing network needs.

**Number normalization**

People deal with (and a database usually stores) telephone numbers in their normalized form, for example, 00441918666223. The network however gives and receives numbers in a denormalized form, that is, where the type of number (the Nature of Address) is known explicitly, for example, [International, 441918666223] for the previous example.

The number rules parameters in the adapters conform to the number normalization configuration described below.

**Example:**

<table>
<thead>
<tr>
<th>Normalized number:</th>
<th>De-Normalized number:</th>
<th>Nature of Address:</th>
<th>Digits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>049393434</td>
<td></td>
<td></td>
<td>49393434</td>
</tr>
</tbody>
</table>

**Possible Natures of Addresses:**

This table shows the different Normalization NoA values depending on the adapter type.

<table>
<thead>
<tr>
<th>NoA</th>
<th>MAP</th>
<th>EMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subscriber number</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>National</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>International</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Network specific</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Normalization parameters**

Enter a conversion rule for each incoming NOA. This rule determines how to convert to the normalized number and a corresponding rule converts back to a denormalized number on the outgoing side.

Number normalization rules are in the following format:

```
{ fromNoa=noa, targetNoa=noa, prefix="digits", [ min=len ], [ max=len ], remove=num, prepend="digits", resultNoa=noa }
```

Here are the configuration parameters for number normalization.
**fromNoa**

**Syntax:**  
fromNoa = noa

**Description:**  
The original nature of address (NOA) that the number is received from. This is prior to normalization and denormalization.

**Type:**

**Optionality:**

**Allowed:**

**Default:**

**Notes:**

**Example:**  
fromNoa = 306

**max**

**Syntax:**  
max = len

**Description:**  
The maximum number length.

**Type:**  
Integer

**Optionality:**  
Optional (default used if not set).

**Allowed:**

**Default:**  
999

**Notes:**  
Used in number normalization (on page 64) and denormalization rules.

**Example:**  
max = 32

**min**

**Syntax:**  
min = len

**Description:**  
The minimum number length.

**Type:**  
Integer

**Optionality:**  
Optional (default used if not set).

**Allowed:**

**Default:**  
0

**Notes:**  
Used in number normalization (on page 64) and denormalization rules.

**Example:**  
min = 4

**prefix**

**Syntax:**  
prefix = "digit"

**Description:**  
This rule is applied to numbers with this prefix.

**Type:**  
String

**Optionality:**  
Optional

**Allowed:**  
One or more decimal digits

**Default:**

**Notes:**  
Used in number normalization (on page 64) and denormalization rules.

**Example:**  
prefix = "25"
prepend

Syntax: prepend= "digits"
Description: Determines the digits that are to be prepended to the number, after stripping any as specified previously.
Type: String
Optionality: Allowed:
Default:
Notes: Used in number normalization (on page 64) and denormalization rules.
Example: prepend = "1111"

remove

Syntax: remove = num
Description: Determines the number of digits that are stripped from the beginning of the number.
Type: Integer
Optionality: Allowed:
Default:
Notes: Used in number normalization (on page 64) and denormalization rules.
Example: remove = 2

resultNoa

Syntax: resultNoa = noa
Description: Resulting NOA after the normalization.
Type: 
Optionality: Allowed:
Default:
Notes: Used in number normalization (on page 64) and denormalization rules.
Example: resultNoa = 4

targetNoa

Syntax: targetNoa=noa
Description: The target NOA.
Type: 
Optionality: Allowed:
Default: 999
Notes: EMI only.
If unspecified, defaults to 999.
Used in number normalization (on page 64) rules.
Example: targetNoa=999
**NOA and Normal rules**

The NOA (nature of address) is a classification to determine in what realm (Local, National or International) a given phone number resides, for the purposes of routing and billing.

Details vary between different implementations of telephone systems, but the following table is representative.

<table>
<thead>
<tr>
<th>Dialed Digits</th>
<th>NOA (aka NOC, NON)</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>477 9425</td>
<td>1 → Subscriber</td>
<td>Number within local telephone exchange</td>
</tr>
<tr>
<td>4 477 9425</td>
<td>3 → National</td>
<td>Number within country telephone exchange</td>
</tr>
<tr>
<td>64 4 477 9425</td>
<td>4 → International</td>
<td>Number within world telephone exchange</td>
</tr>
<tr>
<td>477 9425</td>
<td>2 → UNKNOWN</td>
<td>Numbering Scheme rule → Subscriber</td>
</tr>
<tr>
<td>0 4 477 9425</td>
<td>2 → UNKNOWN</td>
<td>Numbering Scheme rule → National</td>
</tr>
<tr>
<td>00 64 4 477 9425</td>
<td>2 → UNKNOWN</td>
<td>Numbering Scheme rule → International</td>
</tr>
</tbody>
</table>

In essence, the subscriber’s telephone system may try to ascertain the nature by examining the dialed digits. If they can be understood by "built-in" mechanisms, the NOA can unambiguously be one of the values - Subscriber, National, International, or a finer classification determined by the protocol variant.

Otherwise the NOA is unknown and the dialed digits must be disambiguated by a set of (usually simple) rules specified by a Numbering Scheme.

Leading zeros are used in many countries, but the leading characters could be any arbitrary sequence that the numbering scheme could specify.

Ultimately the usage of NOA is determined by the phone network itself which may classify and possibly modify a phone number while it is being transmitted between the service logic and the switch.

**Configuring the MAP Adapter**

**MAP adapter overview**

The MAP adapter communicates between the Messaging Manager platform and:

- HLR and MSC (in FDA situations)
- SMSCs using MAP

In a system using MAP, the MAP adapter must be configured to know of all entities that may connect to it, and all entities that it may connect to.

The MAP adapter is compliant with several versions of MAP:

- Map v1
  - ETSI GTS 09.02 V3.11.0 (1995-01)
  - ETSI GTS 03.40 V3.7.0 (1995-01)
- Map v2
  - ETSI ETS 300 599 ed.3 (1996-09) - GSM 09.02
  - ETSI ETS 300 536 ed.4 (1996-10) - GSM 03.40
- Map v3
  - 3GPP/ETSI GSM TS 09.02 version 7.5.0 Release 1998
  - 3GPP/ETSI GSM TS 03.40 version 7.5.0 Release 1998
General MAP configuration

The following section of the eserv.config specifies the general parameters for all MAP connections.

```java
adapters = [
    # First adapter (MAP)
    {
        lib = "xmsiMap.so"
        adapterName = "MAP1"
        pointCodes = [1001, 1002]
        SSN = 8
        earlyAckMC = true
        earlyAckSME = true
        allowConcatenatedFDA = true
        alwaysProduceNonDeliveryReceipt = false
        config = {
            global_parameters
        }
    }
]
```

General MAP parameters

Here are the general parameters for MAP.

adapterName

**Syntax:**  
adapterName = "name"

**Description:**  
Identifier for the adapter.

**Allowed:**  
Any text string, but should be meaningful, for example include the protocol used.  
For example:
- "MAP1" for MAP
- "EMI1" for EMI
- "SCA1" for SCA
- "SMPP1" for SMPP
- "CDMA1" for IS-41 CDMA
- "TDMA1" for IS-41 TDMA
- "Wrapper" for Wrapper

**Default:**  
No default.

**Notes:**  
This name must also be in the configuration database before Messaging Manager will run correctly.  See *MM User's Guide*.

alwaysProduceNonDeliveryReceipt

Local Unsolicited Non-Delivery Receipt flag.

Causes MM to send an unsolicited non-delivery receipt in the event that:
- a) Early ack was performed
- b) The outgoing message could not be delivered through any route.

This setting overrides the global flag.

**Default:**  
Global `alwaysProduceNonDeliveryReceipt` (on page 41) value

**Allowed:**  
true, false
Note: This only applies when early ack is on. See Setting Early Acknowledgement (see “Setting Early Acknowledgment” on page 58).

**config**
The parameters in this sub-section below this give the configuration for all messages for this adapter.

**lib**
*Syntax:* `lib = "library"`
*Description:* The name of the library that contains the MAP adapter being configured.
*Allowed:* "xmsiMap.so"
*Default:* No default.
*Example:* `lib = "xmsiMap.so"

**pointCodes**
*Syntax:* `pointCodes = [pc1, pc2, ...]`
*Description:* Destination point codes array of messages to be handled by this adapter. This parameter takes priority over SSN match.
*Optionality:* Optional
*Allowed:* Defined by network administrator.
*Example:* `pointCodes = [1001, 1002]

**SSN**
*Syntax:* `SSN = num`
*Description:* Destination subsystem number of messages to be handled by this adapter.
*Allowed:* Valid subsystem number
*Notes:* Non-zero to handle incoming TCAP.
*Example:* `SSN = 18`

**Global MAP configuration**
The following section of the `eserv.config` specifies the global parameters for a MAP connection.

```plaintext
config = {
    disableConcatenatedSegmentPad = false
    abortMessagesWithZeroLengthTPDA = true
    allowIncoming = true
    allowOutgoing = true
    allowDirectDelivery = true
    allowIncomingMap3 = true
    allowUserRequestedDeliveryReceipt = true
    lastSegmentDeliveryReceiptOnly = false
    tcapInterfaceServiceKey = 22
    originatingTimeout = 10
```
smscTimeout = 8
rimsTimeout = 3
mscTimeout = 15
rimsInterfaceName = "rimsIf"
gprsSupport = "supported"
nonGprsAdapter = "MAP2"
sgsnPrefixes = [ "000" ]
doProtocolIdMapping = false
defaultProtocolId = 0
protocolIdMap = [
    { in = 127, out = 0 }
]
fallbackAlphabet = "UCS-2"
scheduledDeliveryTime = ""
defaultMessagePriority = "Normal"
PC = 55
SSN = 8

GT = "5114406267"
GTMap = [
    { prefix = "0010019198", value = "919827002402" }
]

#SCA = "5114406267"
natureOfAddress = 1 # international
numberPlan = 6      # E.212
defaultMapVersionSmsc = 3
defaultMapVersionMsc = 3
deliveryFailureStatusCode = 64
throttledDeliveryFailureCause = 4 # congestion
mscVersionCacheSize = 1000
hybridiseMapVersions = false
maxUnsegmentedLength = 120
splitLongMessages = true
alarmMask = 0
honourReplyPath = false
pathRetryRandomisation = 1
pathRetrySegmentOffset = 1
localTimeZone = "UTC"
defaultTransientFailureErrorCode = 32
defaultPermanentFailureErrorCode = 32

incomingOriginatingNumberRules = [
    { fromNoa=2, prefix="04", min=4, max=32, remove=1,
      prepend="0064", resultNoa=1 }
    { fromNoa=3, prefix="4", min=4, max=32, remove=0, prepend="0064",
      resultNoa=1 }
]

incomingDestinationNumberRules = [
    { extId="1,2,776,8,8,8,8,8,11", asn1Tags= [ 0xE0, 0x80],
      profileTagID=327814, name = "imei" }

    ]
#
# privateExtensions = [
#    {extId="1,2,776,8,8,8,8,8,11", asn1Tags= [ 0xE0, 0x80],
#     profileTagID=327814, name = "imei" }
]

Global MAP parameters

Here are the parameters for configuring the global MAP adapter.

alarmMask
Alarm masking.
Default: 0
Allowed: Sum of:
1  Mask (that is, do not generate) originating timeout alarm
2  Mask alarm for Messaging Manager-originated abort
4  Mask alarm for timeout waiting for HLR
8  Mask alarm for TCAP ABORT from HLR
16 Mask alarm for timeout waiting for MSC
32 Mask alarm for TCAP ABORT from MSC
64 Mask alarm for timeout waiting for SMSC
128 Mask alarm for TCAP ABORT from SMSC

abortMessagesWithZeroLengthTPDA
Syntax: abortMessagesWithZeroLengthTPDA = true|false
Description: Whether or not MM shall return a TCAP U-ABORT to the MSC upon receipt of a
message with a zero length TP Destination-Address.
Type: Boolean
Optionality: Optional
Allowed: true, false
Default: true
Notes: If set to false, MM sends a SM Delivery Failure with the cause set to
'InvalidSMEAddress'.
Example: abortMessagesWithZeroLengthTPDA = true
allowIncoming
Syntax: allowIncoming = true|false
Description: Determines whether inbound messages are allowed.
Optionality: Mandatory
Allowed: true, false
Default: false
Example: allowIncoming = false

allowOutgoing
Syntax: allowOutgoing = true|false
Description: Determines whether initial messages may be sent out through the MAP interface.
Optionality: Mandatory
Allowed: true, false
Default: false
Example: allowOutgoing = false

allowDirectDelivery
Determines whether the adapter may deliver directly to MSCs.
Default: false
Allowed: true, false
Note: Required parameter.

allowIncomingMap3
Whether to allow MAP v3 inbound processing.
Default: true
Allowed: true, false

allowUserRequestedDeliveryReceipt
If false, turn off delivery receipts requested by the input transaction.
Default: true
Allowed: true, false
Note: Required parameter.

defaultMapVersionMsc
MAP version to use for communication with the MSC.
Default: 3
Note: If defaultMapVersionMsc is missing, it tries to find defaultMapVersion for backwards compatibility. If that is also missing uses default value.

defaultMapVersionSmesc
MAP version to use for communication with the SMSC.
Default: 3
Note: If defaultMapVersionSmsec is missing, it tries to find defaultMapVersion for backwards compatibility. If that is also missing, uses default value.
defaultMessagePriority

Syntax:  defaultMessagePriority = "str"
Description:  The priority to be applied to incoming messages that do not have a priority.
Type:  String
Optionality:  Optional (default used if parameter absent).
Allowed
Default  "Normal"
Notes:
Example:  defaultMessagePriority = "Normal"

defaultPermanentFailureErrorCode

The default MAP error code used for permanent failures when no mapping from CS1 release cause is specified.
Default:  32
Allowed:  See deliveryFailureStatusCode (on page 73) for list of values.

defaultProtocolId

If a protocol ID is found that is not in the protocolIdMap, this is the result value.
Default:  0
Note:  Optional parameter

defaultTransientFailureErrorCode

The default MAP error code used for transient failures when no mapping from CS1 release cause is specified.
Default:  32
Allowed:  See deliveryFailureStatusCode (on page 73) for list of values.

deliveryFailureStatusCode

Sets the default status code to be used in a failure status report.
Default:  64
Allowed:  0 to 127.  See table of values for value meaning.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Short Message received by the SME</td>
</tr>
<tr>
<td>1</td>
<td>Short message forwarded by the SC to the SME but the SC is unable to confirm delivery</td>
</tr>
<tr>
<td>2</td>
<td>Short message replaced by the SC Reserved Values</td>
</tr>
<tr>
<td>3-15</td>
<td>Reserved</td>
</tr>
<tr>
<td>16-31</td>
<td>Values specific to each SC Temporary Error, SC still trying to transfer SM</td>
</tr>
<tr>
<td>32</td>
<td>Congestion</td>
</tr>
<tr>
<td>33</td>
<td>SME busy</td>
</tr>
<tr>
<td>34</td>
<td>No response from SME</td>
</tr>
<tr>
<td>35</td>
<td>Service rejected</td>
</tr>
<tr>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>36</td>
<td>Quality of service not available</td>
</tr>
<tr>
<td>37</td>
<td>Error in SME</td>
</tr>
<tr>
<td>38-47</td>
<td>Reserved</td>
</tr>
<tr>
<td>48-63</td>
<td>Values specific to each SC Permanent Error, SC is not making any more transfer attempts</td>
</tr>
<tr>
<td>64</td>
<td>Remote procedure error</td>
</tr>
<tr>
<td>65</td>
<td>Incompatible destination</td>
</tr>
<tr>
<td>66</td>
<td>Connection rejected by SME</td>
</tr>
<tr>
<td>67</td>
<td>Not obtainable</td>
</tr>
<tr>
<td>68</td>
<td>Quality of service not available</td>
</tr>
<tr>
<td>69</td>
<td>No interworking available</td>
</tr>
<tr>
<td>70</td>
<td>SM Validity Period Expired</td>
</tr>
<tr>
<td>71</td>
<td>SM Deleted by originating SME</td>
</tr>
<tr>
<td>72</td>
<td>SM Deleted by SC Administration</td>
</tr>
<tr>
<td>73</td>
<td>SM does not exist (The SM may have previously existed in the SC but the SC no longer had knowledge of it or the SM may never had previously existed in the SC).</td>
</tr>
<tr>
<td>74-79</td>
<td>Reserved</td>
</tr>
<tr>
<td>80-95</td>
<td>Values specific to each SC Temporary Error</td>
</tr>
<tr>
<td>96</td>
<td>Congestion</td>
</tr>
<tr>
<td>97</td>
<td>SME busy</td>
</tr>
<tr>
<td>98</td>
<td>No response from SME</td>
</tr>
<tr>
<td>99</td>
<td>Service rejected</td>
</tr>
<tr>
<td>100</td>
<td>Quality of service not available</td>
</tr>
<tr>
<td>101</td>
<td>Error in SME</td>
</tr>
<tr>
<td>102-105</td>
<td>Reserved</td>
</tr>
<tr>
<td>106-111</td>
<td>Reserved</td>
</tr>
<tr>
<td>112-127</td>
<td>Values specific to each SC</td>
</tr>
</tbody>
</table>

**disableConcatenatedSegmentPad**

**Syntax:** `disableConcatenatedSegmentPad = true|false`

**Description:** Controls segment padding behavior in a concatenated message.

**Type:** Boolean

**Optionality:** Optional (default used if not set).

**Allowed:** true, false

**Default:** false
Notes:

If:

- true: no non-final message segments in a concatenated message will be padded.
  
  **Note:** Padding only affects messages which are UCS-2 encoded.

- false: all non-final message segments in a concatenated message, which is UCS-2 encoded, are padded to the maximum message segment length.

**Example:**

disableConcatenatedSegmentPad = false

doProtocolIdMapping

Whether or not to apply mapping rules to the TP-PID field.

**Default:** false

**Allowed:** true, false

**Note:** If true, defaultProtocolId and protocolIdMap default values apply.

gprsSupport

**Syntax:**

gprsSupport = "str"

**Description:** Whether to ask GPRS questions of the HLR, through Messaging Manager Navigator. Also determines whether inbound messages are allocated to this adapter if separate MAP adapters have been configured for GPRS/non-GPRS messages.

**Type:** Integer

**Optionality:** Optional (default used if not set).

**Allowed:**

- "unsupported"
- "supported"
- "preferred"

**Default:** supported

**Notes:**

- When supported, or preferred, the adapter will include a GPRS supported flag in the Messaging Manager Navigator query. Messaging Manager Navigator may reply with both the VMSC and SGSN numbers. If "preferred", the MAP adapter will then use the SGSN number instead of the VMSC number. If Messaging Manager Navigator replies with only the VMSC number, this will be used instead of SGSN.

- If you are supporting both SMSCs that support GPRS and SMSCs that do not support GPRS, you need to configure two MAP adapters, setting this parameter appropriately.

- Routing to an HLR for GPRS needs the adapters associated with both the incoming and outgoing paths to be GPRS supported.

**Example:**

gprsSupport = "supported"

GT

**Syntax:**

GT = int

**Description:** Originating Global Title in outgoing MAP messages.

**Type:** Integer

**Optionality:** Optional (default used if not set).

**Allowed:**

- 5114406267

**Default:**

**Notes:**

Used if no match found in GTMap. Also used when MM overrides the VMSC / SGSN address in an SRI-SM response with its own address.
Example: \( \text{GT} = "5114406267" \)

**TT**

**Syntax:** \( \text{TT} = \text{int} \)

**Description:** The translation type used for the corresponding SCCP Calling Party GT.

**Type:** Integer

**Optionality:** Optional (default used if not set).

**Allowed:**

- **Default:** 0

**Notes:**

- This applies to both Forward-SMs and SendRoutingInfoForSM messages.
- If the TT value is specified in the control plan, from within RIMS IS41 Query and MAP Query nodes, it will override the default value specified in the configuration.

Example: \( \text{TT} = 0 \)

**GTMap**

**Syntax:** \( \text{GTMap} = [\text{array}] \)

**Description:** Map of incoming originating global title prefix to outgoing originating global title for MO. Also indicates the translation type for SCCP Calling Party GT.

**Type:** Array

**Optionality:** Optional (default used if not set).

**Allowed:**

- **Default:** 0

**Notes:**

Example:

\[
\text{GTMap} = [
\{ \text{prefix} = "0010019198", \text{value} = "919827002402", \text{tt} = 0 \}\]
\]

**honourReplyPath**

**If:**

- True and the incoming MO ForwardSM has TP-Reply-Path set, allowAlternateDelivery will be set to false.
- False or the incoming MO ForwardSM has TP-Reply-Path not set, allowAlternateDelivery will be set to true

**Default:** false

**Allowed:** true, false

**hybridiseMapVersions**

**If:**

- True - MAP version 1 MO ForwardSM messages will contain a MAP phase 2 SMS-Submit.
- False they will contain a MAP phase 1 SMS-Submit.

**Default:** false

**Allowed:** true, false
lastSegmentDeliveryReceiptOnly
If true, a delivery receipt will only be sent for the last part of a concatenated message. Status report requests on the first parts of a concatenated message will be ignored.
Default: false
Allowed: true, false

localTimeZone
Time zone in which the service center (that is, the adapter) is located. The SM Service-Center-Time-Stamps and Validity-Period are set relative to this time zone.
Default: "UTC"
Allowed: Any zoneinfo database time zone is acceptable.

maxUnsegmentedLength
Length of TP-User-Data (in octets) beyond which messages will be segmented.
Default: 120

mscTimeout
Syntax: mscTimeout = seconds
Description: The timer for MSC delivery transactions. It is the period at which an outgoing message (that is, while Messaging Manager waits for a response from the MSC network) will be timed out. The adapter will close the connection to the network and return a "transient failure" to Messaging Manager.
Type: Integer
Optionality: Optional
Allowed: Default: 5
Example: mscTimeout = 5

mscVersionCacheSize
Maximum number of entries that the cache of MSC versions can grow to.
Default: 1000

natureOfAddress
Parameter which configures the destination reference IMSI when we receive a LMSI and an IMSI from the HLR lookup.
Default: 1

numberPlan
Parameter which configures the destination reference IMSI when we receive a LMSI and an IMSI from the HLR lookup.
Default: 6

nonGprsAdapter
If separate MAP adapters have been configured for GPRS/non-GPRS messages, this setting is used in the GPRS adapter to specify the name of the corresponding MAP adapter where GPRS is not supported.
Default: ""
Allowed: String name of an adapter.
Note: Used in the adapter with the configuration of the *gprsSupport* (on page 75) parameter set to "supported", or "preferred".

**originatingTimeout**
The period at which an incoming MAP message (that is, while Messaging Manager/ACS process the message) will be timed out and a MAP error sent to the MSC.

- **Default:** 10
- **Allowed:** Seconds

**pathRetryRandomisation**

- **Syntax:** `pathRetryRandomisation = seconds`
- **Description:** The amount of randomization for the delay interval when selecting a delay for a retry.
- **Allowed:** integer
- **Default:** 1
- **Notes:**
- **Example:** `pathRetryRandomisation = 1`

**pathRetrySegmentOffset**

- **Syntax:** `pathRetrySegmentOffset = seconds`
- **Description:** How much to delay later segments of a concatenated message when a delayed retry is attempted.
- **Allowed:** integer
- **Notes:**
- **Example:** `pathRetrySegmentOffset = 1`

**PC**

Originating Point Code in outgoing MAP messages.

- **Default:** 55
- **Allowed:** integer in range [0, 255]
- **Note:**

**privateExtensions**

- **Syntax:** `privateExtensions = [mapping]`
- **Description:** List of private extension TBCD-STRINGs from the MO-ForwardSM for CPE manipulation.
- **Type:** Array
- **Optionality:** Optional
- **Allowed:**
- **Default:**
- **Notes:**
- **Example:**

```
privateExtensions = [
    {extId="1,2,776,8,8,8,8,11", asnlTags= [ 0xE0, 0x80],
     profileTagID=327814, name = "imei" }
]
```

For full description, including the ASN.1 notation used, see *Example - Extract IMEI into profile tag* (on page 80).
extId
Syntax: extId = "value"
Description: The ID of the private extension as a comma separated sequence of integers representing an object ID.
Type: String
Optionality: Compulsory if privateExtensions is present.
Allowed: None
Default: None
Notes: Member of the privateExtensions array.
Example: extId="1,2,776,8,8,8,8,11"

asn1Tags
Syntax: asn1Tags = {tags}
Description: A list of asn1 tag values giving the location of the TBCD-STRING within the private extension.
Type: String
Optionality: Compulsory if privateExtensions is present.
Allowed: None
Default: None
Notes: Member of the privateExtensions array.
Example: asn1Tags = [ 0xE0, 0x80]

profileTagID
Syntax: profileTagID = tagid
Description: The mapped profile tag ID (in the Temporary Storage profile block)
Type: Integer
Optionality: Compulsory if privateExtensions is present.
Allowed: None
Default: None
Notes: 327814 is a special profile tag being the one defined in ACS for holding the IMEI. Therefore, xmsTrigger will put the value extracted from the private extension into the InitialDP.IMEI parameter as well as in a temporary storage profile tag. 327814 is the only tag value this rule applies to.
Example: profileTagID = 327814

name
Syntax: name = "name"
Description: A string for debug purposes.
Type: String
Optionality: Compulsory if privateExtensions is present.
Allowed: None
Default: None
Notes: Member of the privateExtensions array.
Example: name = "imei"
Example - Extract IMEI into profile tag

The example configuration below is to extract the IMEI into profile tag 327814 according to the following Abstract Syntax Notation One (ASN.1) notation:

```plaintext
mo-ForwardSM OPERATION ::= {
  ARGUMENT SEQUENCE {
    sm-RP-DA CHOICE {
      imsi [0] IMPLICIT OCTET STRING ( SIZE( 3 .. 8 ) ),
      lmsi [1] IMPLICIT OCTET STRING ( SIZE( 4 ) ),
      serviceCentreAddressDA [4] IMPLICIT OCTET STRING ( SIZE( 1 .. 20 ) ),
    sm-RP-OA CHOICE {
      msisdn [2] IMPLICIT OCTET STRING ( SIZE( 1 .. 20 ) ) ( SIZE( 1 .. 9 ) ),
      serviceCentreAddressOA [4] IMPLICIT OCTET STRING ( SIZE( 1 .. 20 ) ),
    sm-RP-UI OCTET STRING ( SIZE( 1 .. 200 ) ),
    extensionContainer SEQUENCE {
      privateExtensionsList[0] IMPLICIT SEQUENCE (SIZE (1..10)) OF {
        SEQUENCE{
          extId ExtId,
          extType MOForwardSMType OPTIONAL} OPTIONAL,
        pcs-Extensions [1] IMPLICIT SEQUENCE {
          ... } OPTIONAL,
        ... } OPTIONAL,
      }
    }
  }
}
```

Here is the example configuration.

```plaintext
privateExtensions = [
  {extId="1,2,776,8,8,8,8,11", asn1Tags= [ 0xE0, 0x80], profileTagID=327814, name = "imei"}
]
```

protocolIdMap

List of TP-PID translations.

Default: empty
Example: Turns 7f (127, not valid in MAP 2) into 0.
```
protocolIdMap = [
  { in = 127, out = 0 }
]
```

Note: Optional parameter.

rimsTimeout

Syntax: rimsTimeout = seconds

Description: The timer for Messaging Manager Navigator queries. It is the period at which an outgoing message (that is, while Messaging Manager waits for a response from Messaging Manager Navigator) will be timed out. The adapter will close the connection to the network and return a "transient failure" to Messaging Manager.

Type: Integer
Optionality: Optional
Allowed:
Default: 5
Example: rimsTimeout = 5

rimsInterfaceName
Syntax: rimsInterfaceName = "name"
Description: Name of the configured Messaging Manager Navigator interface.
Default: "rimsIf"
Notes: This must match the interface name in IN/service_packages/SLEE/etc/SLEE.cfg
Example: rimsInterfaceName = "rimsIf"

SCA
Originating service center address in outgoing MAP messages.
Default: none
Allowed: string
Note: Defaults to GT if not set or empty

scheduledDeliveryTime
Syntax: scheduledDeliveryTime = "time"
Description: The scheduled delivery time to set on outgoing submits that have previously failed at FDA.
Type: String
Optionality: Optional (default used if not set).
Allowed: Format is as per the SMPP spec.
Default: Null
Notes: 
Example: scheduledDeliveryTime = "000000001000000R"
Configures a 10 minute delay.

sgsnPrefixes
Number rules to allow the adapter to distinguish between VMSC and SGSN for originating RIMS updates.
Default: "000"

smscTimeout
Syntax: smscTimeout = seconds
Description: The timer for MC deliveries. It is the period at which an outgoing message (that is, while Messaging Manager waits for a response from the SMSC network) will be timed out. The adapter will close the connection to the network and return a "transient failure" to Messaging Manager.
Type: Integer
Optionality: Optional
Allowed: 
Default: 5
Example: smscTimeout = 5
splitLongMessages

Syntax: splitLongMessages = true | false

Description: If the user data is too long to fit into a single MAP SMS, this option will cause it to be split into multiple outgoing concatenated messages when set to true.

Type: Boolean
Optionality: Optional
Allowed: true, false
Default: true

Notes:

Example: splitLongMessages = true

SSN

Originating subsystem number in outgoing MAP messages.
Default: 8
Allowed: Valid subsystem number

tcapInterfaceServiceKey

SLEE service key of the TCAP interface to use for sending outbound messages.
Default: Must match the TCAP interface's service key as specified in the SLEE.cfg file.
Note: Required parameter.

throttledDeliveryFailureCause

Syntax: throttledDeliveryFailureCause = cause

Description: MAP SM delivery failure cause to set when message is throttled.

Type: Integer
Optionality: Optional (default used if not set).

Allowed:  
  - SMFmemoryCapacityExceeded = 0
  - SMFequipmentProtocolError = 1
  - SMFequipmentNotSM_Equipped = 2
  - SMFunknownServiceCentre = 3
  - SMFsc_Congestion = 4
  - SMFinvalidSME_Address = 5
  - SMFsubscriberNotSC_Subscriber = 6

Default: 4

Notes:

Example: throttledDeliveryFailureCause = 0

Receiving a MAP sm-DeliveryFailure error message

When the adapter receives a MAP error message from a MSC (in direct delivery scenarios) or from a SMSC, the adapter translates the error to a Messaging Manager transient or permanent failure based on the mapping configured in the forwardSmErrorMap parameter in eserv.config. If the MAP error code is not specified in the forwardSmErrorMap parameter, the default is permanent failure, unless the MAP error code is 32 (sm-DeliveryFailure).
In that case the adapter uses the hard-coded mapping shown below to convert from the FailureCause parameter contained within the sm-DeliveryFailure error message to transient or permanent failure.

<table>
<thead>
<tr>
<th>mm-DeliveryFailureCause</th>
<th>MM Result Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (memory capacity exceeded)</td>
<td>transient failure</td>
</tr>
<tr>
<td>1 (equipment protocol error)</td>
<td>permanent failure</td>
</tr>
<tr>
<td>2 (equipment not SM-equipped)</td>
<td>permanent failure</td>
</tr>
<tr>
<td>3 (unknown service centre)</td>
<td>permanent failure</td>
</tr>
<tr>
<td>4 (SC congestion)</td>
<td>transient failure</td>
</tr>
<tr>
<td>5 (invalid SME address)</td>
<td>permanent failure</td>
</tr>
<tr>
<td>6 (subscriber not SC subscriber)</td>
<td>permanent failure</td>
</tr>
</tbody>
</table>

### Sending a MAP mm-DeliveryFailure error message

**Determining the MAP error code**

When the adapter receives an Messaging Manager transient or permanent failure, the adapter translates the Messaging Manager failure message to a MAP error message. If the Messaging Manager failure message specifies the release cause (as a parameter in the Messaging Manager error message), the adapter uses the mapping to MAP error configured in the releaseCauseMap parameter in the eserv.config file. If the Messaging Manager failure message does not specify a release cause, or no mapping is configured in the releaseCauseMap parameter, the adapter uses the MAP error configured in the defaultTransientFailureErrorCode parameter or the defaultPermanentFailureErrorCode parameter in the eserv.config file.

**If the MAP error code is 32**

If the MAP error code determined by the above procedure is 32 (sm-DeliveryFailure) then the error message's sm-DeliveryFailureCause parameter is set to "SC congestion" for Messaging Manager transient failures, or to "subscriber not SC subscriber" for Messaging Manager permanent failures.

<table>
<thead>
<tr>
<th>MM Result Code</th>
<th>sm-DeliveryFailureCause</th>
</tr>
</thead>
<tbody>
<tr>
<td>transient failure</td>
<td>SC congestion</td>
</tr>
<tr>
<td>permanent failure</td>
<td>subscriber not SC subscriber</td>
</tr>
</tbody>
</table>

### Example MAP config

In this example, SRI-SMs will be received with SSN 8 and a PC other than 1001, 1002 or 1003. This means that the message will match both MAP1 and MAP2 adapters, so one will be picked based on GPRS support. If the SRI-SM specifies that GPRS is supported, it will be passed to the MAP1 adapter, otherwise it will be passed to the MAP2 adapter.

MM will send an SRI-SM query to the HLR, and replace the address it gets in the response with its own addresses. If the HLR returns a VMSC address, MM will replace it with the GT of the MAP2 adapter (5114406268). If the HLR returns an SGSN address, MM will replace it with the GT of the MAP1 adapter (5114406267).

The calling SMSC will then send an MT-ForwardSM to one or other of these GT addresses. The network should be configured to translate this to the appropriate point code so that the MT-ForwardSM goes to the right adapter. So, for this example:

<table>
<thead>
<tr>
<th>GT</th>
<th>PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>5114406267</td>
<td>1001 or 1002</td>
</tr>
</tbody>
</table>
Example config:

```python
adapters = [
    # First adapter (MAP)
    {
        'lib': 'xmsiMap.so',
        'adapterName': 'MAP1',
        'pointCodes': [1001, 1002],
        'SSN': 8,
        'earlyAckMC': True,
        'earlyAckSME': True,
        'allowConcatenatedFDA': True,
        'alwaysProduceNonDeliveryReceipt': False,
        'config': {
            'abortMessagesWithZeroLengthTPDA': True,
            'allowIncoming': True,
            'allowOutgoing': True,
            'allowDirectDelivery': True,
            'allowIncomingMap3': True,
            'allowUserRequestedDeliveryReceipt': True,
            'lastSegmentDeliveryReceiptOnly': False,
            'tcapInterfaceServiceKey': 22,
            'originatingTimeout': 10,
            'smscTimeout': 8,  # Timer for MC deliveries
            'rimsTimeout': 3,  # Timer for RIMS queries
            'mscTimeout': 15,  # Timer for MSC delivery transactions
            'rimsInterfaceName': 'rimsIf',
            'gprsSupport': 'supported',
            'nonGprsAdapter': 'MAP2',
            'sgsnPrefixes': ['000'],
            'doProtocolIdMapping': False,
            'defaultProtocolId': 0,
            'protocolIdMap': [],
            'fallbackAlphabet': 'UCS-2',
            'scheduledDeliveryTime': '',
            'defaultMessagePriority': 'Normal'
        }
    }
]
```
GT = "5114406267"
TT = 0

GTMap = [
    { prefix = "0010019198", value = "919827002402", tt = 0 }
]  # SCA = "5114406267"

natureOfAddress = 1  # international
tnumberPlan = 6      # E.212
defaultMapVersionSmsc = 3
defaultMapVersionMsc = 3
defaultDeliveryFailureStatusCode = 64
throttledDeliveryFailureCause = 96  # congestion
mscVersionCacheSize = 1000
hybridiseMapVersions = false
maxUnsegmentedLength = 120
splitLongMessages = true
alarmMask = 0
honourReplyPath = false
pathRetryRandomisation = 1
pathRetrySegmentOffset = 1
localTimeZone = "UTC"

forwardSmErrorMap = [
    { error = 9, permanent = true }
    { error = 32, permanent = false }
]
defaultTransientFailureErrorCode = 32
defaultPermanentFailureErrorCode = 32

incomingOriginatingNumberRules = [
    { fromNoa=2, prefix="04", min=4, max=32, remove=1, prepend="0064", resultNoa=1 } |
    { fromNoa=3, prefix="4", min=4, max=32, remove=0, prepend="0064", resultNoa=1 } |
]

incomingDestinationNumberRules = [
]

# outgoingOriginatingNumberRules = [
# outgoingDestinationNumberRules = [

# xmsiMap.so config

# Non-GPRS MAP adapter

lib = "xmsiMap.so"
Configuring the EMI Adapter

EMI adapter overview

The EMI adapter communicates between the Messaging Manager platform and any configured ASPs and SMSCs using EMI. In a system using EMI, the adapter must be configured to know of all entities that may connect to it and all entities that it may connect to.

General EMI configuration

The following section of the eserv.config specifies the general parameters for all EMI connections.

```
adapters =
    # second adapter (EMI)
    {
        lib = "mmxiEMI.so"
        SSN = 8
        adapterName = "EMI1"
        earlyAckMC = true
        earlyAckSME = true
        allowConcatenatedFDA = true
        config = {
            global_parameters
        }
    }
```

General EMI parameters

Here are the general parameters for EMI.

**adapterName**

Syntax: `adapterName = "name"`

Description: Identifier for the adapter.
config
The parameters in this sub-section below this give the configuration for all messages for this adapter.

lib
Syntax:  \( \text{lib} = "\text{library}" \)
Description: The name of the library that contains the EMI adapter being configured.
Allowed: "mmxiEMI.so"
Default: No default.
Example: \( \text{lib} = "\text{mmxiEMI.so}" \)

SSN
Syntax:  \( \text{SSN} = \text{num} \)
Description: Destination subsystem number of messages to be handled by this adapter.
Allowed: Valid subsystem number
Notes: Non-zero to handle incoming TCAP.
Example: \( \text{SSN} = 18 \)

Global EMI configuration
The following section of the eserv.config specifies the global parameters for all EMI connections.

```python
config = {
    suppressPathInfoReport = true
    displayZeroPathReport = false
    PathReportingInterval = 60
    throttledErrorCode = 4
    transientFailureErrorCode = 4
    permanentFailureErrorCode = 3
    incomingOriginatingNumberRules = [
        { fromNoa=999, prefix="", min=1, max=32, remove=0, resultNoa=2 }
    ]
    incomingDestinationNumberRules = []
    # outgoingOriginatingNumberRules = []
    # outgoingDestinationNumberRules = []
```
emiDefaults = {
    defaultMessagePriority = "Normal"

    pstoreNumberRules = [
        {fromNoa=999, prefix="010", min=1, max=32, remove=3,
         prepend="7" } 
        { fromNoa=999, prefix="091", min=1, max=32, remove=3,
         prepend="7" }
    ]
}

timestampAdvance = true
timestampBucketSize = 5000
timestampFlush = 2
} # emiDefaults
} # mmxiEMI.so config

Global EMI parameters

Here are the parameters for configuring the global EMI adapter.

EMI error codes

Here is a list of EMI error codes for the following:

- throttledErrorCode,
- transientFailureErrorCode
- permanentFailureErrorCode

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Checksum error</td>
</tr>
<tr>
<td>2</td>
<td>Syntax error</td>
</tr>
<tr>
<td>3</td>
<td>Operation not supported by system</td>
</tr>
<tr>
<td>4</td>
<td>Operation not allowed</td>
</tr>
<tr>
<td>5</td>
<td>Call barring active</td>
</tr>
<tr>
<td>6</td>
<td>AdC invalid</td>
</tr>
<tr>
<td>7</td>
<td>Authentication failure</td>
</tr>
<tr>
<td>8</td>
<td>Legitimization code for all calls, failure</td>
</tr>
<tr>
<td>9</td>
<td>GA not valid</td>
</tr>
<tr>
<td>10</td>
<td>Repetition not allowed</td>
</tr>
<tr>
<td>11</td>
<td>Legitimization code for repetition, failure</td>
</tr>
<tr>
<td>12</td>
<td>Priority call not allowed</td>
</tr>
<tr>
<td>13</td>
<td>Legitimization code for priority call, failure</td>
</tr>
<tr>
<td>14</td>
<td>Urgent message not allowed</td>
</tr>
<tr>
<td>15</td>
<td>Legitimization code for urgent message, failure</td>
</tr>
<tr>
<td>16</td>
<td>Reverse charging not allowed</td>
</tr>
<tr>
<td>17</td>
<td>Legitimization code for rev. charging, failure</td>
</tr>
<tr>
<td>18</td>
<td>Deferred delivery not allowed</td>
</tr>
<tr>
<td>19</td>
<td>New AC not valid</td>
</tr>
<tr>
<td>20</td>
<td>New legitimization code not valid</td>
</tr>
<tr>
<td>21</td>
<td>Standard text not valid</td>
</tr>
<tr>
<td>22</td>
<td>Time period not valid</td>
</tr>
<tr>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>23</td>
<td>Message type not supported by system</td>
</tr>
<tr>
<td>24</td>
<td>Message too long</td>
</tr>
<tr>
<td>25</td>
<td>Requested standard text not valid</td>
</tr>
<tr>
<td>26</td>
<td>Message type not valid for the pager type</td>
</tr>
<tr>
<td>27</td>
<td>Message not found in SMSC</td>
</tr>
<tr>
<td>30</td>
<td>Subscriber hang-up</td>
</tr>
<tr>
<td>31</td>
<td>Fax group not supported</td>
</tr>
<tr>
<td>32</td>
<td>Fax message type not supported</td>
</tr>
<tr>
<td>33</td>
<td>Address already in list (60 series)</td>
</tr>
<tr>
<td>34</td>
<td>Address not in list (60 series)</td>
</tr>
<tr>
<td>35</td>
<td>List full, cannot add address to list (60 series)</td>
</tr>
<tr>
<td>36</td>
<td>RPID already in use</td>
</tr>
<tr>
<td>37</td>
<td>Delivery in progress</td>
</tr>
<tr>
<td>38</td>
<td>Message forwarded</td>
</tr>
</tbody>
</table>

emiDefaults

The emiDefaults sub-section contains the default EMI configurations.

permanentFailureErrorCode

Syntax: `permanentFailureErrorCode = code`

Description: The error code to return for permanent failures.

Type: Integer

Optionality: Optional (default used if not set).

Allowed: Refer to EMI error codes (on page 88) for list of values.

Default: 3

Example: `permanentFailureErrorCode = 3`

suppressPathInfoReport

Syntax: `suppressPathInfoReport = true|false`

Description: Do we want path connection reports to be suppressed?

Type: Boolean

Optionality: Allowed: true, false

Default: true

Notes: An ASP receives heartbeats from the SMSC when Messaging Manager is configured to operate as an SMSC, then it will respond to these heartbeats. These are logged in the xmsTrigger logfile. This can cause the logfile to fill up unnecessarily.

If this parameter is set to true the heartbeat message being written to the xmsTrigger log is suppressed.

Example: `suppressPathInfoReport = true`
throttledErrorCode
Error code to return to throttled messages.
Default: 4
Allowed: Refer to EMI error codes (on page 88) for list of values.

transientFailureErrorCode
Error code to return for transient failures.
Default: 4
Allowed: Refer to EMI error codes (on page 88) for list of values.

EMI Defaults configuration
The emiDefaults section of the eserv.config specifies the EMI values that will be used for connections.

```javascript
emiDefaults = {
  defaultMessagePriority = "Normal"
  pstoreNumberRules = [
    {fromNoa=999, prefix="010", min=1, max=32, remove=3, prepend="7" }
    { fromNoa=999, prefix="091", min=1, max=32, remove=3, prepend="7" }
  ]
  timestampAdvance = true
  timestampBucketSize = 5000
  timestampFlush = 2
}
```

EMI Defaults parameters
Here are the parameters for configuring the EMI defaults in the EMI adapter.

defaultMessagePriority
Syntax: defaultMessagePriority = "str"
Description: The priority to be applied to incoming messages that do not have a priority.
Type: String
Optionality: Optional (default used if parameter absent).
Allowed Default "Normal"
Notes: Example: defaultMessagePriority = "Normal"

pstoreNumberRules
Defines the number normalization rules to be applied for SCTS mapping.
Note: Optional
See Number Normalization (on page 64).
Example:
pstoreNumberRules = [
  # number insertion rules
  {fromNoa=999, prefix="010", min=1, max=32, remove=3, prepend="7" }
  # number lookup rules
  { fromNoa=999, prefix="091", min=1, max=32, remove=3, prepend="7" }
]
timestampAdvance
Values for configuring the EMI System Message (SM) field Emulate SMSC behavior by advancing the timestamp.
- true - emulate SMSC timestamp advance
- false - timestamp using current time
Default: true
Allowed: true, false
Note: When on (true) the IP adapter simulates the behavior of the SMSC by advancing the timestamp if another message with the same destination number is found in the message buffer. When off (false) the IP adapter uses the current system time and the SM-field will not be unique for messages to the same destination received within the same 1 second timeframe.

timestampBucketSize
Sets the size of the hash map used for searching the message buffer.
Default: 5000
Note:
- The size of the message buffer is determined by the incoming message rate and the flush period - NOT by this parameter.
- This parameter can only be set at startup.

timestampFlush
Period between buffer cleanup.
Default: 2
Allowed: Seconds
Note: Setting this parameter to a large value will increase memory use. The total number of messages in the buffer is determined by the incoming message rate, the flush period and the number of messages held in the buffer because their timestamp was advanced.

Advancing the Timestamp
This functionality is used where EMI messages need to emulate SMSC behavior in advancing the timestamp. This is done to ensure that the SM-field is unique for messages to the same destination within the same 1 second time frame.
The functionality to advance the timestamp is implemented in the following way:
A list is kept that maps the B-number to the last timestamp sent. There is only one entry for a B-number and it contains the last timestamp sent. When the list is flushed, the current system time is compared with the last timestamp in the list. If this is older than the current system time, the entry is removed.
For speed of lookup a hash map is used that contains the B-number and a pointer to the entry in the list. The size of the map is determined (by the timestampBucketSize parameter. This is fixed at startup and not reread at SIGHUP.
The following parameters influence this:
- timestampBucketSize - For fast lookup, this value should be big. The larger the number the faster the lookup, but requires more memory. A small value gives slow lookup but requires less memory.
Configuring the SMPP Adapter

SMPP adapter overview
The SMPP adapter communicates between the Messaging Manager platform and any configured ASPs and SMSCs using SMPP. In a system using SMPP, the adapter must be configured to know of all entities that may connect to it and all entities that it may connect to.

General SMPP configuration
The following section of the eserv.config specifies the general parameters for all SMPP connections.

```plaintext
adapters = [
  # Third adapter (SMPP)
  {
    lib = "mmxiSMPP.so"
    #pointCodes = [1003, 1004]
    SSN = 0
    adapterName = "SMPP1"
    earlyAckMC = false
    earlyAckSME = true
    allowConcatenatedFDA = true
    config = {
        global_parameters
    }
  }
]
```

General SMPP parameters
Here are the general parameters for SMPP.

adapterName
Syntax: adapterName = "name"
Description: Identifier for the adapter.
Allowed: Any text string, but should be meaningful, for example include the protocol used.
For example:
  - "MAP1" for MAP
  - "EMI1" for EMI
  - "SCA1" for SCA
  - "SMPP1" for SMPP
  - "CDMA1" for IS-41 CDMA
  - "TDMA1" for IS-41 TDMA
  - "Wrapper" for Wrapper
Default: No default.
Notes: This name must also be in the configuration database before Messaging Manager will run correctly. See MM User’s Guide.

config
The parameters in this sub-section below this give the configuration for all messages for this adapter.

lib
Syntax: \( \text{lib} = "\text{library}" \)
Description: The name of the library that contains the SMPP adapter being configured.
Allowed: "mmxiSMPP.so"
Default: No default.
Example: \( \text{lib} = "\text{mmxiSMPP.so}" \)

pointCodes
Syntax: \( \text{pointCodes} = [\text{pc1}, \text{pc2}, \ldots] \)
Description: Destination point codes array of messages to be handled by this adapter. This parameter takes priority over SSN match.
Optionality: Optional
Allowed: Defined by network administrator.
Example: \( \text{pointCodes} = [1001, 1002] \)

SSN
Syntax: \( \text{SSN} = \text{num} \)
Description: Destination subsystem number of messages to be handled by this adapter.
Allowed: Valid subsystem number
Notes: Non-zero to handle incoming TCAP.
Example: \( \text{SSN} = 18 \)

Global SMPP configuration
The following section of the eserv.config specifies the global parameters for all SMPP connections.

\[
\text{config} = \{
\text{suppressPathInfoReport} = \text{true},
\text{displayZeroPathReport} = \text{false},
\text{PathReportingInterval} = 60,
\text{fallbackAlphabet} = "\text{UCS-2}" 
\text{smppDefaults} = \{
\text{throttledCommandStatus} = \text{88} \ # \text{ESME_RTHROTTLED} (88)
\text{teleserviceRoutingMap} = [\{
\text{serviceType} = "\text{"}, \text{teleservice} = 0, 
\text{allowAlternateDelivery} = \text{true}\}
\text{serviceType} = "\text{CMT}" , \text{teleservice} = 4098, 
\text{allowAlternateDelivery} = \text{true}\}
\text{serviceType} = "\text{EMS}" , \text{teleservice} = 4101, 
\text{allowAlternateDelivery} = \text{true}\}
\}
\text{dataCodingMap} = [\{
\text{data_coding} = \text{0x08}, 
\text{alphabet} = "\text{UCS-2}" 
\}
\]
messageClass = 1,
messageWaitingGroup = 0,
messageWaitingIndicator = 0,
messageWaitingType = 0 }
{ data_coding = 0xF0,
  alphabet = "GSM8Bit",
  messageClass = 1,
  messageWaitingGroup = 0,
  messageWaitingIndicator = 0,
  messageWaitingType = 0 }

includePayloadDRInfo = false]
maxValidityPeriod = 0

} # smppDefaults

outgoingOriginatingNumberRules = [
  { fromNoa=2, prefix="04", min=4, max=32, remove=1,
    prepend="0064", resultNoa=1 }*
  { fromNoa=3, prefix="4", min=4, max=32, remove=0, prepend="0064",
    resultNoa=1 }*
]
outgoingDestinationNumberRules = [
]
# incomingOriginatingNumberRules = [ ]
# incomingDestinationNumberRules = [ ]

**Global SMPP parameters**

Here are the parameters for configuring the global SMPP adapter.

**suppressPathInfoReport**

**Syntax:** suppressPathInfoReport = true|false

**Description:** Do we want path connection reports to be suppressed?

**Type:** Boolean

**Optionality:**

**Allowed:** true, false

**Default:** true

**Notes:**

An ASP receives heartbeats from the SMSC when Messaging Manager is configured to operate as an SMSC, then it will respond to these heartbeats. These are logged in the xmsTrigger logfile. This can cause the logfile to fill up unnecessarily.

If this parameter is set to true the heartbeat message being written to the xmsTrigger log is suppressed.

**Example:** suppressPathInfoReport = true
TLVs

Syntax: \[tag\_maps\]

Description: List of TLV tags to map to a profile buffer.

Inbound:
- The SMPP adapter checks all inbound messages for the TLVs mentioned in TLVs section, and if present, passes them to slee_acs, which then populates the configured profile buffer in the temporary profile block for each TLV that was present.

Outbound:
- The CPE can use the copy/set nodes to populate the configured profile tag IDs with data desired for the outbound TLVs and pass them to the SMPP adapter.
- The SMPP adapter uses this config to populate outbound TLVs if any of the configured fields are present.

Type: Array of TLV elements.

Example:
\[
\text{TLVs} = [\{
\text{tlvID}=0x0030, \text{tlvType}=0x01, \text{profileTagID}=4532781, \text{direction}="\text{inbound}"\},
\{\text{tlvID}=0x020b, \text{tlvType}=0x02, \text{profileTagID}=4532782, \text{direction}="\text{outbound}"\},
\{\text{tlvID}=0x1382, \text{tlvType}=0x05, \text{profileTagID}=4532783, \text{direction}="\text{both}"\}\]
\]

TLVs parameters

tlvID

Syntax: \text{tlvID}\=<\text{tag ID}>

Description: The TLV tag ID

Type: Integer, 2 bytes long. Can be in hexadecimal or decimal.

Example: \text{tlvID}=0x0030

tlvType

Syntax: \text{tlvType}\=<\text{type}>

Description: The type of TLV value.

Type: Integer, 1 byte long, may be hexadecimal, or decimal.

Example: \text{tlvType}=0x05
Allowed: Five types are supported. The mappings are:
- 0x01 -> INT8
- 0x02 -> INT16
- 0x03 -> INT32
- 0x04 -> CString
- 0x05 -> OctetString

Default:

Notes:

Example: tlvType=0x01

profileTagID
Syntax: profileTagID=<profiletag>
Description: The profile tag ID which the TLV maps to.
Type: Integer, 4 bytes long, can be in hexadecimal or decimal.
Optionality: Mandatory
Allowed:
Default:

Notes:

Example: profileTagID=453281

direction
Syntax: direction="<direction>"
Description: What type of SMPP message this TLV presents in.
Type: String
Optionality: Mandatory
Allowed: Three options are supported:
- inbound,
- outbound, or
- both.

Default:

Notes:

Example: direction="inbound"

SMPP Defaults configuration
The smppDefaults section of the eserv.config specifies the SMPP values that will be used for connections.

```plaintext
smppDefaults = {
    throttledCommandStatus = 88 # ESME_RTHROTTLED (88)
    teleserviceRoutingMap = [
        { serviceType = "", teleservice = 0, allowAlternateDelivery = true },
        { serviceType = "CMT", teleservice = 4098, allowAlternateDelivery = true },
        { serviceType = "EMS", teleservice = 4101, allowAlternateDelivery = true }
    ]
}
```
dataCodingMap = [
    { data_coding = 0x08,
        alphabet = "UCS-2",
        messageClass = 1,
        messageWaitingGroup = 0,
        messageWaitingIndicator = 0,
        messageWaitingType = 0 }
    { data_coding = 0xF0,
        alphabet = "GSM8Bit",
        messageClass = 1,
        messageWaitingGroup = 0,
        messageWaitingIndicator = 0,
        messageWaitingType = 0 }
]

includePayloadDRInfo = false
maxValidityPeriod = 0
scheduledDeliveryTime = ""
convertMessageIdToHex = false
fixedLengthMessageId = true

SMPP Defaults parameters

Here are the parameters for configuring the SMPP defaults in the SMPP adapter.

alphabet

Syntax:  \[alphabet = "charset"\]

Description: Character set of the desired alphabet.

Type:  String

Allowed:  Binary
8859-1
8859-2
8859-3
8859-4
8859-5
8859-6
8859-7
8859-8
8859-9
8859-10
8859-11
8859-12
8859-13
8859-14
Chapter 3

8859-15
8859-16
ASCI7Bit
646
UTF-8
UCS-2
GSM7Bit
GSM8Bit
GSM7BitComp
GSMBinaryComp
GSMUCS2Comp
JIS
XKJIS
ISO-2022-JP
PCK
ko_KR-euc
SMPPPictogram

Example: alphabet = "UCS-2"

dataCodingMap
dataCodingMap = [datacoding_parameters]

Syntax: Data Coding Map allows you to modify the data coding of SMPP short messages to have a different interpretation of Message Class, Waiting Group and character set to the predefined values. If set here, it will override any associated predefined DCS value that Messaging Manager starts up with.

Description: Optional

Notes: For inbound messages, MM will select the data coding number (for example, 0x08) value and match the parameters for that data coding. For outbound messages, MM will match the parameters, then uses it to calculate the data coding. If there is more than one set of parameters with all values the same, MM will select the last data coding.

Example: dataCodingMap = [
    { data_coding = 0x08,
      alphabet = "UCS-2",
      messageClass = 1,
      messageWaitingGroup = 0,
      messageWaitingIndicator = 0,
      messageWaitingType = 0 }
    { data_coding = 0xF0,
      alphabet = "GSM8Bit",
      messageClass = 1,
      messageWaitingGroup = 0,
      messageWaitingIndicator = 0,
      messageWaitingType = 0 }
]

In this example, for outbound messages, if the alphabet for both data codings for 8 and F0 were the same, then MM would select F0.
data_coding
Syntax:  
Description:  The MAP DCS data coding.
Allowed:  Hex value of number up to 255
Example:  data_coding = 0xF0

fixedLengthMessageId
Syntax:  
Description:  An SMPP option to allow xmsTrigger to perform padding of message IDs so they are always 10 digits long.
Type:  Boolean
Optionality:  Optional (default used if not set).
Allowed:  true, false
Default:  true
Notes:  When set to true, MM performs automatic padding of the hex message IDs so it is always 10 hex digits long before writing the value to pstore. This helps maintain consistency in the message ID format stored in pstore and may help with improving pstore matching for message IDs shorter than 10 digits.
This option must be used in conjunction with convertMessageIdToHex (on page 41).
Only message IDs shorter than 10 digits are affected. Message IDs longer than 10 digits are not padded regardless of the setting of this field.
Example:  fixedLengthMessageId = true

includePayloadDRInfo
Syntax:  
Description:  If set, forces MM to build a delivery receipt message payload containing the extra information in Appendix B of the SMPP 3.4 specification.
Whether set or not, the standard TLVs message_state and receipted_message_id will be used.
Allowed:  true, false
Default:  false
Notes:  This option only applies to MM-generated delivery receipts. If a delivery receipt is received from an SMSC, MM will send the SME one in the same format.
Example:  includePayloadDRInfo = false

maxValidityPeriod
Syntax:  
Description:  If set, and non-zero, defines the maximum possible validity period for outbound messages from the adapter.
Type:  Integer
Optionality:  Optional
Allowed:  
Default:  0
Notes:  Validity periods that would have been greater are shortened to this value, when it is set.
Example: maxValidityPeriod = 0

messageClass
Syntax: messageClass = class
Description: The MAP DCS message class.
Allowed
0 - none
1 - Display (GSM class 0 - also known as Flash)
2 - Mobile Equipment (GSM class 1)
3 - SIM (GSM class 2)
4 - External (GSM class 3)
Default: 0
Notes: Refer to GSM 03.38 version 7.2.0 for the full specification.
Example: messageClass = 1

messageWaitingGroup
Syntax: messageWaitingGroup = group
Description: The MAP DCS message waiting group.
Allowed
0 - none/not specified
1 - Discard
2 - Store
Default: 0
Notes: Refer to GSM 03.38 version 7.2.0 for the full specification.
Example: messageWaitingGroup = 0

messageWaitingIndicator
Syntax: messageWaitingIndicator = ind
Description: The MAP DCS message waiting indicator.
Allowed
0 - Inactive - none or not specified
1 - Active
Default: 0
Notes: Refer to GSM 03.38 version 7.2.0 for the full specification.
Example: messageWaitingIndicator = 0

messageWaitingType
Syntax: messageWaitingType = type
Description: The MAP DCS message waiting type.
Allowed
0 - none or not specified
1 - Voicemail
2 - Fax
3 - Email
4 - Other
Default: 0
Notes: Refer to GSM 03.38 version 7.2.0 for the full specification.
Example: messageWaitingType = 0

SMPP command statuses
Here is a list of SMPP command statuses for use in:
- throttledCommandStatus
- acsReleaseCauseToSmppCommandStatus

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0000</td>
<td>No error</td>
</tr>
<tr>
<td>0x0001</td>
<td>Message length is invalid</td>
</tr>
<tr>
<td>0x0002</td>
<td>Command length is invalid</td>
</tr>
<tr>
<td>0x0003</td>
<td>Invalid command ID</td>
</tr>
<tr>
<td>0x0004</td>
<td>Incorrect BIND status for given command</td>
</tr>
<tr>
<td>0x0005</td>
<td>ESME already in bound state</td>
</tr>
<tr>
<td>0x0006</td>
<td>Invalid priority flag</td>
</tr>
<tr>
<td>0x0007</td>
<td>Invalid registered delivery flag</td>
</tr>
<tr>
<td>0x0008</td>
<td>System error</td>
</tr>
<tr>
<td>0x000A</td>
<td>Invalid source address</td>
</tr>
<tr>
<td>0x000B</td>
<td>Invalid destination address</td>
</tr>
<tr>
<td>0x000C</td>
<td>Message ID is invalid</td>
</tr>
<tr>
<td>0x000D</td>
<td>Bind failed</td>
</tr>
<tr>
<td>0x000E</td>
<td>Invalid password</td>
</tr>
<tr>
<td>0x000F</td>
<td>Invalid system ID</td>
</tr>
<tr>
<td>0x0011</td>
<td>Cancel SM failed</td>
</tr>
<tr>
<td>0x0013</td>
<td>Replace SM failed</td>
</tr>
<tr>
<td>0x0014</td>
<td>Message queue full</td>
</tr>
<tr>
<td>0x0015</td>
<td>Invalid service type</td>
</tr>
<tr>
<td>0x0033</td>
<td>Invalid number of destinations</td>
</tr>
<tr>
<td>0x0034</td>
<td>Invalid distribution list name</td>
</tr>
<tr>
<td>x0040</td>
<td>Destination flag is invalid (submit_multi)</td>
</tr>
<tr>
<td>x0042</td>
<td>Submit w/replace functionality has been requested where it is either unsupported or inappropriate for the particular MC</td>
</tr>
<tr>
<td>0x0043</td>
<td>Invalid esm_class field data</td>
</tr>
<tr>
<td>0x0044</td>
<td>Cannot submit to distribution list</td>
</tr>
<tr>
<td>0x0045</td>
<td>submit_sm, data_sm or submit_multi failed</td>
</tr>
<tr>
<td>0x0048</td>
<td>Invalid source address TON</td>
</tr>
<tr>
<td>0x0049</td>
<td>Invalid source address NPI</td>
</tr>
<tr>
<td>0x0050</td>
<td>Invalid destination address TON</td>
</tr>
<tr>
<td>0x0051</td>
<td>Invalid destination address NPI</td>
</tr>
<tr>
<td>0x0053</td>
<td>Invalid system_type field</td>
</tr>
<tr>
<td>0x0054</td>
<td>Invalid replace_if_present flag</td>
</tr>
<tr>
<td>0x0055</td>
<td>Invalid number of messages</td>
</tr>
<tr>
<td>0x0058</td>
<td>Throttling error (ESME has exceeded allowed message limits)</td>
</tr>
<tr>
<td>0x0061</td>
<td>Invalid scheduled delivery time</td>
</tr>
<tr>
<td>0x0062</td>
<td>Invalid message validity period (Expiry time)</td>
</tr>
<tr>
<td>Status</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>x0063</td>
<td>Predefined message ID is Invalid or specified predefined message was not found</td>
</tr>
<tr>
<td>x0064</td>
<td>ESME receiver temporary app error code</td>
</tr>
<tr>
<td>x0065</td>
<td>ESME receiver permanent app error code</td>
</tr>
<tr>
<td>x0066</td>
<td>ESME receiver reject message error code</td>
</tr>
<tr>
<td>x0067</td>
<td>query_sm request failed</td>
</tr>
<tr>
<td>x00C0</td>
<td>Error in the optional part of the PDU body</td>
</tr>
<tr>
<td>x00C1</td>
<td>TLV not allowed</td>
</tr>
<tr>
<td>x00C2</td>
<td>Invalid parameter length</td>
</tr>
<tr>
<td>x00C3</td>
<td>Expected TLV missing</td>
</tr>
<tr>
<td>x00C4</td>
<td>Invalid TLV value</td>
</tr>
<tr>
<td>x00FE</td>
<td>Transaction delivery failure</td>
</tr>
<tr>
<td>x00FF</td>
<td>Unknown error</td>
</tr>
</tbody>
</table>

**MPP v5.0 Only:**

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x0100</td>
<td>ESME not authorized to use specified service_type</td>
</tr>
<tr>
<td>x0101</td>
<td>ESME prohibited from using specified operation</td>
</tr>
<tr>
<td>x0102</td>
<td>Specified service_type is unavailable</td>
</tr>
<tr>
<td>x0103</td>
<td>Specified service_type is denied</td>
</tr>
<tr>
<td>x0104</td>
<td>Invalid data coding scheme</td>
</tr>
<tr>
<td>x0105</td>
<td>Source address subunit is invalid</td>
</tr>
<tr>
<td>x0106</td>
<td>Destination address subunit is invalid</td>
</tr>
<tr>
<td>x0107</td>
<td>Broadcast frequency interval is invalid</td>
</tr>
<tr>
<td>x0108</td>
<td>Broadcast alias name is invalid</td>
</tr>
<tr>
<td>x0109</td>
<td>Broadcast area format is invalid</td>
</tr>
<tr>
<td>x010A</td>
<td>Number of broadcast areas is invalid</td>
</tr>
<tr>
<td>x010B</td>
<td>Broadcast content type is invalid</td>
</tr>
<tr>
<td>x010C</td>
<td>Broadcast message class is invalid</td>
</tr>
<tr>
<td>x010D</td>
<td>broadcast_sm operation failed</td>
</tr>
<tr>
<td>x010E</td>
<td>query_broadcast_sm operation failed</td>
</tr>
<tr>
<td>x010F</td>
<td>cancel_broadcast_sm operation failed</td>
</tr>
<tr>
<td>x0110</td>
<td>Number of repeated broadcasts is invalid</td>
</tr>
<tr>
<td>x0111</td>
<td>Broadcast service group is invalid</td>
</tr>
<tr>
<td>x0112</td>
<td>Broadcast channel indicator is invalid</td>
</tr>
</tbody>
</table>

scheduledDeliveryTime

**Syntax:**  
`scheduledDeliveryTime = "time"`

**Description:**  
An outgoing submit, that has previously failed at FDA, will have a scheduled delivery time set to this.

**Type:**  
String

**Optionality:**  
Optional (default used if not set).

**Allowed:**  
Format is as per the SMPP spec. A 10 minute delay would be "0000000001000000R"

**Default:**  
""
Notes:  
Example:  

scheduledDeliveryTime = ""

teleserviceRoutingMap
Syntax:  
teleserviceRoutingMap = [mappings]
Description:  
Array of teleservice mappings.
SMPP has an optional attribute called service_type whose value is a string like EMS or CMT. The actual strings tend to be operator-specific. We can map these to numeric IS-41 teleservices in genericSM and set the alternate delivery allowed flag for each one.

Allowed
Default:  
The CMT and EMS entries are defined
Notes:  
Any service types not appearing in this list will have alternate delivery disallowed and a teleservice of 0.
Example:

```plaintext
teleseviceRoutingMap = [
  { serviceType = "", teleservice = 0, allowAlternateDelivery = true },
  { serviceType = "CMT", teleservice = 4098, allowAlternateDelivery = true },
  { serviceType = "EMS", teleservice = 4101, allowAlternateDelivery = true }
]
```

throttledCommandStatus
Syntax:  
throttledCommandStatus = status
Description:  
Command status to return to throttled messages.
Allowed
Default:  
Refer to SMPP command statuses (on page 100) for a list of values.
Default: 88
Example:  

throttledCommandStatus = 88

Configuring the IS-41 CDMA Adapter

IS-41 CDMA adapter overview

The IS41 adapter communicates between the Messaging Manager platform and SMSCs, HLRs, and MSCs, using IS-41.
The IS41 adapter needs to be configured to know about SMSCs that it will connect to.

General IS-41 CDMA configuration

The following section of the eserv.config specifies the general parameters for all IS-41 CDMA connections.

```plaintext
adapters =
  # IS-41 CDMA adapter
  {  
      lib = "xmsiIS41.so"
      adapterName = "CDMA1"
      #pointCodes = [1005, 1006]
```
Chapter 3

SSN = 18

earlyAckMC = false
earlyAckSME = false

allowConcatenatedFDA = true

config = {
  global_parameters
}

General IS-41 CDMA parameters

Here are the general parameters for IS-41 CDMA.

adapterName

Syntax: adapterName = "name"
Description: Identifier for the adapter.
Allowed: Any text string, but should be meaningful, for example include the protocol used.
For example:
  - "MAP1" for MAP
  - "EMI1" for EMI
  - "SCA1" for SCA
  - "SMPP1" for SMPP
  - "CDMA1" for IS-41 CDMA
  - "TDMA1" for IS-41 TDMA
  - "Wrapper" for Wrapper

Default: No default.
Notes: This name must also be in the configuration database before Messaging Manager will run correctly. See MM User’s Guide.

lib

Syntax: lib = "library"
Description: The name of the library that contains the CDMA (UCA-IS41) adapter being configured.
Allowed: "xmsiIS41.so"
Default: No default.
Example: lib = "xmsiIS41.so"

pointCodes

Syntax: pointCodes = [pc1, pc2, ...]
Description: Destination point codes array of messages to be handled by this adapter. This parameter takes priority over SSN match.
Optionality: Optional
Allowed: Defined by network administrator.
Example: pointCodes = [1001, 1002]
SSN

Syntax: \( SSN = \text{num} \)

Description: Destination subsystem number of messages to be handled by this adapter.

Allowed: Valid subsystem number

Notes: Non-zero to handle incoming TCAP.

Example: \( SSN = 18 \)

Global IS-41 CDMA configuration

The following section of the eserv.config specifies the global parameters for all IS-41 CDMA connections.

```json
config = {
    allowIncoming = true
    allowOutgoing = true
    PC = 1005
    SSN = 6
    GT = ""
    originatingTimeout = 20
    smsreqTimeout = 10
    smdppTimeout = 10
    smdppTimeoutSME = 10
    fallbackAlphabet = "UCS-2"
    supportIS841 = true
    defaultMessagePriority = "Normal"
    defaultEndpointType = "SME"
    rimsInterfaceName = "rimsIf"
    pathRetryRandomisation = 1
    pathRetrySegmentOffset = 1
    alarmMask = 0
    relaySmsNotifications = false
    minHLRTransType = 3
    mdnHLRTransType = 14
    defaultTransientFailureCauseCode = 33 # destination busy
    defaultPermanentFailureCauseCode = 39 # other terminal problem
    throttledFailureCauseCode = 35 # destination resource shortage
    deliveryFailureErrorClass = 2
    deliveryFailureStatusCode = 5
    protocol = "CDMA"
    allowFDAforWEMT = true
    allowAlternateDeliveryForWEMT = true
    tcapInterfaceServiceKey = 22
}
```
incomingOriginatingNumberRules = [
  { fromNoa=3, prefix="04", min=4, max=32, remove=1, prepend="0064", resultNoa=4 }
  { fromNoa=2, prefix="4", min=4, max=32, remove=0, prepend="0064", resultNoa=4 }
]

incomingDestinationNumberRules = [
]

# outgoingOriginatingNumberRules = [
#]
# outgoingDestinationNumberRules = [

} # End IS-41 CDMA adapter config section.

**Global IS-41 CDMA parameters**

Here are the parameters for configuring the global IS-41 CDMA adapter.

**alarmMask**

*Syntax:* \( \text{alarmMask} = \text{num} \)

*Description:* Alarm masking.

*Allowed Sum of:* 1 Mask originating timeout alarm. 2 Mask SMSREQ timeout alarm. 4 Mask SMSREQ abort alarm. 8 Mask SMDPP timeout alarm. 16 Mask SMDPP abort alarm.

*Default:* 0

*Example:* \( \text{alarmMask} = 0 \)

**allowAlternateDeliveryForWEMT**

*Syntax:* \( \text{allowAlternateDeliveryForWEMT} = \text{true}|\text{false} \)

*Description:* Allow alternate delivery if the Teleservice identifier is WEMT.

*Allowed:* true, false

*Default:* true

*Notes:* Wireless enhanced messaging teleservice (WEMT) is used to carry enhanced messaging service (EMS) over SMS.

*Example:* \( \text{allowAlternateDeliveryForWEMT} = \text{true} \)

**allowFDAforWEMT**

*Syntax:* \( \text{allowFDAforWEMT} = \text{true}|\text{false} \)

*Description:* Allow FDA if the Teleservice identifier is WEMT.

*Allowed:* true, false

*Default:* true

*Notes:* Wireless enhanced messaging teleservice (WEMT) is used to carry enhanced messaging service (EMS) over SMS.

*Example:* \( \text{allowFDAforWEMT} = \text{true} \)

**allowIncoming**

*Syntax:* \( \text{allowIncoming} = \text{true}|\text{false} \)

*Description:* Determines whether inbound messages are allowed.
Optionality: Mandatory
Allowed: true, false
Default: false
Example: allowIncoming = false

allowOutgoing
Syntax: allowOutgoing = true|false
Description: Determines whether initial messages may be sent out through the MAP interface.
Optionality: Mandatory
Allowed: true, false
Default: false
Example: allowOutgoing = false

defaultEndpointType
Syntax: defaultEndpointType = "type"
Description: The endpoint type that is assumed when the message direction cannot be determined (for example, CDMA User Ack).
Optionality: Mandatory
Allowed: "SME", "MC"
Default: "SME"
Example: defaultEndpointType = "SME"

defaultMessagePriority
Syntax: defaultMessagePriority = "str"
Description: The priority to be applied to incoming messages that do not have a priority.
Type: String
Optionality: Optional (default used if parameter absent).
Allowed
Default: "Normal"
Notes:
Example: defaultMessagePriority = "Normal"

defaultPermanentFailureCauseCode
Syntax: defaultPermanentFailureCauseCode = code
Description: Default SMS_CauseCodes mappings for Permanent failures if no releaseCauseMap entry matches.
Optionality:
Allowed: Refer to SMS_CauseCodes (on page 111) for a list of cause codes.
Default: 39
Example: defaultPermanentFailureCauseCode = 39

defaultTransientFailureCauseCode
Syntax: defaultTransientFailureCauseCode = code
Description: Default SMS_CauseCodes mappings for Transient failures if no releaseCauseMap entry matches.
Optionality:
Allowed Refer to SMS_CauseCodes (on page 111) for a list of cause codes.
Default 33
Example: defaultTransientFailureCauseCode = 33

Delivery failure error class and status code
Values of the parameters:
  • deliveryFailureErrorClass
  • deliveryFailureStatusCode
Set the default error class and status code to be used in a failure delivery report.
SMSSendAckMsg->BearerData->MessageStatus->ErrorClass
SMSSendAckMsg->BearerData->MessageStatus->MsgStatusCode
They must form a valid pair. Valid pairs are:

<table>
<thead>
<tr>
<th>Error class</th>
<th>Status code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0,1,2,3</td>
</tr>
<tr>
<td>2</td>
<td>4,5,31</td>
</tr>
<tr>
<td>3</td>
<td>4 to 11, 31</td>
</tr>
</tbody>
</table>

Invalid pairs will be reset to 2 and 5 respectively in the code.
deliveryFailureErrorClass

Syntax: deliveryFailureErrorClass = class
Description: This value will be used in the error class of delivery receipt messages which signify non-delivery of a message.
Optionality:
Allowed 0 no error
         2 temporary condition
         3 permanent condition
Default 2
Example: deliveryFailureErrorClass = 2
deliveryFailureStatusCode

Syntax: deliveryFailureStatusCode = code
Description: This value will be used in the TP-Status code of delivery receipt messages which signify non-delivery of a message.
Optionality:
Allowed 0  Message accepted
1  Message deposited to Internet
2  Message delivered
3  Message canceled
4  Network congestion
5  Network error
6  Cancel failed
7  Blocked destination
8  Text too long
9  Duplicate message
10  Invalid destination
11  Message expired
31  Unknown error

Default 5

Example: deliveryFailureStatusCode = 5

GT
Syntax: GT = "gt"
Description: Originating global title in outgoing messages.

Example: GT = ""

mdnHLRTransType
Syntax: mdnHLRTransType = type
Description: The global title translation type to be used for lookups to the HLR when using an MDN.

Default: 3
Notes: mdnHLRTransType = 3

minHLRTransType
Syntax: minHLRTransType = type
Description: The global title translation type to be used for lookups to the HLR when using a MIN.

Default: 3
Notes: minHLRTransType = 3

originatingTimeout
Syntax: originatingTimeout = num
Description: Configure our timeout on processing of inbound messages.

Notes: originatingTimeout = 20
Chapter 3

pathRetryRandomisation
Syntax: \texttt{pathRetryRandomisation = seconds}
Description: The amount of randomization for the delay interval when selecting a delay for a retry.
Allowed: integer
Default: 1
Notes: 
Example: \texttt{pathRetryRandomisation = 1}

pathRetrySegmentOffset
Syntax: \texttt{pathRetrySegmentOffset = seconds}
Description: How much to delay later segments of a concatenated message when a delayed retry is attempted.
Allowed: integer
Notes: 
Example: \texttt{pathRetrySegmentOffset = 1}

PC
Syntax: \texttt{PC = code}
Description: Originating point code in outgoing messages.
Allowed: integer in range [0, 255]
Notes: 
Example: \texttt{PC = 1005}

protocol
Syntax: \texttt{protocol = "prot"}
Description: The outbound protocol that this adapter uses.
Allowed: "CDMA" for IS-41 CDMA
          "TDMA" for IS-41 TDMA.
Notes: 
Example: \texttt{protocol = "CDMA"}

relaySmsNotifications
Syntax: \texttt{relaySmsNotifications = true|false}
Description: We can relay SMS-NOT alerts from the HLR to the SMSC, but that is usually a bad idea because the SMSC will have registered for its own alerts. It does not need ours as well.
Optionality: Mandatory
Allowed: true, false
Default: false
Example: \texttt{relaySmsNotifications = false}
releaseCauseMap
Description: Map of releaseCauses to SMS_CauseCodes, plus default mappings for transient and permanent failures if no releaseCauseMap entry matches.
Notes: If ACS did not release the call and the outbound adapter generated an error result code, the following releaseCodes will be used:
  - TransientFailure - 1001
  - PermanentFailure - 1002
  - Abort - 1003
Refer to SMS_CauseCodes (on page 111) for a list of cause codes.

releaseCode
Syntax: releaseCode = code
Description: INAP releaseCode identifier.
Allowed: Refer to SMS_CauseCodes (on page 111) for a list of cause codes.

rimsInterfaceName
Syntax: rimsInterfaceName = "name"
Description: Name of the configured Messaging Manager Navigator interface.
Default: "rimsIf"
Notes: This must match the interface name in IN/service_packages/SLEE/etc/SLEE.cfg
Example: rimsInterfaceName = "rimsIf"

SMS_CauseCode
Description: Error code in SMDPP-Nack.
Notes: Refer to SMS_CauseCodes (on page 111) for a list of cause codes.

**SMS_CauseCodes**
Here is a list of SMS_CauseCodes used by the following parameters:

- releaseCauseMap
- defaultTransientFailureCauseCode
- defaultPermanentFailureCauseCode
- throttledFailureCauseCode

<table>
<thead>
<tr>
<th>Value</th>
<th>CauseCode</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>AddressVacant</td>
</tr>
<tr>
<td>1</td>
<td>AddressTranslationFailure</td>
</tr>
<tr>
<td>2</td>
<td>NetworkResourceShortage</td>
</tr>
<tr>
<td>3</td>
<td>NetworkFailure</td>
</tr>
<tr>
<td>4</td>
<td>InvalidTeleserviceID</td>
</tr>
<tr>
<td>5</td>
<td>OtherNetworkProblem</td>
</tr>
<tr>
<td>32</td>
<td>NoPageResponse</td>
</tr>
<tr>
<td>33</td>
<td>DestinationBusy</td>
</tr>
</tbody>
</table>

Values 6 through 31 reserved - treat as 5 OtherNetworkProblem
<table>
<thead>
<tr>
<th>Value</th>
<th>CauseCode</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>NoAcknowledgement</td>
</tr>
<tr>
<td>35</td>
<td>DestinationResourceShortage</td>
</tr>
<tr>
<td>36</td>
<td>SMSSDeliveryPostponed</td>
</tr>
<tr>
<td>37</td>
<td>DestinationOutOfService</td>
</tr>
<tr>
<td>38</td>
<td>DestinationNoLongerAtThisAddress</td>
</tr>
<tr>
<td>39</td>
<td>OtherTerminalProblem</td>
</tr>
<tr>
<td></td>
<td>Values 40 through 47 reserved - treat as 39 OtherTerminalProblem</td>
</tr>
<tr>
<td></td>
<td>Values 48 through 63 reserved - treat as 36 SMSSDeliveryPostponed</td>
</tr>
<tr>
<td>64</td>
<td>RadioInterfaceResourceShortage</td>
</tr>
<tr>
<td>65</td>
<td>RadioInterfaceIncompatibility</td>
</tr>
<tr>
<td>66</td>
<td>OtherRadioInterfaceProblem</td>
</tr>
<tr>
<td></td>
<td>Values 67 through 95 reserved - treat as OtherRadioInterfaceProblem</td>
</tr>
<tr>
<td>96</td>
<td>EncodingProblem</td>
</tr>
<tr>
<td>97</td>
<td>SMSOriginationDenied</td>
</tr>
<tr>
<td>98</td>
<td>SMSTerminationDenied</td>
</tr>
<tr>
<td>99</td>
<td>SupplementaryServiceNotSupported</td>
</tr>
<tr>
<td>100</td>
<td>SMSNotSupported</td>
</tr>
<tr>
<td></td>
<td>Value 101 reserved.</td>
</tr>
<tr>
<td>102</td>
<td>MissingExpectedParameter</td>
</tr>
<tr>
<td>103</td>
<td>MissingMandatoryParameter</td>
</tr>
<tr>
<td>104</td>
<td>UnrecognizedParameterValue</td>
</tr>
<tr>
<td>105</td>
<td>UnexpectedParameterValue</td>
</tr>
<tr>
<td>106</td>
<td>DataSizeError</td>
</tr>
<tr>
<td>107</td>
<td>OtherGeneralProblems</td>
</tr>
<tr>
<td></td>
<td>Values 108 through 255 reserved - treat as 107 OtherGeneralProblems.</td>
</tr>
</tbody>
</table>

**smsreqTimeout**

**Syntax:**  
\[ \text{smsreqTimeout} = \text{seconds} \]

**Description:** Configure our timeout on processing of the outbound timers for the SMSREQ messages.

**Allowed:**

**Example:**  
\[ \text{smsreqTimeout} = 10 \]

**smdppTimeout**

**Syntax:**  
\[ \text{smdppTimeout} = \text{seconds} \]

**Description:** Configure our timeout on processing of outbound timers for the SMDPP messages.

**Allowed:**

**Example:**  
\[ \text{smdppTimeout} = 10 \]
smdppTimeoutSME
Syntax: smdppTimeoutSME = seconds
Description: Configure our timeout on processing of outbound timers for the SMDPP messages to an SME.
Allowed: no default
Default: If it is not specified, then smdppTimeout will be used.
Example: smdppTimeout = 10

SSN
Syntax: SSN = num
Description: Destination subsystem number of messages to be handled by this adapter.
Allowed: Valid subsystem number
Notes: Non-zero to handle incoming TCAP.
Example: SSN = 18

supportIS841
Syntax: supportIS841 = true|false
Description: IS-841 is an extension of IS-41 and allows the storing of an MSID in SMSRequestResults. The feature is needed for IMSI masking.
Allowed: true, false
Default: true
Note: Set this to false if your hardware does not support IS-841
Example: supportIS841 = true

throttledFailureCauseCode
Syntax: throttledFailureCauseCode = code
Description: Cause code to return when message is throttled.
Allowed: Refer to SMS_CauseCodes (on page 111) for a list of cause codes.
Default: 35
Example: throttledFailureCauseCode = 35

Configuring the IS-41 TDMA Adapter

IS-41 TDMA adapter overview
The IS41 adapter communicates between the Messaging Manager platform and SMSCs, HLRs, and MSCs, using IS-41.
The IS41 adapter needs to be configured to know about SMSCs that it will connect to.

General IS-41 TDMA configuration
The following section of the eserv.config specifies the general parameters for all IS-41 TDMA connections.

adapters =
# IS-41 TDMA adapter
{
    lib = "xmsiIS41.so"
    adapterName = "TDMA1"
    #pointCodes = [1005, 1006]
    SSN = 18
    earlyAckMC = false
    earlyAckSME = false
    allowConcatenatedFDA = true
    config = {
        global_parameters
    }
}

## General IS-41 TDMA parameters

The parameters for the IS-41 TDMA adapter are the same as those for the IS-41 CDMA adapter. See *General IS-41 CDMA parameters* (on page 104) for the description of each parameter.

**Note:** The `lib` parameter is the same name as for IS41 CDMA, but the `adapterName` is different.

### Global IS-41 TDMA configuration

The following section of the `eserv.config` specifies the global parameters for all IS-41 TDMA connections.

    config = {
        allowIncoming = true
        allowOutgoing = true
        PC = 1005
        SSN = 6
        GT = ""
        originatingTimeout = 20
        smsreqTimeout = 10
        smdppTimeout = 10
        defaultMessagePriority = "Normal"
        supportIS841 = true
        rimsInterfaceName = "rimsIf"
        alarmMask = 0
        releaseCauseMap = [  #<??is this still in config??>
            { releaseCode = 31, SMS_CauseCode = 12 }  
            { releaseCode = 16, SMS_CauseCode = 12 }  
            { releaseCode = 17, SMS_CauseCode = 9 }  
        ]
        defaultTransientFailureCauseCode = 8
        defaultPermanentFailureCauseCode = 7
        causeCodeMap = [
            { SMS_CauseCode = 12, failureCode = 31, permanent = false }  
            { SMS_CauseCode = 9, failureCode = 16, permanent = true }  
        ]
defaultReleaseCause = 13
defaultReleaseCausePermanent = false
deliveryFailureErrorClass = 2
deliveryFailureStatusCode = 5
protocol = "TDMA"
tcapInterfaceServiceKey = 22
incomingOriginatingNumberRules = [
    { fromNoa=3, prefix="04", min=4, max=32, remove=1,
      prepend="0064", resultNoa=4 }
    { fromNoa=2, prefix="4", min=4, max=32, remove=0, prepend="0064",
      resultNoa=4 }
]
incomingDestinationNumberRules = []
# outgoingOriginatingNumberRules = []
# outgoingDestinationNumberRules = []
} # End IS-41 TDMA adapter config section.

Global IS-41 TDMA parameters
The parameters for the IS-41 TDMA adapter are the same as those for the IS-41 CDMA adapter. See Global IS-41 CDMA parameters (on page 106) for the description of each parameter.

Configuring the SCA Adapter

SCA adapter overview
The SCA adapter provides support for SIP instant messaging. It interacts with the NCC Session Control Agent (SCA) to convert SIP instant messages (MESSAGE messages) to and from SMSs.
The SCA adapter does not provide an interface to SIP clients but instead interacts with the SCA and xmsTrigger. The SCA adapter converts (adapts) SipSleeEvents received from the SCA to GenericSM events processed by Messaging Manager. In the reverse direction, the SCA adapter converts GenericSM events to SipSleeEvents.

Note: The SCA adapter in MM interacts with the SCA. SCA must be configured in order to make the adapter work. See SCA Technical Guide for SCA configuration details.

General SCA configuration
The following section of the eserv.config specifies the general parameters for all SIP connections.
adapters =
    # SCA (SIP) adapter
    {
        disabled = False
        interfaceName = "xmsIf"
        lib = "mmxiSCA.so"
        adapterName = "SCA1"
        config = {
            defaultReleaseCause = 13
            defaultReleaseCausePermanent = false
            deliveryFailureErrorClass = 2
            deliveryFailureStatusCode = 5
            protocol = "TDMA"
            tcapInterfaceServiceKey = 22
            incomingOriginatingNumberRules = [
                { fromNoa=3, prefix="04", min=4, max=32, remove=1,
                  prepend="0064", resultNoa=4 }
                { fromNoa=2, prefix="4", min=4, max=32, remove=0, prepend="0064",
                  resultNoa=4 }
            ]
            incomingDestinationNumberRules = []
            # outgoingOriginatingNumberRules = []
            # outgoingDestinationNumberRules = []
        } # End IS-41 TDMA adapter config section.
    }
global_parameters

]

General SCA parameters

Here are the general parameters for SCA.

adapterName

Syntax: adapterName = "name"
Description: Identifier for the adapter.
Allowed: Any text string, but should be meaningful, for example include the protocol used.
For example:
  - "MAP1" for MAP
  - "EMI1" for EMI
  - "SCA1" for SCA
  - "SMPP1" for SMPP
  - "CDMA1" for IS-41 CDMA
  - "TDMA1" for IS-41 TDMA
  - "Wrapper" for Wrapper
Default: No default.
Notes: This name must also be in the configuration database before Messaging Manager will run correctly. See MM User's Guide.

disabled

Syntax: disabled = true|false
Description: To enable or disable the adapter.
Allowed: true, false
Default: false
Example: disabled = False

interfaceName

Syntax: interfaceName = "name"
Description: The SLEE interface name for Messaging Manager; to send messages from SCA to Messaging Manager.
Allowed: String
Default: "xmsIf"  
Note: This must match the name specified in the SLEE.cfg file.
Example: interfaceName = "xmsIf"

lib

Syntax: lib = "library"
Description: The name of the library that contains the SCA adapter being configured.
Allowed: "mmxiSCA.so"
Default: No default.
Example: lib = "mmxiSCA.so"
Global SCA configuration

The following section of the eserv.config specifies the global parameters for all SCA connections.

```plaintext
config = {
    sca = {
        serviceKey = 52
        # interface = "sca"
    }
    pathReportingInterval = 60
    inboundTimeout = 5
    outboundTimeout = 5
}
```

Global SCA parameters

Here are the parameters for configuring the global SCA adapter.

**inboundTimeout**

*Syntax:* 
```
inboundTimeout = seconds
```

*Description:* The timeout, in seconds, of inbound transactions.

*Type:* Integer

*Optionality:* Optional

*Default:* 5

*Example:* inboundTimeout = 5

**interface**

*Syntax:* 
```
interface = "name"
```

*Description:* The SLEE service name for SCA; to send messages from the SCA adapter to SCA.

*Allowed:* String

*Default:* No default.

*Notes:* This *must* match the entry in the SLEE.cfg file.

*Example:* interface = "sca"

**outboundTimeout**

*Syntax:* 
```
inboundTimeout = seconds
```

*Description:* The timeout, in seconds, of outbound transactions.

*Type:* Integer

*Optionality:* Optional

*Default:* 10

*Example:* outboundTimeout = 5

**PathReportingInterval**

*Syntax:* 
```
PathReportingInterval = seconds
```

*Description:* The frequency, in seconds, of path connection reports.

*Type:* Integer
Optionality: Optional
Default: 2
Example: PathReportingInterval = 60

serviceKey
Syntax: serviceKey = key
Description: The SLEE service key for SCA; to send messages from the SCA adapter to SCA.
Allowed: 52
Default: No default.
Notes: This must match the entry in the SLEE.cfg file.
Configure either this parameter or the interface parameter, but not both.
Example: serviceKey = 52

Configuring the Wrapper Adapter

General Wrapper adapter configuration

The following section of the eserv.config specifies the general parameters for the Wrapper adapter (the endpoint for the SSMN macro node).

```
adapters =

    # Internal adapter (The endpoint for the SSMN macro node)
    {  
        lib = "xmsiWrapper.so"
        SSN = 9
        adapterName = "Wrapper"
        
        config = {
        }
    }
```

General Wrapper adapter parameters

Here are the general parameters for the Wrapper adapter.

adapterName
Syntax: adapterName = "name"
Description: Identifier for the adapter.
Allowed: Any text string, but should be meaningful, for example include the protocol used.
For example:
- "MAP1" for MAP
- "EMI1" for EMI
- "SCA1" for SCA
- "SMPP1" for SMPP
- "CDMA1" for IS-41 CDMA
- "TDMA1" for IS-41 TDMA
- "Wrapper" for Wrapper
Default: No default.
Notes: This name *must* also be in the configuration database before Messaging Manager will run correctly. See *MM User's Guide*.

lib
Syntax: \( \text{lib} = "\text{library}\" \)
Description: The name of the library that contains the Wrapper adapter being configured.
Allowed: "xmsiWrapper.so"
Default: No default.
Example: \( \text{lib} = "\text{xmsiWrapper.so}\" \)

SSN
Syntax: \( \text{SSN} = \text{num} \)
Description: Destination subsystem number of messages to be handled by this adapter.
Allowed: Valid subsystem number
Notes: Non-zero to handle incoming TCAP.
Example: \( \text{SSN} = 18 \)

Global Wrapper adapter configuration
The following section of the eserv.config specifies the global parameters for the Wrapper adapter.

```plaintext
config = {
    xmsTimeout = 5
    tcapTimeout = 10
    xmsWrapper = {
        interface = "xmsIf"
        pc = 55
        ssn = 7
        type = "itu"
        gt = ""
    }
    xmsTrigger = {
        pc = 51
        ssn = 3
        type = "itu"
        gt = ""
    }
}
```

Global Wrapper adapter parameters
Here are the parameters for configuring the global Wrapper adapter.

GT
Syntax: \( \text{GT} = "\text{gt}\" \)
Description: Global title
Note: This is defined by the network administrator. Required only if the point code is not defined.

PC
Syntax: \( \text{PC} = \text{code} \)
Description: Point code
Allowed: Integer in range [0, 255]
Example: PC = 55

ssn
Syntax: SSN = num
Description: Subsystem number.
Allowed: Integer between 0 and 65535.
Note: Required only if the point code has been defined.
Default: 0
Example: SSN = 0

tcapTimeout
Syntax: tcapTimeout = seconds
Description: How long to wait for response from XMS remote wrapper.
Allowed: 10
Default: 10
Note: This entry is only used in conjunction with the xmsWrapperTA SLEE interface.
Example: tcapTimeout = 10

type
Syntax: type = "type"
Description: Protocol type.
Allowed: "itu", "ansi"
Example: type = "itu"

xmsTimeout
Syntax: xmsTimeout = seconds
Description: How long to wait for a response from XMS trigger application.
Allowed: Suggested value: Look in the MAP adapter section and add up mscTimeout (on page 77) and hlrTimeout (see Messaging Manager Navigator Technical Guide) and add a bit of time to that (up to 5 seconds).
Default: 5
Example: xmsTimeout = 5

xmsTrigger
Syntax: xmsTrigger = {trigger_parameters}
Description: Configuration parameters used to determine the source address for outgoing messages.
Note: No dialogs needed. Address section is not used for working with SSMN node.

xmsWrapper
Syntax: xmsWrapper = {wrapper_parameters}
Description: Configuration parameters used to create dialogs to the TCAP stack, and to determine the destination address.
Note: Remote side’s configuration. Ignored in normal operation (that is, no xmsWrapperTA).
Overview

Introduction

This chapter briefly explains how to configure the Messaging Manager Director modules. This includes details of the configuration of specific nodes that are used for the MM application.

There are many feature nodes that are supplied by the ACS application, and may be used in Messaging Manager control plans. These feature nodes are detailed in *NCC Feature Nodes Reference Guide*; please refer to this document for instructions.

In this chapter

This chapter contains the following topics.

- Configuring Chassis Actions 123
- Configuring Macro Nodes 126
- Creating Control Plans 133
- Configuring Messaging Manager to Send SMPP Parameters in Notifications 133
- Configuring Messaging Manager to load ACS Control Plans 136

Configuring Chassis Actions

Introduction

The ChassisActions section of Messaging Manager contains the configuration to enable:

- The Send Short Message Notification (SSMN) node to send a GenericSM and wait for a result so that it can branch on the result type
- A USSD node to send a message

ChassisActions configuration

Here is an example ChassisActions configuration.

ChassisActions = {
    SendGenericMessageAction = {
        interfaceName = "xmsIf"
        timeoutTick = 5
        tcapOrigAddr = { PC = 0, SSN = 0, type = "itu" }
        tcapDestAddr = { PC = 0, SSN = 0, type = "itu" }
    }
    ussdChassisAction = {
        tcapInterfaceName = "hssScIf"
        timeoutTick = 5
    }
}
SendGenericMessageAction parameters

Here are the parameters in the SendGenericMessageAction sub-section of the ChassisActions section of the eserv.config.

**InterfaceName**

**Syntax:**

interfaceName = "name"

**Description:**
The SLEE interface to send GenericSMs to.

**Type:**
String

**Optionality:**
Mandatory

**Default:**
"xmsIf"

**Example:**

interfaceName = "xmsIf"

**tcapDestAddr**

**Description:**
TCAP destination address to use when ACS and MM are on different machines.

**Default:**
Not set

**Note:**
Required only if MM and ACS are on separate machines.
See PC, SSN, and type parameters.

**Example:**

tcapDestAddr = [ PC = 1, SSN = 40, type = "itu" ]

**tcapOrigAddr**

**Description:**
TCAP originating address to use when ACS and MM are on different machines.

**Default:**
Not set

**Note:**
Required only if MM and ACS are on separate machines.
See PC, SSN, and type parameters.

**timeoutTick**

**Syntax:**

timeoutTick = seconds

**Description:**
The granularity of SLEE dialog timeout checks.

**Note:**
This can conflict with the option of the same name in the RIMS chassis actions. In case of a conflict, the value to use is undefined.

**Example:**

timeoutTick = 5

**xmsDirectFromPrefix**

**Syntax:**

xmsDirectFromPrefix = "prefix"

**Description:**
A prefix that will be added to the source MSISDN when the MMX Direct transport is chosen in the notification configuration.

**Type:**
String

**Optionality:**
Optional (default used if not set).

**Allowed:**

"" (no prefix is added)

**Notes:**

**Example:**

xmsDirectFromPrefix = "1"
**xmsFDAFromPrefix**

Syntax:  
xmsFDAFromPrefix = "prefix"

Description:  
A prefix that will be added to the source MSISDN when the MMX FDA transport is chosen in the notification configuration.

Type:  
String

Optionality:  
Optional (default used if not set).

Allowed:  

Default:  
"" (no prefix is added)

Notes:  

Example:  
xmsFDAFromPrefix = "2"

**ussdChassisAction parameters**

Here are the parameters in the ussdChassisAction sub-section of the ChassisActions section of the eserv.config.

**recordResponseTimes**

Syntax:  
recordResponseTimes = true|false

Description:  
Whether to record response times in a temporary storage tag.

Type:  
Boolean

Optionality:  
Optional (default used if not set).

Allowed:  
true, false

Default:  
false

Notes:  
If true, the response time is stored in tag 3932504, which is of type "Unsigned 32-bit Integer" and is named "USSD_NOTIF_RESPONSE_TIME".

Example:  
recordResponseTimes = false

**tcapInterfaceName**

Syntax:  
tcapInterfaceName = "name"

Description:  
The SLEE interface to send the USSD message to.

Type:  
String

Default:  
"hssScIf"

Example:  
tcapInterfaceName = "hssScIf"

**timeoutTick**

Syntax:  
timeoutTick = seconds

Description:  
The granularity of SLEE dialog timeout checks.

Note:  
This can conflict with the option of the same name in the RIMS chassis actions. In case of a conflict, the value to use is undefined.

Example:  
timeoutTick = 5

**acsChassis configuration in acs.conf**

This text shows the denormalization configuration in acs.conf for the Send USSD Notification node.

Note:  
This text only shows the configuration which is specific to the node. For more information about acs.conf, see ACS Technical Guide.
Configuring Macro Nodes

Introduction

Macro nodes are feature nodes that are used by ACS using the ACS Control Plan Editor, but are not part of the ACS product. They are supplied by other NCC applications, but require the presence of ACS for use.

Macro nodes require some configuration to be entered into the eserv.config file. The following sections will detail the configuration that is necessary for the MM macro nodes.

The macro node reads the global configuration file (eserv.config) on initialization. Should the configuration of a macro node be changed, the configuration files must be re-read.
For more information about the macro nodes used by Messaging Manager, see *NCC Feature Nodes Reference Guide*.

**eserv.config Macro Node configuration**

This is a high level view of the `macroNodes` configuration section of `eserv.config`.

```plaintext
XMS = {
    macroNodes = {
        Macro_Node_Name = {
            configuration_for_macro_node
        }
    }
}
```

**macroNodes configuration**

Here is an example configuration.

```plaintext
macroNodes = {
    SendShortMessageNode = {
        xmsiWrapperIfName = "xmsIf"
        tcapOrigAddr = { PC = 0, SSN = 0, type = "itu" }
        tcapDestAddr = { PC = 0, SSN = 0, type = "itu" }
        dateFormat = "%A %d %B %Y"
        timeFormat = "%I:%M %p"
        time24Format = "%H:%M %Z"
        callTimeFormat = "%I:%M %p"
        maximumDestinations = 1000
        numberPlan = 1
    }
    SendUSSDNotificationNode = {
        MSISDNTranslationType = 2
        destSSN = 6
    }
}
```

**Send Short Message Node configuration**

The Send Short Message Notification node is a Messaging Manager macro node that also uses the Wrapper adapter to send out the notification.

Therefore there are additional configuration tasks that must be completed for this node to function correctly:

- The node must be configured in the `macroNodes` configuration section of the `eserv.config` file.
- The Wrapper adapter must be configured in the `eserv.config` file. See *Configuring the Wrapper Adapter* (on page 118).

**Send Short Message node parameter descriptions**

Here are the `macroNodes` configuration parameters for the Send Short Message feature node.
callTimeFormat
Syntax: callTimeFormat = "format"
Description: Defines the format of the <CALL_TIME> token.
Type: 
Optionality: 
Allowed: See Date and time formats (on page 131).
Default: "%I:%M %p"
Notes: 
Example: callTimeFormat = "%I:%M %p"

dateFormat
Syntax: dateFormat = "format"
Description: Defines the format of the <DATE> token.
Type: 
Optionality: 
Allowed: See Date and time formats (on page 131).
Default: "%A %d %B %Y"
Notes: 
Example: dateFormat = "%A %d %B %Y"

maximumDestinations
Syntax: maximumDestinations = num
Description: Specifies the absolute limit of addresses that will get an SMS if the Profile Tag destination address type is used.
Default: 1000
Notes: The node will loop over the profile list sending notification SMSs (for an individual call) until this limit is reached. This is purely a safety limit to prevent a massive load on the system, and not intended to be the normal method of broadcasting - there is already a better way to broadcast 1 million identical SMSs.
Example: maximumDestinations = 1000

name
Description: Name of unit type.
Note: Unknown unit types will have a name of "units".

numberPlan
Syntax: numberPlan = num
Description: The Number plan value to use on the message.
Type: Integer
Optionality: Mandatory
Allowed: These more or less follow the SMPP:
0 unknown
1 isdn
3 data
4 telex
6    land_mobile
8    national
9    private
10   ermnes
13   pc_ssn
14   ip
18   wap

Default: 1
Example: numberPlan = 1

PC
Syntax:     PC = pc
Description: The point code.
Type:       Integer
Optionality: Optional
Allowed: integer in range [0, 255]
Default:
Notes:
Example:   PC = 123

SSN
Syntax:     SSN = num
Description: Subsystem number
Allowed: Integer in range [0, 65535]
Note:       Required, if TCAP addresses are defined.
Example:    SSN = 0

tcapDestAddr
Description: TCAP destination address to use when ACS and MM are on different machines.
Default: Not set
Note:      Required only if MM and ACS are on separate machines.
           See PC, SSN, and type parameters.
Example:   tcapDestAddr = [ PC = 1, SSN = 40, type = "itu" ]

tcapOrigAddr
Description: TCAP originating address to use when ACS and MM are on different machines.
Default: Not set
Note:      Required only if MM and ACS are on separate machines.
           See PC, SSN, and type parameters.

time24Format
Syntax:     time24Format = "format"
Description: Defines the format of the <TIME24> token.
Chapter 4

Type:
Optionality:
Allowed: See Date and time formats (on page 131).
Default: "%H:%M %Z"
Notes:
Example: time24Format = "%H:%M %Z"

timeFormat
Syntax: timeFormat = "format"
Description: Defines the format of the <TIME> token.
Type:
Optionality:
Allowed: See Date and time formats (on page 131).
Default: "%I:%M %p"
Notes:
Example: timeFormat = "%I:%M %p"

type
Syntax: type = "type"
Description: Address type.
Allowed: "itu", "ansi"
Example: type = "itu"

xmsiWrapperIfName
Syntax: xmsiWrapperIfName = "name"
Description: Which SLEE interface name to send the message to.
Optionality: Mandatory.
Type: String
Default: "xmsIf"
Note: This should be the interface name of the XMS remote wrapper interface.
Example: xmsiWrapperIfName = "xmsIf"

Notes
- While the three date and time formats, as configured above are true to their names, they need not be. Each format will be used to convert the same time_t into a string. So, the three options represent three completely interchangeable date formats.
- If ACS and Messaging Manager Director is on a different machine to Messaging Manager Multigate, the whole of the tcapOrigAddr and tcapDestAddr is required and used for routing.
- If ACS, Messaging Manager Director and Messaging Manager Multigate are installed on the same machine only the SSN from the tcapDestAddr is used, the PC and type must be defined, but are ignored by the system. This is because Messaging Manager uses the SSN to select the adapter to route to.
**Date and time formats**

The formats are all derived from the standard C function strftime, which converts a time_t into ordinary characters.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>%A</td>
<td>Replaced by national representation of the full weekday name.</td>
</tr>
<tr>
<td>%a</td>
<td>Replaced by national representation of the abbreviated weekday name.</td>
</tr>
<tr>
<td>%B</td>
<td>Replaced by national representation of the full month name.</td>
</tr>
<tr>
<td>%b</td>
<td>Replaced by national representation of the abbreviated month name.</td>
</tr>
<tr>
<td>%C</td>
<td>Replaced by (year / 100) as decimal number; single digits are preceded by a zero.</td>
</tr>
<tr>
<td>%c</td>
<td>Replaced by national representation of time and date.</td>
</tr>
<tr>
<td>%D</td>
<td>Equivalent to &quot;%m/%d/%y&quot;.</td>
</tr>
<tr>
<td>%d</td>
<td>Replaced by the day of the month as a decimal number (01-31).</td>
</tr>
<tr>
<td>%E* %O*</td>
<td>POSIX locale extensions. The sequences %Ec %EC %Ex %EX %Ey %Ey %Od %Oe %OH %Ol %Om %OM %OS %Ou %OU %OV %Ow %OW %Oy are supposed to provide alternate representations. Additionally %OB implemented to represent alternative months names (used standalone, without day mentioned).</td>
</tr>
<tr>
<td>%e</td>
<td>Replaced by the day of month as a decimal number (1-31); single digits are preceded by a blank.</td>
</tr>
<tr>
<td>%F</td>
<td>Equivalent to &quot;%Y-%m-%d&quot;.</td>
</tr>
<tr>
<td>%G</td>
<td>Replaced by a year as a decimal number with century. This year is the one that contains the greater part of the week (Monday as the first day of the week).</td>
</tr>
<tr>
<td>%g</td>
<td>Replaced by the same year as in &quot;%G&quot;, but as a decimal number without century (00-99).</td>
</tr>
<tr>
<td>%H</td>
<td>Replaced by the hour (24-hour clock) as a decimal number (00-23).</td>
</tr>
<tr>
<td>%h</td>
<td>The same as %b.</td>
</tr>
<tr>
<td>%I</td>
<td>Replaced by the hour (12-hour clock) as a decimal number (01-12).</td>
</tr>
<tr>
<td>%j</td>
<td>Replaced by the day of the year as a decimal number (001-366).</td>
</tr>
<tr>
<td>%k</td>
<td>Replaced by the hour (24-hour clock) as a decimal number (0-23); single digits are preceded by a blank.</td>
</tr>
<tr>
<td>%l</td>
<td>Replaced by the hour (12-hour clock) as a decimal number (1-12); single digits are preceded by a blank.</td>
</tr>
<tr>
<td>%M</td>
<td>Replaced by the minute as a decimal number (00-59).</td>
</tr>
<tr>
<td>%m</td>
<td>Replaced by the month as a decimal number (01-12).</td>
</tr>
<tr>
<td>%n</td>
<td>Replaced by a newline.</td>
</tr>
<tr>
<td>%O*</td>
<td>The same as %E*.</td>
</tr>
<tr>
<td>%p</td>
<td>Replaced by national representation of either &quot;ante meridiem&quot; or &quot;post meridiem&quot;, as appropriate.</td>
</tr>
<tr>
<td>%R</td>
<td>Equivalent to &quot;%H:%M&quot;.</td>
</tr>
<tr>
<td>%r</td>
<td>Equivalent to &quot;%I:%M:%S %p&quot;.</td>
</tr>
<tr>
<td>%S</td>
<td>Replaced by the second as a decimal number (00-60).</td>
</tr>
<tr>
<td>%s</td>
<td>Replaced by the number of seconds since the Epoch, UTC (see mktime(3)).</td>
</tr>
<tr>
<td>%T</td>
<td>Equivalent to &quot;%H:%M:%S&quot;.</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>%t</td>
<td>Replaced by a tab.</td>
</tr>
<tr>
<td>%U</td>
<td>Replaced by the week number of the year (Sunday as the first day of the week) as a decimal number (00-53).</td>
</tr>
<tr>
<td>%u</td>
<td>Replaced by the weekday (Monday as the first day of the week) as a decimal number (1-7).</td>
</tr>
<tr>
<td>%V</td>
<td>Replaced by the week number of the year (Monday as the first day of the week) as a decimal number (01-53). If the week containing January 1 has four or more days in the new year, then it is week 1; otherwise it is the last week of the previous year, and the next week is week 1.</td>
</tr>
<tr>
<td>%v</td>
<td>Equivalent to <code>&quot;%e-%b-%Y&quot;</code>.</td>
</tr>
<tr>
<td>%W</td>
<td>Replaced by the week number of the year (Monday as the first day of the week) as a decimal number (00-53).</td>
</tr>
<tr>
<td>%w</td>
<td>Replaced by the weekday (Sunday as the first day of the week) as a decimal number (0-6).</td>
</tr>
<tr>
<td>%X</td>
<td>Replaced by national representation of the time.</td>
</tr>
<tr>
<td>%x</td>
<td>Replaced by national representation of the date.</td>
</tr>
<tr>
<td>%Y</td>
<td>Replaced by the year with century as a decimal number.</td>
</tr>
<tr>
<td>%y</td>
<td>Replaced by the year without century as a decimal number (00-99).</td>
</tr>
<tr>
<td>%Z</td>
<td>Replaced by the time zone name.</td>
</tr>
<tr>
<td>%z</td>
<td>Replaced by the time zone offset from UTC; a leading plus sign stands for east of UTC, a minus sign for west of UTC, hours and minutes follow with two digits each and no delimiter between them (common form for RFC 822 date headers).</td>
</tr>
<tr>
<td>%+</td>
<td>Replaced by national representation of the date and time (the format is similar to that produced by <code>date(1)</code>).</td>
</tr>
<tr>
<td>%%</td>
<td>Replaced by `%'.</td>
</tr>
</tbody>
</table>

Send USSD Notification Node configuration

Here are the macroNodes configuration parameters for the Send USSD Notification feature node.

**destSSN**

Syntax: `destSSN = int`

Description: The SSN used in the outgoing destination TCAP address.

Type: Integer

Optionality: Optional (default used if not set).

Allowed: Default:

Notes:

Example: `destSSN = 147`

**MSISDNTranslationType**

Syntax: `MSISDNTranslationType = int`

Description: The destination party translation type for USSD messages sent by the Send USSD Notification node.

Type: Integer

Optionality: Mandatory
Allowed: Any valid translation type
For more information about valid types, see Q.713.
0
Do not set a translation type.

Default: 0

Notes:

Example: MSISDNTranslationType = 3

Creating Control Plans

Creating service control plans

Service control plans are created using the ACS Control Plan Editor. The MM CPE nodes are described in the XMS feature nodes chapters in NCC Feature Nodes Reference Guide, however for full details see CPE User’s Guide.

Messaging Manager allows messages to be routed to ACS for more complicated processing than Messaging Manager alone may achieve. To use this feature, all ACS service control plans to be used for processing of Messaging Manager messages must be owned by the ACS super user (that is, the ACS level 7 user), and the control plan versioning feature must be turned off. See ACS User’s Guide and CPE User’s Guide for details.

Configuring Messaging Manager to Send SMPP Parameters in Notifications

Setting SMPP Parameters for Notifications from a Control Plan

You can use temporary storage tags to set parameters in MAP or SMPP messages sent in notifications from a control plan. For example, to set the value of the protocol_id field in a MAP or SMPP notification message, set the MMX Protocol Identifier temporary storage tag by using a feature node such as the Set feature node or the Copy feature node in your control plan. You send the notification by placing a notifications feature node in the control plan after the Set or Copy feature node. See Notifications Feature Nodes Table (on page 133) for a list of notifications feature nodes that you can use.

You can also define configuration in the XMS section of the eserv.config file to copy temporary storage tags, byte for byte, into information elements in the user data header for MAP or SMPP messages.

Note: This feature applies to notifications sent by feature nodes that use a notifications processor, such as the XMS Send SMS Notification feature node, or the ACS Send Notification feature node. It does not apply to network originated messages modified by ACS control plans.

For more information about NCC feature nodes, see NCC Feature Nodes Reference Guide.

Notifications Feature Nodes Table
This table lists the feature nodes that can be used to send SMPP messages, and the palette group and NCC application for each feature node. For more information about NCC feature nodes, see NCC Feature Nodes Reference Guide.
**Note:** You can use the Short Message Charging (SMCB) feature node to charge for messages you send.

<table>
<thead>
<tr>
<th>Feature Node</th>
<th>Palette Group</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send Notification</td>
<td>Interaction</td>
<td>ACS</td>
</tr>
<tr>
<td>Send Short Message</td>
<td>Interaction</td>
<td>ACS</td>
</tr>
<tr>
<td>Credit Wallet Transfer</td>
<td>CCS Charging</td>
<td>CCS</td>
</tr>
<tr>
<td>Friends And Destination Configuration</td>
<td>CCS Subscriber</td>
<td>CCS</td>
</tr>
<tr>
<td>Friends And Family Configuration</td>
<td>CCS Subscriber</td>
<td>CCS</td>
</tr>
<tr>
<td>Account Status SMS</td>
<td>CCS Wallet</td>
<td>CCS</td>
</tr>
<tr>
<td>SMS Low Balance</td>
<td>CCS Wallet</td>
<td>CCS</td>
</tr>
<tr>
<td>Call Information SMS</td>
<td>CCS Charging</td>
<td>CCS</td>
</tr>
<tr>
<td>Universal Attempt Termination with Billing</td>
<td>CCS Charging</td>
<td>CCS</td>
</tr>
<tr>
<td>Send Short Message Notification</td>
<td>XMS Control</td>
<td>Messaging Manager</td>
</tr>
</tbody>
</table>

**Temporary Storage Tag Configuration**

You configure the temporary storage tags that will be copied into the user data header in MAP or SMPP messages in the XMS ServiceConfig section of the eserv.config file.

```plaintext
XMS = {
  ...
  ServiceConfig = {
    ParameterMappings = {
      UserDataHeader = [
        {
          profileTag=tag_code
          informationElementIdentifier=int
        }
      
      profileTag=tag_code
      informationElementIdentifier=int
    }
    ...
  }
  ...
}
```

**ServiceConfig Parameters**

Here are the ServiceConfig parameters.

**profileTag**

**Syntax:** `profileTag=tag_code`

**Description:** The number used to identify the profile tag to copy from temporary storage to the `informationElementIdentifier` in the user data header.

**Type:** Integer

**Optionality:** Required

**Allowed:** A valid profile tag number

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

**Example:** `profileTag=3932482`
informationElementIdentifier

**Syntax:**
informationElementIdentifier=int

**Description:**
The information element in the user data header that `profileTag` is copied to.

**Type:**
Integer

**Optionality:**
Required

**Example:**
informationElementIdentifier=5

---

**MMX Notification Standard Application Port Example**

The following example configuration maps the profile tag 3932482 to information element ID 5 in the user data header in an SMPP notification:

```plaintext
ServiceConfig = {
    ParameterMappings = {
        UserDataHeader = [
            {
                profileTag=3932482
                informationElementIdentifier=5
            }
        ]
    }
}
```

The profile tag 3932482 (MMX Notification Standard Application Port) is defined as a SHORT (two bytes), and matches the standard two byte destination port encoding used by the information element ID 5 (application port) in SMPP notifications. A Set feature node is used to set the MMX Notification Standard Application Port profile tag value to 5498, and an SMS Send SMS Notification feature node, placed after the Set feature node in the control plan, is used to send the SMPP notification. When the message is sent, the value for the application port in the user data header will be 5498.

---

**MMX Notification Standard Application Port Example**

The following example configuration maps the profile tag 29020 to information element ID 5 in the user data header in an SMPP notification:

```plaintext
ServiceConfig = {
    ParameterMappings = {
        UserDataHeader = [
            {
                profileTag=29020
                informationElementIdentifier=5
            }
        ]
    }
}
```

In this example the custom profile tag 29020 is configured to hold an unsigned integer (four bytes), and the customer wants to set the application port in information element ID 5 to be four bytes containing 5498 in the first two bytes, and also containing 5498 in the third and fourth bytes. The customer uses a Set feature node to set profile tag 29020 to 360322426. Because 5498 is 0x157A in hexadecimal, and 360322426 is 0x157A157A, this means that the first two bytes of information element ID 5 will contain 5498, and the third and fourth bytes will also contain 5498.
Configuring Messaging Manager to load ACS Control Plans

Configuring MMX to load ACS Control Plans

Messaging Manager uses ACS control plans to perform advanced call processing. These control plans must be loaded into cache in order to be used. The following section of the configuration file sets the parameters for this.

serviceLibrary configuration

Here is example of the configuration of the serviceLibrary section in the eserv.config.

```
serviceLibrary = {
    validityTime = 5
    flushTime = 60
    maxAge = 3600
    DialledNumberAvailable = false
    xmsUndoNumTranslation = false
}
```

Note

The configuration parameters, validityTime, flushTime and maxAge apply only to caching of control plans which are matched by the Originator and Destination addresses.

Control plans that are matched purely by NAME of the control plan in the ACS triggering rules are actually stored in the ACS Global Cache. The validity period on that cache is controlled by the globalProfileMaxAge parameter in the acs.conf file. Please be aware that the default value for globalProfileMaxAge is 300 seconds, which is considerably longer than the validity period for the control plans in the Orig/Dest matching cache.

Trigger rules are defined in the GUI. Refer to MM User’s Guide.

Where the matched ACS triggering rule does not specify a control plan name, the originating (or terminating) number is looked up in the CLI or Service Number tables within ACS to find the required control plan, and the values in the serviceLibrary section of the eserv.config are used.

serviceLibrary parameters

Here are the serviceLibrary parameters.

DialledNumberAvailable

Syntax: DialledNumberAvailable = true|false
Description: Retrieves the dialed number from the Original-Originating-Address
Type: Boolean
Optionality: Optional
Allowed: true, false
Default: false
Notes: If true, retrieve the dialed number from the Original-Originating-Address. If false, do not retrieve the dialed number. Only used for IS-41.
Example: DialledNumberAvailable = true
flushTime
Syntax: \texttt{flushTime = seconds}
Description: How often is a check made for data older than its validity time.
Type: Positive integer
Optionality: Optional
Allowed: 
Default: 60
Notes: Applies to control plans matched on originator or destination addresses only.
Example: \texttt{flushTime = 90}

maxAge
Syntax: \texttt{maxAge = seconds}
Description: The time after which an unused or unchanged control plan is dropped from the control plan cache.
Type: Positive integer
Optionality: Optional
Allowed: 
Default: 3600
Notes: Applies to control plans matched on originator or destination addresses only.
Example: \texttt{maxAge = 1800}

validityTime
Syntax: \texttt{validityTime = seconds}
Description: The maximum age of the data before it is refreshed from the database.
Type: Positive integer
Optionality: Optional
Allowed: Any positive integer
Default: 5
Notes: Applies to control plans matched on originator or destination addresses only.
Example: \texttt{validityTime = 15}

\texttt{xmsUndoNumTranslation}
Syntax: \texttt{xmsUndoNumTranslation = true|false}
Description: Indicates when processing a long held reservation, whether or not the service library will undo hash and star number mapping to regain the original dialed numbers.
Type: Boolean
Optionality: Optional
Allowed: true, false
Default: false
Notes: If true, undo hash and star number mapping to regain the original dialed numbers.
If false, do not undo hash and star number mapping to regain the original dialed numbers.
Example: \texttt{xmsUndoNumTranslation = true}
**Overview**

**Introduction**

This chapter explains the steps required to configure several standard services.

*Note:* The steps shown for the configuring of each service give the minimum that is required to be configured to achieve the service.

**In this chapter**

This chapter contains the following topics.

- Mobile to SMSC Messaging 140
- Application to Mobile Messaging 142
- Mobile to Application Messaging 144
- Mobile to Mobile triggering to ACS 147
Example network

For the purposes of this document let us pretend that the network entities that are to be configured to use Messaging Manager are as follows:

These details will be used throughout the document as we work through examples of setting up and configuring Messaging Manager to perform standard services.

Mobile to SMSC Messaging

Description

The MO SMS service is a basic service that provides delivery to an SMSC of SMSs that originated from a mobile phone.

MO SMS and MT SMS are services that validate customers’ requests to send and receive short messages through mobile phones. MO SMS is a service that allows customers to send short messages through a mobile phone. MT SMS is a service that allows customers to receive short messages via a mobile phone. Using Messaging Manager to provide these services ensures the collection of meaningful statistical information and customer usage records.
MO SMS diagram

Using only the Messaging Manager base module, MM can be configured to provide an MO SMS service. In this example we will receive mobile originating MAP messages and deliver to the SMSC over TCP/IP using the SMPP protocol. The following diagram shows the modules required.

Editing the eserv.config

Using the example network (on page 140) follow the steps below to set up MM to do basic MO SMS and MT SMS.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Take a copy of the example eserv.config provided at install of MM.</td>
</tr>
</tbody>
</table>
| 2    | Edit the eserv.config file to have only two adapters, a MAP adapter and an SMPP adapter.  
    | **Note:** You can place a # at the beginning of each unwanted line. |
| 3    | Configure the MAP and SMPP adapters. |
| 4    | In the xmsTrigger area of the configuration file, configure the following features, if required:  
    | - Collecting statistics (on page 62)  
    | - Generating CDRs (on page 56) |
| 5    | Rename the eserv.config that is in use to a known name. |
| 6    | Rename the copy of the eserv.config that you have made all your changes to, to be eserv.config. |
| 7    | Reread the configuration file. See Rereading the eserv.config file (on page 26) for details. |
Configuring Messaging Manager

Here is the process used to configure the service.

The following steps are carried out using the Messaging Manager screens. See MM User’s Guide.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create adapters.</td>
</tr>
<tr>
<td>2</td>
<td>Create nodes.</td>
</tr>
<tr>
<td>3</td>
<td>Create schemes.</td>
</tr>
<tr>
<td>4</td>
<td>Create Message Center.</td>
</tr>
<tr>
<td>5</td>
<td>Open scheme.</td>
</tr>
<tr>
<td>6</td>
<td>Configure adapters.</td>
</tr>
<tr>
<td>7</td>
<td>Configure paths.</td>
</tr>
<tr>
<td>8</td>
<td>Configure connections</td>
</tr>
<tr>
<td>9</td>
<td>Configure domain.</td>
</tr>
<tr>
<td>10</td>
<td>Configure throttling.</td>
</tr>
<tr>
<td>11</td>
<td>Configure triggering.</td>
</tr>
<tr>
<td>12</td>
<td>Configure routing.</td>
</tr>
</tbody>
</table>

Application to Mobile Messaging

Description

Application to mobile is a simple service that provides basic delivery of SMSs to a mobile phone.

Application to Mobile diagram

Using only the Messaging Manager Base module, MM can be configured to provide an application to mobile service. In this example we will receive EMI protocol messages from ASPs and deliver them to an SMSC over SS7 using the IS-41 protocol.
The following diagram shows the modules required:

**Editing the eserv.config**

Using the *example network* (on page 140) follow the steps below to set up MM to do basic MT SMS.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Take a copy of the example <em>eserv.config</em> provided at install of MM.</td>
</tr>
</tbody>
</table>
| 2    | Edit the *eserv.config* file to have only two adapters, an IS41 adapter and an EMI adapter.  
      **Note:** You can place a # (comment tag) at the beginning of each unwanted line. |
| 3    | Configure the IS41 and EMI adapters. |
| 4    | In the *xmsTrigger* area of the configuration file, configure the following features, if required:  
      - *Collecting statistics* (on page 62)  
      - *Generating CDRs* (on page 56) |
| 5    | Rename the *eserv.config* that is in use to a known name. |
| 6    | Rename the copy of the *eserv.config* that you have made all your changes to, to be *eserv.config*. |
| 7    | Reread the configuration file. *See* *Rereading the eserv.config* *file* (on page 26) *for* details. |

**Configuring Messaging Manager**

Here is the process used to configure the service.
The following steps are carried out using the Messaging Manager screens. See *MM User’s Guide*.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create adapters.</td>
</tr>
<tr>
<td>2</td>
<td>Create nodes.</td>
</tr>
<tr>
<td>3</td>
<td>Create schemes.</td>
</tr>
<tr>
<td>4</td>
<td>Create Message Center.</td>
</tr>
<tr>
<td>5</td>
<td>Open scheme.</td>
</tr>
<tr>
<td>6</td>
<td>Configure adapters.</td>
</tr>
<tr>
<td>7</td>
<td>Configure paths.</td>
</tr>
<tr>
<td>8</td>
<td>Configure connections</td>
</tr>
<tr>
<td>9</td>
<td>Configure domain.</td>
</tr>
<tr>
<td>10</td>
<td>Configure throttling.</td>
</tr>
<tr>
<td>11</td>
<td>Configure triggering.</td>
</tr>
<tr>
<td>12</td>
<td>Configure routing.</td>
</tr>
</tbody>
</table>

## Mobile to Application Messaging

### Description

The mobile to application to service provides delivery of SMSs that originated on a mobile phone to an ASP.

Messaging Manager will attempt to deliver the SMS directly to the ASP, falling back to an SMSC if the direct delivery (FDA) fails.

### Setting the scene

This example covers the configuration required for the following flows:

**FDA deliver attempt success**
FDA submit attempt success

Message (S41-CDMA) → RC=Submit
Convert to RC=FDA
Attempt Deliver part of FDA (EMI)

Fail
Attempt Submit part of FDA
Success

Default routing path attempt success

Message (S41-CDMA) → RC=Submit
Convert to RC=FDA
Attempt Deliver part of FDA (EMI)

Fail
Attempt Submit part of FDA (EMI)
Fail
Attempt Relay (IS41) delivery
Success
Mobile to Application diagram

Using the Messaging Manager Multigate and the Messaging Manager Director modules, MM can be configured to provide a Mobile to Application service. In this example we will receive mobile originating IS-41 messages and deliver them to ASPs over EMI using FDA. This diagram shows the modules required.

Editing the eserv.config

Using the example network (on page 140) follow the steps below to set up MM to do MO SMS to ASP with First Delivery Attempt.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Take a copy of the example eserv.config provided at install of MM.</td>
</tr>
<tr>
<td>2</td>
<td>Edit the eserv.config file to have only two adapters, an IS41 (CDMA) adapter and an EMI adapter. <strong>Note:</strong> You can place a # (comment tag) at the beginning of each unwanted line.</td>
</tr>
<tr>
<td>3</td>
<td>Configure the IS41 (CDMA) and EMI adapters.</td>
</tr>
</tbody>
</table>
| 4    | In the xmsTrigger area of the configuration file, configure the following features, if required:  
  * Collecting statistics (on page 62)  
  * Generating CDRs (on page 56) |
### Configuring Messaging Manager

Here is the process used to configure the service.

The following steps are carried out using the Messaging Manager screens. See *MM User's Guide*.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create adapters.</td>
</tr>
<tr>
<td>2</td>
<td>Create nodes.</td>
</tr>
<tr>
<td>3</td>
<td>Create schemes.</td>
</tr>
<tr>
<td>4</td>
<td>Create Message Center.</td>
</tr>
<tr>
<td>5</td>
<td>Open scheme.</td>
</tr>
<tr>
<td>6</td>
<td>Configure adapters.</td>
</tr>
<tr>
<td>7</td>
<td>Configure paths.</td>
</tr>
<tr>
<td>8</td>
<td>Configure connections</td>
</tr>
<tr>
<td>9</td>
<td>Configure domain.</td>
</tr>
<tr>
<td>10</td>
<td>Configure throttling.</td>
</tr>
<tr>
<td>11</td>
<td>Configure triggering.</td>
</tr>
<tr>
<td>12</td>
<td>Configure routing.</td>
</tr>
</tbody>
</table>

### Mobile to Mobile triggering to ACS

**Description**

The Mobile to Mobile messaging (MO SMS) service allows customers to send short messages from one mobile phone to another.

In this example messages will be triggered to an ACS control plan to route large messages to a specific SMSC.
Diagram

Using the Messaging Manager Multigate and the Messaging Manager Director modules, MM can be configured to provide a Mobile to Mobile service, triggering to ACS. In this example we will receive mobile originating MAP messages and deliver them to SMSCs over MAP having triggered them to ACS to offload all large messages to a separate SMSC. The following diagram shows the modules required:

Editing the eserv.config

Using the example network (on page 140) follow the steps below to set up MM to do basic MO SMS and MT SMS.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Take a copy of the example eserv.config provided at install of MM.</td>
</tr>
</tbody>
</table>
| 2    | Edit the eserv.config file to have only two adapters, a MAP adapter and an SMPP adapter.  
\textbf{Note:} You can place a # at the beginning of each unwanted line. |
| 3    | Configure the MAP and SMPP adapters. |
| 4    | In the xmsTrigger area of the configuration file, configure the following features, if required:  
\begin{itemize}  
\item \textit{Collecting statistics} (on page 62)  
\end{itemize} |
### Configuring Messaging Manager

Here is the process used to configure the service.

The following steps are carried out using the Messaging Manager screens. See *MM User's Guide*.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Create adapters.</td>
</tr>
<tr>
<td>2</td>
<td>Create nodes.</td>
</tr>
<tr>
<td>3</td>
<td>Create schemes.</td>
</tr>
<tr>
<td>4</td>
<td>Create Message Center.</td>
</tr>
<tr>
<td>5</td>
<td>Open scheme.</td>
</tr>
<tr>
<td>6</td>
<td>Configure adapters.</td>
</tr>
<tr>
<td>7</td>
<td>Configure paths.</td>
</tr>
<tr>
<td>8</td>
<td>Configure connections</td>
</tr>
<tr>
<td>9</td>
<td>Configure domain.</td>
</tr>
<tr>
<td>10</td>
<td>Configure throttling.</td>
</tr>
<tr>
<td>11</td>
<td>Configure triggering.</td>
</tr>
<tr>
<td>12</td>
<td>Configure routing.</td>
</tr>
</tbody>
</table>
Overview

Introduction

This chapter explains the processes which run automatically as part of the application. These processes are started automatically by one of the following:

- inittab
- crontab
- Service Logic Execution Environment SLEE

Note: This chapter also includes some plug-ins to background processes which do not run independently.

In this chapter

This chapter contains the following topics.

xmsTrigger Application
xmsAgent
Adapters
Statistics
Tracing
Messaging Manager EDRs
Delivery Receipts

xmsTrigger Application

Purpose

xmsTrigger (also known as the XMS Trigger application) is a SLEEs interface which is responsible for:

- Correlating and controlling all of the incoming short messages
- Converting (through adapters) and relaying messages between different SLEEs interfaces
- Triggering INAP service logic on slee_acs as required during message processing

The primary tasks of xmsTrigger are:

- Receive incoming Send requests from an MM interface
- Trigger INAP to the ACS service (slee_acs)
- Possibly pass outgoing send requests to an MM interface for relay
- Receive delivery notifications from an MM interface
- Trigger INAP to the ACS service (slee_acs)
- Possibly pass delivery notifications to an MM interface for relay
Stopping and starting xmsTrigger (XMS)

xmsTrigger is a SLEE interface. Like other SLEE interfaces, it is stopped and started through the SLEE administration scripts. xmsTrigger is restarted when the SLEE is restarted.

For more information about starting and stopping the SLEE, see *SLEE Technical Guide*.

**Configuration**

xmsTrigger supports extensive configuration from `eserv.config`. For more information, see `eserv.config Configuration` (on page 25).

**xmsAgent**

**Purpose**

xmsAgent is a proxy gateway for the SMPP adapter. It will proxy traffic from a single remote ASP/MC to multiple xmsTrigger instances.

**Stopping and starting xmsAgent**

xmsAgent is a SLEE interface. Like other SLEE interfaces, it is stopped and started via the SLEE administration scripts. xmsAgent is restarted when the SLEE is restarted.

For more information about starting and stopping the SLEE, see *SLEE Technical Guide*.

**Adapters**

**Adapter interface location**

Adapter interfaces are supplied as libraries. These are located in `/IN/service_packages/XMS/lib`.

Adapter interfaces are libraries loaded by the xmsTrigger application and are started and accessed by this application as required.

**Available adapters**

There are several adapters available from Oracle, listed below.

<table>
<thead>
<tr>
<th>Protocol</th>
<th>adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMI</td>
<td>mmxiEMI.so</td>
</tr>
<tr>
<td>SCA</td>
<td>mmxiSCA.so</td>
</tr>
<tr>
<td>SMPP</td>
<td>mmxiSMPP.so</td>
</tr>
<tr>
<td>IS-41 (CDMA)</td>
<td>xmsiIS41.so</td>
</tr>
<tr>
<td>IS-41 (TDMA)</td>
<td>xmsiIS41.so</td>
</tr>
<tr>
<td>MAP</td>
<td>xmsiMap.so</td>
</tr>
<tr>
<td>Wrapper</td>
<td>xmsiWrapper.so</td>
</tr>
</tbody>
</table>
Statistics

Introduction

Messaging Manager statistics are generated by each SLC, and then transferred at periodic intervals to the Service Management System (SMS) for permanent storage and analysis. MM allows new statistics to be registered on the system without the need for manual intervention.

An existing statistics system provides functions for the collection of basic statistical events. This is provided in the Oracle SMS application. For more information about the SMS statistics subsystem, see SMS User's Guide.

Setting up statistics collection

Paths and categories used for gathering statistics against are defined using the Messaging Manager Manager screens. Refer to MM User's Guide.

To turn on statistics gathering, see Collecting Statistics (on page 62).

Diagram

Here is an example of statistics collection. There are three ASPs. However, the Category “STOCK_QUOTES” has been applied to both ASP "STOCK" and ASP "REUTERS", so in this instance, the statistics for both ASPs will be counted and added to the database table.
Inbound message types

Every message coming into MM is one of the following transaction types. On receipt of any message, MM will increment the statistic listed below, with the inbound path's statistics category in the detail field.

<table>
<thead>
<tr>
<th>Inbound Message Type</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command</td>
<td>MSG_COMMAND</td>
</tr>
<tr>
<td>Submit</td>
<td>MSG_SUBMIT</td>
</tr>
<tr>
<td>Deliver</td>
<td>MSG_DELIVER</td>
</tr>
<tr>
<td>Notify</td>
<td>MSG_NOTIFY</td>
</tr>
<tr>
<td>RoutInfo</td>
<td>MSG_ROUTEINFO</td>
</tr>
</tbody>
</table>

**Note:** Command type messages are immediately relayed and no further processing is done. The only further statistic that can be recorded for them is to indicate a successful relay.

When the recipient acknowledges receipt of a relayed command message, MM will increment the MSG_COMMAND_SUCCESS statistic, with the inbound path's statistics category in the detail field.

For detailed information on transaction types, refer to *MM User's Guide*.

Result statistics

For all message types, except Command, a corresponding overall result statistic will also be incremented at some subsequent point in the processing.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Result Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed screening</td>
<td>FAIL_SCREENING</td>
</tr>
<tr>
<td>Throttled</td>
<td>FAIL_THROTTLED</td>
</tr>
<tr>
<td>Control plan accept</td>
<td>SUCCESS</td>
</tr>
<tr>
<td>Control plan reject / reject action</td>
<td>FAIL_REJECT</td>
</tr>
<tr>
<td>Successful delivery</td>
<td>SUCCESS</td>
</tr>
<tr>
<td>Delivery failure</td>
<td>FAIL_ROUTING</td>
</tr>
<tr>
<td>Inbound timeout</td>
<td>FAIL_TIMEOUT</td>
</tr>
<tr>
<td>Inbound abort</td>
<td>FAIL_ABORT</td>
</tr>
</tbody>
</table>

**Note:** The format of the statistic produced is MSG_InboundMessageType_ResultStatistic.

Example inbound message statistics

Here are some examples of the statistics incremented.

**Example 1:** When a Submit message is rejected due to any of the screening checks, MM will increment this statistic.
MSG_SUBMIT_FAIL_SCREENING

**Example 2:** When a Deliver message is rejected due to throttling, MM will increment this statistic.
MSG_DELIVER_FAIL_THROTTLED

**Example 3:** When a Deliver message is successfully delivered, MM will increment this statistic.
MSG_DELIVER_SUCCESS
Current message types

A control plan may be triggered based on the inbound message type. If direct delivery is attempted on a Submit message (that is, the action changed to “Deliver” or “FDA”), then two control plans (Submit and Deliver) may be triggered. A new Deliver message is created for the delivery attempt, so at this point the “current message” is a Deliver message and the “inbound message” is a Submit message.

This table describes the current message types.

<table>
<thead>
<tr>
<th>Current Message Type</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submit</td>
<td>MSG_SUBMIT</td>
</tr>
<tr>
<td>Deliver</td>
<td>MSG_DELIVER</td>
</tr>
<tr>
<td>Notify</td>
<td>MSG_NOTIFY</td>
</tr>
</tbody>
</table>

Control Plans result statistics

For all current message types, a result statistic will be incremented.

<table>
<thead>
<tr>
<th>Result Statistic</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDP_TRIGGERED</td>
<td>When a message triggers a control plan.</td>
</tr>
<tr>
<td>IDP_ROUTE</td>
<td>When a trigger rule or control plan specifies a Route action.</td>
</tr>
<tr>
<td>IDP_RELAY</td>
<td>When a trigger rule or control plan specifies a Relay action.</td>
</tr>
<tr>
<td>IDP_DISCARD</td>
<td>In either of the following cases:</td>
</tr>
<tr>
<td></td>
<td>• A trigger rule specifies a Discard action</td>
</tr>
<tr>
<td></td>
<td>• A control plan sends a ReleaseCall operation with the Discard release cause, without having done a Connect or Continue</td>
</tr>
<tr>
<td>IDP_ACCEPT</td>
<td>In either of the following cases:</td>
</tr>
<tr>
<td></td>
<td>• A trigger rule specifies an Accept action</td>
</tr>
<tr>
<td></td>
<td>• A control plan sends a ReleaseCall operation with the Accept release cause, without having done a Connect or Continue</td>
</tr>
<tr>
<td>IDP_REJECT</td>
<td>In either of the following cases:</td>
</tr>
<tr>
<td></td>
<td>• A trigger rule specifies a Reject action</td>
</tr>
<tr>
<td></td>
<td>• A control plan sends a ReleaseCall operation with any release cause other than Accept or Discard, without having done a Connect or Continue</td>
</tr>
</tbody>
</table>

Notes:
- The format of the statistic produced is MSG_CurrentMessageType_ResultStatistic.
- If the message is rejected, discarded or accepted by a trigger rule or control plan, no further processing is done and the appropriate statistic is updated to indicate the final result.

Example current message type statistics

Here are some examples of the statistics incremented.

Example 1: When a Submit message triggers a control plan, MM will increment this statistic: MSG_SUBMIT_IDP_TRIGGERED
Example 2: When a trigger rule or control plan specifies a Route action for a Deliver message, MM will increment this statistic:

MSG_DELIVER_IDP_ROUTE

Example 3: When a trigger rule or control plan specifies a Relay action for a Notify message, MM will increment this statistic:

MSG_NOTIFY_IDP_RELAY

Example 4: When a trigger rule specifies a Discard action or a control plan sends a ReleaseCall operation with a Discard release cause and without having done a Connect or Continue, for a Deliver message, MM will increment this statistic:

MSG_DELIVER_IDP_DISCARD

Example 5: When a trigger rule specifies an Accept action or a control plan sends a ReleaseCall operation with an Accept release cause and without having done a Connect or Continue, for a Submit message, MM will increment this statistic:

MSG_SUBMIT_IDP_ACCEPT

Routing class statistics

The message will then proceed to routing with a routing class:

- Deliver
- FDA
- Submit
- Relay
- Locate

These are set from the message type default, trigger rule or control plan.

For detailed information on routing classes, refer to MM User's Guide.

If there is no routing rule matching the specified routing class, then a virtual routing class of 'Default' will be used for all MSG_ROUTING_* statistics.

This table describes the MSG_Routing statistics.

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG_ROUTING_routingClass</td>
<td>When a message is passed to routing.</td>
</tr>
<tr>
<td>MSG_ROUTING_routingClass_SUCCESS</td>
<td>If a message is successfully delivered and the routing class is not &quot;FDA&quot;.</td>
</tr>
<tr>
<td>MSG_ROUTING_FDA_SUCCESS_DELIVER</td>
<td>If the routing class is &quot;FDA&quot; and the message is successfully delivered via a Deliver routing rule.</td>
</tr>
<tr>
<td>MSG_ROUTING_FDA_SUCCESS_SUBMIT</td>
<td>If the routing class is &quot;FDA&quot; and the message is successfully delivered via a Submit routing rule.</td>
</tr>
</tbody>
</table>

Once a message gets to the routing stage, the overall result will be either SUCCESS, FAIL_ROUTING or TIMEOUT, with the inbound path's statistics category in the detail field. See Result statistics (on page 154).
Deliver
If the routing class is “Deliver” or “FDA”, MM will look for routing rules that specify a routing class of “Deliver”. Each path listed in the routing rule will be attempted in turn, until either a successful or permanent failure response is received. Statistics are recorded for each path that delivery is attempted on, with the detail field being populated by the outbound path’s statistics category. The term “attempt” includes any retries that are configured for the path. The outcome of a delivery attempt is one of:

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG_PATH_DELIVER_RETRY_SUCCESS</td>
<td>Delivery initially fails, but is successful on the first or subsequent retries</td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_TEMP_ERR</td>
<td>Initial delivery and all retries return a temporary error</td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_PERM_ERR</td>
<td>Initial delivery or one of the retries returns a permanent error (so there are no further retries)</td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_TIMEOUT</td>
<td>Initial delivery or one of the retries times out (so there are no further retries)</td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_ATTEMPT</td>
<td>For every delivery attempt on a path listed in a Deliver routing rule, MM will increment this statistic, with the outbound path’s statistics category in the detail field</td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_bucket_COUNT</td>
<td>For every successful delivery attempt on a path listed in a Deliver routing rule, MM will increment this statistic, where the bucket is determined by the response time from the MSC with the outbound path’s statistics category in the detail field. Where bucket can be:</td>
</tr>
<tr>
<td>Bucket</td>
<td>Response Time</td>
</tr>
<tr>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>RT1</td>
<td>(\leq 1) second</td>
</tr>
<tr>
<td>RT2</td>
<td>(\geq 1), (\leq 5) seconds</td>
</tr>
<tr>
<td>RT3</td>
<td>(\geq 5), (\leq 10) seconds</td>
</tr>
<tr>
<td>RTX</td>
<td>(\geq 10) seconds</td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_bucket_TIME</td>
<td>For every successful delivery attempt on a path listed in a Deliver routing rule, MM will add the response time to this statistic, with the outbound path’s statistics category in the detail field (where bucket is determined as above).</td>
</tr>
</tbody>
</table>

Note: The number of attempts that produce a successful delivery with no retries required can be derived by subtracting the other outcomes from MSG_PATH_DELIVER_ATTEMPT.
Submit
If the routing class is “Submit” or “FDA” (where the “Deliver” leg has already failed), MM will look for routing rules that specify a routing class of “Submit”. Each path listed in the routing rule will be attempted in turn, until either a successful or permanent failure response is received.

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG_PATH_SUBMIT_ATTEMPT</td>
<td>For every delivery attempt on a path listed in a Submit routing rule.</td>
</tr>
<tr>
<td>MSG_PATH_SUBMIT_TIMEOUT</td>
<td>For every delivery attempt that times out on a path listed in a Submit routing rule.</td>
</tr>
<tr>
<td>MSG_PATH_SUBMIT_TEMP_ERR</td>
<td>For every delivery attempt resulting in a transient failure, on a path listed in a Submit routing rule.</td>
</tr>
<tr>
<td>MSG_PATH_SUBMIT_PERM_ERR</td>
<td>For every delivery attempt resulting in a permanent failure, on a path listed in a Submit routing rule.</td>
</tr>
</tbody>
</table>

**Note:** All of these statistics will include the outbound path's statistics category in the detail field.

Locate
If the routing class is “Locate”, MM will look for routing rules that specify a routing class of “Locate”. Each path listed in the routing rule will be attempted in turn, until either a successful or permanent failure response is received.

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG_PATH_LOCATE_ATTEMPT</td>
<td>For every delivery attempt on a path listed in a Locate routing rule.</td>
</tr>
<tr>
<td>MSG_PATH_LOCATE_TIMEOUT</td>
<td>For every delivery attempt that times out on a path listed in a Locate routing rule.</td>
</tr>
<tr>
<td>MSG_PATH_LOCATE_TEMP_ERR</td>
<td>For every delivery attempt resulting in a transient failure, on a path listed in a Locate routing rule.</td>
</tr>
<tr>
<td>MSG_PATH_LOCATE_PERM_ERR</td>
<td>For every delivery attempt resulting in a permanent failure, on a path listed in a Locate routing rule.</td>
</tr>
</tbody>
</table>

**Note:** All of these statistics will include the outbound path's statistics category in the detail field.

Other statistics
This table describes the function of each field.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG_inboundMsgType_FAIL_TIMEOUT</td>
<td>If the inbound transaction's timeout is exceeded before sending a result, MM will increment this statistic, with the inbound path's statistics category in the detail field. No other MSG_inboundMsgType_result statistics will be incremented in this case.</td>
</tr>
</tbody>
</table>
Chapter 6

Background Processes

Field Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG_inboundMsType_FAIL_ABORT</td>
<td>If the sending entity aborts the inbound transaction, MM will increment this statistic, with the inbound path’s statistics category in the detail field. No other MSG_inboundMsgType_result statistics will be incremented in this case.</td>
</tr>
</tbody>
</table>

Delivery receipt

When MM generates a delivery receipt (having delivered or failed to deliver an SMS directly), statistics will be recorded in a way that is consistent with the procedure for handling an external delivery receipt. It is intended that in future the same processing logic will be used for internally generated delivery receipts as for external ones.

Whenever it generates a delivery receipt, MM will increment the following statistics.

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG_NOTIFY</td>
<td>Detail field is INTERNAL_DR path’s statistics category.</td>
</tr>
<tr>
<td>MSG_ROUTING_DELIVER</td>
<td></td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_ATTEMPT</td>
<td>Detail field is Inbound path’s statistics category</td>
</tr>
<tr>
<td>MSG_NOTIFY_SUCCESS</td>
<td>Detail field is INTERNAL_DR path’s statistics category</td>
</tr>
<tr>
<td>MSG_NOTIFY_FAIL_ROUTING</td>
<td></td>
</tr>
<tr>
<td>MSG_ROUTING_DELIVER_SUCCESS</td>
<td></td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_bucket_COUNT</td>
<td>Detail field is inbound path’s statistics category. See Routing class statistics - Deliver (on page 157).</td>
</tr>
<tr>
<td>MSG_PATH_DELIVER_bucket_TIME</td>
<td>Detail field is inbound path’s statistics category. See Routing class statistics - Deliver (on page 157).</td>
</tr>
</tbody>
</table>
| MSG_PATH_DELIVER_result | Where result can be one of:  
  - TIMEOUT  
  - TEMP_ERR  
  - PERM_ERR  
  See routing class statistics - Deliver (on page 157). |

Example statistics printout

Here is an example of a list of statistics produced while running MM.

Thu Sep  7 22:45:33 2006
Rims_Service: MSG_GET_ROUTING_INFO = 1484
Rims_Service: MSG_IS41_SMSREQ_ATTEMPT = 113
Rims_Service: MSG_IS41_SMSREQ_PERM_ERR = 5
Mmx_Service: MSG_ROUTING_FDA = 1344
Rims_Service: MSG_GET_ROUTING_INFO_SUCCESS = 1479
Mmx_Service: MSG_ROUTING_LOCATE = 74
Mmx_Service: MSG_ROUTING_FDA_SUCCESS_SUBMIT = 21
Mmx_Service: MSG_ROUTING_Default = 43
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Mmx_Service:
- MSG_ROUTING_Default_SUCCESS = 35
- MSG_ROUTING_SUBMIT = 40701
- MSG_PATH_SUBMIT_ATTEMPT = 40693
- MSG_PATH_LOCATE_ATTEMPT = 63
- MSG_PATH_DELIVER_TIMEOUT = 841
- MSG_PATH_DELIVER_TEMP_ERR = 931
- MSG_PATH_DELIVER_RT1_TIME = 103275
- MSG_PATH_DELIVER_RT2_COUNT = 67
- MSG_PATH_DELIVER_RT2_TIME = 192103
- MSG_PATH_DELIVER_RT3_COUNT = 55
- MSG_PATH_DELIVER_RT3_TIME = 362381
- MSG_PATH_SUBMIT_PERM_ERR = 1
- MSG_PATH_SUBMIT_ATTEMPT_TIMEOUT = 26

Acs_Service:
- CALLS_AT = 121

Rims_Service:
- MSG_GET_ROUTING_INFO_FAIL = 5

Mmx_Service:
- MSG_ROUTING_FDA_SUCCESS_DELIVER = 484
- CALLS_DISCONNECTED = 479

Rims_Service:
- MSG_SET_ROUTING_INFO = 23

Mmx_Service:
- MSG_SUBMIT: EMI_ASP1 = 23
- MSG_SUBMIT: INTERNAL_SME_Wrapper = 2
- MSG_SUBMIT: MAP_SME_Conn1 = 16
- EMI_ASP1 = 23

Mmx_Service:
- MSG_SUBMIT: SMPP_ASP1 = 44
- SMPP_ASP1 = 42

Mmx_Service:
- MSG_SUBMIT: SMPP_SMSC1 = 41

Mmx_Service:
- MSG_NOTIFY: SMPP_SMSC1 = 41

Mmx_Service:
- MSG_NOTIFY: SMPP_ASP1 = 42

Mmx_Service:
- MSG_NOTIFY: INTERNAL_SME_Wrapper = 2

Mmx_Service:
- MSG_NOTIFY: MAP_SME_Conn1 = 13

Mmx_Service:
- MSG_NOTIFY: MAP_SME_Conn1 = 5163

Mmx_Service:
- MSG_NOTIFY: INTERNAL_SME_Wrapper = 2

Mmx_Service:
- MSG_NOTIFY: SMPP_ASP1 = 42

Mmx_Service:
- MSG_NOTIFY: SMPP_SMSC1 = 42

Mmx_Service:
- MSG_NOTIFY: SMPP_SMSC1 = 41

Mmx_Service:
- MSG_NOTIFY: SMPP_ASP1 = 41
Mmx_Service:MSG_PATH_DELIVER_RT1_COUNT: SMPP_ASP1 = 41
Mmx_Service:MSG_PATH_DELIVER_RT1_TIME: SMPP_ASP1 = 7329
Mmx_Service:MSG_NOTIFY_SUCCESS: SMPP_SMSC1 = 41
Mmx_Service:MSG_PATH_LOCATE_ATTEMPT: CDMA_Foreign_SMSC = 9
Mmx_Service:MSG_PATH_LOCATE_TEMP_ERR: CDMA_SME_Conn1 = 2
Mmx_Service:MSG_ROUTEINFO_FAIL_ROUTING: CDMA_Foreign_SMSC = 2
Mmx_Service:MSG_ROUTEINFO_SUCCESS: CDMA_Foreign_SMSC = 7
Mmx_Service:MSG_PATH_SUBMIT_ATTEMPT: EMI_SMSC1 = 25
Mmx_Service:MSG_NOTIFY_SUCCESS: EMI_SMSC1 = 23
Mmx_Service:MSG_SUBMIT: MAP_SME_Conn1 = 23
Mmx_Service:MSG_PATH_SUBMIT_ATTEMPT: MAP_MC1 = 6
Mmx_Service:MSG_PATH_SUBMIT_SUCCESS: CDMA_SME_Conn1 = 9
Mmx_Service:MSG_SUBMIT: CDMA_SME_Conn1 = 15
Mmx_Service:MSG_PATH_SUBMIT_ATTEMPT: CDMA_MC1 = 10
Mmx_Service:MSG_SUBMIT_SUCCESS: CDMA_SME_Conn1 = 11
Mmx_Service:MSG_PATH_SUBMIT_TIMEOUT: CDMA_MC1 = 3
Mmx_Service:MSG_PATH_SUBMIT_TEMP_ERR: CDMA_MC1 = 4
Mmx_Service:MSG_PATH_SUBMIT_FAIL_REJECT: EMI_SMSC1 = 2
Mmx_Service:MSG_SUBMIT_FAIL_TIMEOUT: MAP_SME_Conn1 = 2
Mmx_Service:MSG_ROUTEINFO: MAP_Foreign_SMSC = 5
Mmx_Service:MSG_ROUTEINFO_FAIL_ROUTING: MAP_Foreign_SMSC = 2
Mmx_Service:MSG_ROUTEINFO_SUCCESS: MAP_Foreign_SMSC = 5
Mmx_Service:MSG_DELIVER: MAP_Foreign_SMSC = 5
Mmx_Service:MSG_DELIVER_SUCCESS: MAP_Foreign_SMSC = 5
Mmx_Service:MSG_PATH_DELIVER_ATTEMPT: CDMA_SME_Conn1 = 10
Mmx_Service:MSG_PATH_DELIVER_RT1_COUNT: CDMA_SME_Conn1 = 6
Mmx_Service:MSG_PATH_DELIVER_RT1_TIME: CDMA_SME_Conn1 = 5468
Mmx_Service:MSG_PATH_DELIVER_RT2_COUNT: MAP_SME_Conn1 = 3
Mmx_Service:MSG_PATH_DELIVER_RT2_TIME: MAP_SME_Conn1 = 4170
Mmx_Service:MSG_PATH_DELIVER_TIMEOUT: CDMA_SME_Conn1 = 4
Mmx_Service:MSG_PATH_DELIVER_FAIL_ROUTING: CDMA_Foreign_SMSC = 2
Mmx_Service:MSG_DELIVER_SUCCESS: CDMA_Foreign_SMSC = 2

### Tracing

#### Introduction

The Messaging Manager tracing feature, when turned on, captures all the major decision points in an MM transaction. A trace identifier is generated by the originating adapter transaction and stored in the parent context at the start of a new call. When the terminating transaction is created it fetches the stored trace identifier from the parent context.

Once tracing has been turned on for an SMS transaction, it is on for the duration of that transaction and will not be turned off.

#### Trace points

Here are guidelines as to the bare minimum of trace points in an Messaging Manager adapter transaction:

**Input**

1. Message received from network
   - With which addresses?
2. Message decoding information
   - Do we allow alternate delivery?
Chapter 6

1. Which protocol version is this?
2. What was the message text (if showPrivate)?
3. Message passed to MM
   Result from ParentContext::handleSMSubmit?
4. Response received from MM
5. Response sent to network

Output

1. SMSubmit received from MM
   Is the delivery type SME or MC?
   Do we need to consult a third party (for example, HLR) for any reason?
   What are the addresses involved?
2. Outgoing encoding information
   Which protocol version are we using?
3. Message sent to network
4. Response received from network
5. Response sent to network

Configuring SMSs to trace

The prefixes of SMSs that are to be traced must be configured in the tracing section of the eserv.config file.

Any number entered into the origAddress or destAddress lists in this section will be matched against the CLI or DN. If any match is found, then this specific Messaging Manager transaction will be traced through the system.

Setting the prefixes to be traced too broadly, (for example, to trace all prefixes) could have some impact on the system performance, depending on the free IO bandwidth and the speed of the disks where the log file is being written. We do not suggest tracing every SMS going through the system; this could impact performance.

Tracing output is cached, and the cache written to file periodically. The file is closed and reopened when a specified number of tracepoints have been traced, this flushes anything in the cache. The tracing output is appended to the file specified each time the cache is flushed, either because it is full, or the outputFileCycle period is reached. The tracing output file may become large over time, so it is recommended that it be cleaned out regularly, using the smslogcleaner.

Tracing output

Here is an example tracing output.

2006/09/01 04:17:01.902 ID# 1010: i.MAP: Started originating transaction for adapter MAP1
2006/09/01 04:17:01.902 ID# 1010: i.MAP: Got TCAP BEGIN - OA=00001310:9, DA=0000139:8
2006/09/01 04:17:01.904 ID# 1010: o.MAP: incomingOriginatingNumberRules unmatched:
2006/09/01 04:17:01.904 ID# 1010: (4)'000004'
2006/09/01 04:17:01.905 ID# 1010: i.MAP: DataCodingScheme = '0'
2006/09/01 04:17:01.906 ID# 1010: i.MAP: Received MAP v2 ForwardSM
2006/09/01 04:17:01.907 ID# 1010: i.MAP: Message Type = '0'
2006/09/01 04:17:01.908 ID# 1010: i.MAP: Text = 'Test Message'
2006/09/01 04:17:01.908 ID# 1010: i.MAP: Priority = '0'
2006/09/01 04:17:01.908 ID# 1010: i.MAP: Timezone = ''
2006/09/01 04:17:01.908 ID# 1010: i.MAP: Message class = '0'
2006/09/01 04:17:01.908 ID# 1010: i.MAP: Status Report Requested = '0'
2006/09/01 04:17:01.908 ID# 1010: i.MAP: MEISDN=004001000004, SCA=0040015114406267
2006/09/01 04:17:01.908 ID# 1010: i.MAP: OA=004001000004, DA=004001000004
2006/09/01 04:17:01.908 ID# 1010: i.MAP: Alternate delivery is allowed
2006/09/01 04:17:01.909 ID# 1010: i.MAP: Sending GenericSM to MMX
2006/09/01 04:17:01.909 ID# 1010: MMX: Handling SM for adapter MAP1, Message Type Submit(0)
2006/09/01 04:17:01.909 ID# 1010: MMX: Source adapter protocol was MAP
2006/09/01 04:17:01.914 ID# 1010: MMX: Inbound path 'MAP_SME_MAP1'
Messaging Manager EDRs

EDR collection

The xmsTrigger of Messaging Manager produces EDRs to be used in post processing as required.
Diagram

This diagram shows the components on the SLC that generate and migrate Messaging Manager EDRs.

File name and location

Messaging Manager EDRs are saved to file, in the `eserv.config`:

- With the base filename specified by the `filename` (on page 57) parameter (in the format `Base_file_nameDate_and_time.cdr`)
- In the location specified by the `destdir` (on page 57) parameter (by default `"/IN/service_packages/XMS/cdr/closed/"`)

List of tags

For a full list of tags and description of Messaging Manager EDRs, refer to *NCC Event Detail Record Reference Guide.*

Delivery Receipts

Introduction

When an SMS is sent, a delivery receipt may be requested. A delivery receipt may be requested for a number of reasons:

- The sender may request a delivery receipt.
- MM may request a delivery receipt. This may be used for billing on delivery of a SMS to the handset, rather than just to the SMSC.

A delivery receipt is requested from the SMSC by setting the registered delivery flag. After delivering the SMS to the destination, the SMSC sends a delivery receipt back to the sender. This indicates if the SMS was successfully sent or not. The delivery receipt contains an ID (or delivery receipt ID) that links it to the original SMS sent.
Delivery Receipt rules

Here are the basic delivery receipt rules for all adapters.

- **Delivery Receipts for FDA to an SME** -
  Messaging Manager will produce delivery receipts for direct delivery where the originating party has requested a delivery receipt. This applies for successful FDAs. Only one attempt will be made to send these internally produced delivery receipts. They will be sent direct to the sender over the originating Protocol.

- **Delivery Receipts Received from a Message Centre** -
  Requested Delivery receipts can be sent to Messaging Manager over the IP adapters. The original transaction must have had a delivery path where either inbound or outbound processing was over the IP adapter.

- **Delivery Receipts are timestamped in local time.**
  These delivery receipts will be subject to the normal routing rules of the relevant adapter. It is important to note that a delivery receipt can only be sent over a route that is going to an SME (FDA).

Each delivery receipt is prefixed with the value of the deliveryReceiptId parameter.

Exceptions are:

- The TDMA instance of the IS41 adapter as this will not accept delivery receipts.
- MAP v1 of the MAP protocol will not support receiving delivery receipts.

**Notes:**

1. **ASP - MM - SS7 SMSC** is only going to work if the HLR is configured to map the ASP's address to Messaging Manager.
2. **Handset - MM - SS7 SMSC** - Similarly, the DR is only going to go via MM (rather than straight to the handset) if the network is set up to use Messaging Manager Navigator to direct MT traffic to Messaging Manager.
3. DRs may also be produced due to the alwaysProduceNonDeliveryReceipt adapter setting.
4. Some protocols (for example, SMPP) have separate flags for requesting delivery and non-delivery receipts.
5. The Translation Type can be passed in delivery receipts sent by the MAP protocol. This requires the TT to be set in the inbound adapter's outbound TT field.
Chapter 7
Tools and Utilities

Overview

Introduction
This chapter explains the tools and utilities that are installed by the Messaging Manager application and how to configure them.

In this chapter
This chapter contains the following topics.

PME Configuration 167
Adding and Removing Replication Nodes 168

PME Configuration

Introduction
The mmxPMEConfig.sh shell script is provided to allow you to configure the per-product type profile tags that are used by MM for configuring terminating services such as PME and email/IM <-> SMS.

PME configuration script
Run the command ./mmxPMEConfig.sh from /IN/service_packages/XMS/bin as acs_oper, for each of the tags listed below. This will populate the ACS global profile with the tag and value.

Syntax
The syntax is:
./mmxPMEConfig.sh tag value
where
• tag is the name of the tag
• value is the value for the tag

Example:
To populate the global profile tag 'MM Enhanced SMS to Email Shortcode' with the value 71, which is required for Enhanced SMS to Email processing:
./mmxPMEConfig.sh ENHANCED_SMS_TO_EMAIL 71
or
./mmxPMEConfig.sh ENHANCED_SMS_EMAIL 71
or
./mmxPMEConfig.sh enhanced_sms_email" 71
Tags

This table describes each tag.

<table>
<thead>
<tr>
<th>Tag</th>
<th>Suggested Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BARRING_RESPONSE</td>
<td>BAR_RESPONSE</td>
</tr>
<tr>
<td>BARRING_NOTIFY</td>
<td>BAR_NOTIFY</td>
</tr>
<tr>
<td>WAIT_FOR_HUNTING_RESULT</td>
<td>WAIT_FOR_HUNTING</td>
</tr>
<tr>
<td>UNIQUE_AUTOREPLY_INTERVAL</td>
<td>AUTOREPLY_INTERVAL</td>
</tr>
<tr>
<td>DEFAULT_DOMAIN</td>
<td>domain</td>
</tr>
<tr>
<td>TEMP_ACCESS_NUMBER_RANGE_START</td>
<td>TAN_START</td>
</tr>
<tr>
<td>TEMP_ACCESS_NUMBER_RANGE_END</td>
<td>TAN_END</td>
</tr>
<tr>
<td>SMS_TO_IM</td>
<td>SMS_IM</td>
</tr>
<tr>
<td>ENHANCED_SMS_TO_IM</td>
<td>ENHANCED_SMS_IM</td>
</tr>
<tr>
<td>SMS_TO_EMAIL</td>
<td>SMS_EMAIL</td>
</tr>
<tr>
<td>ENHANCED_SMS_TO_EMAIL</td>
<td>ENHANCED_SMS_EMAIL</td>
</tr>
</tbody>
</table>

Note: You can specify any of the three forms of each tag, for example, SMS_TO_IM, or SMS_IM, or sms_im".

Adding and Removing Replication Nodes

Introduction

SLCs running MM can be added to or removed from the main Messaging Manager platform configuration. This means you can take a SLC out of service for a while and then add it back in as needed.

install_routing_node.sh

You must run the following script to add a SLC to the Messaging Manager platform:

/IN/service_packages/XMS/bin/install_routing_node.sh

remove_routing_node.sh

You must run the following script to remove a SLC to the Messaging Manager platform:

/IN/service_packages/XMS/bin/remove_routing_node.sh
Chapter 8

About Installation and Removal

Overview

Introduction

This chapter provides details of the installation and removal process for the application.

In this chapter

This chapter contains the following topics.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-installation</td>
<td>169</td>
</tr>
<tr>
<td>Installation and Removal Overview</td>
<td>170</td>
</tr>
<tr>
<td>Checking the Installation</td>
<td>170</td>
</tr>
<tr>
<td>Post-installation Configuration</td>
<td>172</td>
</tr>
</tbody>
</table>

Chapter

Pre-installation

Raw devices

When installing xmsSms on a clustered SMS, you must provide the location of the raw devices. MM can allocate tablespace storage based on raw (without a file system) partitions. This enhances the performance of MM on the SMS.

You must create the raw partitions before installing the database, using tools such as the system’s format command.

The raw devices file (which you will be prompted to complete during the installation) must contain the full paths of the device files for the appropriate partitions.

The partitions must be at least as big as the required datafile sizings listed in the sizing file which will be used by the installation.

You must provide the location of the raw devices created for DEVICE_MMX_DATA1 and DEVICE_MMX_INDEX1 as the install process will use these raw devices and the location to create the data and index tablespaces used to store relevant MMX tables.

The name and location of the file is /IN/service_packages/XMS/db/install/create/SMP/xms_devices.sql.

Example blank file

The blank file that is provided for the person installing MM to fill out looks like this:

```sql
* $Id: xms_devices.sql,v 1.1.6.1 2006/09/05 23:35:03 radamson Exp $
* Copyright (c) 2006, Oracle
* This file contains the raw devices that will be
* used when creating the MMX_DATA and MMX_INDEX
* tablespaces on a cluster installation.
*```
* It must be updated with the correct raw devices 
* before installing the xmsSms package on a cluster. 
*
*/

/* Raw device for the MMX_DATA tablespace */
define DEVICE_MMX_DATA1=

/* Raw device for the MMX_INDEX tablespace */
define DEVICE_MMX_INDEX1=

Example completed file
An example of a file that has been completed by the person installing MM might look something like this:

/*
 * $Id: xms_devices.sql,v 1.1.4.1 2006/06/01 04:24:46 gthomas Exp $
 * Copyright (c) 2006, Oracle
 *
 * This file contains the raw devices that will be
 * used when creating the MMX_DATA and MMX_INDEX
 * tablespaces on a cluster installation.
 *
 * It must be updated with the correct raw devices
 * before installing the xmsSms package on a cluster.
 *
 */

/* Raw device for the MMX_DATA tablespace */
define DEVICE_MMX_DATA1=/dev/md/ora0/rdsk/d92

/* Raw device for the MMX_INDEX tablespace */
define DEVICE_MMX_INDEX1=/dev/md/ora0/rdsk/d93

Installation and Removal Overview

Introduction

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

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

PI packages

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

- SMS:
  - xmsSms
- SLC:
  - xmsScp

Checking the Installation

Checking the xmsSms installation

On successful installation the xmsSms package will have created the following directories:
Chapter 8

About Installation and Removal

On successful installation the xmsSms package will have installed the following:

- /IN/service_packages/XMS/bin/mmxPMEConfig.sh

This shell script allows you to populate the ACS Global Profile with the tags required for PME. For more information on setting PME tags, see PME Configuration (on page 167).

Compiling control plans manually

If the ACS control plan compiler fails to compile control plans for any reason, you can manually compile using the Control Plan Editor. You should check the two control plans that use the Sub Control Plan node to make sure that these nodes are configured correctly. The two control plans are:

- SMS_Submit has a single instance of the Sub Control Plan that invokes SMS_to_IM_via_TAN.
- PME_Delivery has two instances of the Sub Control Plan, which invoke the IM_to_SMS and Email_to_SMS control plans. The notes beside these nodes state which sub control plan they should be attached to.

Follow these steps to compile the control plans.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Open the control plan in the Control Plan Editor.</td>
</tr>
<tr>
<td>2</td>
<td>Open the Sub Control Plan node.</td>
</tr>
<tr>
<td>3</td>
<td>Check that the right control plan is selected.</td>
</tr>
<tr>
<td>4</td>
<td>Save the node.</td>
</tr>
<tr>
<td>5</td>
<td>After this you can save and compile the main control plan.</td>
</tr>
</tbody>
</table>

Checking the xmsScp installation

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

- /IN/service_packages/XMS/bin/xmsTrigger
- /IN/service_packages/XMS/bin/oraPStoreCleaner

The following configuration files will have been installed:

- /IN/service_packages/XMS/etc/eserv.config.example
- /IN/service_packages/XMS/etc/tdp.conf.example

The following shared libraries will have been installed:

- /IN/service_packages/XMS/lib/xmsiIP.so
- /IN/service_packages/XMS/lib/xmsiMap.so
- /IN/service_packages/XMS/lib/xmsiIS41.so
- /IN/service_packages/XMS/lib/xmsSvcLibrary.so
- /IN/service_packages/XMS/lib/libxmsMacroNodes.so
- /IN/service_packages/XMS/lib/libnumberRules.so
- /IN/service_packages/XMS/lib/xmsiWrapper.so
- /IN/service_packages/XMS/lib/liboraPStore.so
Post-installation Configuration

**Run install_routing_node.sh**

For SLCs, you must run the `install_routing_node.sh` script to include the SLC in the Messaging Manager platform configuration.
Appendix A

Configuring IN Call Model Triggers

Overview
This introduces the generic configuration requirements of the NCC IN Call Model.
The NCC IN Call Model is not a separate product, rather it is a set of libraries that is bound into a final usable interface (such as the UCA-ISUP).

Environment variables
This table describes the UNIX shell environment variables to be configured.

<table>
<thead>
<tr>
<th>Environment Variable Name</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDP_DEFINITIONS</td>
<td>Defines the full path name of the Trigger Detection Point definition file.</td>
<td>/IN/service_packages/SLEE/etc/tdp.conf</td>
</tr>
</tbody>
</table>

Trigger detection point (TDP) definition file
The tdp.conf file has two sections:
1. A number of configuration parameters.
2. The trigger tables used to determine when to trigger a call to the SCF.

Example: This text shows an example tdp.conf file:

```
# A comment
KEEP SD
ETC RULES=6 3
3 1 3 request all 123 6
4 2 4 notify all 222 keep
3 1 3 request 2:122 3:222 keep
```

Note: All lines starting with # are treated as comments. If no TDP definition file is defined, a default action is taken where:
- ALL calls are triggered to the SCF with a service key of 1 (one) and a trigger point of 3 (analyzedInformation.)
- None of the global configuration parameters are considered set.

Global configuration parameters
The following configuration parameters may be set once on individual lines in the TDP definition file.

<table>
<thead>
<tr>
<th>Global Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEEP SD</td>
<td>If defined ALL all stop digits (defined by the BCD digit 'F') on the end of called party numbers are kept in the called party number. By default the stop digit is stripped from ALL triggered numbers.</td>
</tr>
<tr>
<td>CAMEL</td>
<td>This parameter is intended for CAMEL testing purposes only and should not be defined under normal usage. If defined, the called party number is also copied into the initialDP's</td>
</tr>
<tr>
<td>Global Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>calledPartyBCDNumber</td>
<td>CAMEL parameter. The NOA of the called party number becomes the BCD number type.</td>
</tr>
<tr>
<td>ADDITIONALNUMS</td>
<td>If defined, the IN Call Model will request all additional numbers available from the underlying protocol and insert them into the InitialDP message sent to the SLC. All these additional numbers are placed into a G8 extension in the InitialDP except any additional calling party number that is placed in the additionalCallingPartyNumber field.</td>
</tr>
<tr>
<td>ETC RULES= c or ETC RULES= c s</td>
<td>If defined then additional EstablishTemporaryConnection (ETC) rules are used. If the integer c is defined, the correlationID in all ETC messages from the SCF are appended on to the end of the assistingSSPIPRoutingAddress that is used, the digits are padded to a width of c digits. If s is also defined, then the scfID of the ETC is also appended on afterwards in the same way. For example: With &quot;ETC RULES=6 4&quot; and an ETC message with: assistingSSPIPRoutingAddress =1111, correlationID =55, scfID =0x42 Then the actual assistingSSPIPRoutingAddress used will be &quot;11110000550042&quot;</td>
</tr>
<tr>
<td>USER LIB = library</td>
<td>If defined the call model will use the user written shared object library specified by the full pathname library when dealing with ApplyCharging operations.</td>
</tr>
<tr>
<td>AC=a,b,c....</td>
<td>Sets the TCAP application context used by the call model to the comma separated list of OIDs supplied.</td>
</tr>
<tr>
<td>ORIG_PC= pc</td>
<td>If defined, all InitialDPs will be sent with an SCCP calling party (origination) address that includes a Point Code defined by the integer pc. Note: This value may be defined in hex using a prefix of 0x.</td>
</tr>
<tr>
<td>ORIG_SSN= ssn</td>
<td>If defined, all initialDPs will be sent with an SCCP calling party (origination) address that includes a subsystem number defined by the integer ssn. See note 1</td>
</tr>
<tr>
<td>ORIG_GT=1, n, addr or ORIG_GT=2, t, addr or ORIG_GT=3, t, p, addr or ORIG_GT=4, t, p, n, addr</td>
<td>If defined, all initialDPs will be sent with an SCCP calling party (origination) address that includes a Global Title defined by the integers n, t, p and the number string addr. The initial value (1 to 4) identifies the Global Title type: • n is the NOA • t is the translation type • p is the numbering plan • addr is the address digits (0 to 9, A to F) See note 1</td>
</tr>
<tr>
<td>DEST_PC= pc</td>
<td>If defined, all initialDPs will be sent with an SCCP called party (destination) address that includes a Point Code defined by the integer pc. Note: This value may be defined in hex using a prefix of 0x.</td>
</tr>
<tr>
<td>DEST_SSN= ssn</td>
<td>If defined, all initialDPs will be sent with an SCCP called party (destination) address that includes a subsystem number defined by See note 2</td>
</tr>
</tbody>
</table>
### Global Parameter

<table>
<thead>
<tr>
<th>Global Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEST_GT=1, n, addr or DEST_GT=2, t, addr or DEST_GT=3, t, p, addr or DEST_GT=4, t, p, n, addr</td>
<td>See note 2</td>
</tr>
</tbody>
</table>
|                    | If defined all initialDPs will be sent with an SCCP called party (destination) address that includes a Global Title defined by the integers n, t, p and the number string addr. The initial value (1 to 4) identifies the Global Title type:  
|                    |   - n is the NOA  
|                    |   - t is the translation type  
|                    |   - p is the numbering plan  
|                    |   - addr is the address digits (0 to 9, A to F) |
| ACH WARN PERIOD=period | Sets the default ApplyCharging warning to occur \( \text{period} \) seconds before the end of the call. |
| ACH RESOURCE=ad | Sets the default ApplyCharging warning announcement/tone to use the resource identified by the address digits \( \text{ad} \).  
| Note: This is only applicable if the underlying controlled call supports the ability to play announcements/tones |
| ACH ANNOUNCE=messageId | Causes the default ApplyCharging warning to use announcement with message identifier \( \text{messageId} \).  
| Note: This is only applicable if the underlying controlled call supports the ability to play announcements/tones |
| ACS TONE=id,dur | Causes the default ApplyCharging warning to use tone with identifier \( \text{id} \) for a duration of \( \text{dur} \) seconds.  
| Note: This is only applicable if the underlying controlled call supports the ability to play announcements/tones |

#### Note 1

If none of these entries is defined all InitialDPs will be sent without an SCCP calling party address.

### Trigger detection point definitions

After any global parameters have been set, the configuration file may take one or more trigger detection point (TDP) definitions. Each line defines a single trigger; its trigger parameter values that get sent and the conditions under which it gets sent.

Each line takes the following form:

\[
\text{tdp} \ \text{svcKey} \ \text{eventType} \ \text{msgType} \ \text{cgPn} \ \text{cdPn} [\text{wild}] [\text{keep}]
\]

The table below defines the meanings and forms of these parameters.

<table>
<thead>
<tr>
<th>Global Parameter Value</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| tdp                    | integer  | This integer value defines the point that the TDP is triggered at.  
|                        |          | Together with \( \text{cgPn}, \ \text{cdPn} \) and \( \text{wild} \) it defines the condition that the trigger will fire on.  
<p>|                        |          | See the TDP event type table for a list of valid values and meanings. |
| svcKey                 | integer  | This parameter defines the serviceKey value that will be... |</p>
<table>
<thead>
<tr>
<th>Global Parameter Value</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>inserted into the initialDP message when this trigger fires.</td>
</tr>
<tr>
<td>eventType</td>
<td>integer</td>
<td>This parameter defines the eventTypeBCSM value that will be inserted into the initialDP message when this trigger fires. See the TDP event type table for a list of valid values and meanings. Generally this will be the same value as $tdp$.</td>
</tr>
<tr>
<td>msgType</td>
<td>request or notify</td>
<td>This parameter defines whether the TDP is sent as a TDP-R (request) or TDP-N(notify). Generally request is used here.</td>
</tr>
</tbody>
</table>
| cgPn                   | $num$ or $nat: num$ or all | This parameter defines the calling party numbers that will trigger the TDP. Together with $tdp$, $cdPn$ and $wild$ it defines the condition that the trigger will fire on.  
  - $num$ defines the prefix of the calling party digits, numbers must begin with these digits for the trigger to fire.  
  - $nat$ is optional and defines additionally a nature of address (NOA) of the calling party that must match for the trigger to fire. If not provided a nature of 2 (unknown) is assumed.  
  If all is defined then ALL calling party numbers will match. |
| cdPn                   | $num$ or $nat: num$ or all | This parameter defines the called party numbers that will trigger the TDP. Together with $tdp$, $cgPn$ and $wild$ it defines the condition that the trigger will fire on.  
  - $num$ defines the prefix of the called party digits, numbers must begin with these digits for the trigger to fire.  
  - $nat$ is optional and defines additionally a nature of address (NOA) of the called party that must match for the trigger to fire. If not provided a nature of 2 (unknown) is assumed.  
  If all is defined then ALL called party numbers will match. |
| wild                   | integer  | This optional parameter defines the number of digits that must be present in the called party numbers before the TDP will trigger. Together with $tdp$, $cgPn$ and $cdPn$ it defines the condition that the trigger will fire on. If set the trigger will not fire until the called party number has this number of digits. Note: The $wild$ parameter can be set to a special value of "stop". If it is set to this value, then the trigger will only fire when a stop digit is received. |
| keep                   | -        | If this optional flag is defined then all numbers triggered by this TDP will keep their stop digits (if they have one). |
## TDP event type values

The following table defines the list of TDPs as defined by the CS-1 standard. It also defines the point at which the trigger will be instantiated by the NCC IN Call Model.

<table>
<thead>
<tr>
<th>TDP</th>
<th>CS-1 Trigger Name</th>
<th>Call Model TDP Creation Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>origAttemptAuthorized</td>
<td>digitsReceived</td>
</tr>
<tr>
<td>2</td>
<td>collectedInfo</td>
<td>digitsReceived</td>
</tr>
<tr>
<td>3</td>
<td>analyzedInformation</td>
<td>digitsReceived</td>
</tr>
<tr>
<td>4</td>
<td>routeSelectFailure</td>
<td>released (cause != 16, 17, 18, 21 or 31)</td>
</tr>
<tr>
<td>5</td>
<td>oCalledPartyBusy</td>
<td>released (Aparty, cause==17)</td>
</tr>
<tr>
<td>6</td>
<td>oNoAnswer</td>
<td>released (Aparty, cause==18, 19 or 21)</td>
</tr>
<tr>
<td>7</td>
<td>oAnswer</td>
<td>answered(Aparty)</td>
</tr>
<tr>
<td>8</td>
<td>oMidCall</td>
<td>not supported</td>
</tr>
<tr>
<td>9</td>
<td>oDisconnect</td>
<td>released (Aparty, cause==16 or 31)</td>
</tr>
<tr>
<td>10</td>
<td>oAbandon</td>
<td>released (Aparty, cause==16 or 31)</td>
</tr>
<tr>
<td>12</td>
<td>termAttemptAuthorized</td>
<td>digitsReceived</td>
</tr>
<tr>
<td>13</td>
<td>tCalledPartyBusy</td>
<td>released (Bparty, cause==17)</td>
</tr>
<tr>
<td>14</td>
<td>tNoAnswer</td>
<td>released (Bparty, cause==18, 19 or 21)</td>
</tr>
<tr>
<td>15</td>
<td>tAnswer</td>
<td>answered(Bparty)</td>
</tr>
<tr>
<td>16</td>
<td>tMidCall</td>
<td>not supported</td>
</tr>
<tr>
<td>17</td>
<td>tDisconnect</td>
<td>released (Bparty, cause==16 or 31)</td>
</tr>
<tr>
<td>18</td>
<td>tAbandon</td>
<td>released (Bparty, cause==16 or 31)</td>
</tr>
<tr>
<td>100</td>
<td>n/a</td>
<td>ringing (Aparty)</td>
</tr>
<tr>
<td>101</td>
<td>n/a</td>
<td>ringing (Bparty)</td>
</tr>
</tbody>
</table>
NCC Glossary of Terms

AAA

AC
Application Context. A parameter in a TCAP message which indicates what protocol is conveyed. May indicate, for example, MAP, CAMEL, or INAP. Also usually specifies the particular version of the conveyed protocol, for example, which CAMEL Phase.

ACS
Advanced Control Services configuration platform.

AMC
The Advanced Message Control component of Messaging Manager. It provides:
- Real time billing interaction
- Customized Service Control
- SMS "service plan" capability
- Enhanced service support

Note: Also known as "SMS Director".

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

API
Application Programming Interface

ASN.1
Abstract Syntax Notation One - a formal notation used for describing data transmitted by telecommunications protocols. ASN.1 is a joint ISO/IEC and ITU-T standard.

ASP
- Application Service Provider, or

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 (or Prepaid Charging) component.
2) Common Channel Signalling. A signalling system used in telephone networks that separates signalling information from user data.

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.

CDR
Call Data Record
Note: The industry standard for CDR is EDR (Event Detail Record). Over time EDR will replace CDR in the Oracle documentation.

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

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

CPE
Control Plan Editor (previously Call Plan Editor) - software used to define the logic and data associated with a call - for example, "if the subscriber calls 0800 nnnnnn from a phone at location xxx then put the call through to bbb bbb bbb".

cron
Unix utility for scheduling tasks.

crontab
File used by cron.

CS1
ETSI INAP Capability Set 1. An ITU standard.

DB
Database

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.

EDR
Event Detail Record

Note: Previously CDR. The industry standard for CDR is EDR (Event Detail Record). Over time EDR will replace CDR in the NCC documentation.

EMI
Exchange Message Interface protocol

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.

GMSC
Gateway MSC. The first MSC which handles a call. For a MOC, this is the caller’s attached MSC. For an MTC, this is the first non-transit MSC in the subscriber’s network that receives the inbound call.

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.
GUI

Graphical User Interface

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

HTML

HyperText Markup Language, a small application of SGML used on the World Wide Web. It defines a very simple class of report-style documents, with section headings, paragraphs, lists, tables, and illustrations, with a few informational and presentational items, and some hypertext and multimedia.

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.

IO

Input/Output

IP

1) Internet Protocol
2) Intelligent Peripheral - This is a node in an Intelligent Network containing a Specialized Resource Function (SRF).
**IP address**
Internet Protocol Address - network address of a card on a computer

**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.

**ISUP**
ISDN User Part - part of the SS7 protocol layer and used in the setting up, management, and release of trunks that carry voice and data between calling and called parties.

**ITU**
International Telecommunication Union

**LMSI**
The subscriber's Local Mobile Subscriber Identity. When the subscriber is roaming, FDA uses both a LMSI and an IMSI.

**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.

**MDN**
Mobile Directory Number

**Messaging Manager**
The Messaging Manager service and the Short Message Service components of Oracle Communications Network Charging and Control product. Component acronym is MM (formerly MMX).

**MIN**
Mobile Identification Number, also known as an MSID.
MM

Messaging Manager. Formerly MMX, see also XMS (on page 188) and Messaging Manager (on page 183).

MM4

Multimedia Messaging Reference Point 4 - defines the link between MMS Relay/Server belonging to different MMSE (Multimedia Messaging Service Environment).

MM7

Multimedia Messaging Reference Point 7 - defines the link between the MMS Relay/Server and MMS VAS (Value Added Services) applications.

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.

MO

Mobile Originated

MOC

Managed Object Class

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

**MTP**  
Message Transfer Part (part of the SS7 protocol stack).

**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.

**NPI**  
Number Plan Indicator

**Oracle**  
Oracle Corporation

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

**Peer**  
Remote machine, which for our purposes is capable of acting as a Diameter agent.

**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).

**SCF**  
Service Control Function - this is the application of service logic to control functional entities in providing Intelligent Network services.

**SCI**  
Send Charging Information. An INAP operation sent from ACS to the SSP to control real time charging by the SSP.
**SCTP**

Stream Control Transmission Protocol. A transport-layer protocol analogous to the TCP or User Datagram Protocol (UDP). SCTP provides some similar services as TCP (reliable, in-sequence transport of messages with congestion control) but adds high availability.

**Session**

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

**SGML**


**SGSN**

Serving GPRS Support Node

**SIM**

Usually referred to as a SIM card, the Subscriber Identity Module is the user subscription to the mobile network. The SIM contains relevant information that enables access onto the subscribed operator’s network.

**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

**SMDPP**

SMSDeliveryPointToPoint SM-TL Message.

**SME**

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

**SMPP**

Short Message Peer-to-Peer protocol

**SMS**

Depending on context, can be:

- Short Message Service
• Service Management System platform
• NCC Service Management System application

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

SMS-MO
Short Message Service Mobile Originated

SMS-MT
Short Message Service Mobile Terminating

SM-TL
Short Message Transport Layer.

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

TDMA
Time Division Multiple Access - a communications technique that uses a common channel for communications among multiple users by allocating each a unique time slot.

TDP
Trigger Detection Point.

TLV
Tag-Length-Value. Optional parameters introduced in the SMPP protocol since version 3.4.

URI
Uniform Resource Identifier.

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

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.

VMP
Virtual Message Point

VMSC
Visited Mobile Switching Centre

VWS
Oracle Voucher and Wallet Server (formerly UBE).

WEMT
Wireless Enhanced Messaging Teleservice

XMS
Three letter code used to designate some components and path locations used by the Oracle Communications Network Charging and Control Messaging Manager (on page 183) service and the Short Message Service. The published code is MM (on page 184) (formerly MMX).
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