Oracle® Communications Network Charging and Control

External Machine Interface (EMI) Protocol Implementation Conformance Statement

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Contents

About This Document

Scope

This document describes the extent to which Messaging Manager (MM) conforms with the EMI - UCP Interface Specification.

Audience

This document is intended to be read by Oracle staff. It has been prepared on the assumption that the reader is familiar with Messaging Manager as well as the short message capabilities of the GSM specification.

Document Conventions

Typographical Conventions

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

Formatting Convention	Type of Information
Special Bold	Items you must select, such as names of tabs. Names of database tables and fields.
Italics	Name of a document, chapter, topic or other publication. Emphasis within text.
Button	The name of a button to click or a key to press. **Example:** To close the window, either click **Close**, or press **Esc**.
Key+Key	Key combinations for which the user must press and hold down one key and then press another. Example: **Ctrl+P** or **Alt+F4**.
`Monospace`	Examples of code or standard output.
`Monospace Bold`	Text that you must enter.
variable	Used to indicate variables or text that should be replaced with an actual value.
menu option > menu option >	Used to indicate the cascading menu option to be selected. Example: **Operator Functions > Report Functions**
hypertext link	Used to indicate a hypertext link.

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

Chapter 1

Messaging Manager and CMG Document Versions

Overview

Introduction

This chapter defines the version of Messaging Manager and the CMG document against which it is compared.

In this chapter

This chapter contains the following topics.

Messaging Manager

Messaging Manager implementation

This document states compliance for Messaging Managerversion 3.1.1. The environment for this version of Messaging Manager is defined below.

- Target platform
  - Platform - SPARC Solaris
  - Operating system - SunOS 5.9
  - Database - Oracle 9.2.05
- Build environment
  - Compiler - GNU GCC 3.2.3
  - Binutils - GNU binutils 2.14
  - bison - 1.35
  - flex - 2.5.4
- Oracle packages
  - Full installation of SLEE - 3.2.0 and HssScIF - 3.4.27
  - The following SCP packages: smsScp - 3.0.0, acsScp - 2.4.0, beApiScp - 2.2.0.5, and acsCbScp 2.2.0.6
  - The following SMP packages: smsSms - 3.0.0, acsSms - 2.4.0, beApiSms - 2.2.0.5, and acsCbSms - 2.2.0.6

CMG

CMG document

This statement of compliance refers to the CMG Wireless Data Solutions document entitled:

Short Message Service Centre 4.5
EMI - UCP Interface
Specification
Version 4.22.

For the purpose of this document, *Short Message Service Centre 4.5 EMI - UCP Interface Specification Version 4.22* will be referred to as *The Specification*.

Chapter 2

Compliance Statement

Overview

Introduction

This chapter identifies which EMI services are supported by Messaging Manager.

In this chapter

This chapter contains the following topics.

CMG References

Convention

As a cross reference, the clause number of *The Specification* is included in brackets at the end of each compliance statement title.

Specification Sections 2 and 3

Introduction

Statements of compliance with sections 2 and 3 of *The Specification* follow.

Structure of EMI Messages (2)

Messaging Manager complies.

Messaging Manager stores message text internally as UCS-2 (Unicode) or the GSM default alphabet. The Euro symbol (€) is converted to an 'E' if the message is altered.

stx and etx

Messaging Manager complies.

header

Messaging Manager complies.

data

See compliance statements for individual operation types.

checksum

Messaging Manager complies.

EMI Commands (3)

Statements of compliance for EMI commands are covered under the following three headings.

- SMT initiated commands
- SMSC initiated commands
- Flow control

SMT initiated commands (3.1)

Messaging Manager complies.

SMSC initiated commands (3.2)

Messaging Manager complies.

Flow control (3.3)

Messaging Manager complies.

Messaging Manager supports windowing with a configurable 'windowsize' parameter that defaults to 100. Messages outside the window are correctly ignored.

Specification Section 4

Introduction

Statements of compliance for clauses of Section 4 of *The Specification* follow.

Address syntax (4.1)

Messaging Manager complies.

Messaging Manager has configurable numberRules to allow correct conversion and normalisation of addresses.

Call input operation -01 (4.2)

Messaging Manager complies.

- Messaging Manager does not construct a call input operation unless it is creating an altered copy of one already passed in.
- Messaging Manager can accept -01 messages from both the SMT and SMSC.
- EMI messages are converted to and from GenericSM.
- The GenericSM message type is set to *Submit* if the message comes from an SMT, or *Deliver* if the message comes from an SMSC.

Individual message parameters and their internal storage locations are set out in the following table.

EMI parameter	GenericSM location	Comments
AdC	destinationAddress	TON and NPI come from numberRules.
OAdC	sourceAddress	TON and NPI come from numberRules. **Note:** Although the OAdC parameter is optional in the EMI specification, it is mandatory for Messaging Manager. Messaging Manager cannot successfully handle incoming messages unless the OAdC parameter is present.
AC		• Ignored by Messaging Manager. • Set to "" on generated outgoing messages.
MT		Not stored in GenericSM.
NMsg	userData	Converted to GSM format.
AMsg	userData	Converted to GSM format.

Call input operation (positive result) (4.2.1)

Messaging Manager complies.

The message is converted to a GenericSMResponse with the parameter conversions listed in the following table.

EMI parameter	GenericSMResult location	Comments
ACK	resultCode	• If commandStatus = 0, ACK = 'A'. • If commandStatus ≠ 0, ACK = 'N'.
SM	deliverReceiptId	Stored text is AdC:SCTS

Call input operation (negative result) (4.2.2)

Messaging Manager does not comply.

Message properties are stored in the same places as those of the positive result in *Call input operation (positive result)*. However the EC is obtained from the action and error codes configuration mapping of the CS1ReleaseCause of the genericSMResult to EMI error code.

Multiple address call input operation -02 (4.3)

Messaging Manager complies.

Note: The OAdC parameter is optional in the EMI specification but mandatory for Messaging Manager. Messaging Manager cannot successfully handle incoming messages unless the OAdC parameter is present.

- Each terminating address is converted directly to a GenericSM.
- The GenericSM message type is set to *Submit*.
- No check is made on the limit of 20 destinations.
- See *Call input operation -01 (4.2)* (on page 4) for the stored location of each parameter.
- Legitimisation codes are ignored by Messaging Manager.

Multiple address call input operation (positive result) (4.3.1)

Messaging Manager does not comply.

The Specification does not define what a -02 result means.

It could mean 'the SMSC has accepted your request', or 'all destinations terminated successfully', or something else. If the second interpretation is assumed, then a NACK implies that at least one destination address failed. However *The Specification* does not specify which one and a sensible retry cannot be attempted.

It seems reasonable to suppose that the second interpretation is incorrect. The real arbiter in these matters appears to be established use. That is, EMI is what a CMG SMSC does.

If Messaging Manager is forced to create a response, it is always positive. This means 'we have accepted your request' and the optional field SM is always set to "". Messaging Manager may be forced to create a response when all destination addresses terminate via another plugin. Otherwise the SMSC response is proxied verbatum.

Multiple address call input operation (negative result) (4.3.2)

Messaging Manager does not comply.

The EC field is generated in the same way as for a single address result and so suffers from the same problem. See *Call input operation (negative result) (4.2.2)* (on page 5).

The SM field is set to "".

Call input with supplementary services operation -03 (4.4)

Messaging Manager complies.

Messaging Manager does not construct call input with supplementary services operations unless it is creating an altered copy of one already passed in.

EMI messages are directly converted to and from GenericSM.

The GenericSM message type is set to *Submit*.

Individual message parameters and their internal storage locations are set out in the following table.

EMI parameter	GenericSM location	Comments
RAd	destinationAddress	• TON and NPI come from numberRules. • The legitimisation code is ignored.
OAdC	sourceAddress	TON and NPI come from numberRules. **Note:** The OAdC parameter is optional in *The Specification* but mandatory for Messaging Manager. Messaging Manager cannot successfully handle incoming messages without the OAdC parameter.
AC		• Ignored by Messaging Manager. • Set to "" in generated outgoing messages.
NPL		Set to 0.
GA:s		Ignored by Messaging Manager.
RP		Set to empty.
PR		Set to empty.

EMI parameter	GenericSM location	Comments
LPR		Set to empty.
UR		Set to empty.
LUR		Set to empty.
RC		Set to empty.
LRC		Set to empty.
DD	Not stored in GenericSM	
DDT	Not stored in GenericSM	If DD =1, DDT is stored in smpp::MsgSubmitSM and allowAlternateDelivery is set to false.
MT		Not stored in SMPP or SMSubmit.
NMsg	userData	Converted to GSM 7-bit format.
AMsg	userData	Converted to GSM 7-bit format.

- The DD and DDT parameters are only preserved because allowAlternateDelivery is set to false. The original message is therefore available to the outgoing plugin.
- On the incoming message, no check is made to verify that fields that must be empty are in fact empty.

Call input with supplementary services operation (positive result) (4.4.1)

Messaging Manager complies.

The message is converted to a GenericSMResult with the parameter conversions listed in the following table.

EMI parameter	GenericSMResult location	Comments
ACK	resultCode	If commandStatus = 0, ACK = 'A'. If commandStatus ≠ 0, ACK = 'N'.
SM	deliverReceiptId	Stored text is AdC:SCTS

If the original message is not available in the outgoing plugin, SM is set to "".

Call input with supplementary services operation (negative result) (4.4.2)

Messaging Manager does not comply.

Message properties are stored in the same places as those of the positive result above. However the EC is obtained from the action and error codes configuration mapping of the CS1ReleaseCause of the genericSMResult to EMI error code.

MS message transfer operation -30 (4.5)

Messaging Manager complies.

Messaging Manager does not construct an MS message transfer unless it is creating an altered copy of one already passed in.

EMI messages are directly converted to and from GenericSM.

The GenericSM message type is set to *Submit*.

Individual message parameters and their internal storage locations are set out in the following table.

EMI parameter	GenericSM location	Comments
AdC	destinationAddress	TON and NPI come from numberRules.
OAdC	sourceAddress	TON and NPI come from numberRules. **Note:** The OAdC parameter is optional in *The Specification* but mandatory for Messaging Manager. Messaging Manager cannot successfully handle incoming messages without the OAdC parameter.
AC		Ignored by Messaging Manager. Set to "" on generated outgoing messages.
NRq	Not stored.	If true and NAd and NPID are not empty, allowAlternateDelivery is set to false. This makes NAd and NPID accessible to the outgoing plugin.
NAd		
NPID		
DD	Not stored in genericSM.	If DD = 1, FDA and allowAlternateDelivery are set to false. The SMSC receiving this message is expected to perform the delayed delivery.
DDT	Not stored in genericSM.	
VP	validityperiod	
AMsg	userData	Converted to GSM 7-bit format.

MS message transfer operation (positive result) (4.5.1)

Messaging Manager complies.

The message is converted to GenericSMResult with the parameter conversions set out in the following table.

EMI parameter	GenericSMResult location	Comments
ACK	resultCode	• If commandStatus = 0, ACK = 'A' . • If commandStatus ≠ 0, ACK = 'N' .
MVP		Ignored by Messaging Manager.
SM	deliverReceiptId	Stored text is AdC:SCTS.

If the original message is not available in the outgoing plugin, SM is set to "".

MS message transfer operation (negative result) (4.5.2)

Messaging Manager complies.

- If it is available on the outgoing plugin, the original message is correctly recreated. If the message is not available it is set to '4'.
- Message properties are stored in the same places as those of *MS message transfer operation (positive result)*.
- The EC is obtained from the action and error codes configuration mapping of the CS1ReleaseCause of the genericSMResult of EMI error code.

MT alert operation -31 (4.6)

Messaging Manager does not comply.

- To determine the number of outstanding calls, the alert message is not passed on to the SC. Instead the message is immediately responded to with 0 outstanding messages.
- Outgoing alert messages are used as link heartbeats, with the AdC and PID coming from the plugin configuration options alertAddress and alertPID. The default alertPID is 639.

MT alert operation (positive result) (4.6.1)

Messaging Manager does not comply.

The returned SM is always "0000".

Receipt of these messages by Messaging Manager is only used to reset the heartbeat timer.

MT alert operation (negative result) (4.6.2)

Messaging Manager does not comply.

MT alert operation (negative result) messages are never sent by Messaging Manager. Receipt of one simply resets the link heartbeat timer.

Specification Section 5

Introduction

Statements of compliance for clauses of Section 5 of *The Specification* follow.

50-Series of EMI Messages (5)

Messaging Manager complies.

- Not all 50-series messages are actively processed by the high level Messaging Manager trigger; some are simply forwarded directly, unchanged. But all messages are handled.
- Directly forwarded messages terminate via the inbound path's relay.

Details of specific messages are covered in the following Section 5 conformance statements.

Abstract Data Types (5.1)

Messaging Manager complies.

- When it stores 50-series messages, Messaging Manager uses the concept of abstract data types.
- Result messages also use the concept of abstract data types.

The use of each parameter is covered in the following compliance statements for Section 5.

How to encode the alphanumeric OAdC (5.1.1.1)

Messaging Manager complies.

TC_PROTOS only supports BcdDigits. If TC_PROTOS contains characters other than digits, stars and hashes and it is sent to ACS, the OAdC field will be corrupted.

Description Of XSer Extra Services (5.1.2)

Messaging Manager complies.

The restriction that each service can only appear once in any message is enforced.

XSer Type of service 00, Not Used (5.1.2.1)

Messaging Manager complies.

XSer Type of service 01, GSM UDH information (5.1.2.2)

Messaging Manager complies.

XSer Type of service 01 is converted to octets and stored in the userDataHeader variable of GenericSM.

XSer Type of service 02, GSM DCS information (5.1.2.3)

Messaging Manager complies.

XSer Type of service 02 is used to construct the alphabet and message waiting variables of GenericSM.

XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4)

Messaging Manager does not comply.

- All but the urgency indicator are ignored by Messaging Manager.
- The urgency is investigated by Messaging Manager for both the GSM and TDMA networks.
- The urgency is gathered and set for type -53 messages when it should only be present for type -51 and type -52.
- XSer Types of Service 03-0B is stored in the priority field of a GenericSM.

The mapping from EMI priority to a GenericSM is described in the following table.

EMI	GenericSM	EMI
Bulk	Normal	Normal
Normal	Interactive	Urgent
Urgent	Urgent	urgent
Very urgent	Emergency	Very urgent

XSer Type of service 0C: Billing Identifier (5.1.2.5)

Messaging Manager does not comply.

- This extension is examined for both type -51 and -52 messages. It should only be present in types -51 and -54.
- Outgoing type -51 messages will not have this field set. Because type -54 messages are unaltered, they will have this field set.

XSer Type of service 0D: Single Shot indicator (5.1.2.6)

Messaging Manager complies.

XSer Type of service 0D is stored in the GenericSM::singleShot parameter.

Standard string (5.2)

Messaging Manager complies.

Submit Short Message operation -51 (5.3)

- EMI messages are directly converted to and from GenericSM.
- The GenericSM message type is set to *Submit*.

A comliance statement for each of the members of Submit Short Message operation -51 is listed in the following table.

EMI parameter	GenericSM location	Statement of compliance
AdC	destinationAddress	Messaging Manager complies. TON and NPI come from numberRules.
OAdC	sourceAddress	Messaging Manager complies. Both alphanumeric and number formats are considered. • TON and NPI come from numberRules. • See *How to encode the alphanumeric OAdC (5.1.1.1)* (on page 9) for alphanumeric addresses.
AC		Messaging Manager does not comply. • Ignored by Messaging Manager. • Set to "" on generated outgoing messages.
NRq	Not stored.	Messaging Manager does not comply. If NRq is true, and NAdC and NPID are not empty, allowAlternateDelivery is set to false. This allows NAdC and NPID to be accessible to the outgoing plugin.
NAdC		Messaging Manager does not comply.
NT	statusReportRequested	Messaging Manager complies. If BN is included, allowAlternateDelivery is set to false.
NPID		Messaging Manager does not comply. If it is present, allowAlternateDelivery is set to false.
LRq		Messaging Manager does not comply. If it is present, allowAlternateDelivery is set to 1 (false).
LRAd		Messaging Manager does not comply.
LPID		Messaging Manager does not comply.
DD	Not stored in GenericSM.	Messaging Manager does not comply. If DD = 1, FDA and allowAlternativeDelivery are set to false. The SMSC receiving this message is expected to perform the delayed delivery.
DDT	Not stored in GenericSM.	Messaging Manager does not comply.
VP	validityPeriod	Messaging Manager complies.
RPID	protocolIdentifier	Messaging Manager complies.
MT		Messaging Manager complies. Used to determine the decoding of shortMessage.

EMI parameter	GenericSM location	Statement of compliance
		Reconstructed for outgoing messages.
NMsg	userData	Messaging Manager complies. Converted to GSM 7-bit format.
AMsg	userData	Messaging Manager complies. Converted to GSM 7-bit format.
NB		Messaging Manager complies. • Used to determine the decoding of shortMessage. • Reconstructed for outgoing messages.
TMsg	userData	Messaging ManagerMX complies. Stored as binary of UCS-2 format.
MMS		Messaging Manager does not comply. Messaging Manager ignores MMS.
PR	priorityIndicator	Messaging Manager complies. The Xser priority is used in preference to this parameter. For outgoing messages, PR is set to true if priorityIndicator > Normal.
DCs		Messaging Manager complies. Set a blank to outgoing messages.
MCLs	messageClass	Messaging Manager complies. Not set for constructed messages. The xSer DCS is used in preference.
RPI	provideReplypath	Messaging Manager complies. If non-zero, set allowAlternateDelivery to false.
OTOA		Messaging Manager does not comply. If non-zero, set allowAlternateDelivery to false.
XSer		See: • *Description Of XSer Extra Services (5.1.2)* (on page 10) • *XSer Type of service 00, Not Used (5.1.2.1)* (on page 10) • *XSer Type of service 01, GSM UDH information (5.1.2.2)* (on page 10) • *XSer Type of service 02, GSM DCS information (5.1.2.3)* (on page 10) • *XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4)* (on page 10) • *XSer Type of service 0C: Billing Identifier (5.1.2.5)* (on page 10) • *XSer Type of service 0D: Single Shot indicator (5.1.2.6)* (on page 10)

No check is made on the MT value if RPID is 0127.

Submit Short Message operation (positive result) (5.3.1)

Messaging Manager complies.

Messaging Manager ignores the MVP paramater.

Parameters in the positive result data field are set out in the following table.

EMI parameter	genericSM location	Comments
ACK	resultCode	If commandStatus = 0, ACK = 'A'. If commandStatus ≠ 0, ACK = 'N'.
MVP		
SM	deliverReceiptId	• Stored text is AdC:SCTS. • Set by Messaging Manager. • SCTS is at most 30 seconds ahead of wall time.

Submit Short Message operation (negative result) (5.3.2)

Messaging Manager complies.

- Message properties are stored in the same place as those of *Submit Short Message operation (positive result)*.
- For Messaging Manager version 2.2, in the intermediate form of the EC, EC is represented by the smpp::commandStatus. There is no addition of 0x400 as in type -01 messages.
- For Messaging Manager version 3.1.1, the EC is obtained from the action and error codes configuration mapping of the CS1ReleaseCause of the genericSMResult to EMI error code.

Delivery Short Message operation -52 (5.4)

Messaging Manager complies.

Note: Messaging Manager accepts type -52 message with a billingIdentifier. This functionality does not comply with *The Specification*. However in practice, if all other network users are compliant, Messaging Manager will never receive a type -52 message with a billingIdentifier and *The Specification* will not be violated.

- EMI messages are directly converted to and from GenericSM.
- The GenericSM message type is set to *Deliver*.

EMI parameter	GenericSM location	Comments
AdC	destinationAddress	TON and NPI come from numberRules.
OAdC	sourceAddress	• Both alphanumeric and number formats are considered. • TON and NPI come from numberRules. • See *How to encode the alphanumeric OAdC (5.1.1.1)* (on page 9) for alphanumeric addresses.
RPID	protocolIdentifier	
SCTS		Outgoing messages have the current SCP time (in GenericSM's user time zone) in the SCTS field.
MT		• Used to determine the decoding of shortMessage. • Reconstructed for outgoing messages.
NMsg	userData	Converted to GSM 7-bit format.
AMsg	userData	Converted to GSM 7-bit format.
NB		• Used to determine the decoding of shortMessage.

EMI parameter	GenericSM location	Comments
		• Reconstructed for outgoing messages.
TMsg	userData	Stored as binary of UCS-2 format.
MNS		Ignored by Messaging Manager, so not compliant.
DCs		Set to blank on outgoing messages.
MCLs	messageClass	Not set for constructed messages. The xSer DCS is used in preference.
RPI	provideReplyPath	If non-zero, set allowAlternateDelivery to false.
HPLMN	Ignored by Messaging Manager	Read only if provideVMSCInHPLMN configuration option is set.
XSer		See: • *Description Of XSer Extra Services (5.1.2)* (on page 10) • *XSer Type of service 00, Not Used (5.1.2.1)* (on page 10) • *XSer Type of service 01, GSM UDH information* (on page 10) • *XSer Type of service 02, GSM DCS information (5.1.2.3)* (on page 10) • *XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4)* (on page 10) • *XSer Type of service 0C: Billing Identifier (5.1.2.5)* (on page 10) • *XSer Type of service 0D: Single Shot indicator (5.1.2.6)* (on page 10)

Delivery Short Message operation (positive result) (5.4.1)

Messaging Manager complies.

The positive result data field is handled the say way as a type -51 response. See *Submit Short Message operation (positive result) (5.3.1)* (on page 12).

Delivery Short Message operation (negative result) (5.4.2)

Messaging Manager complies.

The negative result data field is handled the say way as a type -51 response. See *Submit Short Message operation (negative result) (5.3.2)* (on page 13).

Delivery notification operation -53 (5.5)

Messaging Manager complies.

- EMI messages are directly converted to and from GenericSM.
- The GenericSM message type is set to Notify and message contents set to Delivery receipt.

EMI parameter	SMSubmit location	Comments
Adc	destinationAddress	TON and NPI come from numberRules.
OAdC	sourceAddress	• Both alphanumeric and number formats are considered. • TON and NPI come from numberRules.

EMI parameter	SMSubmit location	Comments
		• See *How to encode the alphanumeric OAdC (5.1.1.1)* (on page 9) for alphanumeric addresses.
SCTS		Outgoing messages contain the submission time stamp of the -51 message to which they refer. The timestamp is derived from the SM field of the -51 response to the ASP.
Dst	DeliverySucceeded	DeliverySucceeded is a Boolean variable. The Dst value is lost for outgoing transactions. Outgoing value is 0 or 2.
Rsn	DeliverySucceeded	DeliverySucceeded is a Boolean variable. The Rsn value is lost for outgoing transactions. Outgoing value is 108.
DSCTS		Outgoing messages have the current SCP time (in the SMSubmit's user time zone) in the DSCTS field.
MT		• Used to determine the decoding of shortMessage. • Reconstructed for outgoing messages.
NMsg	userData	Converted to GSM 7-bit format.
AMsg	userData	Converted to GSM 7-bit format.
HPLMN	Ignored by Messaging Manager	Only read if the provideVMSCInHPLMN configuration option is set.
XSer		See See: • *Description Of XSer Extra Services (5.1.2)* (on page 10) • *XSer Type of service 00, Not Used (5.1.2.1)* (on page 10) • *XSer Type of service 01, GSM UDH information (5.1.2.2)* (on page 10) • *XSer Type of service 02, GSM DCS information (5.1.2.3)* (on page 10) • *XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4)* (on page 10) • *XSer Type of service 0C: Billing Identifier (5.1.2.5)* (on page 10) • *XSer Type of service 0D: Single Shot indicator (5.1.2.6)* (on page 10) **Note:** XSer should not be present for type -53 messages. However Messaging Manager does examine the XSer field and extracts the urgency indicator.

Delivery Notification operation (positive result) (5.5.1)

Messaging Manager complies.

The positive result data field is handled in the say way as a type -51 response. See *Submit Short Message operation (positive result) (5.3.1)* (on page 12).

Delivery Notification operation (negative result) (5.5.2)

Messaging Manager complies.

The negative result data field is handled in the say way as a type -51 response. See *Submit Short Message operation (negative result) (5.3.2)* (on page 13).

Modify Short Message operation - 54 (5.6)

Messaging Manager does not comply.

Messaging Manager does not support these messages. On receiving one, Messaging Manager responds with an error message, EC = 3 ("Permanent: Operation not supported by system"). This is because type -54 operations refer to the delivered message via the time stamp returned in the SM field of the type -51 operation. Early ack requires Messaging Manager to store persistent data in order to proxy this time stamp. Supporting early ack for type -54 operations is too expensive with the current pStore implementation. See also CTS 18625.

Modify Short Message operation (positive result) (5.6.1)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Modify Short Message operation (negative result) (5.6.2)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Inquiry message operation -55 (5.7)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Inquiry message operation (positive result) (5.7.1)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Inquiry message operation (negative result) (5.7.2)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Delete message operation -56 (5.8)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Delete message operation (positive result) (5.8.1)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Delete message operation (negative result) (5.8.2)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Response Inquiry message operation -57 (5.9)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Response inquiry message operation (positive result) (5.9.1)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Response inquiry message operation (negative result) (5.9.2)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Response delete message operation -58 (5.10)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Response delete message operation (positive result) (5.10.1)

Messaging Manager complies.

v does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Response delete message operation (negative result) (5.10.2)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Specification Section 6

Introduction

Statements of compliance for clauses of Section 6 of *The Specification* follow.

60-Series of EMI Messages (6)

Messaging Manager does not comply.

- Only one sub type of the type -60 message is supported.
- Message type -61 is not supported.

Details of specific messages are covered in the following Section 6 conformance statements.

Abstract Data Types (6.1)

Messaging Manager complies.

Messaging Manager uses the concept of abstract data types in storing 60-series messages.

The use of each parameter is covered in the following compliance statements for Section 6.

Standard string (6.2)

Messaging Manager complies.

Session management operation -60 (6.3)

Messaging Manager does not comply.

Only open session commands are processed and then only if the Messaging Manager state is WaitingSessionManagementMessage. All others are responded to with EC = 3 ("Operation not supported on this system").

Individual members of the session management operation are listed in the following table.

EMI parameter	Messaging Manager handling
OAdC	Used as loginName.
OTON	• Ignored by Messaging Manager. • Set to the configuration option loginOTON for outgoing messages.
ONPI	• Ignored by Messaging Manager. • Set to the configuration option loginONPI for outgoing messages.
STYP	Only STYP=1 (open session) is handled.
PWD	Used as loginPassword.
NPWD	• Ignored by Messaging Manager. • Blank for outgoing messages.
VERS	• Ignored by Messaging Manager. • Set to 100 for outgoing messages.
OPID	• Ignored by Messaging Manager. • Set to 39 for outgoing messages.

Session management operation (positive result) (6.3.1)

Messaging Manager complies.

Outgoing messages have a blank system message.

Session management operation (negative result) (6.3.2)

Messaging Manager complies.

- Except for their ACK/NACK status, incoming messages are not parsed.
- Outgoing messages have EC of any one of the following three values:
  0 (success),

3 (Messaging Manager in wrong state), or
7 (all other errors).

Provisioning actions operation -61 (6.4)

Messaging Manager does not comply.

- Messaging Manager responds to all type -61 incoming messages with an error message; EC = 3 (operation not supported).
- These messages are never sent out by Messaging Manager.

Provisioning actions operation (positive result) (6.4.1)

Messaging Manager does not comply.

- Messaging Manager should never receive type -61 messages.
- Receipt of a type -61 message causes a cmmError.
- Messaging Manager never sends a type -61 message.

Provisioning actions operation (negative result) (6.4.2)

Messaging Manager does not comply.

- Messaging Manager should never receive type -61 messages.
- If it does receive a type -61 message:
  - Messaging Manager raises a cmmError,
  - Messaging Manager constructs a response, compliant with *The Specification*, and
  - Messaging Manager responds with an error message, EC = 3.
- Messaging Manager never sends a type -61 message.

Specification Section 7

Introduction

Statements of compliance with clauses of Section 7 of *The Specification* follow.

Error Codes Overview (7)

Messaging Manager complies.

Error codes (7.1)

Messaging Manager complies.

The only errorCodes that Messaging Manager explicitly constructs are 0, 3, 4, 6 and 7. All other errors come from:

- Unaltered messages passed through Messaging Manager.
- The ACS release cause mapping which is configured via the action and error codes configuration option.
- The configured throttledErrorCode; that is, the error code returned whenever a message is throttled by Messaging Manager.
- The configured transientFailureErrorCode; that is, the error code returned whenever a message delivery attempt returns a transient failure.

- The configured permanentFailureErrorCode; that is, the error code returned whenever the message delivery attempt returns a permanent failure.

Glossary of Terms

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.

AS

Application Server. The logical entity serving a SUA routing key. An AS is equivalent to an SS7 end point (for example, HLR, MSC,…). An AS contains, at least, one ASP.

ASP

- Application Service Provider, or
- Application Server Process. An IP based instance of an AS. An ASP implements a SCTP connection between 2 platforms.

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.

Diameter

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

EMI

Exchange Message Interface protocol

FDA

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

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.

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

IN

Intelligent Network

INAP

Intelligent Network Application Part - a protocol offering real time communication between IN elements.

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.

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).

MM

Messaging Manager. Formerly MMX, see also *XMS* (on page 24) and *Messaging Manager* (on page 22).

MS

Mobile Station

MSC

Mobile Switching Centre. Also known as a switch.

MT

Mobile Terminated

NPI

Number Plan Indicator

Peer

Remote machine, which for our purposes is capable of acting as a Diameter agent.

PLMN

Public Land Mobile Network

SCP

Service Control Point. Also known as SLC.

SLC

Service Logic Controller (formerly UAS).

SLEE

Service Logic Execution Environment

SME

Short Message Entity - This is an entity which may send or receive short messages. It may be located in a fixed network, a mobile, or an SMSC.

SMP

Service Management Platform (also referred to as SMS).

SMPP

Short Message Peer-to-Peer protocol

SMS

Depending on context, can be:

- Service Management System hardware platform
- 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.

TCAP

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

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.

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.

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 22) service and the Short Message Service. The published code is *MM* (on page 22) (formerly MMX).

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