Oracle® Communications Network Charging and Control

Intersystem Operations ANSI-41 Protocol Implementation Conformance Statement

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About This Document

Scope

This document states the extent to which Messaging Manager (MM) conforms to the ANSI/TIA/EIA-41-D Standard. Where messages are altered by the TIA/EIA/IS-841 Interim Standard, compliance with extension parameters is also stated.

For the following teleservice layers, the extent to which MM complies is stated:

- TDMA (32513) against Standard ANSI-136.
- CDMA Wireless Messaging Teleservice (4098) against 3rd Generation Partnership Project 2 document C.S0015-B v2.0.
- CDMA Wireless Enhanced Messaging Teleservice (4101) against 3rd Generation Partnership Project 2 document C.S0015-B v2.0.

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 ANSI-41 Standard.

Related Documents

The following Standards are related to this document:

- ANSI Standard entitled:
  Cellular Radiotelecommunications
  Intersystem Operations
  ANSI/TIA/EIA-41-D-1997.
  Note: Throughout this document, this Standard may be referred to by the abbreviated name ANSI-41.
- 3rd Generation Partnership Project 2 document entitled:
  Short Message Service (SMS) for Wideband Spread Spectrum Systems
  3GPP2 C.S0015-B
  Release B, September 2005.
  Note: Throughout this document, this Standard may be referred to by the abbreviated name C.S0015.
- ANSI Standard entitled:
  TDMA Third Generation Wireless -
  Short Message Service -
  Cellular Messaging Teleservice
  ANSI/TIA/EIA-136-710-C-2002.
  Note: Throughout this document, this Standard may be referred to by the abbreviated name ANSI-136.
- TIA/EIA Interim Standard entitled:
  TIA/EIA/-41-D Based Network Enhancements for MDN Based Message Centers
  TIA/EIA/IS-841, September 2000.
  Note: Throughout this document, this Standard may be referred to by the abbreviated name IS-841.

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.

System Overview

Overview

Introduction

This chapter provides introductory and background information about Messaging Manager compliance with the ANSI-41 Standard.

In this chapter

This chapter contains the following topics.

Structure

Overview

Messaging Manager implementation of the ANSI-41protocol has three layers:

1 Transport layer compliance.   This enumerates the SM-TL messages we support, e.g. SMSDeliveryPointToPoint and SMSRequest.
2 Teleservice layer compliance.   For each supported teleservice we list the supported application-level procedures supported, for example, SMS Deliver and SMS Submit.
3 We do not discuss the Relay layer, which is implemented over ANSI TCAP by the TC_PROTOS module.

Transport layer parameter compliance levels

The following table defines levels of compliance.

Level	Description
Full	The parameter, sub-parameter or information element complies fully with the Standard.
Partial	The parameter, sub-parameter or information element only partially complies with the Standard.
Conditional	The parameter, sub-parameter or information element is usually ignored internally.
None	The parameter, sub-parameter or information element does not comply with the Standard.

Implementation Identification

MMX implementation

This document states compliance for Messaging Manager version 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
- Oracle packages
    - SMS v3.0
    - ACS v2.4
    - SLEE v3.2
    - Hughes IF v3.4.26

Transport Layer

Overview

Introduction

This chapter states compliance with clauses of the ANSI-41 Standard and IS-841 Interim Standard.

In this chapter

This chapter contains the following topics.

SMSDeliveryPointToPoint

Introduction

The SMSDeliveryPointToPoint operation is a general purpose operation.   It is used to:

- Convey a short message or (in general) any other information or encapsulated data from one point to another point.
- Report on the success of failure of that transfer.

Messaging Manager supports SMDPP messages in both input and output transactions.

Standards

Compliance statements for SMSDeliveryPointToPoint are made against the following two Standards.

- Clause 6.4.2.43 of ANSI-41.
- IS-841.

Most of the compliance statements are made against the first Standard.   Where it is necessary to differentiate between the two, reference to the Standard is placed after the parameter name.   For example, MobileIdentificationNumber (ANSI-41) and MSID (IS-841).

Request parameters

This table describes the supported SMSDeliveryPointToPoint parameters for requests.

Parameter	Supported	Notes
SMS_BearerData	Partial	Contains Teleservice layer data - see Section 3 for compliance details.
SMS_TeleserviceIdentifier	Full	Becomes the GenericSM Teleservice parameter.
ElectronicSerialNumber	Conditional	Ignored internally.
MobileIdentificationNumber (ANSI-41)	Conditional	If present, MobileIdentificationNumber is stored in the originatingImsi field.

Parameter	Supported	Notes
		• For outgoing MC delivery, the normal rules for conditional parameter support apply. • For SME delivery, Messaging Manager calculates the MIN through a set of number rules in the RIMS interface. It then populates the MobileIdentificationNumber field in the outgoing message.
MSID (IS-841)	Partial	• Becomes the GenericSM originatingImsi. • For SME delivery, the MIN returned from RMIS is used. MIN may be derived from number rules or an HLR lookup, depending on the configuration option of supportIS841. • For MC delivery, the normal rules for conditional parameter support apply.
SMS_ChargeIndicator	Conditional	Ignored internally.
SMS_DestinationAddress	Full	Becomes the GenericSM DestinationAddress parameter, which is used as the destination MobileDirectoryNumber.
SMS_MessageCount	Conditional	Ignored internally.
SMS_NotificationIndicator	Conditional	Ignored internally.
SMS_OriginalDestination-Address	Partial	Becomes the GenericSM DestinationAddress if there is no SMS_DestinationAddress present, otherwise obeys the conditional parameter rules.
SMS_OriginalDestination-Subaddress	Conditional	Ignored internally.
SMS_OriginalOriginating-Address	Partial	Becomes the GenericSM OriginatingAddress if there is no SMS_OriginatingAddress present, otherwise obeys the conditional parameter rules.
SMS_OriginalOriginating-Subaddress	Conditional	Ignored internally.
SMS_OriginatingAddress	Full	Becomes the GenericSM OriginatingAddress.

Response

This table describes the supported SMSDeliveryPointToPoint response parameters.

Parameter	Supported	Notes
SMS_BearerData	None	On receipt of a positive acknowledgement this parameter is ignored, and it is never populated by Messaging Manager in outgoing acknowledgements.
SMS_CauseCode	Full	We use this parameter to indicate the permanent/transient nature of failures.

SMSRequest

Introduction

The SMSRequest operation is used to request an MS's current SMS routing address.   If the MS is currently not available, notification is requested when the MS does become available.

Messaging Manager can do either of these:

- Construct SMSRequests itself through RIMS while performing a first delivery attempt
- Proxy SMSRequests from an SMSC to the HLR.

When acting as a proxy, the global title of Messaging Manager will be used as the SMS_Address parameter.

To reach the HLR we use the method outlined in section 5.1.2 of ANSI-41.

- Global title translation on MIN or global title translation on MDN is used for communication with the HLR.
- Global title indicator type 2 is used.
- A translation type value of:
    - 3 is used for "MIN to HLR" translation.
    - 14 is used for a "MDN to HLR" translation.

    Both of these values are alterable via configuration options.
- The global title address information field contains the 10-digit MIN or the MDN.
- The encoding scheme is BCD.

Standards

Compliance statements for SMSRequest are made against the following two Standards:

- Clause 6.4.2.45 of ANSI-41.
- IS-841.

Most of the compliance statements are made against the first Standard.   Where it is necessary to differentiate between the two, a reference to the Standard is placed after the parameter name.   For example, MobileIdentificationNumber (ANSI-41) and MSID (IS-841).

Request

The extent to which parameters of SMSRequest INVOKE comply with the Standards is set out in the following table.

Parameter	Supported	Notes
MobileIdentificationNumber (ANSI-41)	Full	- If present inbound, MobileIdentificationNumber is stored in the destination address field. - When constructed by RIMS, if no MIN is present and supportIS841 is false, mdnMin number rules are used.
MSID (IS-841)	Full	- If present inbound, MSID is stored in the destination address field. - For messages constructed by RIMS, if the MDN is present and supportIS841 is true, MDN is used. Otherwise MIN is used and mdnMin number rules may be required.

Parameter	Supported	Notes
ElectronicSerialNumber	Partial	• If the SMSRequest was initiated from Messaging Manager, this parameter is not populated. • If an SMSRequest is received from an SMSC, the ElectronicSerialNumber from the received message is copied into the SMSRequest sent to the HLR.
SMS_NotificationIndicator	None	Never populated.
SMS_TeleserviceIdentifier	Full	• If the SMSRequest is initiated by Messaging Manager, SMS_TeleserviceIdentifier will be populated from the GenericSM Teleservice parameter. • If an SMSRequest is received from the SMSC, SMS_TeleserviceIdentifier is copied from the received operation to the SMSRequest sent to the HLR.

Response

This table states the extent to which parameters of SMSRequest RETURN RESULT comply with the Standards.

Parameter	Supported	Notes
ElectronicSerialNumber	Full	**Messages received from the HLR** • If the SMSREquest was initiated by Messaging Manager, ElectronicSerialNumber is ignored. • If the SMSRequest came from an SMSC, ElectronicSerialNumber is copied into the SMSResponse to the SMSC. **Messages sent to the SMSC** • If the electronic serial number received in the response from the HLR is present, ElectronicSerialNumber is set to that electronic serial number. • If the electronic serial number received in the response from the HLR is not present, ElectronicSerialNumber is set to the electronic serial number received in the SMSRequest.
SMS_AccessDeniedReason	Full	Used to determine the permanent or transient nature of a failure.
SMS_Address	Full	• If the SMSRequest was initiated by Messaging Manager, SMS_Address becomes the destination global title address for SME message deliveries. • If an SMSRequest is received from an SMSC, SMS_Address is set to the global title of Messaging Manager in the response sent to the SMSC.
MSID (IS-841)	Partial	• MSID will only be present in responses from Messaging Manager if supportIS841 is configured in the IS41 adapter.

Parameter	Supported	Notes
		• RIMS will only examine responses from the HLR for MSID if supportIS841 is configured in RIMS. • RIMS cannot support receipt of an IMSI in this field.

SMSNotification

Standard

Compliance statements for SMSNotification are made against clause 6.4.2.44 of ANSI-41.

Statement

The SMSNotification operation is used to report a change in an MS's ability to receive SMS messages based on the location or status of the MS.   This message, at a minimum, is used to report the accessibility of an MS following a postponed SMSRequest or SMSDeliveryPointToPoint.   This message may also be used to revoke delivery permission previously granted with either an SMSRequest or an SMSNotification.

This message is never handled internally; it is always relayed to the SMSC.   The SMSC responds directly to the original source, so Messaging Manager has no knowledge of the eventual outcome.

Teleservice Layer

Overview

Introduction

This chapter states compliance with clauses of the C.S0015 technical requirements and the ANSI-136 Standard.

In this chapter

This chapter contains the following topics.

Teleservice layers

General notes

Messaging Manager supports the following bearer data interpretations.

- CDMA Wireless Messaging teleservice (4098)
- CDMA Wireless Enhanced Messaging Teleservice (4101)
- TDMA Cellular messaging Teleservice (32513)

SMS operations containing any other teleservice suffer the following restrictions.

- SMS_BearerData is not interpreted because bearer data includes message text.
- FDA is not allowed.   The message must be delivered to the SMSC.
- The message may not be delivered by any other plugin instance because Messaging Manager must copy bearer data between input and output transactions.

CDMA 4098

SMS submit

SMS Submit messages are used in all the MO scenarios: all messages arriving at Messaging Manager and all messages sent to the SMSC.

Set out in the following table is the extent to which Messaging Manager implementation of the SMS Submit Message sub-parameters complies with clause 4.3.4 of *C.S0015*.

Sub-parameter	Supported	Notes
Message Identifier	Full	Message type will be 0010. The header indicator sub-parameter becomes the GenericSM UserDataHeaderIndicator, but must be 0 for this teleservice: see the WEMT service (4101) for UDH support. The Message Identifier sub-parameter becomes the GenericSM MessageReference.
User Data	Partial	• All types of encoding except GSM DCS (encoding 10) are supported. • Messages containing 8-bit data, Shift-JIS or Korean (encoding types 0, 5 and 6, respectively) are supported but cannot be used with text-matching features like the text-branching macro node. • Unsupported types of encoding are treated as opaque data and force the alternative-delivery-allowed flag to false in an attempt to meet the requirements for conditional parameter use in the output transaction.
Validity Period - Absolute	Full	Stored internally as the GenericSM ValidityPeriod parameter.
Validity Period - Relative	Full	Stored internally as the GenericSM ValidityPeriod parameter.
Deferred Delivery Time - Absolute	Full	Because Messaging Manager doesn't store and forward, the presence of a deferred delivery time forces the alternate-delivery-allowed flag to false. Messaging Manager can perform only immediate deliveries.
Deferred Delivery Time - Relative	Full	Because Messaging Manager doesn't store and forward, the presence of a deferred delivery time forces the alternate-delivery-allowed flag to false. Messaging Manager can perform only immediate deliveries.
Priority Indicator	Full	Stored internally as the GenericSM PriorityIndicator parameter.
Privacy Indicator	Full	Stored internally as the GenericSM PrivacyIndicator parameter.
Reply Option	Partial	• Reply option has three parts: Delivery ACK Requested, User ACK Requested and Read ACK Requested. • The Delivery ACK reply option is fully supported. It is represented internally as a GenericSM StatusReportRequest type smeRequested. It is only allowed to be set in MO messages, not during FDA. It obeys the rules for conditional parameters. • The User ACK and Read ACK options obey the rules for conditional parameters and are ignored internally.
Alert On Message Delivery	Conditional	Ignored internally.
Language Indicator	Conditional	Ignored internally.
Call-Back Number	Conditional	Ignored internally.
Multiple Encoding User Data	Conditional	Ignored internally.

Sub-parameter	Supported	Notes
Message Deposit Index	Conditional	Ignored internally.

SMS deliver

SMS Deliver messages are used in all the MT scenarios.

Set out in the following table is the extent to which Messaging Manager implementation of the SMS Deliver Message sub-parameters complies with clause 4.3.4 of *C.S0015*.

Sub-parameter	Supported	Notes
Message Identifier	Full	• Message type will be 0010. • The header indicator sub-parameter becomes the GenericSM UserDataHeaderIndicator, but must be 0 for this service. See the WEMT service (4101) for UDH support. • For outgoing messages the header indicator is set from the GenericSM UserDataHeaderIndicator, and if set, the WEMT teleservice (4101) will be used. • The message identifier is stored in, and read from, the GenericSM MessageReference.
User Data	Partial	• All types of encoding except GSM DCS (encoding 10) are supported. • Messages containing 8-bit data, Shift-JIS or Korean (encoding types 0, 5 and 6, respectively) are supported but cannot be used with text-matching features like the text branching macro node. • Unsupported types of encoding are treated as opaque data and force the alternate-delivery-allowed flag to false in an attempt to meet the requirements for conditional parameter use in the output transaction.
Message Center Time Stamp	Full	• The inbound field value is saved in the GenericSM ServiceCentreTimestamp parameter. • If the time is set in GenericSM, the outbound time stamp is set to the GenericSM ServiceCentreTimestamp. • If the time is not set in GenericSM, the outbound time stamp is set to the current time of the SLC sending the message.
Deferred Delivery Time - Absolute		Not used by telservice 4098.
Deferred Delivery Time - Relative		Not used by telservice 4098.
Priority Indicator	Full	Internally stored in and read from the GenericSM PriorityIndicator parameter.
Privacy Indicator	Full	Internally stored in and read from the GenericSM PriorityIndicator parameter.
Reply Option	Conditional	Reply Option has three parts: Delivery ACK Requested, User ACK Requested and Read ACK requested.

Sub-parameter	Supported	Notes
		• The User ACK and Read ACK options obey the rules for conditional parameters and are ignored internally. • The Delivery ACK reply option must be zero in inbound MT messages and is not used. It will always be set to zero in outbound messages.
Number of Messages	Conditional	• Ignored internally. • Number of Messages will only be set if the incoming message is also an SMS Deliver.
Alert On Message Delivery	Conditional	Ignored internally.
Language Indicator	Conditional	Ignored internally.
Call-Back Number	Conditional	Ignored internally.
Message Display Node	Partial	• If it is present, an inbound message is stored in messageClass. • Immediate display is encoded correctly. • All other values map to unset messageClass. • Non-immediate values will only be preserved outbound if an incoming message is also an SMS Deliver.
Multiple Encoding User Data	Conditional	Ignored internally.
Message Deposit Index	Conditional	Ignored internally.

SMS cancellation

This following text is relevant to clause 4.4.3 of *C.S0015*.

The SMS Cancellation Message is a request to the SMSC to cancel a previously-submitted message.

Messaging Manager does not handle an SMS Cancellation Message internally.   It is classified as a Command type message and is relayed directly to the SMSC.   As the SMSC responds directly to the message's source, Messaging Manager has no knowledge of the eventual outcome.

SMS user acknowledge-ment

This bearer data set appears in SMSC-generated CDMA delivery receipts.

Set out in the following table is the extent to which Messaging Manager implementation of the SMS User Acknowledgment Message sub-parameters complies with clause 4.4.4 of *C.S0015*.

Sub-parameter	Supported	Notes
Message Identifier	Full	• The message type will be 0101. The header indicator sub-parameter is always 0 and the message identifier comes from the GenericSM MessageReference (modulo 2^{16}). • The message identifier is stored in, and read from, the GenericSM MessageReference.

Sub-parameter	Supported	Notes
User Data	Conditional	Messaging Manager will never include user data in a user acknowledgement unless it is copied from an incoming message following the rules for Conditional parameters.
User Response Code	Conditional	Ignored internally.
Message Center Time Stamp	Full	• The value of the inbound Message Center Time Stamp sub-parameter is saved in the GenericSM ServiceCentreTimestamp parameter. • If ServiceCentreTimestamp is set in GenericSM, the outbound time stamp is set to the GenericSM ServiceCentreTimestamp. • If ServiceCentreTimestamp is not set in GenericSM, the outbound time stamp is set to the current time of the SLC sending the message.
Multiple Encoding User Data	Conditional	Ignored internally.

SMS delivery acknowledge-ment

This bearer data set appears in CDMA delivery receipts.

Set out in the following table is the extent to which Messaging Manager implementation of the SMS Delivery Acknowledgment Message sub-parameters complies with clause 4.4.5 of *C.S0015*.

Parameter	Supported	Notes
Message Identifier	Full	• Message type will be 0100. The header indicator sub-parameter is always 0 and the message identifier comes from the GenericSM MessageReference (modulo 2^{16}). • The Message Identifier sub-parameter is stored in and read from the GenericSM MessageReference.
User Data	Conditional	Messaging Manager will never include user data in a delivery acknowledgement unless it is copied from an incoming message following the rules for Conditional parameters.
Message Center Time Stamp	Full	• The value of the inbound Message Center Time Stamp sub-parameter is saved in the GenericSM ServiceCentreTimestamp parameter. • If it is set in GenericSM, the outbound time stamp is set to the GenericSM ServiceCentreTimestamp. • If it is not set in GenericSM, the outbound time stamp is set to the current time of the SLC sending the message.
Multiple Encoding User Data	Conditional	Ignored internally.
Message Status	Full	Both the error class and failure code are configurable.

CDMA 4101

Compliance statement

This following text is relevant to clause 4.3.7 of C.S0015.

This teleservice is identical to CDMA 4098 except that the User Data may include a GSM User Data Header.   The header is not interpreted, but is available to the output transaction.

TDMA 32513

Standard

Compliance statements for TDMA 32513 are made against clause 3.2 of ANSI-136.

SMS submit

As FDA is not supported for this service, Messaging Manager implements only the SMS Submit message (MO).

Set out in the following table is the extent to which Messaging Manager implementation of the SMS Submit Message information elements complies with the Standard.

Parameter	Supported	Notes
Message Type Indicator	Partial	Must be 001 (Submit or Deliver). The path endpoint type is used to determine whether this is an MS-to-BMI scenario. If it is an MS-to-BMI scenario, 001 is interpreted as Submit.
Message Reference	Full	Stored in the GenericSM MessageReference parameter.
PrivacyIndicator	Full	Stored in the GenericSM PrivacyIndicator parameter.

Urgency Indicator	Full	Stored in the GenericSM PriorityIndicator. The mapping to GenericSM priorities is:
		    Bulk - Normal
		    Normal - Normal
		    Urgent - Urgent
		    Very Urgent - Emergency
		The SMPP 5.0 Standard implies (in section 4.7.19) that Normal should in fact map to an internal priority of Interactive, but that would mean that Normal TDMA messages get promoted to high priority traffic in other outbound protocols (e.g. MAP).
		In the output plugin the Urgency Indicator is preserved exactly if we meet the requirements for conditional parameter use. If not, the mapping from GenericSM is:
		    Normal - Normal
		    Interactive - Urgent
		    Urgent - Urgent
		    Emergency - Very Urgent

Delivery Acknowledgement Request	Full	• The Delivery Acknowledgement Request information element is stored in the GenericSM StatusReportRequest parameter. • Messaging Manager does not actually send a status report.

Parameter	Supported	Notes
Manual Acknowledgement Request	Conditional	Ignored internally.
Message Updating	Conditional	Ignored internally.
User Data Unit	Full	- All types of encoding are supported. - Only those characters that are part of the Latin 1 character set are supported for text manipulation nodes in ACS. - User Data Structure Type must be 0 (text message)
Validity Period	Full	Stored in the GenericSM ValidityPeriod parameter.
Deferred Delivery Time	Conditional	Ignored internally.
Call Back Number	Conditional	Ignored internally.
Call Back Number Presentation	Conditional	Ignored internally.
Call Back Number Alpha Tag	Conditional	Ignored internally.
Multilingual Call Back Number	Conditional	Ignored internally.
Multilingual Call Back Alpha Tag	Conditional	Ignored internally.
Multilingual Destination Address.	Conditional	Ignored internally.