

# Oracle® Communications

## EAGLE MO SMS User's Guide



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# Acronyms

The following table provides information about the acronyms and the terminology used in the document.

**Table Acronyms**

<b>Acronym</b>	<b>Definition</b>
ASD	Additional Subscriber Data
DN	Dialed Number
DN	Directory Number
EPAP	EAGLE Application Processor Provisioning
GRN	Generic Routing Number
MO SMS	Mobile Originated Short Message Service
NE	Network Entity
NP	Number Portability
NPP	Numbering Plan Processor
RN	Routing Number
RTDB	Real-time Database
SMSC	Short Message Service Center
PPSMS	Prepaid Short Message Service

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# What's New in This Guide

This section introduces the documentation updates for Release 47.1 in Oracle Communications EAGLE MO SMS User's Guide.

**Release 47.1 -F88475-01, October 2023**

There are no updates in the document for this release.



# 1

## Introduction

This chapter provides a brief description of the Mobile Originated Short Message Service (MO SMS) features of the Oracle Communications EAGLE. The chapter also includes the scope, audience, and organization of the manual; how to find related publications; and how to contact Oracle for assistance.

### 1.1 Overview

This manual provides feature descriptions, along with commands, maintenance, measurements, and configuration details associated with the Mobile Originated Short Message Service (**MO SMS**) features of the Oracle Communications **EAGLE**. The MO SMS features allow wireless network operators to route Short Message Service (**SMS**) messages within **number portability** environments for **GSM**, **IS41**, and **IS41-to-GSM Migration**.

Wireless operator SMSCs typically use the SMS destination subscriber address to route an SMS message. Information about whether the destination subscriber is within the operator's network or belongs to a foreign network, and about the network protocol to be used (GSM or IS41) is required to correctly route the SMS message. Before the implementation of number portability, operators could determine the destination subscriber's network by comparing the called party number against the predefined number ranges allocated to network operators. With number portability, the SMSC cannot make this determination based solely on the called party number.

The MO SMS features provide the routing information for the called subscriber to the SMSC, enabling the SMSC to correctly route the SMS message.

Refer to *Database Administration - Global Title Translation User's Guide* for information about MO SMS B-Party Routing (GSM and IS41) features and Prepaid SMS Intercept feature for GSM B-Party.

### 1.2 Scope and Audience

This manual is intended for anyone responsible for installing, maintaining, and using the MO SMS features of the Oracle Communications **EAGLE**. Users of this manual must have a working knowledge of telecommunications and network installations.

### 1.3 References

For more information, refer to the following documents:

- *Database Administration - Global Title Translation User's Guide*
- *Commands User's Guide*
- *Database Administration – GWS User's Guide*
- *Application B Card Hardware and Installation Guide*
- *Hardware Reference*

- *Numbering Plan Processor (NPP) User's Guide*
- *Measurements Reference*
- *Database Administration - System Management User's Guide*
- *EPAP Alarms and Maintenance Guide*
- *Unsolicited Alarm and Information Messages Reference*
- *EPAP Administration Guide*

# 2

## Feature Description

This chapter describes the Mobile Originated Short Message Service (MO SMS) features which include:

- Mobile Originated Based GSM SMS Number Portability (MO-Based GSM SMS NP)
- Mobile Originated Based IS41 SMS Number Portability (MO-Based IS41 SMS NP)
- Mobile Originated SMS IS41-to-GSM Migration (MO SMS IS-41-to-GSM Migration)
- Portability Check for Mobile Originated SMS (MNP SMS)
- Prepaid Short Message Service Intercept (PPSMS)
- MO SMS Additional Subscriber Data (MO SMS ASD)
- MO SMS Generic Routing Number (MO SMS GRN)

### 2.1 Introduction

The Mobile Originated Short Message Service (MO SMS) features address the number portability requirements of wireless network operators for delivery of Mobile Originated SMS messages. The EAGLE 5 ISS MO SMS features apply number portability database lookup to SMS messages for IS41 and GSM networks, migrates subscribers from IS41 to GSM networks, validates subscriber use of the correct Short Message Service Center, and delivers messages to Prepaid Servers if either the Calling Party Number or Called Party Number is associated with a prepaid subscriber.

These features include:

- Mobile Originated Based GSM SMS Number Portability (MO-Based GSM SMS NP)
- Mobile Originated Based IS41 SMS Number Portability (MO-Based IS41 SMS NP)
- Mobile Originated SMS IS41-to-GSM Migration (MO SMS IS41-to-GSM Migration)
- Portability Check for Mobile Originated SMS (MNP SMS)
- Prepaid Short Message Service Intercept (PPSMS)
- Mobile Originated SMS Additional Subscriber Data (MO SMS ASD)
- Mobile Originated SMS Generic Routing Number (MO SMS GRN)

The MO SMS features are based on the EAGLE 5 ISS platform with EPAP. Numbering Plan Processor (NPP) is used by the MO SMS features for number conditioning and service logic execution.

#### **Mobile Originated Based GSM SMS Number Portability**

The Mobile Originated Based GSM SMS Number Portability (MO-Based GSM SMS NP) feature provides network information to the Short Message Service Center (SMSC) for subscribers in the GSM network. This ported information allows the SMSC to distribute the messages to the correct operating network for the Called Party Number.

The MO-Based GSM SMS NP feature:

- Intercepts SMS messages after they have undergone Prepaid Short Message Service Intercept (PPSMS) and Portability Check for Mobile Originated SMS (MNP SMS) processing and before they reach the SMSC.

 **Note:**

The MO-Based GSM SMS NP feature does not require the PPSMS or MNP SMS features to be enabled.

- Decodes the **TCAP/MAP** message destination address and performs lookup in the number portability (NP) database
- Modifies the destination address in the TCAP message with dialed number (DN) porting information,
- Relays the message to the SMSC

The SMSC uses the DN porting information to determine whether to forward the message to other operators or to process the message for an in-network subscriber.

The MO-Based GSM SMS NP feature applies to GSM MAP ForwardSM MSUs for either ITU or ANSI MTP messages.

### Mobile Originated Based IS41 SMS Number Portability

The Mobile Originated Based IS41 SMS Number Portability (MO-Based IS41 SMS NP) feature allows wireless operators to route Short Message Service (SMS) messages originating from a mobile subscriber within a number portability environment. The MO-Based IS41 SMS NP feature:

- Intercepts SMS messages before they reach the Home Short Message Service Center (**SMSC**)
- Decodes the TCAP/MAP message destination address and performs lookup in the Real-time Database (**RTDB**) to identify whether the destination number is ported.
- Modifies the destination address in the TCAP message with **DN** (dialed number) porting information
- Relays the SMS message to its original destination

The Home SMSC uses the DN porting information to determine whether to forward the message to other operators or to process the message for an in-network subscriber.

The MO-Based IS-41 SMS NP feature applies to ANSI IS41 SMDPP MSUs for either ITU or ANSI MTP messages.

### MO SMS IS41-to-GSM Migration

The MO SMS IS41-to-GSM Migration feature allows IS41 to GSM migration. This feature migrates subscribers based on Called Party Number from IS41 networks to GSM networks, and also allows the IS412GSM Migration Prefix to be used instead of the Routing Number (RN) obtained from the Real-time Database (RTDB). The MO SMS IS41-to-GSM Migration feature:

The MO SMS IS41-to-GSM Migration feature applies to ANSI TCAP/MAP and ANSI or ITU transport (MTP and SCCP).

- Intercepts SMS messages before they reach the Home Short Message Service Center (SMSC)
- Decodes the TCAP/MAP message destination address and performs lookup in the Real-time Database (RTDB)
- Modifies the destination address in the TCAP message with DN (dialed number) porting information or the IS412GSM Migration Prefix.
- Relays the SMS message to its original destination

### Portability Check for Mobile Originated SMS

When the Portability Check for Mobile Originated SMS (MNP SMS) feature is enabled and turned on, the EAGLE 5 ISS filters incoming messages based on the MAP Operation Code. If the message is an MO Forward Short Message (MO FSM), the **MSISDN** number of the originating subscriber is used to search the G-Port Mobile Number Portability database. If a match is found indicating the subscriber has been ported-out, the EAGLE 5 ISS uses the destination SMSC address obtained from the **SCCP CdPA** to search a list of home network SMSC addresses. If a match is found, indicating the ported-out subscriber is fraudulently attempting to send SMS using the SMSC of the old network, the message is discarded and an error message is generated and returned to the originating MSC.

### Prepaid Short Message Service Intercept

The Prepaid Short Message Service Intercept (**PPSMS**) feature applies to only mobile originated SMS, which are messages sent from a mobile handset through an Mobile Switching Center (MSC) to the Short Message Service Center (SMSC). PPSMS screens incoming messages from the MSC based on the MAP operation code. Message Discrimination determines whether the MSISDN of the sender is retrieved and a database lookup performed. Database lookup determines if the MSISDN belongs to a contract subscriber or a prepaid subscriber. If the MSISDN belongs to a contract subscriber, the message is routed to the SMSC. If the MSISDN belongs to a prepaid subscriber, the message is diverted to a Prepaid SMS Server for a credit check before allowing the message to be delivered to the SMSC.

### MO SMS Additional Subscriber Data

The MO SMS Additional Subscriber Data (MO SMS ASD) feature allows for the insertion of Additional Subscriber Data (ASD) values into the outgoing message. The MO SMS ASD feature supports the ASDLKUP or CGPNASDRQD NPP Service Actions for GSM or IS41 MO SMS NPP Services. The ASDLKUP and CGPNASDRQD NPP Service Actions are mutually exclusive within the same NPP Rule.

The ASDLKUP Service Action populates the ASD digits retrieved from an RTDB lookup of the individual or range DN table. The ASD digits are used with the Formatting Action. ASDLKUP supports both Calling Party and Called Party NPP Services for GSM and IS41: MOSMSGCDPN, MOSMSGCGPN, MOSMSICDPN, MOSMSICGPN. However, ASD digits retrieved by Calling Party or Called Party NPP Services are not used for modifying CgPN. ASD digits retrieved by Calling Party NPP Service are used with the Formatting Action for the Called Party Number if CGPNASDRQD Service Action is executed from Called Party NPP Service. If no ASD digits are found, no action is taken.

The CGPNASDRQD Service Action retrieves the ASD digits from the RTDB lookup of the Calling Party Number. The ASD digits are used with the Formatting Action for the Called Party Number. CGPNASDRQD supports Called Party NPP Services for GSM or IS41: MOSMSGCDPN, MOSMSICDPN.

## MO SMS Generic Routing Number

The MO SMS Generic Routing Number (MO SMS GRN) feature allows for the insertion of a Generic Routing Number (GRN) digit string into the outgoing message. The MO SMS GRN feature supports the GRNLKUP or CGPNRNRQD NPP Service Actions in GSM or IS41 MO SMS NPP Services. The GRNLKUP and CGPNRNRQD NPP Service Actions are mutually exclusive within the same NPP Rule.

The GRNLKUP Service Action populates the GRN digits retrieved from an RTDB lookup of the individual or range DN table. The GRN digits are used with the Formatting Action. GRNLKUP supports both Calling Party and Called Party NPP Services for GSM and IS41: MOSMSGCDPN, MOSMSGCGPN, MOSMSICDPN, MOSMSICGPN. However GRN digits retrieved by Calling Party or Called Party NPP Services are not used for modifying CgPN. GRN digits retrieved by Calling Party NPP Service are used with the Formatting Action for the Called Party Number if CGPNRNRQD Service Action is executed from Called Party NPP Service. If no GRN digits are found, no action is taken.

The CGPNRNRQD Service Action retrieves the GRN digits from the RTDB lookup of the Calling Party Number. The GRN digits are used with the Formatting Action for the Called Party Number. CGPNRNRQD supports Called Party NPP Services for GSM or IS41: MOSMSGCDPN, MOSMSICDPN.

## Service Portability

**Service Portability (S-Port)** extends the scope of the MO SMS Number Portability solutions beyond traditional number portability processing. Service Portability allows a subscriber to retain the same subscriber number when moving from one network type or service technology to another within the network of a single operator. Unlike traditional number portability, the subscriber does not move from one network operator or service provider to another. Service Portability provides different routing number digits for formats that require routing numbers. Service Portability does not affect message flows.

## MTP Routed SCCP Traffic

When the **MTP Msgs for SCCP Apps** feature is turned on, all **MTP** routed **UDT**/non-segmented **XUDT SCCP** messages are routed to **Service Module cards**. When the **MTP Routed GWS Stop Action** feature is turned on, messages are filtered based on the provisioned Gateway Screening rules on a per linkset basis. This feature forwards only UDT, UDTS, XUDT and XUDTS SCCP messages to the Service Module cards for processing. The Service Module cards then perform SCCP decode and verification on the MTP routed messages.

## TCAP Segmented SMS Support Phase 1

The TCAP Segmented SMS Support Phase 1 enhancement allows the Portability Check for Mobile Originated SMS and Mobile-Originated Based GSM SMS NP features to correctly process TCAP Segmented SMS messages. If a segmented message is subjected to the service associated with either of these features, then the EAGLE 5 ISS routes the initial TC\_Begin message using standard GTT processing. The subsequent TC\_Continue message is subjected to the specified service. The GTT feature and either the Portability Check for Mobile Originated SMS or the Mobile-Originated Based GSM SMS NP feature must be turned on before the TCAP Segmented SMS Support Phase 1 enhancement can be provisioned. The

MOSMSTCAPSEG parameter of the `chg-gsmsmsopts` command is used to provision TCAP Segmented SMS Support Phase 1.

### HomeSMSC Match with Digits

The HomeSMSC Match with Digits option enhances the ability of the EAGLE 5 ISS to compare the Home Short Message Service Center (HomeSMSC) digits in the SCCP CdPA, if present, of incoming Mobile Originated Forward Short Messages (MO\_FSM) or the SMDPP message to HomeSMSCs that are stored in the database. If the beginning digits of the incoming HomeSMSC matches a stored HomeSMSC, then the HomeSMSCs are considered a match, even if additional digits are attached to the end of the incoming HomeSMSC. If a match is found, then the message is processed further.

This option can be used with these features:

- MO-Based GSM SMS NP
- MO-Based IS41 SMS NP
- MO SMS IS41-to-GSM Migration
- Portability Check for Mobile Originated SMS
- Service Portability (S-Port)

The HomeSMSC Match with Digits option is provisioned with the `MOSMSDIGMAT` parameter of commands `chg-is41smsopts` and `chg-gsmsmsopts`. The possible values of the parameter are:

- `GSMSMSOPTS:MOSMSDIGMAT= exact, bestfit`
- `IS41SMSOPTS:MOSMSDIGMAT= exact, bestfit, bypass`

If a message is subjected to multiple SMS-related features that require matching with the provisioned HomeSMSCs, a single HomeSMSC address lookup in the HomeSMSC table is performed; the result is used for subsequent processing by all features which need the HomeSMSC address result.

Because the CdPA GTA digits are not available for GTI=0 MTP routed messages, the message is checked to determine whether the MTP DPC is a HomeSMSC in the Destination table. If the MTP DPC is a HomeSMSC in the Destination table, the HomeSMSC match is considered successful.

### HomeSMSC Check Bypass

The HomeSMSC Check Bypass option allows the HomeSMSC address check to not be performed. In some IS41 networks, the SCCP CdPA digits do not contain the SMSC address used by the HomeSMSC check. This bypass option applies to only the MO-Based IS41 SMS NP and MO SMS IS41-to-GSM Migration features; the bypass option is not needed in GSM networks.

## 2.2 System Options for MO SMS Features in GSM Networks

The system level options stored in the `GSMSMSOPTS` table are used to perform number conditioning, response generation, and other feature-specific options. [Table 2-1](#) shows the MO SMS options in the `GSMSMSOPTS` table, possible values, and the actions taken for each value.

The MO-Based GSM SMS NP, MO SMS ASD, MO SMS GRN, Portability Check for MO SMS, or Prepaid SMS Intercept feature must be enabled before these options can be

specified in the GSMSMSOPTS table. Refer to `chg-gsm41smsopts` in [EAGLE GSM SMS Options Commands](#) and in *Commands User's Guide* for associations and limitations.

**Table 2-1 System Options - MO SMS Features in GSM Networks**

GSMSMSOPTS Option	Value	Action in the EAGLE
DEFRN	1-15 digits, NONE (default)	The value is the default routing number used for <b>own-network</b> subscribers.
MOSMSACLEN	0-8 (default =0)	The value is the number of digits from the MO SMS CgPA used as the Area Code in the MO SMS CdPA.
MOSMSDIGMAT	BESTFIT	When the HomeSMSC Match with Digits option is set to <i>BESTFIT</i> , an exact match is attempted on the incoming SCCP CdPA digits in the Home SMSC table. If an exact match is not found, a best fit match of the leading digits of the incoming SCCP CdPA digits is attempted to the Home SMSC table entries.
	EXACT (default)	When the HomeSMSC Match with Digits option is set to <i>EXACT</i> , an exact match must be made of the incoming SCCP CdPA digits in the Home SMSC table.
MOSMSFWD	NO (default)	No MO-SMS forward will be performed.
	YES	If the MO-SMS TCAP Called Party Number is modified, then the MO-SMS message will be redirected by modifying the SCCP CdPA, to the GTA value identified in the MOSMSGTA field.  This option cannot be set to YES unless the MOSMSGTA option has a valid value specified.
MOSMSGTA	5-21 digits, NONE (default)	This option is used to replace the SCCP CdPA in the MO-SMS message. If the MO-SMS TCAP Called Party Number is modified, then the MO-SMS message will be redirected by modifying the SCCP.  This option cannot be specified unless a GTA with the same value has been provisioned in the GTT translation table. For more information about the GTT translation table, refer to the <i>Database Administration - GTT User's Guide</i> .
MOSMSNAI	INTL (default)	When SNAI=INTL, no number conditioning is required before lookup in the Number Portability database.
	NAI	The NAI from the MO_SMS message is used for conditioning before lookup in database. <ul style="list-style-type: none"> <li>If the NAI is INTL, then Number Portability lookup is performed immediately.</li> <li>If the NAI is any other value, then the number is considered to be in national format. The CC is added before Number Portability lookup is performed.</li> </ul>
	NAT	The CdPN is treated as National number for lookup in the Number Portability database. When SNAI=NAT, the CC will be added to the DN before lookup in the Number Portability database.
	UNKNOWN	When this value is set, the NAI will be treated as Unknown for the purposes of Number Conditioning.



Table 2-1 (Cont.) System Options - MO SMS Features in GSM Networks

GSM SMS OPTS Option	Value	Action in the EAGLE
MOSMSSA	NO (default)	No subaddress is searched for in the B party number from the TCAP part.
	YES	The subaddress is searched in the B party number. If the subaddress (identified by "#" present in the B party number) is found, the subaddress is removed before Number Portability database lookup is performed.
MOSMSTCAPSE G	OFF (default)	Mobile Originated Segmented TCAP messages are not supported.
	ON	Mobile Originated Segmented TCAP messages are supported.
MOSMSTYPE	ALL	When the lookup in the Number Portability database has entitytype=SP or RN or no_entity, then the lookup is considered successful.
	RN	When the lookup in the Number Portability database has entitytype=RN, then the lookup is considered successful.
	SP	When the lookup in the Number Portability database has entitytype=SP, then the lookup is considered successful.
	SPRN (default)	When the lookup in the Number Portability database has entitytype=SP or RN, then the lookup is considered successful.
SPFILL	OFF (default)	The Numbering Plan Processor (NPP) does not populate both RN and SP entities for own-network subscribers at the same time.
	ON	The Numbering Plan Processor (NPP) populates both RN and SP entities for own-network subscribers at the same time.
SPORTTYPE	ALL	The Service Portability prefix (GRN from RTDB) for own-network GSM and IS41 subscribers is applied.
	GSM	The Service Portability prefix (GRN from RTDB) for own-network GSM subscribers is applied.
	IS41	The Service Portability prefix (GRN from RTDB) for own-network IS41 subscribers is applied.
	NONE (default)	Service Portability is not performed for the associated feature.

## 2.3 System Options for for MO SMS Features in IS41 Networks

The system level options stored in the IS41SMSOPTS table are used to perform number conditioning, response generation, and other feature-specific options. [Table 2-2](#) shows the MO SMS options in the IS41SMSOPTS table, possible values, and the actions taken for each value.

The MO-Based IS41 SMS NP, MO SMS IS41-to-GSM Migration, MO SMS ASD, or MO SMS GRN feature must be enabled before these options can be specified in the IS41SMSOPTS table. Refer to `chg-is41smsopts` in [EAGLE IS41 SMS Options Commands](#) and in *Commands User's Guide* for associations and limitations.

Table 2-2 System Options - MO SMS Features in IS41 Networks

IS41SMSOPTS Option	Value	Action in the EAGLE
DEFRN	1-15 digits, NONE (default)	The value is the default routing number used for own-network subscribers.
MODAPARAM	DA (default)	The SMS_Destination_Address from the IS41 SMDPP message is used for conditioning, lookup, and modification.
	ODA	The SMS_Original_Destination_Address from the IS41 SMDPP message is used for conditioning, lookup, and modification.
MOIGMPFX	IS412GSM	IS412GSM digits are used as a prefix to modify the destination address in the outgoing SMDPP.
	NE (default)	Digits from the RTDB network entity (NE) associated with the B number are used as a prefix to modify the destination address in the outgoing SMDPP.
MOSMSACLEN	0-8 (default = 0)	The value is the number of digits from the MO SMS CgPA used as the Area Code in the MO SMS CdPA.
MOSMSDIGMAT	BESTFIT	When the HomeSMSC Match with Digits option is set to <i>BESTFIT</i> , an exact match is attempted on the incoming SCCP CdPA digits in the Home SMSC table. If an exact match is not found, a best fit match of the leading digits of the incoming SCCP CdPA digits is attempted to the Home SMSC table entries.
	BYPASS	When the HomeSMSC Match with Digits option is set to <i>BYPASS</i> , the HomeSMSC Match with Digits look up is not performed.
	EXACT (default)	When the HomeSMSC Match with Digits option is set to <i>EXACT</i> , an exact match must be made of the incoming SCCP CdPA digits in the Home SMSC table.
MOSMSNAI	INTL (default)	When SNAI=INTL, no number conditioning is required before lookup in the Number Portability database.
	NAI	The NAI from the SMDPP (short message delivery point to point) message is used for conditioning before lookup in the Number Portability database. <ul style="list-style-type: none"> <li>If the NAI is INTL, then Number Portability database lookup is performed immediately.</li> <li>If the NAI is any other value, then the number is considered to be in national format. DEFCC is added before Number Portability database lookup is performed.</li> </ul>
	NAT	The CdPN is treated as National number for lookup in the Number Portability database. DEFCC will be added to the DN before lookup in the NP database.
	UNKNOWN	When this value is set, the NAI is treated as Unknown for the purposes of Number Conditioning.
MOSMSTYPE	ALL	When the lookup in the Number Portability database has entitytype=SP or RN or no_entity, then the lookup is considered successful.

Table 2-2 (Cont.) System Options - MO SMS Features in IS41 Networks

IS41SMSOPTS Option	Value	Action in the EAGLE
	RN	When the lookup in the Number Portability database has entitytype=RN, then the lookup is considered successful.
	SP	When the lookup in the Number Portability database has entitytype=SP, then the lookup is considered successful.
	SPRN (default)	When the lookup in the Number Portability database has entitytype=SP or RN, then the lookup is considered successful.
SPFILL	OFF (default)	The Numbering Plan Processor (NPP) does not populate both RN and SP entities for own-network subscribers at the same time.
	ON	The Numbering Plan Processor (NPP) populates both RN and SP entities for own-network subscribers at the same time.
SPORTTYPE	ALL	The Service Portability prefix (GRN from RTDB) for own-network GSM and IS41 subscribers is applied.
	GSM	The Service Portability prefix (GRN from RTDB) for own-network GSM subscribers is applied.
	IS41	The Service Portability prefix (GRN from RTDB) for own-network IS41 subscribers is applied.
	NONE (default)	Service Portability is not performed for the associated feature.

## 2.4 MO SMS Considerations

1. GTT must be turned on before enabling the MO-Based GSM SMS NP, MO-Based IS41 SMS NP, and MO SMS IS41-to-GSM Migration features.
2. The MO-Based GSM SMS NP and MO-Based IS41 SMS NP features can be turned on, but not turned off.
3. The MO SMS IS41-to-GSM Migration feature can be turned on or off; however, after the feature is enabled, it cannot be disabled.
4. No Temporary Feature Access Key is provided for the MO SMS features with the exception of the MNP SMS feature.
5. The enabling or turning on of the MO SMS features is not dependent upon the A-Port or G-Port feature being enabled or turned on.
6. All MO SMS features can co-exist with other EPAP-related EAGLE features, including G-Port, A-Port, INP, G-Flex, and EIR.
7. All MO SMS features are mutually exclusive with all features that require ELAP, such as LNP and TLNP, unless the Dual ExAP Configuration feature is enabled.
8. The MO SMS features require Service Module cards running the VSCCP application.
9. The MO SMS features require that the Service Module cards have a minimum of 4 GB of memory. If the MO SMS features are enabled and a Service Module card with less than 4 GB of memory is inserted, the Service Module card will be auto-inhibited. If a Service

Module card with less than 4 GB of memory is provisioned and installed, then the MO SMS features will not be allowed to be enabled.

## 2.5 MO-Based GSM SMS NP

The **MO**-Based GSM SMS NP feature provides network information to the Short Message Service Center (**SMSC**) for subscribers using the GSM network. This information allows the SMSC to select a protocol to deliver **SMS** messages to the called party.

The MO-Based GSM SMS NP feature:

- Intercepts SMS messages after they have undergone Prepaid Short Message Service Intercept (**PPSMS**) and Portability Check for Mobile Originated SMS (**MNP SMS**) processing and before they reach the SMSC

 **Note:**

The MO-Based GSM SMS NP feature does not require the PPSMS or MNP SMS features to be enabled.

- Decodes the TCAP/MAP message destination address and performs lookup in the number portability (**NP**) database
- Modifies the destination address in the TCAP message with directory number (**DN**) porting information
- Relays the message to the SMSC

The SMSC uses the DN porting information to determine whether to forward the message to other operators or to process the message for an in-network subscriber.

The MO-Based GSM SMS NP feature applies to ForwardSM SMS MSUs with ITU TCAP/MAP for either ITU or ANSI MTP messages.

### 2.5.1 Options

The MO-Based GSM SMS NP feature provides the following configurable options for controlling the processing of GSM **SMS** messages:

- Modifying SMS destination address information for processing
- Outbound digit format
- When an **NP** DB lookup is considered to be successful
- Handling of sub address field in destination address

### 2.5.2 Feature Control Requirements

The MO-Based GSM SMS NP feature has the following feature control requirements:

- The part number is 893-0194-01.
- The feature cannot be enabled if LNP is enabled.
- A temporary FAK cannot be used to enable the feature.

- The feature cannot be turned off after it has been turned on.

## 2.5.3 MO-Based GSM SMS NP Protocol Handling

After the MO-Based GSM SMS NP feature has been enabled and turned on, it provides the following protocol handling:

- The MO-Based GSM SMS NP feature traps the MO\_SMS message and performs NPDB lookup based on the B number from the TCAP SM-RP-UI parameter. If the entity type is the same as the value of the MOSMSTYPE option in the GSMSMSOPTS table, then this feature modifies the outgoing MO\_SMS based on the value of the MOSMSDNFMT option.
- When the outgoing MO-SMS is modified, the NAI is based on the value of the MOSMSDNNAI parameter in the GSMSMSOPTS table.
- The MO-Based GSM SMS NP feature performs SCCP **CdPA** GTA lookup against the **SMSC** list maintained by the **STP**. If the lookup is not successful, the **MSU** falls through to **GTT** handling.
- When both the MO-Based GSM SMS NP feature and the Portability Check for MO-SMS feature are enabled:
  - Both features must have the same service-selector service.
  - The MO-Based GSM SMS NP feature processes an MSU only when the MSU has passed the processing by the Portability Check for MO\_SMS feature and no **NACK** has been sent.
- The MO-Based GSM SMS NP feature is required only for MO\_SMS messages with SMS-Submit and SMS-Command.
- The number conditioning is based on the Conditioning Actions provisioned in the NPP Rule Set.
- For messages handled within this feature, the SCCP CdPA is always used to route the message.
- If the MOSMSTYPE=ALL, MOSMSDNFMT=RN, and the RTDB lookup has no entity assigned to the DN, then the MO\_SMS message is not modified.
- The MAP Called Party Number is modified by the formatted digits computed by the Formatting Actions in the NPP Rule Set.
- If the MOSMSSA=YES, then the subaddress is searched and removed from **MAP** called Party number for **NPDB** lookup. The subaddress is not removed from the final MO\_SMS message.
- If the number of called party digits in the modified MO\_SMS message is greater than 20, then the digits are not modified and the original message is routed to the **SMSC** based on SCCP CdPA.
- The MO-Based GSM SMS NP feature considers a successful RTDB lookup with entitytype=RN and portabilitytype=0 to be entitytype=SP, if the IS41-to-GSM Migration feature is turned on or Service Portability is enabled.
- If the MOSMSFWD=Yes and the MO-SMS **TCAP** called-party number is modified after successful RTDB lookup, then the MO-SMS message is redirected to the **GTA** identified in the MOSMSGTA field by modifying the SCCP CdPA.

## 2.5.4 MO-Based GSM SMS NP Call Flows

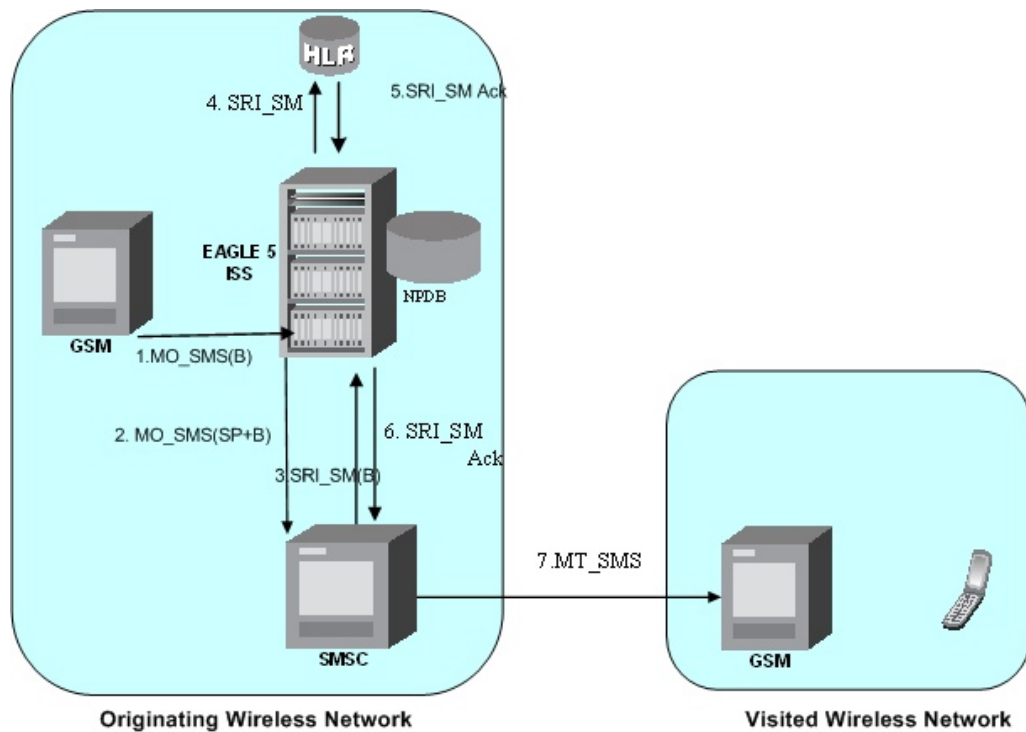
This section illustrates the sequence of messages that occur when a mobile operator delivers SMS messages in a number portability environment to:

- A called subscriber that is in the same network as the calling subscriber
- A called subscriber that is in a different network from the calling subscriber

 **Note:**

The MO-Based GSM SMS NP feature must be enabled and turned on before messages are processed as shown in this section.

**Figure 2-1 MO-Based GSM SMS NP Call Flow for In-Network Subscriber**



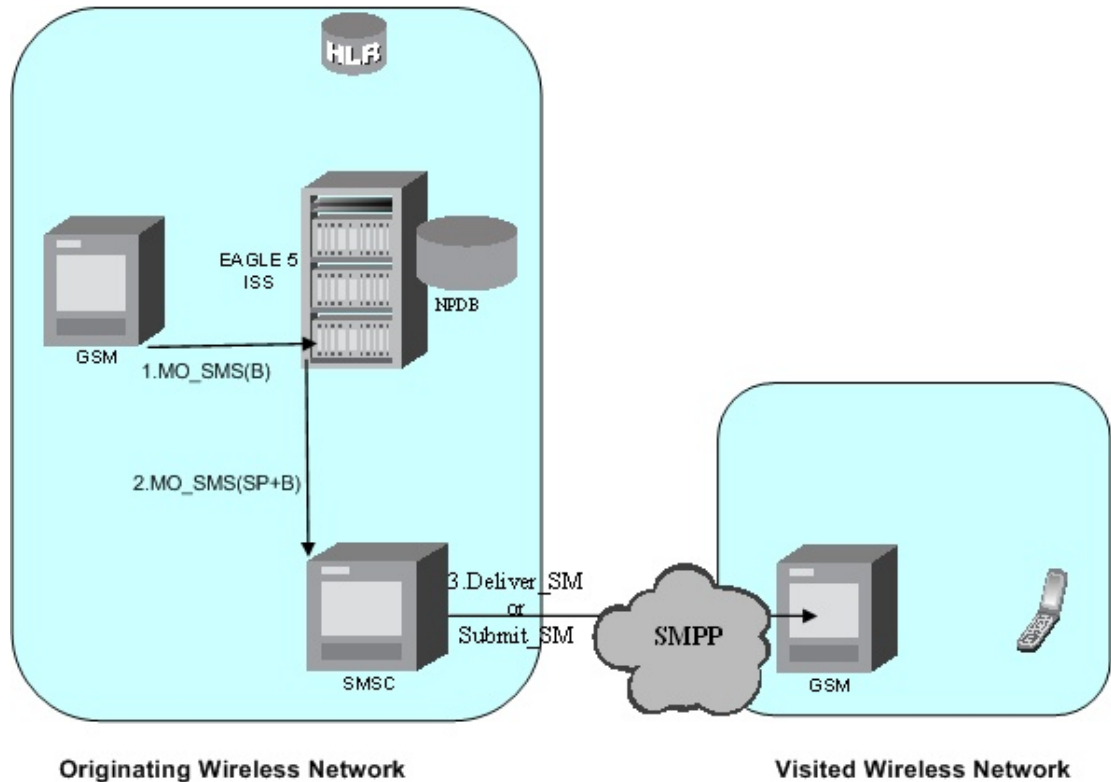
Call considerations:

- The TCAP calling party is a wireless GSM subscriber.
- The TCAP called party is a non-ported or ported-in wireless subscriber that belongs to the same carrier as the TCAP calling party.
- The call type is SMS.
- The SMSC (Short Message Service Center) has to remove the prefix that indicates that the DN (dialed number) is ported in.
- If the called subscriber is ported-in, it must be provisioned individually.

Message Flow:

1. MO\_SMS(B) - EAGLE intercepts SMS messages after they have undergone Prepaid Short Message Service Intercept (PPSMS) and Portability Check for Mobile Originated SMS (MNP SMS) processing and decodes the TCAP/MAP message destination address.
2. MO\_SMS(SP+B) - If successful, modify B-party Number and relay to SMSC.
3. SRI\_SM(B) - Send message to HLR to find B-party.
4. SRI\_SM - Send message to HLR to locate B-party.
5. SRI\_SM Ack - HLR sends message to EAGLE.
6. SRI\_SM Ack - EAGLE routes message to SMSC.
7. MT\_SMS - Deliver message to in-network subscriber.

Figure 2-2 MO-Based GSM SMS NP Call Flow for Other-Network Subscriber



Call considerations:

- The TCAP calling party is a wireless IS41 subscriber.
- The TCAP called party is a non-ported or ported-in wireless subscriber that belongs to a different carrier from the TCAP calling party.
- The call type is SMS.
- The SMSC (Short Message Service Center) has to remove the prefix that indicates that the DN (dialed number) is ported in. If the called subscriber is ported-out, it must be provisioned individually.

- If the called subscriber is TDMA, the EAGLE Migration feature ensures that the message gets delivered in the TDMA network.

Message Flow:

1. MO\_SMS(B) - EAGLE intercepts SMS messages after they have undergone Prepaid Short Message Service Intercept (PPSMS) and Portability Check for Mobile Originated SMS (MNP SMS) processing and decodes the TCAP/MAP message destination address.
2. MO\_SMS(SP+B) - If successful, modify B-party Number and relay to SMSC.
3. Deliver\_SM - Forward message or submit message other network.

## 2.6 MO-Based IS41 SMS NP

The **MO**-based IS41 SMS NP feature provides network information to the Short Message Service Center (**SMSC**) for subscribers using the IS41 network. This information allows the SMSC to select a protocol to deliver Short Message Service Delivery Point-to-Point (**SMDPP**) messages to the called party.

The MO-Based IS41 SMS NP feature:

- Intercepts SMDPP messages before they reach the SMSC
- Decodes the TCAP/MAP message destination address and performs lookup in the number portability (**NP**) database
- Modifies the destination address in the TCAP message with Directory Number (**DN**) porting information
- Relays the message to the SMSC

The SMSC uses the DN porting information to determine whether to forward the message to other operators or to process the message for an in-network subscriber.

The MO-Based IS41 SMS NP feature applies to TCAP SMDPP and ANSI or ITU transport (**MTP** and **SCCP**) messages.

### 2.6.1 Options

The MO-Based IS41 SMS NP feature provides configurable options for controlling the processing of **SMDPP** messages. These options specify the following:

- How to consider SMDPP destination address for processing
- Outbound digit format
- When an **RTDB** lookup is considered to be successful

### 2.6.2 Feature Control

The MO-Based IS41 SMS NP feature has the following feature control requirements:

- The feature part number is 893-0195-01
- The feature cannot be enabled if the LNP feature is enabled.
- A temporary FAK cannot be used to enable the feature.
- The feature cannot be turned off after it has been turned on.



## 2.6.3 MO-Based IS41 SMS NP Protocol Handling

After the MO-Based IS41 SMS NP feature has been enabled and turned on, it provides the following protocol handling:

- The MO-Based IS41 SMS NP feature traps the **SMDPP** message and performs **RTDB** lookup based on the TCAP SMS\_Destination\_Address or SMS\_Original\_Destination\_Address parameter. If MODAPARAM=DA, then SMS\_Destination\_Address is chosen. If MODAPARAM=ODA, then SMS\_Original\_Destination\_Address is chosen. If the entity type is the same as the value of the MOSMSTYPE option in the IS41SMSOPTS table (see [Table 2-2](#)), then the MO-Based IS41 SMS NP feature modifies the outgoing MO\_SMS based on the value of the MOSMSDNFMT option.
- When the outgoing SMDPP is modified, the NAI is based on the value of the MOSMSNAI parameter in the IS41SMSOPTS table.
- The MO-Based IS41 SMS NP feature performs **SCCPCDPAGTA** lookup against the **SMSC** list maintained by the **STP**. If the lookup is not successful, the **MSU** falls through to **GTT** handling.
- The number conditioning is based on the value of the MOSMSNAI option:
  - If MOSMSNAI=NAT, then the number is treated like a national number: **DEFCC** is prepended before performing lookup in the **RTDB**.
  - If MOSMSNAI=INTL, then the number is treated like an international number: this number is used for lookup in the **RTDB**.
  - If MOSMSNAI=NAI, then the conditioning is based on the NAI value from the TCAP part.
  - If MOSMSNAI=UNKNOWN, then a lookup in the CSL table is performed. The matching leading digits are deleted from the incoming digits, and the number is treated as a national number.
- For messages handled within this feature, the SCCP CDPA is always used to route the message.
- If the MOSMSTYPE=ALL and MOSMSDNFMT=RN and the **RTDB** lookup has no entity assigned to the **DN**, then the message is not modified.
- If the modified **SMDPP** message SMS\_Destination\_Address or SMS\_Original\_Destination\_Address digits are greater than 21, then the digits are not modified and the original message is routed to the **SMSC** based on **SCCPCDPA**.
- The MO-Based IS41 SMS NP feature considers a successful **RTDB** lookup with entitytype=RN and portabilitytype=0 to be entitytype=SP, if the IS41-to-GSM Migration feature is turned on or Service Portability is enabled. When the IS41-GSM Migration feature is enabled, entitytype=RN, and portabilitytype=0, the subscriber is considered to be migrated, and therefore is considered to be local (in-network, SP) for the MO-Based IS41 SMS NP feature.

## 2.6.4 MO-Based IS41 SMS NP Call Flows

This section illustrates the sequence of messages that occur when a mobile operator delivers SMS messages in a number portability environment to:

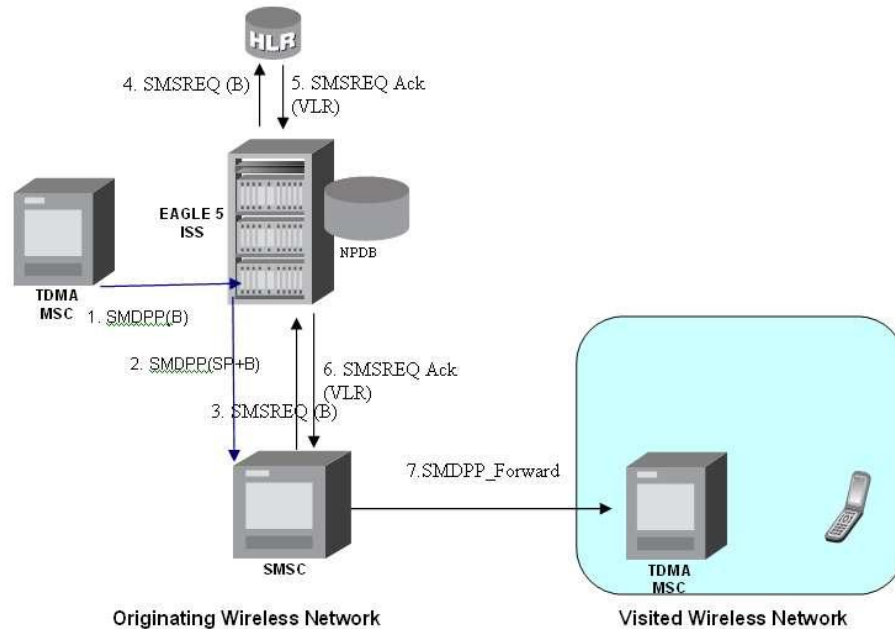
- A called subscriber who is in the same network as the calling subscriber

- A called subscriber who is in a different network from the calling subscriber

### MO-Based IS41 SMS NP Call Flow for In-Network Subscriber

Figure 2-3 depicts the message and control flows for a called subscriber who is in the same network as the calling subscriber.

Figure 2-3 MO-Based IS41 SMS NP Call Flow for In-Network Subscriber



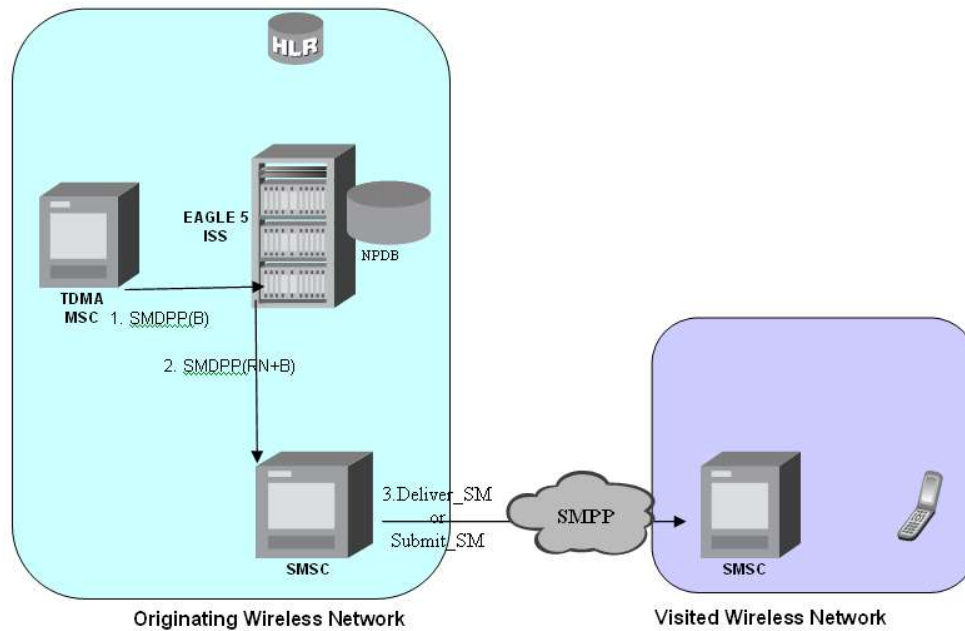
Call considerations:

- The TCAP calling party is a wireless IS41 subscriber.
- The TCAP called party is a non-porting or ported-in wireless subscriber that belongs to the same carrier as the TCAP calling party.
- The call type is SMS.
- The SMSC (Short Message Service Center) has to remove the prefix that indicates that the DN (dialed number) is ported in.
- If the called subscriber is ported-in, it must be provisioned individually.
- If the called subscriber is TDMA, the EAGLE IS41-to-GSM NP feature ensures that the message is delivered in the TDMA network.

### MO-Based IS41 SMS NP Call Flow for Other-Network Subscriber

Figure 2-4 depicts the message and control flows for a called subscriber who is in a different network from the calling subscriber.

Figure 2-4 MO-Based IS41 SMS NP Call Flow for Other-Network Subscriber



Call considerations:

- The TCAP calling party is a wireless IS41 subscriber.
- The TCAP called party is a non-ported or ported-in wireless subscriber that belongs to a different carrier from the TCAP calling party.
- The call type is SMS.
- The SMSC (Short Message Service Center) has to remove the prefix that indicates that the DN (dialed number) is ported in. If the called subscriber is ported-out, it must be provisioned individually.
- If the called subscriber is TDMA, the MO SMS IS41-to-GSM Migration feature ensures that the message is delivered in the TDMA network.

## 2.7 MO SMS IS41-to-GSM Migration

The MO SMS IS41-to-GSM Migration feature provides network information to the Short Message Service Center (SMSC) for subscribers using the IS41 network. This information allows the SMSC to select a protocol to deliver Short Message Service Delivery Point-to-Point (SMDPP) messages to the called party.

The MO SMS IS41-to-GSM Migration feature:

- Intercepts SMDPP messages before they reach the SMSC
- Decodes the TCAP/MAP message destination address and performs lookup in the number portability (NP) database

- Modifies the destination address in the TCAP message with Directory Number (**DN**) porting information or the IS412GSM Migration Prefix
- Relays the message to the SMSC

The SMSC uses the DN porting information to determine whether to forward the message to other operators or to process the message for an in-network subscriber.

The MO SMS IS41-to-GSM Migration feature applies to ANSI TCAP/MAP and ANSI or ITU transport (**MTP** and **SCCP**) messages.

## 2.7.1 Options

The MO SMS IS41-to-GSM Migration feature provides configurable options for controlling the processing of **SMDPP** messages. These options specify the following:

- How to consider SMDPP destination address for processing
- Outbound digit format
- When an **RTDB** lookup is considered to be successful

## 2.7.2 Feature Control

The MO SMS IS41-to-GSM Migration feature has the following feature control requirements:

- The feature part number is 893-0262-01
- The feature cannot be enabled if the LNP feature is enabled.
- A temporary FAK cannot be used to enable the feature.
- The feature can be turned off after it has been turned on.

## 2.7.3 System Options for MO SMS IS41-to-GSM Migration

The system level options in the IS41SMSOPTS table are used to perform number conditioning, response generation, and other feature-specific options. [Table 2-2](#) shows the options stored in the IS41SMSOPTS table, their possible values, and the action taken for each value for the MO SMS IS41-to-GSM Migration feature.

## 2.7.4 MO SMS IS41-to-GSM Migration Protocol Handling

After the MO SMS IS41-to-GSM Migration feature has been enabled and turned on, the feature provides the following protocol handling:

- The MO SMS IS41-to-GSM Migration feature traps the **SMDPP** message and performs RTDB lookup based on the TCAP SMS\_Destination\_Address or SMS\_Original\_Destination\_Address parameter. If MODAPARAM=DA, then SMS\_Destination\_Address is chosen. If MODAPARAM=ODA, then SMS\_Original\_Destination\_Address is chosen. If the entity type = SP and the portability type = 5 (migrated), then the MO SMS IS41-to-GSM Migration feature modifies the outgoing MO\_SMS based on the value of the MOSMSDNFMT option.
- When the outgoing SMDPP is modified, the NAI is based on the value of the MOSMSNAI parameter in the IS41SMSOPTS table.

- The MO SMS IS41-to-GSM Migration feature performs SCCP CDPA GTA lookup against the SMSC list maintained by the STP. If the lookup is not successful, the MSU falls through to GTT handling.
- The number conditioning is based on the value of the MOSMSNAI option:
  - If MOSMSNAI=NAT, then the number is treated like a national number: DEFCC is prepended before performing lookup in the RTDB.
  - If MOSMSNAI=INTL, then the number is treated like an international number: this number is used for lookup in the RTDB.
  - If MOSMSNAI=NAI, then the conditioning is based on the NAI value from the TCAP part.
  - If MOSMSNAI=UNKNOWN, then a lookup in the CSL table is performed. The matching leading digits are deleted from the incoming digits, and the number is treated as a national number.
- For messages handled within this feature, the SCCP CDPA is always used to route the message.
- If the modified SMDPP message SMS\_Destination\_Address or SMS\_Original\_Destination\_Address digits are greater than 21, then the digits are not modified and the original message is routed to the SMSC based on SCCP CDPA.

## 2.8 Portability Check for Mobile Originated SMS

The Portability Check for Mobile Originated SMS (**MNP SMS**) feature is designed to prevent subscriber use of an incorrect Short Message Service Center by filtering incoming messages based on **MAP** Operation Code. If the message is a MO Forward Short Message (**MOFSM**), the Mobile Subscriber Integrated Services Digital Network (**MSISDN**) number of the originating subscriber, or subscriber phone number, is used to search the G-Port Mobile Number Portability database.

When a mobile subscriber sends a Mobile Originated Short Message Service message (**MOSMS**) using a GSM handset, the message is first deposited in a Short Message Service Center (**SMSC**). The SMSC determines where the intended recipient, who is also a mobile subscriber, is located by querying the Home Location Register (**HLR**) of the recipient to determine the current Mobile Switching Center (**MSC**) of the recipient.

The SMSC address to which a message is routed is programmed into the GSM mobile handset. After a subscriber ports to another network, the handset is reprogrammed with the SMSC address for the new network; however, the subscriber could change the SMSC address to the address of the former network, causing Short Message Service (**SMS**) messages to be sent incorrectly to the former network SMSC of the subscriber. Because the former network would not have billing records for the ported-out subscriber, the subscriber would receive free SMS service.

If a match is found in the G-Port Mobile Number Portability database to indicate that the subscriber has been ported-out, the EAGLE 5 ISS uses the destination SMSC address obtained from the SCCP CdPA to search a list of home network SMSC addresses. If a match is found to indicate that the ported-out subscriber is attempting to send a short message using the SMSC of the subscriber's former network, the message is discarded. An error message is generated and returned to the originating MSC.

### Portability Check for Mobile Originated SMS Call Flow

The MAP\_FORWARD\_SHORT\_MESSAGE (FSM), in the following Call Flow example is used to carry a text message (short message) being transmitted from the mobile handset of one subscriber to the mobile handset of another subscriber. In practice, the short message is delivered first to the Short Message Service Center (SMSC) of the sending subscriber, and then the SMSC is responsible for sending the short message to the intended recipient.

Refer to the following steps in the flow for this call.

The EAGLE 5 ISS will perform the following with respect to MNP SMS Feature functionality.

1. The EAGLE 5 ISS receives an **UDT** message.
2. EAGLE 5 ISS checks whether the service selector value is `smsmr`. If the service selector matches `smsmr`, continue to the next step. If the service selector is not `smsmr`, the message falls through to GTT (#12).
3. The MAP OpCode is examined. If the OpCode is `MO_FSM`, PPSMS processing continues with the next step. If the OpCode is not `MO_FSM`, the message falls through to GTT (#12).
4. If the PPSMS feature is on, the message falls through to PPSMS processing (#8). If the PPSMS feature is not on, processing continues with the next step.
5. If the MNP SMS feature is on, the Mobile Subscriber Integrated Services Digital Network (MSISDN) number is used to search the G-Port Mobile Number Portability subscriber database. If the MNP SMS feature is not on, the message falls through to GTT (#12).
6. If the MSISDN Number is found in the PDB/DN table, then the portability type of the subscriber is checked for *Not Known to be Ported (0)* / *Ported-out (1)* / *FNPTFN (2)* / *Not identified to be ported (36)* and processing continues. If the MSISDN Number is not found in the PDB/DN table, the message falls through to GTT (#12). If the portability type is in the range of *Prepaid1 (3)* to *Prepaid32 (35)*, the message falls through to GTT (#12).
7. The SCCP CdPA Address is used to search the list of home network SMSC addresses. If a match is found, the ported-out subscriber is fraudulently attempting to send SMS using the SMSC of the old network. The message is discarded; UIM #1129 is issued; an error message is generated and returned to the originating MSC, and the message falls through to #15. If the message is not on the list, the message falls through to GTT (#12).
8. If the message is from one of the IN Platforms (PPSMS Servers), The message exits from MNP SMS feature functionality and falls through to PPSMS processing (#14). If the message is not from one of the PPSMS Servers, processing continues to the next step.
9. The MSISDN number (phone number) of the originating subscriber is used to search the G-Port Mobile Number Portability subscriber database. If the MSISDN Number is found in the PDB/DN table, then continue to the next step. Otherwise, exit from MNP SMS feature functionality and continue with Normal GTT processing (#12).
10. Check the portability type of the subscriber. If the portability type matches the range of *Prepaid1 (3)* to *Prepaid32 (35)*, go to #14; otherwise, continue with the next step.

11. If the subscriber portability type is *Not Known to be Ported (0) /Ported-out (1) / FNPTFN (2) /Not identified to be ported (36)* and MNP SMS feature is also ON, then go to #7. Otherwise, exit from MNP SMS feature functionality and continue with Normal GTT processing.
12. Exit from MNP SMS feature functionality and continue with existing processing for other services or GTT.
13. Exit from MNP SMS feature functionality and continue with existing processing for G-Port.
14. Exit from MNP SMS feature functionality and continue with existing processing for PPSMS.
15. Exit from MNP SMS feature functionality.

## 2.9 Prepaid Short Message Service Intercept

Prepaid Short Message Service Intercept (PPSMS) is applicable to the A-Party (MSISDN) and B-Party (TP-DA of SM-RP-UI) sides of the GSM Forward Short Message. Refer to *Database Administration - GTT User's Guide* for information about the Prepaid Short Message Service Intercept feature for B-Party.

PPSMS performs the following main functions:

### Message Discrimination

PPSMS uses the G-Port message selection methods to determine whether the message should receive PPSMS/G-Port service versus GTT.

If the incoming selectors match a SRVSEL entry and the entry has SERV=SMSMR, PPSMS is performed. If no match is found in SRVSEL table then GTT is performed. If the SSN is for HLR, G-Port is performed. If the SSN is for MSC, PPSMS is performed, and if the SSN is for neither, GTT is performed. Next, the MAP Operation Code received in the message is examined. Only Mobile originated forward short message calls receive PPSMS service. Other messages fall through to GTT. After MAP operation code discrimination, PPSMS provides discrimination based on SCCP CgPA GTA digits. This allows the operator to decide whether messages from certain CgPAs will receive PPSMS service or fall through to GTT, even if the messages meet all of the previous service selection criteria.

### Number Conditioning

The **RTDB** stores international MSISDNs only. The received **MSISDN** number or SCCP CdPA digits may need to be converted to an international number to do a database lookup.

When **PPSMS** is required to be performed on a message and the number is not international (that is, the NAI of MSISDN number is "National (Significant) Number" or "Subscriber Number"), the National/Local to International number conditioning is triggered.

For a National (Significant) Number, the received MSISDN digits are prepended with the default country code and for a Subscriber number, the MSISDN digits are prepended with the default country code and the default network code. If the NAI is neither International or Subscriber, the message is treated as National.

### Prepaid Screening

Once the number is conditioned, the PPSMS feature performs a database search to determine if the MSISDN belongs to a prepaid subscriber. This is determined by the portability type field associated with the database entry for the MSISDN. PPSMS performs



the database lookup using the international MSISDN. The individual number database is searched first, and if the number is not found, then the number range database is searched. If a match is not found in individual nor range-based database, then GTT is performed on the message. In case of MSISDN numbers in the PPSMS database being odd and the last digit of the decoded MSISDN from the FSM being 'zero', PPSMS first performs a database lookup once using the even number. If no match is found, then PPSMS performs the database lookup again, now using the odd number (without last digit).

### Message Relay to IN Platform

If the database search determines that the subscriber is prepaid, the message is redirected to one of the two IN platforms using the translation data in the PPSOPTS table. If the routing indicator in the IN platform translation data is route-on-SSN, the mated application table is accessed to determine the point code/subsystem status for the IN platform, and if it has a mate. The SCCP CdPA GTA should not be changed as a result of this operation. If the RI in the translation data indicates route-on-GT, and if the Intermediate GTTLoad Sharing feature is turned on, the Mated Relay Node (MRN) table is accessed to determine the point code status and if the IN platform has a mate. Subsystem status is not maintained in the mated relay node.

### Prepaid Short Message Service Intercept Message Handling

Prepaid Short Message Service Intercept (PPSMS) performs message handling in the following steps.

1. The message arrives at the EAGLE route-on-gt. The EAGLE decodes the SCCP portion and uses the data to perform the G-Port selection based on the CdPA NP, NAI, TT, SSN, and GTI. The result of the selection provides a service indicator. The service indicator is SMSMR if PPSMS is required. If a SMSMR selector does not match the incoming GT fields, the message is passed on for GTT selection.
2. If #1 indicates PPSMS is required, and the message is not a UDTS generated by EAGLE, the EAGLE performs PPSMS service.
3. If the message is a UDTS generated by the EAGLE, then regular GTT is performed on the message.
4. If the EAGLE receives a UDTS message from another node, it is treated in the same manner as any other message. If GTT is indicated, then the UDTS translation is based on the CdPAGTA, and the message is routed to the translated address. If GTT is not indicated, the UDTS is through switched via MTP routing. The one exception is that if translation fails on the UDTS, the EAGLE will not generate another UDTS to send to the originator of the UDTS that failed.
5. The TCAP/MAP portion of the message is decoded by PPSMS. If the message is not a TC\_BEGIN, the message falls through to GTT.
6. If the message is a TC\_BEGIN, PPSMS decodes the Operation Code of the MAP message to distinguish MO\_FSMs from the rest. If the OpCode is not FSM (MAP version 1 or 2) or MO\_FSM (MAP version 3), the message falls through to GTT.
7. If the OpCode is FSM (MAP version 1 or 2) or MO\_FSM (MAP version 3), the MAP portion of the message is decoded and searched for a MSISDN tag. If a MSISDN tag is not found, the message falls through to GTT. For version 3 MO\_FSMs, the SMRPOA parameter would contain the MSISDN tag. For version 1 or 2 FSMs, a MSISDN tag is found if the message is mobile originated. If it is mobile terminated, a MSISDN tag is not found and the message falls through to GTT.



8. If the MSISDN is found in #7, the SCCP CgPA GTA is compared to the IN platform GTAs provisioned in the PPSOPTS table. If the decoded GTA matches one of the IN platform Gas, the message falls through to GTT.
9. If the SCCP CgPA GTA in #8 does not match any of the IN platform GTAs, the MSISDN from the MAP portion is decoded and conditioned to an international number before performing the lookup. The number conditioning is based on NAI of MSISDN parameter. The number is converted to an international number, if necessary.
10. The database lookup is performed in two parts:
  - The exception or individual number database is searched for a match. If the match is found, the data associated with this entry is considered.
  - If the conditioned number is absent in the exception database, the number range database is searched. If the match is found, the data associated with this range entry is considered. If the search is unsuccessful, the result is no match.

In case of MSISDN numbers in the PPSMS database being odd and the last digit of the decoded MSISDN from the FSM being 'zero', PPSMS first performs database lookup once using the even number. If no match is found then PPSMS performs the database lookup again, using the odd number (without last digit).
11. If a number match is found as a result of the search, the portability type field associated with the entry is examined.
  - If the portability type is in the range of *Prepaid1* to *Prepaid32*, the IN platform translation information (PC and RI) associated with that type is retrieved from the GSM options. If the RI is SSN, the information is used to access the mated application (MAP) table for point code status and to see if the selected IN platform is in a load sharing relationship with another. If the RI is GT, and if the IGTTLoad Sharing feature is on, the mated relay node table is used for this purpose. If the point code is available, the message is routed the IN platform. If the point code is in a load sharing relationship with other point codes, messages are equally divided between them.
  - If the portability type is not in the range of *Prepaid1* to *Prepaid32*, the message falls through to GTT.
12. If a number match is not found as a result of the search in #10, the message falls through to GTT.

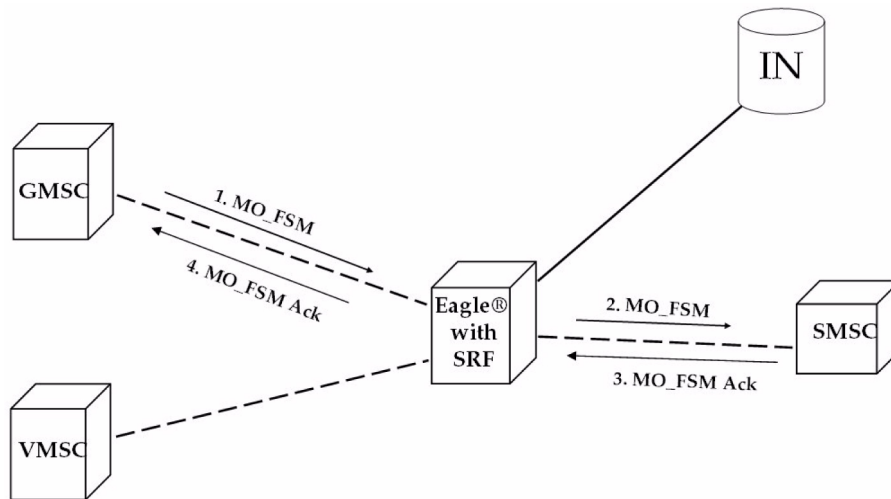
## 2.9.1 Prepaid Short Message Service Intercept Call Flows

The MAP\_FORWARD\_SHORT\_MESSAGE (**FSM**), in the following Call Flow examples is used to carry a text message (short message) being transmitted from the mobile handset of one subscriber to the mobile handset of another subscriber. In practice, the short message is delivered first to the Short Message Service Center (SMSC) of the sending subscriber, and then the SMSC is responsible for sending the short message to the intended recipient.

### Successful Delivery of Mobile Originated FSM from Contract/Postpaid Subscriber

Refer to [Figure 2-5](#) for the steps in the flow for this call.

**Figure 2-5 Successful Delivery of MO\_FSM from Contract Subscriber**



1. The Gateway Mobile Switching Center (**GMSC**) sends the Mobile Originated Forward Short Message (**MO\_FSM**) to the EAGLE with PPSMS (TCBEGIN). Based on **MTPDPC = EAGLE** point code and **SCCP CdPA TT, NP, NAI, SSN, and GTI**, the message is pre-selected for PPSMS service. If service is not PPSMS, the message falls through to GTT.)

Next, the MAP OpCode and SCCP **CgPA GTA** are examined. The OpCode is **MO\_FSM** and the **CgPAGTA** is not from one of the **IN** platforms, therefore, PPSMS processing continues. (If the OpCode is not **MO\_FSM**, or if CgPA GTA is for one of the IN platforms, the message falls through to **GTT**.)

The EAGLE queries the **DB** using the sender's MSISDN from the OA field in the MAP portion of message.

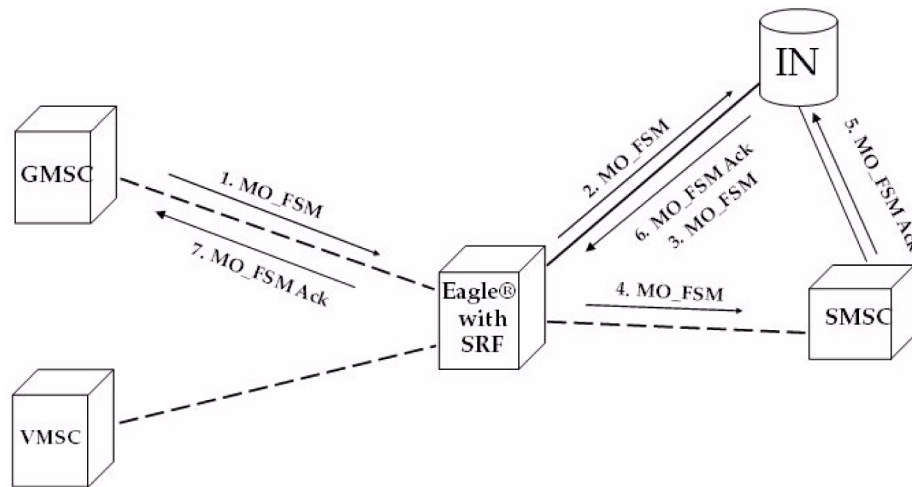
MSISDN is present in the database, but the portability type is not in the range of *prepaid1* to *prepaid32*, meaning the sender is not a prepaid subscriber.

2. The EAGLE therefore GTT-routes the **MO\_FSM** to the **SMSC** (TCBEGIN).
3. The **SMSC** returns the **MO\_FSM\_ack** (TCEND).
4. One of two possibilities:
  - a. The SMSC sends the **MO\_FSM\_ack** route-on-**SSN** to the GMSC, then the SRF will simply MTP route the **MO\_FSM\_ack** to the GMSC. G-Port is not involved.
  - b. The SMSC sends the **MO\_FSM\_ack** route-on-GT, and the service selectors indicate G-Port/PPSMS. CdPA SSN = GMSC, which is same as SMSC, so PPSMS is selected. As PPSMS decodes message, it discovers it is a TCEND. Therefore, the message falls through to normal GTT and is routed to the GMSC.

### Successful Delivery of Mobile Originated FSM from Prepaid Subscriber

Refer to [Figure 2-6](#) for the steps in the flow for this call.

**Figure 2-6 Successful Delivery of Mobile Originated FSM from Prepaid Subscriber**



1. The Gateway Mobile Switching Center (GMSC) sends the Mobile Originated Forward Short Message (MO\_FSM) to the EAGLE with PPSMS (**TCBEGIN**). Based on MTPDPC = EAGLE point code and SCCP **CdPA TT, NP, NAI, SSN, and GTI**, the message is pre-selected for PPSMS service. If service is not PPSMS, the message falls through to GTT.

Next, the **MAP OpCode** and **SCCP CgPA GTA** are examined. The OpCode is MO\_FSM and the CgPAGTA is not from one of the **IN** platforms, therefore, PPSMS processing continues. If OpCode is not MO\_FSM, or if CgPA GTA is for one of the IN platforms, the message falls through to GTT.

The EAGLE queries the DB using sender's MSISDN from **SM RP OA** field in MAP portion of message.

**MSISDN** is present in the database, and the portability type is *prepaid1*, meaning the sender is a prepaid subscriber.

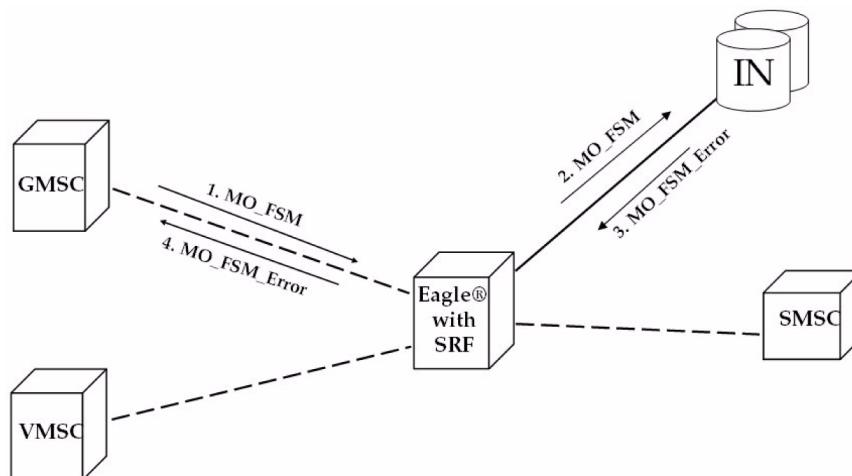
2. The EAGLE forwards the MO\_FSM to the IN Platform (TCBEGIN) associated with *prepaid1*, after checking mated application or mated relay node table. The portability types *prepaid1* through *prepaid32* are used to select which of the IN platforms the message should be sent.
3. The IN Platform checks the account, finds there is enough credit to send the message, opens a new TCAP dialogue, and returns the MO\_FSM to the SRF (TCBEGIN-2).
4. The message arrives at EAGLE and is again selected for PPSMS service based on CdPATT, NP, NAI, GTI, and CdPA SSN = SMSC. The OpCode is MO\_FSM but the SCCP CgPA GTA is IN platform, therefore, PPSMS service is not indicated and the message falls through to GTT and is routed to the SMSC.
5. The SMSC returns the MO\_FSM\_ack to the IN platform (TCEND-2). There are two possibilities:
  - a. The SMSC sends the MO\_FSM\_ack route-on-SSN to the IN platform, then the SRF will simply MTP route the MO\_FSM\_ack to the IN platform. G-Port is not involved.
  - b. The SMSC sends the MO\_FSM\_ack route-on-GT, and the service selectors indicate G-Port/PPSMS. CdPA SSN = GMSC, which is same as SMSC, so PPSMS is selected. As PPSMS decodes the message, it discovers it is a TCEND. Therefore, the message falls through to normal GTT and is routed to the GMSC.

6. The IN Platform transfers the MO\_FSM\_ack to the first transaction and returns the MO\_FSM\_ack to the SRF (TCEND).
7. One of two possibilities:
  - a. The IN platform sends the MO\_FSM\_ack route-on-SSN to the GMSC, then the SRF will simply MTP route the MO\_FSM\_ack to the GMSC. G-Port is not involved.
  - b. The IN platform sends the MO\_FSM\_ack route-on-GT, and the service selectors indicate G-Port/PPSMS. CdPA SSN = GMSC, which is same as SMSC, so PPSMS is selected. PPSMS decodes message, discovers it is a TCEND, and the message falls through to normal GTT and is routed to the GMSC.

### Unsuccessful Delivery of Mobile Originated FSM from Prepaid Subscriber - Credit Check Failure

Refer to [Figure 2-7](#) for the steps in the flow for this call.

**Figure 2-7 Unsuccessful Delivery of Mobile Originated FSM from Prepaid Subscriber at SCP**



1. The Gateway Mobile Switching Center (GMSC) sends the Mobile Originated Forward Short Message (MO\_FSM) to the EAGLE with PPSMS (TCBEGIN). Based on MTPDPC = EAGLE point code and SCCP CdPA TT, NP, NAI, and GTI, the message is pre-selected for PPSMS service. If service is not PPSMS, the message falls through to GTT.

Next, the MAP OpCode and SCCP CgPA GTA are examined. The OpCode is MO\_FSM and the CgPAGTA is not from one of the IN platforms, therefore, PPSMS processing continues. If the OpCode is not MO\_FSM, or if CgPA GTA is for one of the IN platforms, the message falls through to GTT.

The EAGLE queries the DB using sender's MSISDN from the SM RP OA field in the MAP portion of message.

MSISDN is present in the database, and the portability type is *prepaid1*, meaning the sender is a prepaid subscriber.

2. The EAGLE forwards the MO\_FSM to the IN Platform (TCBEGIN) associated with *prepaid1*. The portability types *prepaid1* through *prepaid32* are used to select to which of the IN platforms the message should be sent.
3. The IN Platform checks the account, finds there is not enough credit to send the message, and rejects the message by returning a **MO\_FSM\_Neg\_Response** to the SRF (TCEND).
4. One of two possibilities:
  - a. The IN platform sends the MO\_FSM\_Neg\_Response route-on-SSN, then the SRF will simply MTP route the MO\_FSM\_Neg\_Response to the GMSC. G-Port is not involved.
  - b. The IN platform sends the MO\_FSM\_Neg\_Response route-on-GT, and the service selectors indicate G-Port/PPSMS. CdPA SSN = GMSC, which is same as SMSC, so PPSMS service is selected. PPSMS decodes message, discovers it is a TCEND, and the message falls through to normal GTT and is routed to the GMSC.

## 2.10 Numbering Plan Processor for MO SMS Features

Numbering Plan Processor for MO SMS features (MO SMS NPP) provides comprehensive NPP number conditioning and service logic execution for MO SMS features that support the GSM and IS41 protocols. The MO SMS features can be selected and sequenced as required without repetitive number conditioning functions. NPP resolves complex number conditioning using a flexible provisioning logic. For detailed information about NPP, refer to *Numbering Plan Processor (NPP) Overview*.

Numbering Plan Processor for MO SMS features (MO SMS NPP) supports the following features:

- MO-Based GSM SMS NP
- MO-Based IS41 SMS NP
- MO SMS IS41-to-GSM Migration
- Portability Check for MO SMS (MNP SMS)
- Prepaid SMS Intercept (PPSMS)
- MO SMS Additional Subscriber Data (MO SMS ASD)
- MO SMS Generic Routing Number (MO SMS GRN)
- Service Portability (S-Port)

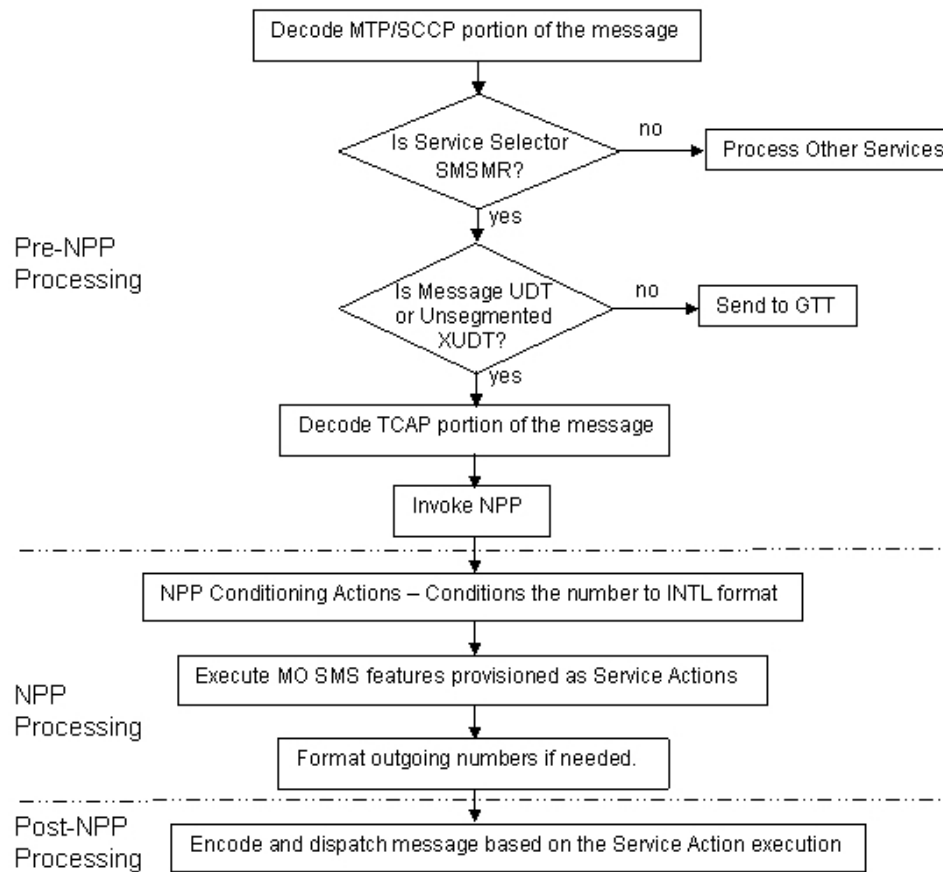
### MO SMS NPP Message Processing

After decoding the MTP and SCCP portion of the MSU, the system verifies whether the SCCP parameters of the message match any of the provisioned Service Selectors. If the Service Selector = `smsmr`, MO SMS processing begins. The TCAP portion of the message is decoded.

NPP-related functions are performed next. The incoming Called Party Number or Calling Party Number is conditioned to international format using Conditioning Actions. All Service Actions provisioned for the NPP Services are performed after verifying whether the feature is enabled and turned on.

After the NPP service functions are completed, the message is directed to post-NPP processing. The message is encoded and dispatched. If the message is redirected to Global Title Translation (GTT), translation can be performed based on the SCCP Called Party Address digits or the TCAP Called Party Number.

**Figure 2-8 MO SMS NPP Message Processing**



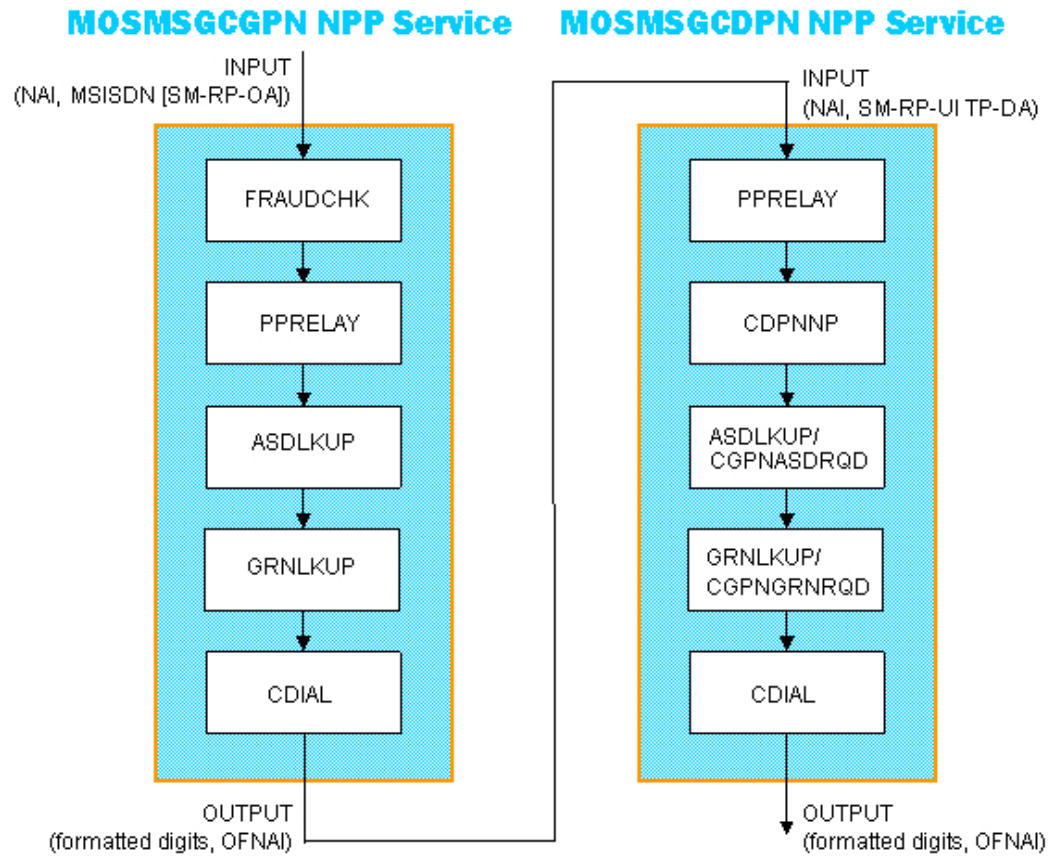
### NPP Processing

NPP processing supports both GSM Forward Short Message Mobile Originated (MO) messages and IS41 SMDPP messages. GSM protocol supports MO-Based GSM SMS NP, Portability Check for MO SMS, and Prepaid SMS Intercept. IS41 protocol supports MO-Based IS41 SMS NP and MO SMS IS41-to-GSM Migration features.

### NPP processing for GSM

NPP processing performed for GSM protocol and possible Service Actions that can be provisioned are shown in [Figure 2-9](#). GSM protocol supports two NPP Services: MOSMSGCDPN for processing Called Party Numbers and MOSMSGCGPN for processing Calling Party Numbers. The Calling Party Number is processed first. The Calling Party Number is the MSISDN digits of the SM-RP-OA parameter of the Forward Short Message. The Called Party Number is processed second. The Called Party Number is the TP-DA digits of the SM-RP-UI parameter of the message being processed.

Figure 2-9 MO SMS NPP - GSM NPP Processing

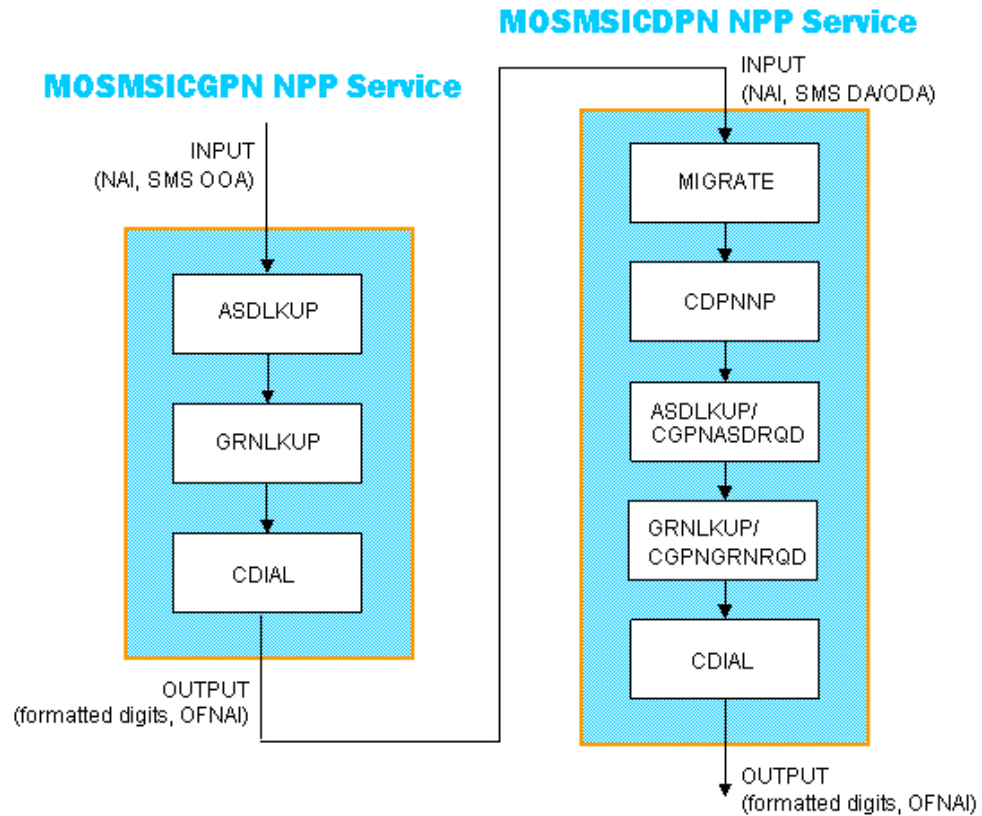


**NPP processing for IS41**

NPP processing performed for IS41 protocol and possible Service Actions that can be provisioned are shown in [Figure 2-10](#). IS41 protocol supports two NPP Services: MOSMSICDPN for processing Called Party Numbers and MOSMSICGPN for processing Calling Party Numbers. The Calling Party Number is processed first. The Calling Party Number is the Original Originating Address (OOA) digits of the message. The Called Party Number is processed second. The Called Party Number can be either the Destination Address (DA) or Original Destination Address (ODA) parameter of the message being processed.



Figure 2-10 MO SMS NPP - IS41 Processing



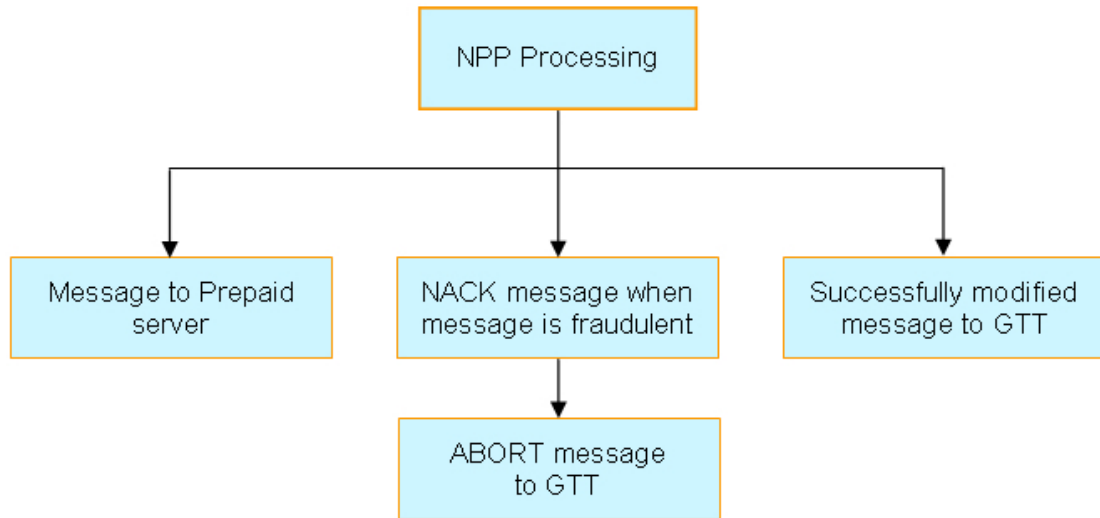
### Post-NPP Processing

After conditioning the number, performing Service Actions, and formatting the number passed to NPP, the decoded message is encoded and sent to the correct module or destination for further processing. For IS41 protocol, only two features are supported and the message falls through to GTT. For GSM protocol, several dispositions are possible:

- The message can be sent to a Prepaid Server after PPRELAY Service Action processing.
- The message can be NACK if the FRAUDCHK Service Action determines that the message is fraudulent.
- The message can fall through to GTT after CDPNNP Service Action processing.



**Figure 2-11 Post-NPP Processing**



**RTDB Lookup for NPP Services**

An entry for a conditioned number can be found in either an Individual DN RTDB Table or a range DN RTDB Table. If an entry is found in the Individual DN RTDB Table, the range DN table is not searched. An Individual DN Table entry has precedence over a range DN Table entry. Most NPP Service Actions require an RTDB Lookup result. For a given NPP Service, RTDB Lookup is performed only once. This RTDB Lookup is performed by the first Service Action that needs an RTDB Lookup result.

**2.10.1 NPP Provisioning**

Numbering Plan Processing (NPP) provides number conditioning and service logic execution for the following MO SMS-related features:

- Mobile Originated Based GSM SMS Number Portability (MO-Based GSM SMS NP)
- Mobile Originated Based IS41 SMS Number Portability (MO-Based IS41 SMS NP)
- Mobile Originated SMS IS41-to-GSM Migration (MO SMS IS-41-to-GSM Migration)
- Portability Check for Mobile Originated SMS (MNP SMS)
- Prepaid Short Message Service Intercept (PPSMS)
- Mobile Originated Additional Subscriber Data (MO SMS ASD)
- Mobile Originated Generic Routing Number (MO SMS GRN)

**NPP Services**

The NPP Service in the first column of [Table 2-3](#) must be provisioned before turning on the MO SMS-related feature in the second column for the feature to be functional.

**Table 2-3 Required NPP Services**

Feature	NPP Service
MO-Based GSM SMS NP	MOSMSGCDPN

**Table 2-3 (Cont.) Required NPP Services**

Feature	NPP Service
MO-Based IS41 SMS NP	MOSMSICDPN
MO SMS IS-41-to-GSM Migration	MOSMSICDPN
MNP SMS	MOSMSGCGPN
PPSMS	MOSMSGCDPN and MOSMSGCGPN
MO SMS ASD	MOSMSGCDPN, MOSMSGCGPN, MOSMSICDPN, and MOSMSICGPN
MO SMS GRN	MOSMSGCDPN, MOSMSGCGPN, MOSMSICDPN, and MOSMSICGPN

The NPP Services to process Called Party and Calling Party Numbers in GSM and IS41 protocols are described below:

- MOSMSGCDPN - NPP Service to process the Called Party Number of the SM-RP-UI TP-DA parameter of SMS-SUBMIT or SMS-COMMAND GSM Forward Short Message.
- MOSMSGCGPN - NPP Service to process the Calling Party Number MSISDN SM-RP-OA parameter of SMS-SUBMIT or SMS-COMMAND GSM Forward Short Message.
- MOSMSICDPN - NPP Service to process the Called Party Number SMS-DA or SMS-ODA parameter of the IS41 SMDPP message.
- MOSMSICGPN - NPP Service to process the Calling Party Number SMS-OOA parameter of the IS41 SMDPP message. Currently, no MO SMS features exist which use this NPP Service.

### Service Actions

The NPP Service Actions supported by MO SMS NPP are shown in [Table 2-4](#). The precedence and applicability of the service actions are specified for each NPP Service.

**Table 2-4 Supported Service Actions**

Service Action	MOSMSGCDPN	MOSMSGCGPN	MOSMSICDPN	MOSMSICGPN
ASDLKUP	50	50	50	50
CDIAL	10	10	10	10
CDPNNP	60	n/a	60	n/a
CGPNASDRQD	50	n/a	50	n/a
CGPNGRNRQD	50	n/a	50	n/a
FRAUDCHK	n/a	90	n/a	n/a
GRNLKUP	50	50	50	50
MIGRATE	n/a	n/a	70	n/a
PPRELAY	80	80	n/a	n/a

**Table 2-5 Service Action Value Definitions by NPP Service**

Service Action Value	MOSMSGCDPN	MOSMSGCGPN	MOSMSICDPN	MOSMSICGPN
ASDLKUP	Populates ASD FA with ASD data received from DN RTDB Lookup	Populates ASD FA with ASD data received from DN RTDB Lookup	Populates ASD FA with ASD data received from DN RTDB Lookup	Populates ASD FA with ASD data received from DN RTDB Lookup
CDIAL	Performs corrective dialing	Performs corrective dialing	Performs corrective dialing	Performs corrective dialing
CDPNNP	Performs CdPN RTDB Lookup and determines whether ported	-	Performs CdPN RTDB Lookup and determines whether ported	-
CGPNASDRQ D	Populates ASD FA with CgPN ASD data if available from CgPN RTDB Lookup by MOSMSGCGPN	-	Populates ASD FA with CgPN ASD data if available from CgPN RTDB Lookup by MOSMSICGPN	-
CGPNGRNRQ D	Populates GRN FA with CgPN GRN data if available from CgPN RTDB Lookup by MOSMSGCGPN	-	Populates GRN FA with CgPN GRN data if available from CgPN RTDB Lookup by MOSMSICGPN	-
FRAUDCHK	-	Performs CgPN RTDB Lookup and discards message if the subscriber is fraudulent	-	-
GRNLKUP	Populates GRN FA with GRN data received from DN RTDB Lookup	Populates GRN FA with GRN data received from DN RTDB Lookup	Populates GRN FA with GRN data received from DN RTDB Lookup	Populates GRN FA with GRN data received from DN RTDB Lookup
MIGRATE	-	-	Performs CdPN RTDB Lookup and determines whether migrated	-
PPRELAY	Performs CdPN RTDB Lookup and redirects message to prepaid subscriber if CdPN is prepaid	Performs CdPN RTDB Lookup and redirects message to prepaid subscriber if CdPN is prepaid	-	-

### Conditioning Actions

#### ACCgPN Conditioning Action

In addition to the general Conditioning Actions available in the **NPP** feature, the ACCgPN Conditioning Action is supported by the MOSMSGCDPN and MOSMSICDPN NPP Services.

ACCgPN (Area Code from **CgPN**) extracts the Called Party Number (**CdPN**) area code information from the Calling Party Number (CgPN). The ACCgPN Conditioning Action skips DEFCC length from the international number and removes the number of digits specified in

the SCCPOPTS ACLEN configuration option from the beginning of the CgPN. These digits are used as the Area Code (**AC**) to condition the Called Party digits for any subsequent Service Action or Formatting Action.

If the ACCgPN Conditioning Action is invoked, but the Calling Party is not present or has fewer digits than the SCCPOPTS ACLEN option value after any CC digits, then no change to Area Code is made.

The ACCgPN Conditioning Action can be provisioned with the MOSMSGCDPN and MOSMSICDPN NPP Services. The ACCgPN Conditioning Action is mutually exclusive with the ACCgPNx Conditioning Actions and with any other Conditioning Action used to populate the AC (Area Code) Formatting Action value for NPP.

**Table 2-6 ACCgPN Conditioning Action**

Conditioning Action	Description
ACCgPN	Area Code extracted from Calling Party Number (CgPN)

**ACCgPN1 through ACCgPN8 Conditioning Actions**

The ACCgPN1 - ACCgPN8 (ACCgPNx) Conditioning Actions to extracts the Area Code from the Calling Party Number (**CgPN**) while processing Called Party Number (**CdPN**) services. The length of the Area Code to be extracted from the CgPN is not specified by SCCPOPTS:ACLEN configuration parameter. Instead, the digit suffix "x" of the Conditioning Action parameter name specifies the length of the Area Code to be extracted. For example, the Conditioning Action ACCgPN4 will extract an Area Code of 4 digits from the CgPN. The ACCgPNx Conditioning Actions skip any Country Code digits (matching DefCC or Multiple **CC**) and remove the specified "x" number of Area Code (AC) digits.

If an ACCgPNx Conditioning Action is invoked, but the Calling Party is not present or has fewer digits than the specified "x" number of digits after any CC digits, then no change to Area Code is made.

The ACCgPNx Conditioning Actions can be provisioned with the MOSMSGCDPN and MOSMSICDPN NPP Services. The ACCgPNx Conditioning Actions are mutually exclusive with each other, with the ACCgPN Conditioning Action, and with any other Conditioning Action used to populate the AC (Area Code) Formatting Action value for NPP.

**Table 2-7 ACCgPNx Conditioning Actions**

Conditioning Action	Description
ACCgPN1	Area Code from Calling Party Number: one-digit Area Code extracted
ACCgPN2	Area Code from Calling Party Number: two-digit Area Code extracted
ACCgPN3	Area Code from Calling Party Number: three-digit Area Code extracted
ACCgPN4	Area Code from Calling Party Number: four-digit Area Code extracted
ACCgPN5	Area Code from Calling Party Number: five-digit Area Code extracted

**Table 2-7 (Cont.) ACCgPNx Conditioning Actions**

Conditioning Action	Description
ACCgPN6	Area Code from Calling Party Number: six-digit Area Code extracted
ACCgPN7	Area Code from Calling Party Number: seven-digit Area Code extracted
ACCgPN8	Area Code from Calling Party Number: eight-digit Area Code extracted

**Formatting Actions**

In addition to the general Formatting Actions available in the NPP feature, the following Formatting Actions support MO SMS NPP.

- RNOSPODN - RN or SP value, if RN or SP was found in RTDB Lookup; Otherwise, the Conditioning Action DNx is used for this Formatting Action value.
- RNOSPOZN - RN or SP value, if RN or SP was found in RTDB Lookup; Otherwise, the Conditioning Action SNx is used for this Formatting Action value.
- RNOSPOSN - RN or SP value, if RN or SP was found in RTDB Lookup; Otherwise, the Conditioning Action ZNx is used for this Formatting Action value.

**Note:**

CgPN is not modified by any MOSMS NPP feature.

## 2.11 Service Portability for Mobile Originated SMS

Service Portability (S-Port) supports MO-based IS41 SMS NP for IS41 SMDPP message processing and MO-based GSM SMS NP for GSM Forward Short Message Mobile Originated message processing. S-Port applies to the messages selected for number portability processing which are destined for own-network GSM or IS41 subscribers. The SPORTTYPE option indicates whether Service Portability processing applies to the messages.

The CDPNNP Service Action includes Number Portability and Service Portability functionality. Because the CDPNNP Service Action requires the MO-based IS41 SMS NP or the MO-based GSM SMS NP feature to be turned on, Service Portability processing occurs only when the S-Port feature is turned on and either the MO-based IS41 SMS NP or the MO-based GSM SMS NP feature is turned on.

Number Portability functions use the Network Entity Type (RN/SP) from the RTDB when formatting outgoing Called Party digits in a relayed message. The S-Port feature allows RTDB GRN Entity digits to be used for own-network GSM and IS41 subscribers in response digit formats. The GRN field in the RTDB is used to provision Service Portability prefixes on a per subscriber basis.

When Service Portability is applied, the Destination address in outgoing messages is prefixed with the Generic Routing Number (GRN) associated with the DN, instead of the Network Entity Type (RN/SP) that is used by number portability. The GRN digits can indicate the

protocol (IS41 or GSM), calling area, and Operator network as defined by individual operators.

Table 2-8 shows whether Service Portability or Number Portability is applied when Service Portability is turned on and RTDB lookup is successful based on the MOSMSTYPE option of GSMSMSOPTS or IS41SMSOPTS. The GSMSMSOPTS:SPORTTYPE option is used for GSM Forward Short Message Mobile Originated messages. The IS41SMSOPTS:SPORTTYPE option is used for SMDPP messages. If Service Portability is turned off and RTDB lookup is successful based on the MOSMSTYPE option, Number Portability is applied. If RTDB lookup is not successful based on the MOSMSTYPE option, neither Service Portability nor Number Portability is applied and the CDPNNP Service Action is skipped. Neither Service Portability nor Number Portability is applied if the message is handled by the MIGRATE Service Action.

**Table 2-8 Service Portability vs Number Portability by Destination Subscriber Type**

SPORTTYPE	Own-Network GSM Entity Type = SP, any Portability Type	Own-Network IS41 Entity Type = RN, Portability Type = 0	Foreign (OLO) and others Entity Type = RN, Portability Type ≠ 0 -or- No Entity Type , any Portability Type
None	Apply Number Portability	Apply Number Portability	Apply Number Portability
GSM	Apply Service Portability - use GRN	Apply Number Portability	Apply Number Portability
IS41	Apply Number Portability	Apply Service Portability - use GRN	Apply Number Portability
ALL	Apply Service Portability - use GRN	Apply Service Portability - use GRN	Apply Number Portability

### S-Port Subscriber Differentiation

S-Port Subscriber Differentiation is used to allow use of provisioned ASD digits in place of GRN digits as an alternative Routing Number for own-network subscribers. For example, the ASD digits are used as the subscriber's private routing number for message relay features and the GRN digits are used as the subscriber's public routing number for query/response features.

S-Port Subscriber Differentiation processing occurs if the S-Port Subscriber Differentiation feature is enabled and turned on using Part Number 893-0379-01 and a Feature Access Key. The SUBDFRN option value must also be on to allow S-Port Subscriber Differentiation processing. The SUBDFRN option cannot be specified by the `chg-sccpopts` command unless the S-Port Subscriber Differentiation feature is enabled and turned on.

Provisioned ASD digits are used in place of GRN digits when these conditions are met:

- The Service Portability feature is enabled and turned on.
- The GSMSMSOPTS:SPORTTYPE or IS41SMSOPTS:SPORTTYPE option is provisioned. Refer to [Table 2-8](#).

- The S-Port Subscriber Differentiation feature is enabled and turned on.
- The SUBDFRN option value is on.
- Service Portability is applicable.

Subscribers without provisioned ASD digits follow standard Service Portability processing and always use GRN digits.

## 2.12 MTP Routed SCCP Traffic

The **MTP Msgs for SCCP Apps** and **MTP Routed GWS Stop Action** features forward **MTP** routed **SCCP** messages to the **Service Module cards**. The SCCP messages forwarded by either feature are processed in the same way on the Service Module cards. The difference between the two features is that the MTP Routed GWS Stop Action feature filters messages based on provisioned **Gateway Screening** rules on a per **linkset** basis and forwards only **UDT, UDTS, XUDT** and **XUDTS** SCCP messages to Service Module cards, while the MTP Msgs for SCCP Apps feature forwards all MTP routed SCCP messages to the Service Module card without filtering. Because the MTP Routed GWS Stop Action feature selectively forwards the messages to the Service Module card, the feature has less impact on SCCP performance than the MTP Msgs for SCCP Apps feature. The features can coexist, which means that both features can be turned on in the same system.

### MTP Msgs for SCCP Apps

MTP routed SCCP messages are supported with the MTP Msgs for SCCP Apps feature. **LOCREQ** and **SMSREQ** messages are supported. A **Feature Access Key (FAK)** for part number 893-0174-01 is required to enable the MTP Msgs for SCCP Apps feature. ThisThe MTP Msgs for SCCP Apps feature (part number 893-0174-01) can be turned on and off, but cannot be enabled with a temporary FAK. GTT must be on to enable the MTP Msgs for SCCP Apps feature.

After the MTP Msgs for SCCP Apps feature is turned on, all SCCP messages are routed to Service Module cards. The Service Module card then performs SCCP decode/verification. Use of the MTP Msgs for SCCP Apps feature adversely affects the SCCP capacity because all of these messages are counted under SCCP capacity.

If the MTP routed messages have CdPA RI=GT or SSN and GTI ≠ 0 (GTI = 2 or 4), then a service selection (**SRVSEL**) lookup is performed using the SCCP CdPA information. If the result of the lookup is MNP service, then the message is sent to MNP handling. If a service selector does not match or the service is OFFLINE, then MTP routing is performed on the messages. MNP SCCP Service re-route is not performed on MTP routed messages.

If the MTP routed messages have CdPA GTI=0, the TCAP portion of ANSI TCAP messages is decoded. SMSMR service is invoked for SMDPP messages; IAR Base feature is invoked for Analyzed messages. For all other messages, MNP service is invoked.

The SMSMR service and IAR Base feature require the global title address to determine whether the destination of the message is Home SMSC or Home SCP. Because GTI=0 messages do not have a global title address, two additional parameters, `homesmsc` and `homescp`, for the `chg-dstn` and `ent-dstn` commands are provided for each provisioned point code to indicate whether the DPC is a Home SMSC (SMSMR service) or a Home SCP (IAR Base feature).

MNP handling checks whether the TCAP portion of the message is ITU or ANSI.

If the message has ANSI TCAP, then:

- General TCAP/MAP verification for A-Port is performed if the A-Port or IGM feature is turned on. Only LOCREQ and SMSREQ messages are handled by A-Port or IGM for MTP routed messages.
- When  $GTI \neq 0$ , message relay is performed on non-LOCREQ and non-SMSREQ ANSI TCAP messages based on the SCCP CdPA portion of the message.
- When  $GTI = 0$ , MTP routing is performed on non-LOCREQ ANSI TCAP messages.

If the message has ITU TCAP, the IGM feature is on, and  $GTI \neq 0$ , then:

- The message is considered for relaying based on the RTDB lookup results. General TCAP/MAP verification is not performed on the message.
- Message relay is performed based on the SCCP CdPA portion of the message with  $GTI = 2$  or  $4$ .

If the message has ITU TCAP, the IGM feature is on, and  $GTI = 0$ , then MTP routing of the message is performed.

ITUN-ANSI SMS Conversion is not affected by the MTP Msgs for SCCP Apps feature; ITUN-ANSI SMS Conversion handles only Registration Notification and SMS Notification messages.

### MTP Routed GWS Stop Action

The MTP Routed GWS Stop Action feature (part number 893-0356-01) provides a Gateway Screening (GWS) stop action: `sccp`. This stop action allows IS41-based features to process MTP routed traffic. GWS rules are used to filter MTP routed SCCP messages (UDT, UDTS, XU DT, and XU DTS) on a per linkset basis. The messages are then forwarded to Service Module cards for processing by features that support MTP routed messages based on Service Selection criteria. A Feature Access Key (FAK) for part number 893-0356-01 is required to enable the MTP Routed GWS Stop Action feature. This feature can be turned on and off, but cannot be enabled with a temporary FAK. GTT must be on to enable the MTP Routed GWS Stop Action feature. The MTP Routed GWS Stop Action feature must be enabled before the `sccp` stop action can be provisioned, and before message processing can occur. The `sccp` stop action must be the last stop action in the GWS action set.

If the MTP Msgs for SCCP Apps feature is turned on, all SCCP messages are forwarded to Service Module cards without the `sccp` GWS stop action being executed, regardless of whether the MTP Routed GWS Stop Action feature is turned on.

After provisioning, the `sccp` stop action can be used by these features:

- A-Port
- G-Flex
- Info Analyzed Relay ASD
- Info Analyzed Relay Base
- Info Analyzed Relay GRN
- Info Analyzed Relay NP
- IS41 GSM Migration (IGM)
- ITUN-ANSI SMS Conversion
- MNP Circular Route Prevention



- MO-Based IS41SMS NP
- MO SMS ASD
- MO SMS B-Party Routing
- MO SMS GRN
- MO SMS IS41 to GSM Migration
- MTP MAP Screening
- MT-Based IS41 SMS NP

Refer to *Database Administration – GWS User's Guide* for additional information and provisioning procedures for the MTP Routed GWS Stop Action feature.

### SMSREQ Handling for Migrated or Ported Subscribers

The SMSREQ Handling for Migrated or Ported Subscribers enhancement allows MTP routed SMSREQ messages to be supported by A-Port, IGM, MNPCRP, and MT-Based IS41 SMS NP features. Service selection criteria for MTP routed SMSREQ messages is the same for MTP routed LOCREQ messages. The MNP service processing for MTP routed SMSREQ messages is the same for Global Title (GT) routed SMSREQ messages. However, MTP routing is performed on MTP routed messages when these messages fall through from the MNP service. Feature precedence is applied for SMSREQ messages as shown:

1. MNPCRP - If a circular route condition is detected, a UIM is generated and MTP routing is performed on the message.
2. IGM - If the DN is **own-network** GSM subscriber (Portability Type = 5) and SMSREQBYPASS = No, then send an SMSREQ Error Response (Return Result message) to the originator with SMS Access Denied Reason = 5.
3. MT-Based IS41 SMS NP - If the DN matches the MT-Based IS41 SMS NP feature criteria (IS41SMSOPTS:MTSMSTYPE), the SMSREQ response is generated.
4. A-Port - A-Port relays the message based on the RTDB lookup result. If relay information is not present in the RTDB data associated with the DN, then the message is MTP routed.
5. If A-Port is not turned on, then IGM relays the SMSREQ message for only own-network subscribers if the SMSREQ response is not previously sent for subscribers not handled by IGM. If relay information is not present in the Network Entity Type (RN/SP) associated with the DN or if Network Entity Type indicates an Other Licensed Operator (OLO) subscriber, then the message is MTP routed.
6. If none of the feature processing in the previous items is performed, then the message is MTP routed.

If a feature in the precedence list is off, processing by that feature is not performed.

**Table 2-9 Subscriber Portability Type**

Network Entity Type (NE)	Portability Type (PT)	Subscriber Type
RN	0	Own-network subscriber, if IGM or Service Portability is on Otherwise, Other Licensed Operator (OLO) subscriber
RN	any value other than 0	OLO subscriber

**Table 2-9 (Cont.) Subscriber Portability Type**

Network Entity Type (NE)	Portability Type (PT)	Subscriber Type
SP	any	Own-network subscriber
No entity, or any entity other than RN or SP	0, 1, 2, 36, or none (255)	OLO subscriber
No entity, or any entity other than RN or SP	any value other than 0, 1, 2, 36, or none (255)	Own-network subscriber

## 2.13 Hardware Requirements

EPAP-related features that perform an RTDB lookup require Service Module cards (E5-SM4G, E5-SM8G-B, or SLIC cards) running the SCCPHC application. The EAGLE can be equipped with up to 32 (31+1) Service Module cards.

Features that do not perform an RTDB lookup require Service Module cards only for GTT processing that might be performed for the feature. These features can coexist in systems with EPAP, but do not require an EPAP connection.

## 2.14 MPS/EPAP Platform

Oracle provides the Multi-Purpose Server (MPS) platform as a subsystem of the Oracle Communications EAGLE. The MPS provides support for EPAP-related features that perform Real Time Database (RTDB) lookups.

The MPS is composed of hardware and software components that interact to create a secure and reliable platform. For details about the MPS hardware, refer to *Application B Card Hardware and Installation Guide*. The MPS provides the means of connecting the customer provisioning application with the EAGLE and accepts the customer number portability data, while accommodating numbers of varying lengths.

The Oracle Communications EAGLE Application Processor (EPAP) is software that runs on the MPS hardware platform. EPAP collects and organizes customer provisioning data, and forwards the data to the EAGLE Service Module cards. For detailed information about EPAP, refer to *Administration Guide for EPAP*.

In this manual, Service Module card refers to an E5-SM4G, E5-SM8G-B, or SLIC card unless a specific card is required. For more information about the supported cards, refer to *Hardware Reference*.

# 3

## Commands

This chapter contains brief descriptions of the EAGLE commands that are used for the configuration, control, maintenance, and measurements of the Mobile Originated Short Message Service (MO SMS) features.

### 3.1 Introduction

This chapter describes the EAGLE commands used to administer the **MO SMS related** feature. The command descriptions include parameters that are used with the MO SMS related feature. Refer to *Commands User's Guide* for complete command descriptions including parameter names, valid parameter values, examples, and dependencies.

### 3.2 EAGLE STP System Options Commands

The **STP** system options commands (`stpopts`) change and display the STP node level processing options in the **EAGLE** database. The following sections describe the two variations: `chg-stpopts` and `rtrv-stpopts`.

#### **chg-stpopts**

**Change STP System Options Command** – The `chg-stpopts` command changes STP system options in the database. This command updates the **STPOPTS** table. The `defcc` and `defndc` parameters are used to convert non-international numbers received in the **MSU** to an international number. The `defcc` and `defndc` parameters can be specified only if the ATINP, G-Port, MO SMS IS41-to-GSM Migration, MO-based GSM SMS NP, MO-based IS41 SMS NP, Prepaid IDP Query Relay (IDPR), Prepaid Short Message Service Intercept (PPSMS), or V-Flex feature is enabled or if the AINPQ, G-Flex, or INP feature is turned on.



#### **Note:**

If the MT-Based GSM SMS NP or ATINP feature is turned on, the `defcc` parameter cannot be set to `none`.

**Table 3-1 chg-stpopts Parameters - Class = DATABASE**

Parameter	Range	Description
<code>defcc</code>	1-3 digits, none	Default country code
<code>defndc</code>	1-5 digits, none	Default network destination code

Command example:

- `chg-stpopts: defcc=33: defndc=22345`

**rtrv-stpopts**

**Retrieve STP System Options Command** – The `rtrv-stpopts` command is used to retrieve all STP options from the database. The options that appear in the output vary, depending on the features that are enabled or turned on.

## 3.3 EAGLE GSM System Options Commands

The GSM system options (`gsmopts`) commands change and display GSM system options in the EAGLE database. The following sections describe the two variations: `chg-gsmopts` and `rtrv-gsmopts`.

**chg-gsmopts**

**Change GSM System Options Command** – The `chg-gsmopts` command changes GSM system options in the database. This command updates the **GSMOPTS** table. The default parameters are always overwritten when specified.

**Table 3-2** `chg-gsmopts` Parameters - Class = DATABASE

Parameter	Range	Description
defmapvr	1-3	Default MAP version
is412gsm	1-15 digits, none	IS41 to GSM migration prefix

Command example:

- `chg-gsmopts: defmapvr=2`

**rtrv-gsmopts****Retrieve GSM System Options Command**

The `rtrv-gsmopts` command displays all GSM system options from the database. The G-Port, EIR, IGM, MO-based GSM SMS NP, MO SMS IS41-to-GSM Migration, MO SMS ASD, MO SMS GRN, MO SMS B-Party Routing, Prepaid SMS Intercept, or V-Flex feature must be enabled, or the G-Flex feature must be turned on before the command output is displayed.

## 3.4 EAGLE GSM SMS Options Commands

The GSM SMS options (`gsmsmsopts`) commands change and display specific SMS options in the EAGLE database for the MO SMS ASD, MO SMS GRN, MO-based GSM SMS NP, Prepaid SMS Intercept, and Portability Check for MO SMS features. The following sections describe the two variations: `chg-gsmsmsopts` and `rtrv-gsmsmsopts`.

The MO SMS ASD, MO SMS GRN, or MO-based GSM SMS NP feature must be enabled to specify the parameters: `mosmsfwd`, `mosmsgta`, `mosmssa`, `mosmstype`.

The MO-based GSM SMS NP or Portability Check for MO SMS feature must be enabled to specify the `mosmsdigmat` parameter.

The MO-based GSM SMS NP or Portability Check for MO SMS feature must be turned on to specify the `mosmstcapseg` parameter.

The MO SMS ASD, MO SMS GRN, MO-based GSM SMS NP, or PPSMS feature must be enabled to specify the parameters: `mosmsaclen`, `mosmsnai`.

The MO-based GSM SMS NP feature must be enabled to specify the parameters: `defrn`, `spfill`.

The Service Portability feature must be enabled to specify the `sporttype` parameter.

### chg-gsmsmsopts

**Change GSM SMS Options Command** – The `chg-gsmsmsopts` command changes GSM SMS system options in the database. This command updates the **GSMSMSOPTS** table. The default parameters are always overwritten when specified.

**Table 3-3** `chg-gsmsmsopts` Parameters - Class = DATABASE

Parameter	Range	Description	Applies to
<code>defrn</code>	1-15 hexadecimal digits, none	Default Routing Number for own-network subscribers	This parameter applies to only messages modified by the MO-based GSM SMS NP feature.
<code>mosmsaclen</code>	0-8	Area Code length. This parameter specifies the number of digits taken from the MO SMS CgPA parameter and used as the Area Code in the MO SMS CdPA parameter.	This parameter applies to only messages modified by the MO SMS ASD, MO SMS GRN, MO-based GSM SMS NP, or PPSMS feature.
<code>mosmsdigmat</code>	exact, bestfit	MO-based SMS HomeSMSC match.	This parameter applies to only messages processed by the MO-based GSM SMS NP feature or the Portability Check for MO SMS feature.
<code>mosmsdnfmt</code>	rn, rndn, ccrndn	MO-based SMS directory number format	This parameter applies to only messages modified by the MO-based GSM SMS NP feature.
<code>mosmsdnnai</code>	0-7, none	MO-based SMS directory number NAI	This parameter applies to only messages modified by the MO-based GSM SMS NP feature.
<code>mosmsfwd</code>	yes, no	MO-based SMS forward	This parameter applies to only messages modified by the MO SMS ASD, MO SMS GRN, or MO-based GSM SMS NP feature.
<code>mosmsgta</code>	5-21 digits, none	MO-based SMS GTA	This parameter applies to only messages modified by the MO SMS ASD, MO SMS GRN, or MO-based GSM SMS NP feature.
<code>mosrnsnai</code>	intl, nai, nat, unknown	MO-based SMS NAI	This parameter applies to only messages modified by the MO SMS ASD, MO SMS GRN, MO-based GSM SMS NP, or PPSMS feature.

**Table 3-3 (Cont.) chg-gsmsmsopts Parameters - Class = DATABASE**

Parameter	Range	Description	Applies to
mosmssa	yes, no	MO-based SMS sub-address	This parameter applies to only messages modified by the MO SMS ASD, MO SMS GRN, or MO-based GSM SMS NP, or PPSMS feature.
mosmstcapseq	on, off	MO-based SMS TCAP Segmentation for GSM	This parameter applies to only messages that are modified by the Portability Check for MO SMS feature or the MO-based GSM SMS NP feature.
mosmstype	sp, rn, sprn, all	MO-based SMS type	This parameter applies to only messages modified by the MO-based GSM SMS NP feature.
spfill	on, off	Fill SP Formatting Action. This parameter applies to the handling of own-network subscribers, and controls whether NPP populates both SP and RN Formatting Action values.	This parameter applies to only messages modified by the MO-based GSM SMS NP feature.
sporttype	gsm, is41, all, none	Service Portability Type. This parameter indicates which of the own-network subscribers need Service Portability applied.	This parameter applies to only messages modified by the MO-based GSM SMS NP feature.

Command example for setting the GSM SMS options when the MO-based GSM SMS NP feature is enabled:

- `chg-gsmsmsopts:mosmsnai=intl:mosmstype=sp:mosmssa=no`

Command example for setting the GSM SMS options when the MO-based GSM SMS NP or Portability Check for MO SMS feature is enabled and turned on:

- `chg-gsmsmsopts:mosmsdigmat=bestfit`

### rtrv-gsmsmsopts

#### Retrieve GSM SMS Options Command

The `rtrv-gsmsmsopts` command displays all GSM SMS options from the database when at least one GSM SMS-related feature is enabled.

## 3.5 EAGLE IS41 SMS Options Commands

The IS41 SMS options (`is41smsopts`) commands change and display SMS options in the EAGLE database for the MO SMS ASD, MO SMS GRN, MO-based IS41 SMS NP, and MO SMS IS41-to-GSM Migration features. The following sections describe the two variations: `chg-is41smsopts` and `rtrv-is41smsopts`.

The MO SMS ASD, MO SMS GRN, MO-based IS41 SMS NP, or MO SMS IS41-to-GSM Migration feature must be enabled to specify the parameters: `modaparam`, `mosmsaclen`, `mosmsnai`.

The MO-based IS41 SMS NP or MO SMS IS41-to-GSM Migration feature must be enabled to specify the `mosmsdigmat` parameter.

The MO-based IS41 SMS NP feature must be enabled to specify the `mosmstype` parameter.

The MO SMS IS41-to-GSM Migration feature must be enabled to specify the `moigmpfx` parameter.

The MO-based IS41 SMS NP feature must be enabled to specify the parameters: `defrn`, `spfill`.

The Service Portability feature must be enabled to specify the `sporttype` parameter.

### chg-is41smsopts

**Change IS41 SMS Options Command** - The `chg-is41smsopts` command changes the IS41 SMS system options in the database. This command updates the IS41SMSOPTS table. The default parameters are always overwritten when specified.

**Table 3-4 chg-is41smsopts Parameters - Class = DATABASE**

Parameter	Range	Description	Applies to
<code>defrn</code>	1-15 hexadecimal digits, none	Default Routing Number for own-network subscribers	This parameter applies to only messages modified by the MO-based IS41 SMS NP feature.
<code>modaparam</code>	da, oda	Specifies whether the SMS_DestinationAddress or SMS_Original DestinationAddress from the IS41 SMDPP message is used for conditioning, lookup, and modification.	This parameter applies to only messages modified by the MO SMS ASD, MO SMS GRN, MO-based IS41 SMS NP, or MO SMS IS41-to-GSM Migration feature.
<code>moigmpfx</code>	ne, is412gsm	MO SMS IS41-to-GSM Migration prefix. This parameter specifies whether the MO SMS IS41-to-GSM Migration feature uses digits from the RTDB network entity (NE) associated with the B number or the <code>is412gsm</code> parameter as a prefix to modify the destination address in the outgoing SMDPP.	This parameter applies to only messages modified by the MO SMS IS41-to-GSM Migration feature.
<code>mosmsaclen</code>	0-8	Area Code length. This parameter specifies the number of digits taken from the MO SMS CgPA parameter and used as the Area Code in the MO SMS CdPA parameter.	This parameter applies to only messages modified by the MO SMS ASD, MO SMS GRN, MO-based IS41 SMS NP, or MO SMS IS41-to-GSM Migration feature.
<code>mosmsdigmat</code>	exact, bestfit, bypass	HomeSMSC Match with Digits search option	This parameter applies to only messages modified by the MO-based IS41 SMS NP or MO SMS IS41-to-GSM Migration feature.
<code>mosmsdnfmt</code>	rn, rndn, ccrndn	MO-based SMS directory number format	This parameter applies to only messages modified by the MO-based IS41 SMS NP or MO SMS IS41-to-GSM Migration feature.

**Table 3-4 (Cont.) chg-is41smsopts Parameters - Class = DATABASE**

Parameter	Range	Description	Applies to
mosmsdnai	0-15, none	MO-based SMS directory number NAI	This parameter applies to only messages modified by the MO-based IS41 SMS NP or MO SMS IS41-to-GSM Migration feature.
mosmsnai	intl, nai, nat, unknown	MO-based SMS Nature Address Indicator	This parameter applies to only messages modified by the MO SMS ASD, MO SMS GRN, MO-based IS41 SMS NP, or MO SMS IS41-to-GSM Migration feature.
mosmstype	sp, rn, sprn, all	MO-based SMS Type	This parameter applies to only messages modified by the MO-based IS41 SMS NP feature.
spfill	on, off	Fill SP Formatting Action. This parameter applies to the handling of own-network subscribers, and controls whether NPP populates both SP and RN Formatting Action values.	This parameter applies to only messages modified by the MO-based IS41 SMS NP feature.
sporttype	gsm, is41, all, none	Service Portability Type. This parameter indicates which of the own-network subscribers need Service Portability applied.	This parameter applies to only messages modified by the MO-based IS41 SMS NP feature.

Command example for setting the IS41 SMS options when the MO-based IS41 SMS NP feature is enabled:

- `chg-is41smsopts:mosmstype=sp:mosmsnai=intl:mosmsdigmat=exact:modaparam=da:mosmsaclen=3`

### **rtrv-is41smsopts**

#### **Retrieve IS41 SMS Options Command**

The `rtrv-is41smsopts` command displays all IS41 SMS options from the database when at least one IS41 SMS-related feature is enabled.

## 3.6 EAGLE Prepaid SMS Options Commands

The Prepaid SMS options (`ppsopts`) commands change and display specific SMS options in the EAGLE database for the Prepaid Short Message Service Intercept (PPSMS) feature. The following sections describe the two variations: `chg-ppsopts` and `rtrv-ppsopts`.

The Prepaid Short Message Service Intercept (PPSMS) feature must be enabled to use this command.

### **chg-ppsopts**

**Change Prepaid SMS Options Command** – The `chg-ppsopts` command changes Prepaid SMS system options in the database. This command updates the **PPSOPTS**



table with entries that correspond to Intelligent Network (IN) platforms. The default parameters are always overwritten when specified.

**Table 3-5 chg-ppsopts Parameters - Class = DATABASE**

Parameter	Range	Description
pci	s-, 0-255, none	ITU international point code with subfields zone-area-id. The prefix subfield indicates a spare point code (prefix-zone-area-id).
pcn	s-, 0-16383. aa-zz, none	ITU national point code in the format of <ul style="list-style-type: none"> <li>a 5-digit number (<i>nnnnn</i>), or</li> <li>two to four numbers (members) separated by dashes (<i>m1-m2-m3-m4</i>)</li> </ul> The prefix subfield indicates a spare point code.
ppt	1-32	Prepaid portability type. This parameter specifies the IN platform where the incoming message is sent.
ri	gt, ssn	Routing indicator. This parameter specifies the IN platform routing indicator.
setid	1-36000, none, dflt	Set ID. This parameter specifies the MAP set ID if <i>ri=ssn</i> , or MRN set ID if <i>ri=gt</i> . The Set ID is used by a loadsharing IN platform.
ssn	2-255, none	Subsystem number. This value is used as the CdPA <i>ssn</i> when routing the message to a Prepaid server. If <i>ssn=none</i> and <i>ri=ssn</i> , the subsystem number is populated using the <i>ssn</i> value from the incoming message CdPA parameter. If subsystem number value is not in the CdPA, then <i>ssn=8</i> is used to route the message. If a value is specified for <i>ssn</i> , then the <i>pci</i> or <i>pcn</i> must be provisioned for the corresponding Prepaid server.

Command example for setting the Prepaid SMS options when the Prepaid SMS Intercept feature is enabled:

- `chg-ppsopts:ppt=1:pci=1-1-1:ssn=1:ri=gt`

#### rtrv-ppsopts

#### Retrieve Prepaid SMS Options Command

The `rtrv-ppsopts` command displays all Prepaid SMS options from the database.

## 3.7 EAGLE Feature Control Commands

These commands are used to enable, update, view, and control features. A feature must be purchased to have access to the **Feature Access Key (FAK)**. Two steps are required to activate a feature.

1. A Feature Access Key and feature part number are used to enable a feature with the `enable-ctrl-feat` command.
2. The feature part number is used to turn on a feature with the `chg-ctrl-feat` command.

### chg-ctrl-feat

**Change Controlled Feature command** - The `chg-ctrl-feat` command is used with controlled features that have been purchased and enabled with the `enable-ctrl-feat` command. The `chg-ctrl-feat` command requires a feature to be enabled as a prerequisite. The `chg-ctrl-feat` command is used to:

- Turn on or turn off On/Off features
- Turn on Permanently On features, which are features that cannot be turned off after being turned on
- Clear an expired temporary key alarm without purchasing a permanent Feature Access Key

Command example:

- `chg-ctrl-feat:partnum=893016601:status=on`

### enable-ctrl-feat

**Enable Controlled Feature command** - The `enable-ctrl-feat` command is used to enable a purchased feature. Additional verifications are performed before enabling certain features. These checks include verifying that **GTT** is turned on before enabling the MO-Based GSM SMS NP, MO-Based IS41 SMS NP, MO SMS IS41-to-GSM Migration, Portability Check for MO SMS, Prepaid SMS Intercept, MO SMS ASD, or MO SMS GRN feature.

Command example:

- `enable-ctrl-feat:partnum=893009301:fak=<Feature Access Key>`

### rtrv-ctrl-feat:

**Retrieve Controlled Feature Command** - The `rtrv-ctrl-feat` command is used to display the on/off status of the features and to show the remaining trial period if features are temporarily enabled.

## 3.8 EAGLE Numbering Plan Processor Commands

The Numbering Plan Processor (NPP) commands enter, change, delete, and display specific NPP components and options in the EAGLE database. [Numbering Plan Processor for MO SMS Features](#) and the following sections describe the NPP command parameters and values specific to the MO SMS features.

Refer to *Numbering Plan Processor (NPP) User's Guide* for comprehensive descriptions of NPP components: Service Actions, Conditioning Actions, Formatting Actions, Action Sets, Rules, and Service Rule Sets.

### ent/chg/dlt/rtrv-npp-as

These commands are used to enter, change, delete, and display Numbering Plan Processor (NPP) Action Sets that contain Service Actions, Conditioning Actions, and Formatting Actions. An Action Set is used by NPP to assist with digit string filtering, conditioning, and encoding. The default parameters are overwritten when specified.

**Table 3-6 NPP Action Set Parameters for MO SMS NPP - Class = DATABASE**

Parameter	Range	Description
fa1 through fa12	rnospodn, rnospoz, rnosposn	Formatting Action
sa1 through sa8	asdlkup, cdial, cdpnp, cgpnsdrqd, cgpngrqd, fraudchk, grnkup, migrate, pprelay	Service Action

**ent/chg/dlt/rtrv-npp-serv**

These commands are used to enter, change, delete, and display a Numbering Plan Processor (NPP) Service entry. An NPP Service is any EAGLE application that uses NPP to assist with processing of digit strings.

**Table 3-7 NPP Service Entries for MO SMS NPP**

Parameter	Range	Description
srvn	mosmsgcdpn, mosmsgcgp, mosmigcdpn, mosmigcgp	NPP Service name

**ent/chg/dlt/rtrv-npp-srs**

These commands are used to enter, change, delete, and display a Numbering Plan Processor (NPP) Service Rules Set. A Service Rules Set is a collection of NPP Rules associated with an NPP Service. An NPP Rule is an association between a single NPP filter and a single NPP Action Set.

**Table 3-8 NPP Service Rules Set**

Parameter	Range	Description
srvn	mosmsgcdpn, mosmsgcgp, mosmigcdpn, mosmigcgp	NPP Service name

## 3.9 MO SMS NPP Test Tool Commands

The MO SMS NPP Test Tool is used to send a test message to a specified NPP service to verify the call flow behavior when message information is injected into the call path without permitting an effect on actual traffic. Refer to [MO SMS NPP Test Tool](#) for a description of the provisionable table parameters.

The `tst-msg` command invokes the test for the specified ISUP test message from the TESTMSG table, and displays the results.

**chg/rtrv-gsm-msg**

These commands are used with the MO SMS NPP Test Tool to change and display provisioned parameters for MO SMS GSM test messages. These messages test the flow of MO SMS GSM feature processing.

**chg/rtrv-is41-msg**

These commands are used with the MO SMS NPP Test Tool to change and display provisioned parameters for MO SMS IS41 test messages. These messages test the flow of MO SMS IS41 feature processing.

**tst-msg**

This command invokes the Test Tool to test the feature call flow for the message specified from the TESTMSG table. The command sends the specified message from the TESTMSG table to an EAGLE Service Feature. The test message that is sent does not create a new raw MSU. The test message is used to modify the internal data structures to analyze call flow behavior when a message with the specified parameters is injected into the call path. The test message is not transmitted to the network.

## 3.10 EAGLE Service Selector Commands

The service selector (*srvsel*) commands are used to provision service selectors for DSM services. The following sections describe the four variants: *chg-srvsel*, *dlt-srvsel*, *ent-srvsel* and *rtrv-srvsel*.

The *smsmr* value for the *nserv* or *serv* parameters specifies the features:

- MO-based GSM SMS NP
- MO-based IS41 SMS NP
- MO SMS IS41-to-GSM Migration
- Portability Check for Mobile Originated SMS (MNP SMS)
- Prepaid Short Message Service Intercept (PPSMS)
- Mobile Originated SMS Additional Subscriber Data (MO SMS ASD)
- Mobile Originated SMS Generic Routing Number (MO SMS GRN)

**chg-srvsel**

**Change Service Selector Command** – The *chg-srvsel* command assigns the applicable service selectors required to change a service entry for Service Module card services.

**Table 3-9 chg-srvsel Parameters - Class = DATABASE**

Parameter	Range	Description
gti, gtia, gtii, gtin, gtin24	2, 4	Global Title Indicator
ssn	0-255, *	<b>Subsystem Number</b>
tt	0-255	<b>Translation Type</b>
nai	sub, rsvd, natl, intl	Nature of Address Indicator
naiv	0-127	<b>NAI Value</b>
np	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
npv	0-15	Numbering Plan Value
nserv	eir, gflex, gport, inpq, inpmr, smsmr, idpr, idps, mnp, vflex, atinp	New service
nsnai	sub, natl, intl, rnidn, rnsdn, ccrndn, none	New Service Nature of Address Indicator
nsnp	e164, e212, e214, none	New Service Numbering Plan

**dlt-srvsel**

**Delete Service Selector Command** – The `dlt-srvsel` command deletes a service selector.

**ent-srvsel**

**Enter Service Selector command** – The `ent-srvsel` command assigns the applicable service selectors required to specify a service entry for DSM services.

**rtrv-srvsel**

**Retrieve Service Selector Command** – The `rtrv-srvsel` command displays a list of the administered service selectors combinations. Output is sorted first by service, then by global title domain, GTI, translation type, numbering plan, and nature of address indicator. The output can be filtered using various optional parameter combinations.

## 3.11 EAGLE SCCP Options Commands

The SCCP options commands (`sccpopts`) change and display the SCCP option indicators in the EAGLE database.

**chg-sccpopts**

**Change SCCP System Options** – The `chg-sccpopts` command changes the value of one or more SCCP option indicators. This command updates the STPOPTS table.

**Table 3-10 chg-sccpopts Parameters - Class = DATABASE**

Parameter	Range	Description
subdfn	off, on	S-Port Subscriber Differentiation option <ul style="list-style-type: none"> <li>off = Do not perform S-Port Subscriber Differentiation (Default)</li> <li>on = Perform S-Port Subscriber Differentiation</li> </ul> The S-Port Subscriber Differentiation feature must be enabled and turned on before this parameter can be specified.

Command example:

- `chg-sccpopts:subdfn=on`

**rtrv-sccpopts**

**Retrieve SCCP Options** – The `rtrv-sccpopts` command is used to display the current value of one or more of the SCCP option indicators in the STPOPTS table.

# 4

## Feature Configuration

This chapter provides procedures for configuring the Mobile Originated Short Message Service (MO SMS) features of the EAGLE which include:

- Mobile Originated Based GSM SMS Number Portability (MO-Based GSM SMS NP)
- Mobile Originated Based IS41 SMS Number Portability (MO-Based IS41 SMS NP)
- Mobile Originated SMS IS41-to-GSM Migration (MO SMS IS-41-to-GSM Migration)
- Mobile Originated SMS Additional Subscriber Data (MO SMS ASD)
- Mobile Originated SMS Generic Routing Number (MO SMS GRN)
- Portability Check for Mobile Originated SMS (MNP SMS)
- Prepaid Short Message Service Intercept (PPSMS)
- Service Portability for MO SMS (S-Port)
- MTP Msgs for SCCP Apps
- Number Processing Plan for MO SMS (NPP)

### 4.1 Introduction

This chapter contains the following feature activation procedures:

- [MO-Based GSM SMS NP Feature Activation Procedure](#)
- [MO-Based IS41 SMS NP Feature Activation Procedure](#)
- [MO SMS IS41-to-GSM Migration Feature Activation Procedure](#)
- [Portability Check for MO SMS Activation Procedure \(MNP SMS\)](#)
- [Prepaid Short Message Service Intercept Activation Procedure \(PPSMS\)](#)
- [MO SMS ASD Activation Procedure](#)
- [MO SMS GRN Activation Procedure](#)
- [Service Portability Activation Procedure \(S-Port\)](#)
- [S-Port Subscriber Differentiation Activation Procedure](#)
- [MTP Routed Messages for SCCP Applications Activation Procedure](#)

#### Summary of Feature Activation

[Table 4-1](#) provides a summary of the activation information about these features. Refer to *Commands User's Guide* for complete descriptions of the commands used in these procedures.

**Table 4-1 Feature Activation Summary**

Feature Name	Part Number	Temporary FAK Available?	Permanently-On?
MO-Based GSM SMS NP	893019401	No	Yes
MO-Based IS41 SMS NP	893019501	No	Yes
MO SMS IS-41-to-GSM Migration	893026201	No	No, the feature can be turned on or turned off with the <code>chg-ctrl-feat</code> command.
MNP SMS	893009301	Yes	No, the feature can be turned on or turned off with the <code>chg-ctrl-feat</code> command.
PPSMS	893006701	No	No, the feature can be turned on or turned off with <code>chg-ctrl-feat</code> command.
MO SMS ASD	893026701	No	No, the feature can be turned on or turned off with <code>chg-ctrl-feat</code> command.
MO SMS GRN	893026601	No	No, the feature can be turned on or turned off with <code>chg-ctrl-feat</code> command.
Service Portability	893034301	No	No, the feature can be turned on or turned off with <code>chg-ctrl-feat</code> command.
S-Port Subscriber Differentiation	893037901	No	Yes
MTP Msgs for SCCP Apps	893017401	No	No, the feature can be turned on or turned off with <code>chg-ctrl-feat</code> command.
MTP Routed GWS Stop Action	893035601	No	No, the feature can be turned on or turned off with <code>chg-ctrl-feat</code> command.

**Feature Activation Considerations**

- All MO SMS features are mutually exclusive with all features that require ELAP, unless the Dual ExAP Configuration feature is enabled.
- MO-Based GSM SMS NP and MO-Based IS41 SMS NP can be enabled and turned on at the same time; however, an incoming MSU will be processed by either MO-Based GSM SMS NP or MO-Based IS41 SMS NP based on certain MSU characteristics.
- MO SMS IS-41-to-GSM Migration can be enabled and turned on independently of the MO-Based GSM SMS NP and MO-Based IS41 SMS NP features.
- MO-Based GSM SMS NP may co-exist with the MNP SMS and PPSMS features. MO-Based GSM SMS NP intercepts SMS messages after the MNP SMS and PPSMS features process the message.
- Feature activation procedures described in this chapter can be performed only if the Global Title Translation (GTT) feature is turned on.

- With the exception of PPSMS, the MO SMS features described in this chapter cannot be enabled if STPOPTS:ANSIGFLEX is enabled.

### ▲ Caution:

After a permanently-on feature has been enabled and turned on with the `enable-ctrl-feat` and `chg-ctrl-feat` commands, the feature cannot be turned off. Because features may overwrite other features or create changes in the database, confirm that you have a license and full technical support from Oracle before turning on this or any feature. If you are not sure whether you have purchased a specific feature, contact your Oracle Sales or Account Representative.

The MO SMS features require Service Module cards running the VSCCP application.

## 4.2 EPAP Entity Provisioning

Oracle recommends that EPAP entity (**SP** or **RN**) administration not be performed until after the Point Code and/or Subsystem Number has been entered into the EAGLE MAP table.

- EPAP-administered entity data can become out-of-sync with the EAGLE MAP table when the creation of Point Codes and/or Subsystem Numbers in the MAP table is performed after EPAP database administration.
- If this mismatch is discovered in real-time operations, a UIM is sent to the EAGLE maintenance terminal. (Example UIMs: SCCP did not route - DPC not in MAP tbl, SCCP did not route - SS not in MAP tbl.)

## 4.3 MO-Based GSM SMS NP Feature Activation Procedure

This procedure activates the MO-Based GSM SMS NP feature.

### Note:

The MO-Based GSM SMS NP feature must be enabled before the Service Action value `cdpnp` can be specified for the MOSMSGCDPN NPP service. The MOSMSGCDPN NPP service must be provisioned before the MO-Based GSM SMS NP feature is turned on for the feature to be functional.

1. Enter the `enable-ctrl-feat` command to enable the MO-Based GSM SMS NP feature.  

```
enable-ctrl-feat:partnum=893019401:fak=<Feature Access Key>
```
2. Enter the `chg-stpopts` command to set the default country code and, if desired, the default network destination code to convert the nature of address indicator (**NAI**) of **MDNs** to the international format (`nai=intl`).

The parameters in this command are used for number conditioning.

Command example:



```
chg-stpopts:defcc=49:defndc=177
```

where:

**defcc**

The default country code.

**defndc**

The default network destination code.

3. Verify the new country code and network destination code using the `rtrv-stpopts` command.
4. Enter the `rtrv-gsmsmsopts` command to view the values of the GSMSMSOPTS table options.
5. If desired, change the GSM SMS options in the database for the MO-Based GSM SMS NP feature.

Command example:

```
chg-gsmsmsopts:mosmstype=sp:mosmsnai=intl:mosmssa=no
```

where:

**mosmstype**

Indicates the entity type for which a database lookup is considered successful.

**mosmsnai**

Indicates how the called party number will be conditioned before lookup in the database.

**mosmssa**

Specifies whether the MO-based SMS sub-address is searched in the SMS called party (destination) address.

6. Verify the changes using the `rtrv-gsmsmsopts` command.  
This command displays all GSM SMS options from the database.
7. Provision NPP components for this feature. Refer to *Numbering Plan Processor (NPP) User's Guide* and [Provisioning NPP for MO SMS Features](#) for provisioning information and procedures. After provisioning NPP components for this feature, return to this procedure and continue with the next step.
8. Enter the `chg-ctrl-feat` command to turn on the MO-Based GSM SMS NP feature.

```
chg-ctrl-feat:partnum=893019401:status=ON
```

The MO-Based GSM SMS NP feature is enabled, turned on, and operating in the system. The MO-Based GSM SMS NP feature cannot be turned off and cannot be disabled.

## 4.4 MO-Based IS41 SMS NP Feature Activation Procedure

This procedure is used to activate the MO-Based IS41 SMS NP feature.

 **Note:**

The MO-Based IS41 SMS NP feature must be enabled before the Service Action value `cdpnp` can be specified for the MOSMSICDPN NPP service. The MOSMSICDPN NPP service must be provisioned before the MO-Based IS41 SMS NP feature is turned on for the feature to be functional.

1. Enter the `enable-ctrl-feat` command to enable the MO-Based IS41 SMS NP feature.

```
enable-ctrl-feat:partnum=893019501:fak=<Feature Access Key>
```

2. Enter the `ent-srvsel` command to assign the service selector with service feature `serv=smsmr`.

This command assigns the service selectors required to specify the service entry for the Service Module card services.

Command example:

```
ent-srvsel:gtia=2:tt=10:serv=smsmr:snp=e164:snai=intl:ssn=255
```

where

**gtia**

Specifies the global title translation indicator (2 = ANSI, ITU; 4 = ITU)

**tt**

Specifies the translation type

**serv**

Specifies the service feature

**snp**

Defines the service numbering plan (e164, e212, or e214)

**snai**

Specifies the international Service Nature of Address Indicator

**ssn**

Defines the subsystem number

3. Enter the `chg-stpopts` command to set the default country code and, if desired, the default network destination code to convert the nature of address indicator (**NAI**) of **MDNs** to the international format (`nai=intl`).

The parameters in this command are used for number conditioning.

Command example:

```
chg-stpopts:defcc=49:defndc=177
```

where:

**defcc**

The default country code.

**defndc**

The default network destination code.

4. Verify the new country code and, if changed, network destination code using the `rtrv-stpopts` command.
5. Enter the `rtrv-is41smsopts` command to view the values of the IS41SMSOPTS table options.
6. If desired, change the **IS41** SMS options in the database for the MO-Based IS41 SMS NP feature.

Command example:

```
chg-is41smsopts:mosmstype=sp:mosmsnai=intl
```

where:

**mosmstype**

Indicates the entity type for which a database lookup is considered successful.

**mosmsnai**

Indicates how the called party number will be conditioned before lookup in the database.

7. Verify the changes using the `rtrv-is41smsopts` command.  
This command displays all IS41 SMS options from the database.
8. Provision NPP components for this feature. Refer to *Numbering Plan Processor (NPP) User's Guide* and [Provisioning NPP for MO SMS Features](#) for provisioning information and procedures. After provisioning NPP components for this feature, return to this procedure and continue with the next step.
9. Enter the `chg-ctrl-feat` command to turn on the MO-Based IS41 SMS NP feature.

```
chg-ctrl-feat:partnum=893019501:status=ON
```

The MO-Based IS41 SMS NP feature is enabled, turned on, and operating in the system. The MO-Based IS41 SMS NP feature cannot be turned off and cannot be disabled.

## 4.5 MO SMS IS41-to-GSM Migration Feature Activation Procedure

This procedure is used to activate the MO SMS IS41-to-GSM Migration feature. This procedure assumes that GTT is enabled and turned on.

 **Note:**

The MO SMS IS41-to-GSM Migration feature must be enabled before the Service Action value `migrate` can be specified for the MOSMSICDPN NPP service. The MOSMSICDPN NPP service must be provisioned before the MO SMS IS41-to-GSM Migration feature is turned on for the feature to be functional.

1. Enter the `enable-ctrl-feat` command to enable the MO SMS IS41-to-GSM Migration feature.

```
enable-ctrl-feat:partnum=893026201:fak=<Feature Access Key>
```

2. Enter the `ent-srvsel` command to assign the service selector with service feature `serv=smsmr`.

This command assigns the service selectors required to specify the service entry for the Service Module card services.

Command example:

```
ent-srvsel:gtia=2:tt=10:serv=smsmr:snp=e164:snai=intl:ssn=255
```

where

**gtia**

Specifies the global title indicator (2 = ANSI, ITU; 4 = ITU)

**tt**

Specifies the translation type

**serv**

Specifies the service feature

**snp**

Defines the service numbering plan (e164, e212, or e214)

**snai**

Specifies the international Service Nature of Address Indicator

**ssn**

Defines the subsystem number

3. Enter the the `chg-stpopts` command to set the default country code and, if desired, the default network destination code to convert the nature of address indicator (**NAI**) of **MDNs** to the international format (`nai=intl`). The parameters in this command are used for number conditioning.

Command example:

```
chg-stpopts:defcc=49:defndc=177
```

where:

**defcc**

The default country code.

**defndc**

The default network destination code.

4. Verify the new country code and, if changed, network destination code using the `rtrv-stpopts` command.
5. Enter the `rtrv-is41smsopts` command to view the values of the IS41SMSOPTS table options.
6. If desired, change the IS41 SMS options in the database for the MO SMS IS41-to-GSM Migration feature with the `chg-is41smsopts` command.

Command example:

```
chg-is41smsopts:mosmsnai=nat:moigmpfx=is412gsm:modaparam=da
```

where:

**mosmsnai**

Indicates how the called party number will be conditioned before lookup in the database

**moigmpfx**

Specifies the MO SMS IS41-to-GSM Migration prefix

**modaparam**

Specifies whether the SMS\_Destination\_Address or SMS\_Original\_Destination\_Address from the IS41 SMDPP message is used for conditioning, lookup, and modification

7. Verify the changes using the `rtrv-is41smsopts` command.

This command displays all IS41 SMS options from the database.

8. Provision NPP components for this feature. Refer to *Numbering Plan Processor (NPP) User's Guide* and [Provisioning NPP for MO SMS Features](#) for provisioning information and procedures. After provisioning NPP components for this feature, return to this procedure and continue with the next step.
9. Enter the `chg-ctrl-feat` command to turn on the MO SMS IS41-to-GSM Migration feature.

```
chg-ctrl-feat:partnum=893026201:status=ON
```

The MO SMS IS41-to-GSM Migration feature is enabled, turned on, and operating in the system. The MO SMS IS41-to-GSM Migration feature can be turned off, but cannot be disabled.

## 4.6 MO SMS ASD Activation Procedure

This procedure is used to activate the MO SMS ASD feature. This procedure assumes that GTT is enabled and turned on, and that the NT serial number has been entered and locked.

- The MOSMSGCDPN and MOSMSGCGPN NPP services must be provisioned before the MO SMS ASD feature is turned on for the feature to be functional.
- The MO SMS ASD feature must be enabled and turned on before the ASDLKUP and CGPNASDRQD Service Actions can execute. The ASDLKUP Service Action is used by the NPP Services: MOSMSGCDPN, MOSMSGCGPN, MOSMSICDPN, MOSMSICGPN. The CGPNASDRQD Service Action is used by the NPP Services: MOSMSGCDPN and MOSMSICDPN.

1. Enter the `enable-ctrl-feat` command to enable the MO SMS ASD feature.

```
enable-ctrl-feat:partnum=893026701:fak=<Feature Access Key>
```

2. Provision NPP components for this feature. Refer to *Numbering Plan Processor (NPP) User's Guide* and [Provisioning NPP for MO SMS Features](#) for provisioning information and procedures. After provisioning NPP components for this feature, return to this procedure and continue with the next step.

3. Enter the `chg-ctrl-feat` command to turn on the MO SMS ASD feature.

```
chg-ctrl-feat:partnum=893026701:status=ON
```

The MO SMS ASD feature is now enabled, turned on, and operating in the system. The MO SMS ASD feature can be turned off, but cannot be disabled.

## 4.7 MO SMS GRN Activation Procedure

This procedure is used to activate the MO SMS GRN feature. This procedure assumes that GTT is enabled and turned on, and that the NT serial number has been entered and locked.

- The MOSMSGCDPN and MOSMSGCGPN NPP services must be provisioned before the MO SMS GRN feature is turned on for the feature to be functional.
- The MO SMS GRN feature must be enabled and turned on before the GRNLKUP and CGPNRNRQD Service Actions can execute. The GRNLKUP Service Action is used by the NPP Services: MOSMSGCDPN, MOSMSGCGPN, MOSMSICDPN, MOSMSICGPN. The CGPNRNRQD Service Action is used by the NPP Services: MOSMSGCDPN and MOSMSICDPN.

1. Enter the `enable-ctrl-feat` command to enable the MO SMS GRN feature.

```
enable-ctrl-feat:partnum=893026601:fak=<Feature Access Key>
```

2. Provision NPP components for this feature. Refer to *Numbering Plan Processor (NPP) User's Guide* and [Provisioning NPP for MO SMS Features](#) for provisioning information and procedures. After provisioning NPP components for this feature, return to this procedure and continue with the next step.

3. Enter the `chg-ctrl-feat` command to turn on the MO SMS GRN feature.

```
chg-ctrl-feat:partnum=893026601:status=ON
```

The MO SMS GRN feature is now enabled, turned on, and operating in the system. The MO SMS GRN feature can be turned off, but cannot be disabled.

## 4.8 Portability Check for MO SMS Activation Procedure

This procedure is used to activate the Portability Check for MO SMS feature. This procedure assumes that GTT is enabled and turned on, and that the NT serial number has been entered and locked.

### Note:

The Portability Check for MO SMS feature must be enabled before the Service Action value `fraudchk` can be specified for the MOSMSGCGPN NPP service. The MOSMSGCGPN NPP service must be provisioned before the Portability Check for MO SMS feature is turned on for the feature to be functional.

1. Enter the `enable-ctrl-feat` command to enable the Portability Check for MO SMS feature.

```
enable-ctrl-feat:partnum=893009301:fak=<Feature Access Key>
```

2. Provision NPP components for this feature. Refer to *Numbering Plan Processor (NPP) User's Guide* and [Provisioning NPP for MO SMS Features](#) for provisioning information and procedures. After provisioning NPP components for this feature, return to this procedure and continue with the next step.

3. Enter the `chg-ctrl-feat` command to turn on the Portability Check for MO SMS feature.

```
chg-ctrl-feat:partnum=893009301:status=ON
```

4. Enter the `ent-srvsel` command to assign the service selector with service feature `serv=smsmr`. This command assigns the service selectors required to specify the service entry for the Service Module card services.

Command example:

```
ent-  
srvsel:gtii=4:tt=10:serv=smsmr:snp=e164:snai=intl:ssn=255
```

where

**:gtii**

Specifies the global title indicator (2 = ANSI, ITU; 4 = ITU)

**:tt**

Specifies the translation type

**:serv**

Specifies the DSM service

**:snp**

Defines the service numbering plan (e164, e212, or e214)

**:snai**

Specifies the service nature of address indicator

**:ssn**

Defines the subsystem number

5. Enter the `rtrv-gsmsmsopts` command to view the values of the GSMSMSOPTS table options.
6. Change the **GSM** SMS options in the database for the Portability Check for MO SMS feature.

Command example:

```
chg-gsmsmsopts:mosmsdigmat=bestfit:mosmstcapseg=on
```

where:

**:mosmsdigmat**

Specifies the method used by Portability Check for MO SMS feature to find a Home SMSC match

**:mosmstcapseg**

Specifies whether Mobile-Originated segmented TCAP messages are supported

7. Verify the changes using the `rtrv-gsmsmsopts` command.  
This command displays all GSM SMS options from the database.
8. Enter the `chg-stpopts` command to set the value for the default country code and default network destination code to convert the Nature of Address Indicator (NAI) of MDNs to the international format (`nai=intl`). The parameters in this command are used for number conditioning.

Command example:

```
chg-stpopts:defcc=49:defndc=177
```

**:defcc**

Specifies the default country code

**defndc**

Specifies the default network destination code

9. Verify the new values for the default country code and default network destination code using the `rtrv-stpopts` command.

The Portability Check for MO SMS feature is enabled, turned on, and operating in the system. The Portability Check for Mobile Originated SMS feature cannot be turned off if the HomeSMSC Match with Digits option is set to `MOSMSDIGMAT = BESTFIT` or if the TCAP Segmented SMS Support is set to `MOSMSTCAPSEG = ON`. The Portability Check for MO SMS feature cannot be disabled.

## 4.9 Prepaid Short Message Service Intercept Activation Procedure

This procedure is used to activate the Prepaid Short Message Service Intercept feature. This procedure assumes that GTT is enabled and turned on, and that the NT serial number has been entered and locked.

 **Note:**

The Prepaid Short Message Service Intercept feature must be enabled before the Service Action value `pprelay` can be specified for the `MOSMSGCDPN` NPP service. The `MOSMSGCDPN` and `MOSMSGCGPN` NPP services must be provisioned before the Prepaid Short Message Service Intercept feature is turned on for the feature to be functional.

1. Enter the `enable-ctrl-feat` command to enable the Prepaid Short Message Service Intercept feature.

```
enable-ctrl-feat:partnum=893006701:fak=<Feature Access Key>
```

2. Provision NPP components for this feature. Refer to *Numbering Plan Processor (NPP) User's Guide* and [Provisioning NPP for MO SMS Features](#) for provisioning information and procedures. After provisioning NPP components for this feature, return to this procedure and continue with the next step.

3. Enter the `chg-ctrl-feat` command to turn on the Prepaid Short Message Service Intercept feature.

```
chg-ctrl-feat:partnum=893006701:status=ON
```

4. Enter the `ent-srvsel` command to assign the service selector with service feature `serv=smsmr`.

This command assigns the service selectors required to specify the service entry for the Service Module card services. The `serv=smsmr` parameter of the `ent-srvsel` command is used for PPSMS Service. This service can be assigned to ITU selectors



only. The SNP parameter must be set to E.164 and all values of the SNAI parameter are supported. Refer to [EAGLE Service Selector Commands](#) for more information.

Command example:

```
ent-
srvsel:gtii=4:tt=0:np=e164:nai=intl:serv=smsmr:snp=e164:snai
=intl:ssn=8
```

where

**:gtii**

Specifies the global title indicator (2 = ANSI, ITU; 4 = ITU)

**:tt**

Specifies the translation type

**:np**

Specifies the numbering plan

**:nai**

Specifies the nature of address indicator

**:serv**

Specifies the DSM service

**:snp**

Defines the service numbering plan

**:snai**

Specifies the service nature of address indicator

**:ssn**

Defines the subsystem number

5. Use the `chg-ppsopts` command to enter Prepaid Short Message Service Intercept options. This command updates the PPSOPTS table.

Command example:

```
chg-ppsopts:ppt=1:ri=gt:pci=1-1-1:ssn=1
```

where:

**:ppt**

Specifies the prepaid portability type

**:ri**

Specifies the routing indicator

**:pci**

Specifies the ITU international point code with subfields *zone-area-id*

**:ssn**

Specifies the subsystem number

6. Use the `ent-map` command to enter mated applications for use with SCCP network management and routing to mated nodes when outgoing RI = route-on-SSN.

Command example:

```
ent-  
map:pci=1-1-1:ssn=8:rc=10:mpci=3-3-3:mssn=8:materc=10:grp=smsc
```

This example enters ITU international point code 1-1-1 and ITU international destination point code 3-3-3 as load shared mates. This entry is used only if the Prepaid Short Message Service Intercept RI is equal to the SSN in the PPSOPTS table.

7. Use the `ent-mrn` command to enter mated relay nodes for routing to the mated node when outgoing RI = route-on-GT.

Command example:

```
ent-mrn:pci=2-2-2:rc=10:pci1=3-3-3:rc1=10
```

This example enters Prepaid Short Message Service ITU international point code 2-2-2 and node ITU international point code 3-3-3 as load shared mates. This entry is used only if the Prepaid Short Message Service Intercept RI is equal to the GT in the PPSOPTS table.

The Prepaid Short Message Service Intercept feature is now enabled, turned on, and operating in the system. The Prepaid Short Message Service Intercept feature can be turned off, but cannot be disabled.

## 4.10 Service Portability Activation Procedure

This procedure is used to enable and turn on the Service Portability (S-Port) feature in the EAGLE.

The Service Portability feature is optional and must be purchased from Oracle. The feature must be purchased to receive the Feature Access Key (FAK) that is required to enable the feature. Contact your Oracle Sales Representative or Account Representative to determine whether you are entitled to use the Service Portability feature has been purchased and for additional information.

The Service Portability (S-Port) feature is enabled using part number 893034301 and the Feature Access Key (FAK). The S-Port feature cannot be disabled after it is enabled and cannot be enabled with a temporary FAK. After the S-Port feature is enabled and turned on, the S-Port feature can be turned off.

S-Port options can be provisioned after the S-Port feature is enabled and before the S-Port feature is turned on. After the S-Port feature is enabled and provisioning is complete, the S-Port feature must be turned on (status set to *on*), before S-Port processing will occur.

1. Display the status of the controlled features that are controlled with Feature Access Keys (FAKs).

Command example:

```
rtrv-ctrl-feat
```

The output shows the enabled features and the on/off status for each enabled feature in the EAGLE. If the `rtrv-ctrl-feat` output shows an LNP ported TNs quantity entry, this procedure cannot be performed. If the Service Portability entry appears in the `rtrv-ctrl-feat` output with status = on, this procedure does not need to be performed. If the Service Portability entry appears in the `rtrv-ctrl-feat` output with status = off, go to [4](#) to turn on the S-Port feature. To enable and turn on the S-Port feature, continue to [2](#).

2. Enable the S-Port feature.

Command example:

```
enable-ctrl-feat:partnum=893034301:fak=<Feature Access Key>
```

**3. Verify that the S-Port feature is enabled.**

Command example:

```
rtrv-ctrl-feat

rlghncxa03w 09-06-29 16:40:40 EST EAGLE5 41.1.0
The following features have been permanently enabled:
Feature Name          Partnum   Status   Quantity
HC-MIM SLK Capacity   893012707 on        64
Service Portability   893034301 off       ----
;
```

S-Port options can be provisioned after the feature is enabled. S-Port processing will not occur until the feature is enabled and turned on.

**4. Turn on the S-Port feature.**

Command example:

```
chg-ctrl-feat:partnum=893034301:status=on
```

**5. Verify that the S-Port feature is enabled and turned on.**

Command example:

```
rtrv-ctrl-feat

rlghncxa03w 09-06-29 16:43:40 EST EAGLE5 41.1.0
The following features have been permanently enabled:
Feature Name          Partnum   Status   Quantity
HC-MIM SLK Capacity   893012707 on        64
Service Portability   893034301 on       ----
;
```

S-Port processing can occur after the feature is enabled and turned on.

**6. Back up the database changes using the chg-db:action=backup:dest=fixed command.**

The following messages appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk
complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk
complete.
```

The Service Portability (S-Port) feature is now enabled, turned on, and operating in the system. The feature can be turned off using the `chg-ctrl-feat` command, but cannot be disabled.

## 4.11 S-Port Subscriber Differentiation Activation Procedure

This procedure is used to enable and turn on the S-Port Subscriber Differentiation feature and to provision the S-Port Subscriber Differentiation SUBDFRN option to permit S-Port Subscriber Differentiation processing of MSUs in the EAGLE.

- The S-Port Subscriber Differentiation feature is optional and must be purchased from Oracle. The feature must be purchased to receive the Feature Access Key (FAK) that is required to enable the feature. Contact your Oracle Sales Representative or Account Representative to determine whether the Service Portability feature has been purchased and for additional information.
- The Service Portability (S-Port) feature must be enabled before the S-Port Subscriber Differentiation feature can be enabled. Refer to [Service Portability Activation Procedure](#) to enable the Service Portability feature.

The S-Port Subscriber Differentiation feature is enabled using part number 893037901 and the Feature Access Key (FAK). The S-Port Subscriber Differentiation feature cannot be disabled after it is enabled and cannot be enabled with a temporary FAK. After the S-Port Subscriber Differentiation feature is enabled and turned on, the S-Port feature cannot be turned off.

Provisioning of the S-Port Subscriber Differentiation SUBDFRN option can be performed only after the S-Port Subscriber Differentiation feature is enabled and turned on.

Before S-Port Subscriber Differentiation processing of MSUs can occur, these conditions must be met:

- Service Portability must be enabled and turned on. Refer to [Service Portability Activation Procedure](#).
  - S-Port Subscriber Differentiation must be enabled (2) and turned on (5).
  - S-Port Subscriber Differentiation SUBDFRN option must be set to `on` using the `chg-sccpopts` command (10).
  - A feature that uses Service Portability must be enabled and turned on. Refer to the feature activation procedure for the feature.
1. Display the status of features controlled by feature access keys. The resulting output displays the features that are enabled in the system and the `on/off` status for each feature.

Command example:

```
rtrv-ctrl-feat
```

Output example:

```
rlghncxa03w 10-06-29 16:40:40 EST EAGLE5 42.0.0
The following features have been permanently enabled:
Feature Name          Partnum   Status   Quantity
HC-MIM SLK Capacity   893012707 on        64
Service Portability   893034301 off       ----
;
```

- If the Service Portability feature, displayed as `Service Portability`, does not appear in the `rtrv-ctrl-feat` output, this procedure cannot be performed.

Perform [Service Portability Activation Procedure](#) to enable the Service Portability feature before continuing with this procedure.

- If the S-Port Subscriber Differentiation feature, displayed as `S-Port Sub Dfrntiation`, appears in the `rtrv-ctrl-feat` output with a status of `on`, go to [8](#) to set the S-Port Subscriber Differentiation SUBDFRN option to `on`.
- If the S-Port Subscriber Differentiation feature, displayed as `S-Port Sub Dfrntiation`, appears in the `rtrv-ctrl-feat` output with a status of `off`, go to [5](#) to turn on the S-Port Subscriber Differentiation feature.
- If the S-Port Subscriber Differentiation feature, displayed as `S-Port Sub Dfrntiation`, does not appear in the `rtrv-ctrl-feat` output, continue to the next step to enable the S-Port Subscriber Differentiation feature.

**2. Enable the S-Port Subscriber Differentiation feature.**

Command example:

```
enable-ctrl-feat:partnum=893037901:fak=<feature access key>
```

**3. Verify that the S-Port Subscriber Differentiation feature, displayed as `S-Port Sub Dfrntiation`, is enabled with a status of `off`.**

Command example:

```
rtrv-ctrl-feat
```

Output example:

```
rlghncxa03w 10-06-29 16:40:40 EST EAGLE5 42.0.0
The following features have been permanently enabled:
Feature Name          Partnum   Status   Quantity
HC-MIM SLK Capacity   893012707 on        64
Service Portability   893034301 off       ----
S-Port Sub Dfrntiation 893037901 off       ----
```

**4. If the S-Port Subscriber Differentiation feature is to be turned on, continue to the next step. Otherwise, go to [12](#).**

**5. Turn on the S-Port Subscriber Differentiation feature.**

Command example:

```
chg-ctrl-feat:partnum=893037901:status=on
```

**6. Verify that the S-Port Subscriber Differentiation feature, displayed as `S-Port Sub Dfrntiation`, is enabled with a status of `on`.**

Command example:

```
rtrv-ctrl-feat
```

Output example:

```
rlghncxa03w 10-06-29 16:40:40 EST EAGLE5 42.0.0
The following features have been permanently enabled:
Feature Name          Partnum   Status   Quantity
HC-MIM SLK Capacity   893012707 on        64
Service Portability   893034301 off       ----
S-Port Sub Dfrntiation 893037901 on        ----
```

7. If the S-Port Subscriber Differentiation SUBDFRN option is to be set to `on`, continue to the next step. Otherwise, go to [12](#).
8. Determine whether the S-Port Subscriber Differentiation SUBDFRN option is `on`.

Command example:

```
rtrv-sccpopts
```

Output example:

```
tekelecstp 10-02-15 14:07:11 EST EAGLE 42.0.0
SCCP OPTIONS
-----
CLASS1SEQ                off
CCLLEN                   1
ACLEN                    3
INTLUNKNNAI              no
SUBDFRN                  off
MOBRSCCPOPC              MTP
DFLTGTTMODE              CdPA
```

9. If the S-Port Subscriber Differentiation SUBDFRN option is `on`, go to [12](#). Otherwise, continue to the next step to turn on the S-Port Subscriber Differentiation SUBDFRN option.
10. Set the S-Port Subscriber Differentiation SUBDFRN option to `on`.

Command example:

```
chg-sccpopts:subdfrn=on
```

11. Verify that the S-Port Subscriber Differentiation SUBDFRN option is `on`.

Command example:

```
rtrv-sccpopts
```

For S-Port Subscriber Differentiation processing of MSUs to occur:

- Service Portability must be enabled and turned on.
- S-Port Subscriber Differentiation must be enabled and turned on.
- S-Port Subscriber Differentiation SUBDFRN option must be set to `on`.
- A feature that uses Service Portability must be enabled and turned on.

12. Back up the database changes.

Command example:

```
chg-db:action=backup:dest=fixed
```

This message is displayed with the active Maintenance and Administration Subsystem Processor (MASP) listed first .

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

The S-Port Subscriber Differentiation feature cannot be turned off and cannot be disabled. To prevent message processing with S-Port Subscriber Differentiation after the feature is

enabled and turned on and the SUBDFRN option is set to `on`, use the `chg-sccpopts` command to set the SUBDFRN option to `off`.

## 4.12 MTP Routed Messages for SCCP Applications Activation Procedure

This procedure is used to enable and turn on the MTP Routed Messages for SCCP Applications (**MTP Msgs for SCCP Apps**) feature in the EAGLE.

- Before the MTP Msgs for SCCP Apps feature can be enabled, GTT must be on.
- The MTP Msgs for SCCP Apps feature is optional and must be purchased from Oracle. The feature must be purchased to receive the Feature Access Key (FAK) that is required to enable the feature. Contact your Oracle Sales Representative or Account Representative to determine whether you are entitled to use the MTP Msgs for SCCP Apps feature has been purchased and for additional information.

The MTP Msgs for SCCP Apps feature is enabled using part number 893017401 and the Feature Access Key (FAK). The MTP Msgs for SCCP Apps feature cannot be disabled after it is enabled and cannot be enabled with a temporary FAK. After the MTP Msgs for SCCP Apps feature is enabled and turned on, the feature can be turned off.

The MTP Msgs for SCCP Apps feature must be enabled and turned on (status set to `on`) before MTP Msgs for SCCP Apps processing will occur.

1. Display the status of the controlled features that are controlled with Feature Access Keys (FAKs).

Command example:

```
rtrv-ctrl-feat
```

The output shows the enabled features and the on/off status for each enabled feature in the EAGLE.

- If the MTP Msgs for SCCP Apps entry appears in the `rtrv-ctrl-feat` output with status = `on`, this procedure does not need to be performed.
  - If the MTP Msgs for SCCP Apps entry appears in the `rtrv-ctrl-feat` output with status = `off`, go to [4](#) to turn on the MTP Msgs for SCCP Apps feature.
  - If the MTP Msgs for SCCP Apps entry does not appear in the `rtrv-ctrl-feat` output, continue with [2](#).
2. Enable the MTP Msgs for SCCP Apps feature.

Command example:

```
enable-ctrl-feat:partnum=893017401:fak=<Feature Access Key>
```

3. Verify that the MTP Msgs for SCCP Apps feature is enabled.

Command example:

```
rtrv-ctrl-feat
```

```
rlghncxa03w 09-06-29 16:40:40 EST EAGLE5 41.1.0
The following features have been permanently enabled:
Feature Name          Partnum    Status    Quantity
```

```

HC-MIM SLK Capacity      893012707  on          64
MO-based IS41 SMS NP    893019501  on          ----
MTP Msgs for SCCP Apps  893017401  off         ----
;

```

MTP Msgs for SCCP Apps processing will not occur until the feature is enabled and turned on.

4. Turn on the MTP Msgs for SCCP Apps feature.

Command example:

```
chg-ctrl-feat:partnum=893017401:status=on
```

5. Verify that the MTP Msgs for SCCP Apps feature is enabled and turned on.

Command example:

```

rtrv-ctrl-feat

rlghncxa03w 09-06-29 16:43:40 EST  EAGLE5 41.1.0
The following features have been permanently enabled:
Feature Name          Partnum  Status  Quantity
HC-MIM SLK Capacity   893012707  on      64
MO-based IS41 SMS NP  893019501  on      ----
MTP Msgs for SCCP Apps 893017401  on      ----
;

```

MTP Msgs for SCCP Apps processing can occur after the feature is enabled and turned on.

6. Back up the database changes using the `chg-db:action=backup:dest=fixed` command.

The following messages appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```

BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.

```

The MTP Msgs for SCCP feature is now enabled, turned on, and operating in the system. The feature can be turned off using the `chg-ctrl-feat` command, but cannot be disabled.

## 4.13 Provisioning NPP for MO SMS Features

For detailed information about Numbering Plan Processor, refer to *Numbering Plan Processor (NPP) User's Guide*. NPP and the associated components for MO SMS features are described in [Numbering Plan Processor for MO SMS Features](#).

NPP provisioning is performed in the following sequence:

1. Provision the FNAI mnemonic values required for filter matches on the NAI values for the service, using the `chg-npp-serv` command.



2. Provision the NPP Action Sets with the Conditioning Actions, Service Actions, Formatting Actions, and outgoing NAI value for the enabled MO SMS feature using the `ent-npp-as` command.
3. Provision the Service Rule Sets (Rules that specify the filter values and Action Sets) MO SMS feature with the `ent-npp-srs` command. Service Rule Sets are Rules that specify the filter values and Action Sets.
4. Provision any delimiter values used in the outgoing digit string formatting using the `chg-npp-serv` command.
5. Change the Service Status to `on` to allow NPP processing for the specified service:

```
chg-npp-serv:svrn=<service name>:status=on
```

## 4.14 MO SMS NPP Test Tool

The MO SMS NPP Test Tool sends GSM or IS41 messages to test MO SMS NPP provisioning and display information about all NPP filters, rules, and formatting applied to the messages. The GSM messages flow through NPP Services MOSMSGCDPN and MOSMSGCGPN. The IS41 messages flow through NPP Services MOSMSICDPN and MOSMSICGPN. The MO SMS NPP Test Tool is useful for debugging and tracing changes introduced by NPP to the incoming TCAP Called Party Number (CdPN) or Calling Party Number (CgPN) digits. An MO SMS NPP Test Tool message is not transmitted to the network. All test messages are stored in table TSTMSG.

The MO SMS NPP Test Tool provides the following capabilities:

- Define up to 10 GSM test messages ([Table 4-2](#))
- Define up to 10 IS41 test messages ([Table 4-3](#))
- Invoke the feature with NPP to process the test message
- Generate a report of the actions taken and the results of the test

Differences between Test Messages and Actual MO SMS GSM/IS41 Message Flow:

- Test messages are executed from task `Npp_Test`.
- Test messages do not contribute to `rept-stat-sccp` counters displayed under SMSMR service.
- Test messages do not contribute to measurements.
- Test messages are not sent to the network.

Refer to *Commands User's Guide* and [MO SMS NPP Test Tool Commands](#) for descriptions of the commands, parameter values, and output examples.



### Note:

The specified test message must be set to `active=yes` before the test is invoked for the message.

**Table 4-2 GSM Parameters for TSTMSG Table**

Parameter	Range	Default
active	yes, no	no
cdpadgts	hexadecimal digit string of 1 to 15 digits	0123456789abcde
cdpagti	0-15	4 (GT with TT/NP/ES/NAI)
cdpagtnai	0-127	4 (International)
cdpndgts	hexadecimal digit string of 1 to 20 digits	0123456789abcde
cdpnnai	0-7	1 (International)
cdpnp	0-15	1 (MAP_NUM_ISDN)
cgpadgts	hexadecimal digit string of 1 to 15 digits	0123456789abcde
cgpagti	0-15	4 (GT with TT/NP/ES/NAI)
cgpagtnai	0-127	4 (International)
cgpndgts	hexadecimal digit string of 1 to 21 digits	0123456789abcde
cgpnnai	0-7	1 (International)
cgpnp	0-15	1 (MAP_NUM_ISDN)

**Table 4-3 IS41 Parameters for TSTMSG Table**

Parameter	Range	Default
active	yes, no	no
cdpadgts	hexadecimal digit string of 1 to 15 digits	0123456789abcde
cdpagti	0-15	4 (GT with TT/NP/ES/NAI)
cdpagtnai	0-127	4 (International)
cdpndgts	hexadecimal digit string of 1 to 21 digits	0123456789abcde
cdpnes	0-15	1 (IS41_BCD_ECD)
cdpnnai	0-1	1 (International)
cdpnp	0-15	2 (IS41_TELEPHONY_NUM)
cgpadgts	hexadecimal digit string of 1 to 15 digits	0123456789abcde
cgpagti	0-15	4 (GT with TT/NP/ES/NAI)
cgpagtnai	0-127	4 (International)
cgpndgts	hexadecimal digit string of 1 to 21 digits	0123456789abcde
cgpnes	0-15	1 (IS41_BCD_ECD)
cgpnnai	0-1	1 (International)
cgpnp	0-15	2 (IS41_TELEPHONY_NUM)

The `tst-msg` command sends the message provisioned in table TSTMSG to the EAGLE Service Feature indicated by the `feat` parameter. The `tst-msg` format is:

```
tst-msg:loc=<loc>:prot=<gsm, is41,
ttr>:msgn=<message_number>:feat=<mosmsnpp, ttr>
```

**loc**

Location of the network card where the test message is sent

**prot**

Type of test message

**msgn**

Message number of test message within the PROT=type messages

**feat**

EAGLE Service Feature that processes the message on the network card. For feat=mosmsnpp, the only valid choice is prot=gsm or prot=is41.

# 5

## Measurements

This chapter describes the measurements information available from the EAGLE for the MO SMS features.

### 5.1 MO SMS Measurements

Refer to *Measurements Reference* for information about measurement systems and reporting.

Refer to *Commands User's Guide* for descriptions of commands used to generate, schedule, and transfer measurements reports.

Refer to *Database Administration - System Management User's Guide* for provisioning information and procedures for these measurement systems:

- OAM-based Measurements - MO SMS measurements are available using the File Transfer Area (FTA) feature and not directly by EAGLE terminals.
- Measurements Platform
- E5-OAM Integrated Measurements

Both System Total (SYSTOT) pegs and Service Switching Point (SSP) pegs are updated as described in [Table 5-1](#). The measurement pegs track events on the basis of system total and Service Switching Point (SSP).

**Table 5-1 Measurements Pegs for MO SMS Features**

Event Name	Description	Feature	Unit
GPNOCL	Number of non-call related messages relayed by G-Port; Number of MO Forward Short Messages (MO FSMs) relayed by Prepaid SMS Intercept to an IN platform	G-Port, Prepaid SMS Intercept	Peg count
GPNOCLGT	Number of non-call related messages that fell through to GTT; Number of messages subject to Prepaid SMS Intercept to processing that fell through to GTT	G-Port, Prepaid SMS Intercept	Peg count
SMSMOGERR	Total number of MO Forward Short Messages (MO FSMs) received that result in an error	MO-based GSM SMS NP, Service Portability	Peg count
SMSMOGRCV	Total number of MO Forward Short Messages (MO FSMs) received that result in a modification of the outgoing MO Forward Short Messages	MO-based GSM SMS NP, Service Portability	Peg count
SMSMOIERR	Total number of SMDPP messages received that result in an error	MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration, Service Portability	Peg count

**Table 5-1 (Cont.) Measurements Pegs for MO SMS Features**

<b>Event Name</b>	<b>Description</b>	<b>Feature</b>	<b>Unit</b>
SMSMOIRCV	Total number of SMDPP messages received that result in a modification of the outgoing SMDPP	MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration, Service Portability	Peg count
MOSMSSEGER	Total number of TC_CONTINUE messages with Component Portion discarded by the Portability Check for Mobile Originated SMS feature or the MO-Based GSM SMS NP feature	TCAP Segmented SMS Support Phase 1	Peg count
MOSMSSEGO K	Total number of TC_CONTINUE messages with Component Portion relayed successfully by the Portability Check for Mobile Originated SMS feature or the MO-Based GSM SMS NP feature	TCAP Segmented SMS Support Phase 1	Peg count

# 6

## Maintenance

This chapter describes the maintenance information available from the EAGLE for the MO SMS features. The information includes status, alarms (UAMs), and information messages (UIMs).

### 6.1 Alarms

Refer to *Unsolicited Alarms and Information Messages Reference* for descriptions and corrective procedures associated with EAGLE-related alarms (UAMs). Refer to *Alarms and Maintenance Guide* for EPAP for the descriptions and corrective procedures associated with MPS-related alarms.

### 6.2 UIMs

This section lists the Unsolicited Information Messages (UIMs) used to support the MO SMS features. Refer to *Unsolicited Alarm and Information Messages Reference* for a complete description of all UIM text and formats.

**Table 6-1 Unsolicited Information Messages**

UIM	Text	Description	Action
1374	SMS B-party Address decode failed	An error was detected during decode of the SMS message destination address.	The message should be analyzed to determine the error, and the originating node should be contacted to send a corrected message.
1375	SMS Failed to modify TCAP MSU	The formatted outbound digit string length generated by MO SMS features for encoding the TCAP message exceeded system limits.	The message and outbound digits formatting should be analyzed to determine the error, and the originating node or the requested outbound digits formatting option should be modified to correct the encoding error.
1376	SMS Failed to modify B-party digits	During processing of the SMS message, the formatted outbound digit string length exceeded limit for number of digits.	The message and the digit format provisioning should be analyzed to determine the error, and the originating node or the requested outbound digit formatting option should be modified to correct the encoding error.
1410	MOSMS: Migrated Subscriber with no entity	No entity is defined in the RTDB for the migrated subscriber. The subscriber is found to be migrated and the migration prefix must be the entity resulting from the RTDB Lookup.	Ensure that the subscriber has an entity in the RTDB or change the value for MOIGMPFX in Table IS41SMSOPTS.

**Table 6-1 (Cont.) Unsolicited Information Messages**

UIM	Text	Description	Action
1416	MAP Missing Mandatory Parameters	An MO SMS feature cannot decode the GSM MAP message because mandatory parameters (SM-RP-UI or SM-RP-OA) in the TCAP portion of the message are missing.	Ensure that the message contains all mandatory parameters.
1425	SMS A-party Address decode failed	Decoding of the SMS_OOA parameter fields of the IS41 SMDPP message failed. MSU encountered a decoding error.	Ensure that the SMDPP message contains a correctly formatted SMS_OOA parameter.
1426	S-Port: Missing GRN for srvc prtd subs	Service Portability is to be applied and RTDB GRN is required to format outbound digits but is not provisioned for the DN.	Verify EPAP and EAGLE provisioning to configure the GRN for the DN.

## 6.3 Maintenance Commands

The following commands can be used for maintenance when an EPAP-related feature is on.

Refer to *Commands User's Guide* for complete descriptions of the commands, including parameters, valid parameter values, rules for using the commands, and output examples.

**Table 6-2 Maintenance Commands**

Command	Description
rept-stat-sys	Reports the status of system entities, including cards. The output includes the number of Service Module cards that are in service (IS-NR) and how many are in another state (IS-ANR, OOS-MT, OOS-MT-DSBLD).
rept-stat-sccp	Reports operating status of services and subsystems, CPU usage, and Service Module card status. When the <code>loc</code> parameter is specified, the command displays detailed card traffic statistics, including cards that are denied SCCP service. See the section in this manual that describes the use of the <code>rept-stat-sccp</code> command.
rept-stat-mps	Displays the overall status of the EPAP application running on the MPS (multi-purpose server). Command output for the various reports of this command include overall MPS alarm status and card status, and status for a specific Service Module card when a feature is on.
rept-stat-trbl	Includes a summary of any trouble notifications ( <b>UAMs</b> ) for local subsystems, cards, and linksets. The severity of each alarm is indicated in the output report.
rept-stat-alm	Displays the alarm counts and totals for local subsystems and Service Module card/EPAP IP links.

Table 6-2 (Cont.) Maintenance Commands

Command	Description
rept-stat-db	Displays the status information for the EAGLE databases. This includes the level information for each Service Module card, and for the active and standby EPAP RTDB. The command reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birth dates and levels. It shows the status of each PDB and RTDB when an EPAP-related feature is enabled.
rtrv-tbl capacity	Retrieves table use capacity summary information. For each table listed, the number of table entry elements in use and the total allowed number of table elements is presented, along with a percent (%) full value. Information is shown for some tables only if the feature that uses the table is enabled.
inh-card/alw-card	The <code>inh-card</code> command is used to change the operating state of the card from In-Service Normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD). A craftsperson then can test the card or physically remove it from the shelf.  The <code>alw-card</code> command is used to change the card from OOS-MT-DSBLD (Out-of-Service Maintenance-Disabled) to IS-NR (In-Service Normal) if card loading is successful.
inh-alm/unhb-alm	Used to allow and inhibit reporting of alarms for a given device, including the Service Module card ports. The commands allow both Port A and Port B to be specified. Inhibited alarms will not generate UAMs or cause alarm indicators to be turned on. All <code>rept-stat-xxx</code> commands continue to display the alarms with an indication that the device has its alarms inhibited.
rtrv-data-rtdb	Retrieves Entity data, DN data, IMEI data, IMSI data, TN data, NPANXX data, and LRN data from the RTDB on an active Service Module card.  If the <code>loc</code> parameter is specified and the target card is an active Service Module card, the RTDB data is retrieved from that card.  If the <code>loc</code> parameter is not specified, the RTDB data is retrieved on the active Service Module card that has the lowest IMT address.  The RTDB status on the active Service Module card can be coherent or incoherent.

### 6.3.1 rept-stat-sccp

The `rept-stat-sccp` command provides statistics for local subsystem operating status, CPU usage related to the subsystem, and Service Module cards and the services that execute on the cards. Statistics can be displayed for all Service Module cards, or detailed card traffic statistics can be displayed for a single card when the `loc` parameter is specified.

Statistics are displayed under SMSMR Service Statistics for MO SMS IS41-to-GSM Migration, MO-Based GSM SMS NP, MO-Based IS41 SMS NP, and PPSMS features.

Refer to *Commands User's Guide* for a complete description of the `rept-stat-sccp` command, including parameters and valid values, rules for using the command correctly, and output examples.

#### MO SMS-Related Feature Statistics



All `rept-stat-sccp` counters for MO SMS processing are displayed with the SMSMR Service. The `rept-stat-sccp` counters show the outcome of the cumulative processing of all Mo SMS-related features.

All of the `rept-stat-sccp` counters except the ERRORS counter are incremented. The ERRORS counter is pegged only by the features that respond to the incoming message. MO SMS-related features are message relay features.

MO SMS-related features are processed independently based on whether the feature is provisioned and turned on with an NPP service. Each feature keeps track of whether the message processing is SUCCESS, FAILURE or WARNINGS. At the end of all processing, `rept-stat-sccp` counters are derived by considering all feature outcome cumulatively. The counters are derived in the following order - first FAILURE, second WARNINGS, third SUCCESS. and last FALL THROUGH:

- **FAILURE:** The message had all information required for processing and was processed, but encountered delivery problems due to cross network routing failure, lack of routing information, or encoding failure. Failure errors do not mean that the message being processed is discarded. Because all MO SMS-related features are intercepting the message being translated by GTT, the messages fall back to GTT routing without modification when a failure to process has occurred.
- **WARNINGS:** This count will be incremented for the feature if a decoding failure, lack of information to process, parameter not provisioned, or processing failure is encountered.
- **SUCCESS:** The feature successfully processed the message. Message contents have been modified.
- **FALL THROUGH:** The message is good; none of the features changed the contents of the message.
- **TOTAL:** SUCCESS + FAILURE + WARNINGS + FALL THROUGH = TOTAL number of messages processed by the SMSMR service.

### SMDPP or Forward Short Message Decoding and Pre-NPP Processing

**Table 6-3 Service Status Counters-Message Decoding and Pre-NPP Processing**

Service Status Completion	Description
WARNINGS	Could not decode Calling Party or Called Party parameters from the message. See x
FALL THROUGH	Message is not valid. IS41: Not an SMDPP message. GSM: Message is not MO-FSM. PDU type is not SMS_SUBMIT or SMS-COMMAND. NPP Service Status is OFF. SCCP message is not UDT Or non-segmented XUDT.

**Table 6-4 rept-stat-sccp Counters Incremented During Decoding**

	Missing CgPN	Missing CdPN	Decode Error in CgPN	Decode Error in CdPN
GS M	Missing mandatory parameter- WARNINGS	Missing mandatory parameter- WARNINGS	WARNINGS	WARNINGS
IS4 1	--	--	WARNINGS (An error)	WARNINGS (An error)

The following tables describe the counters that are incremented specifically for message decoding and for MO SMS-related features.

**Prepaid SMS Intercept Phase 1 Feature Service Status Counters****Table 6-5 Service Status Counters-Prepaid SMS Intercept Phase 1**

Service Completion Status	Description
SUCCESS	Message is for a Prepaid subscriber, and the message was processed
WARNINGS	Length of the MSISDN digits is less than 0 or greater than 21 Length of the outbound DN digits is greater than 20 MSU number conditioning failed because DEFCC or DEFNDC is not provisioned NPP processing failed
FAILURE	Length of the conditioned digits is greater than 15 Failed to route to the Prepaid server Invalid Point Code is defined for IN Plat form No SSN is present in entity data and no CdPA SSN is present SCCP layer encode to Prepaid server failed In all of these cases, the message falls through to GTT without modification.
FALL THROUGH (Did not process)	Message is not from or to a Prepaid subscriber Message is from a Prepaid server. MSISDN is not found in RTDB MOSMSGCGPN or MOSMSGCDPN NPP service state is OFF PPSMS feature is not turned on

**Portability Check for MO SMS Feature Service Status Counters****Table 6-6 Service Status Counters-Portability Check for MO SMS**

Service Completion Status	Description
SUCCESS	FRAUD detected
WARNINGS	Length of the MSISDN digits is less than 0 or greater than 21 Length of the outbound DN digits is greater than 20 MSU number conditioning failed because DEFCC or DEFNDC is not provisioned NPP processing failed

**Table 6-6 (Cont.) Service Status Counters-Portability Check for MO SMS**

Service Completion Status	Description
FAILURE	Length of the conditioned digits is greater than 15 Encoding and sending of NACK message failed. (TCAP length is zero; translated PC after GTT is in a different domain.) Encoding and sending ABORT message to SMSC failed. (TCAP portion length is zero during encoding.)
FALL THROUGH (Did not process)	MSISDN is not found in RTDB Subscriber is not FRAUD Destination is not HOME SMSC MOSMSGCGPN NPP service state is OFF Portability Check for MO SMS feature is not turned on

**MO SMS IS41-to-GSM Migration Feature Service Status**

**Table 6-7 Service Status Counters-MO SMS IS41-to-GSM Migration**

Service Completion Status	Description
SUCCESS	User found to have migrated, and message is modified
WARNINGS	MIGRATE failed because the IS41SMSOPTS MOIGMPFX option is not provisioned MIGRATE failed because the GSMOPTS IS412GSM option is not provisioned and the IS41SMSOPTS MOIGMPFX option is set to IS412GSM Subscriber is migrated base on NO ENTITY with DN PORT TYPE = 5 and the IS41SMSOPTS MOIGMPFX option is set to NE Length of the outbound DN digits is greater than 20 MSU number conditioning failed because DEFCC or DEFNDC is not provisioned NPP Conditioning Action execution or Formatting Action execution failed
FAILURE	Length of the conditioned digits is greater than 15 Modified TCAP encoding failed The message falls through to GTT without being modified.
FALL THROUGH (Did not process)	DA/ODA not found in RTDB Called Party parameter is not found to have migrated Destination is not HOME SMSC The MOSMSICDPN NPP service state is OFF MO SMS IS41-to-GSM Migration feature is not turned on

**Number Portability and Service Portability Service Status**

**Table 6-8 Service Status Counters-Number Portability and Service Portability**

Service Completion Status	Description
SUCCESS	Number Portability or Service Portability was applied and the message was modified
WARNINGS	<p>Length of the outbound DN digits is greater than 20 for GSM messages and 21 for IS41 messages</p> <p>MSU number conditioning failed because DEFCC or DEFNDC is not provisioned</p> <p>Decode of SM-RP-UI parameter failed. The length of the TP_DA parameter and valued do not conform with the GSM MAP protocol requirements.</p> <p>NPP Conditioning Action execution or Formatting Action execution failed</p> <p>Length of the conditioned digits is greater than 15</p> <p>Service Portability is applicable but GRN is not provisioned for the DN in the RTDB. Service Portability is applicable if the S-Port feature is turned on and any of the following conditions is true:</p> <ul style="list-style-type: none"> <li>Subscriber is own-network IS41 subscriber and the SPORTTYPE configuration option value is IS41 or ALL</li> <li>Subscriber is own-network GSM subscriber and the SPORTTYPE configuration option value is GSM or ALL</li> </ul>
FAILURE	<p>Modified TCAP encoding failed</p> <p>The message falls through to GTT without being modified.</p>
FALL THROUGH (Did not process)	<p>RTDB lookup was unsuccessful because DA/ODA were not found in the RTDB or an Entity was not found or validated</p> <p>Called Party parameter is not ported out and Service Portability does not apply</p> <p>Destination is HOME SMSC</p> <p>The MOSMSICDPN or MOSMSGCDPN NPP service state is OFF</p> <p>The required Number Portability feature is not turned on</p>

**MO SMS B-Party Routing Feature Service Status Counters**

**Table 6-9 Service Status Counters-MO SMS B-Party Routing**

Service Completion Status	Description
SUCCESS	Successfully routed MSU on B-Party Number
WARNINGS	Length of the outbound DN digits is greater than 20
FAILURE	<p>Modified TCAP encoding failed</p> <p>The message falls through to GTT without being modified.</p> <p>SCRC_ERR_USER_ACTION_UDTS. UDTS generated.</p> <p>SCRC_ERR_USER_ACTION_DISCARD. MSU discarded.</p> <p>SCRC_ERR_NO_SSN_IN. MSG_OR_XLATION. Lack of routing information. Message falls through to GTT without being modified..</p> <p>SCRC_ERR_MSG_XING_DOMAIN. Delivery problems were encountered due to cross network. Message falls through to GTT without being modified..</p>

**Table 6-9 (Cont.) Service Status Counters-MO SMS B-Party Routing**

Service Completion Status	Description
	SCRC_ERR_CLG_PC_CONVERSION. Delivery problems were encountered due to cross network. Message falls through to GTT without being modified..
FALL THROUGH (Did not process)	SCRC_ERR_NO_XLATION. No rules were configured for the B-Party GTA.. MO SMS B-Party Routing feature is not turned on

## 6.4 EAGLE Debug Commands

The *Debug Commands* chapter of *Commands User's Guide* contains descriptions of commands that can be used in assessing and modifying system status and operation. The Debug commands are used only under the supervision of Oracle support personnel.

## 6.5 Status Reporting and Problem Identification

EAGLE commands can be used to obtain status and statistics for the EAGLE system, the EPAP systems, system devices including Service Module cards, EPAP-related features, local subsystems, and SCCP services.

Refer to *Commands User's Guide* for complete descriptions of the commands, including parameters and valid values, rules for using the commands correctly, and output examples.

Refer to *Unsolicited Alarm and Information Messages Reference* for descriptions and recovery procedures for UAMs and UIMs.

Refer to *Administration Guide* for EPAP for descriptions of EPAP functions and operation.

Refer to *Alarms and Maintenance Guide* for descriptions and recovery procedures for EPAP alarms.

Refer to the appropriate feature User's Guide for information about the functions and operation of EPAP-related features.

**Table 6-10 Status Reporting for EPAP-Related Features**

Reports, Status, and Statistics	Command
<b>EAGLE</b>	
Maintenance Status Report - indicates whether Maintenance, Routing, and SCCP Baselines have been established.	<code>rept-stat-sys</code>
Alarms and operating state for system devices, including Service Module ("SCCP") cards.	<code>rept-stat-sys</code>
Unsolicited Alarm Messages (UAMs) and Unsolicited Information Messages (UIMs)	<code>rept-stat-alm</code> <code>rept-stat-trbl</code>

**Table 6-10 (Cont.) Status Reporting for EPAP-Related Features**

Reports, Status, and Statistics	Command
<b>EPAP/MPS (from the EAGLE)</b>	
EPAP code version and operating state for each EPAP.	<code>rept-stat-mps</code>
MPS hexadecimal alarm strings for the active and standby EPAPs.	<code>rept-stat-mps</code>
Operating state and alarm status of equipped Service Module cards and their DSM ports and IP connections.	<code>rept-stat-mps</code> <code>rept-stat-mps:loc=&lt;Service Module card location&gt;</code>
Amount of memory used by the RTDB on the specified card, as a percent of available Service Module card memory.	<code>rept-stat-mps:loc=&lt;Service Module card location&gt;</code>
EPAP Provisioning Database (PDB), EPAP Real Time Database (RTDB), and Service Module card RTDB status information - Coherent, birthdate (date and time of creation), and exception (condition when a problem was detected).	<code>rept-stat-db</code> <code>rept-stat-db:db=mps</code>
<b>Service Module Cards, EPAP-Related Features, Services, Local Subsystems</b>	
Status of the Service Module cards, and the services executing on the cards for EPAP-related features that are turned on. Includes Service Report, Subsystem Report, and Alarm Status; Total Service Statistics.	<code>rept-stat-sccp</code>
Operating state and alarm status of equipped Service Module cards and their DSM ports and IP connections; EPAP-related feature status per card.	<code>rept-stat-mps:loc=&lt;Service Module card location&gt;</code>
Alarms and operating state for Service Module ("SCCP") cards.	<code>rept-stat-sys</code> <code>rept-stat-mps</code>
Any cards that are denied SCCP service.	<code>rept-stat-sccp</code>
Detailed view of the status of SCCP services provided by the specified Service Module card. Includes Card Alarm Status, Card Service Statistics	<code>rept-stat-sccp:loc=&lt;Service Module card location&gt;</code>
General SCCP traffic performance for Service Module cards. Message rates for TVG performance.	<code>rept-stat-sccp:mode=perf</code>
Statistics for EPAP-related feature local subsystems - Subsystem Report	<code>rept-stat-sccp</code>
Statistics for EPAP-related features	<code>rept-stat-sccp</code>

## 6.5.1 EPAP Status and Alarm Reporting

Because EPAP has no direct means of accepting user input or displaying output messages on EAGLE terminals, EPAP maintenance, measurements, and status information are routed through a Service Module card. EPAP sends two types of messages to the Service Module

card: [EPAP Maintenance Blocks](#) and [DSM Status Requests and DSM Status Messages](#). Each message type is discussed in the following sections.

### EPAP Maintenance Blocks

The EPAP forwards all status and error messages to the Service Module cards in maintenance blocks. Maintenance blocks are asynchronously sent whenever the EPAP has something to report. The status information that is displayed when a `rept-stat-mps` command is issued includes information that came from the maintenance blocks.

The active EPAP generates and sends maintenance blocks to the primary Service Module card. One maintenance block is sent as soon as the IP link is established between the active EPAP and the primary Service Module card. Additional maintenance blocks are sent whenever the EPAP needs to report any change in status or error conditions. The information returned in maintenance blocks is included in the output of the `rept-stat-mps` and `rept-stat-sccp` commands.

The EPAP sends maintenance blocks that contain at least the following information:

- Status of EPAP A - actual states are active, standby, and down (inoperative). Maintenance blocks include a field for this information so that it can be available for the output of the `rept-stat-mps` command.
- Status of EPAP B - actual states are active, standby, and down (inoperative). Maintenance blocks include a field for this information so that it can be available for the output of the `rept-stat-mps` command.
- Identification of Active EPAP - a field to identify the active EPAP.
- Congestion Indicator - an indicator showing provisioning link congestion. The link between the EPAPs and the external source of provisioning data can become congested in high-provisioning traffic situations. When this occurs and subsequently as the congestion clears, the EPAP sends maintenance blocks to the Service Module card.
- Alarm Conditions - an error code field. If the EPAP needs to report an alarm condition, it puts an appropriate UAM identifier in this field.
- Current MPS Database Size - a field indicating the current RTDB size. The Service Module card uses this information to calculate the percentage of memory used by the RTDB.

### DSM Status Requests and DSM Status Messages

When the EPAP needs to know the status of a Service Module card, the EPAP sends a DSM Status Request to all Service Module cards, and each Service Module card returns its status to the EPAP.

Service Module cards send a DSM Status Message to the EPAP when any the following events occur in the Service Module card:

- The Service Module card is booted.
- The Service Module card receives a DSM Status Request message from the EPAP.
- The Service Module card determines that it needs to download the entire RTDB; for example, the Service Module card determines that the RTDB needs to be downloaded because it is totally corrupted, or a user requests that the RTDB be

reloaded. The Service Module card sends a Full Download Request message to the EPAP

- The Service Module card starts receiving RTDB downloads or updates. When a Service Module card starts downloading the RTDB or accepting updates, the Service Module card sends a DSM Status Message informing the EPAP of the first record received. This helps the EPAP keep track of downloads in progress.

The DSM Status Message provides the following information to the EPAP:

- **DSM Memory Size.** When the Service Module card is initialized, it determines the amount of memory present. The EPAP uses the value to determine if the Service Module card has enough memory to hold the RTDB.
- **Load Mode Status.** This indicator indicates whether or not a sufficient number of the IS-NR (In-Service Normal) LIMs have access to SCCP services.