

# *Tekelec EAGLE<sup>®</sup> 5 Integrated Signaling System*

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## **Feature Manual - MO SMS**

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This product is covered by one or more of the following U.S. and foreign patents:

### U.S. Patent Numbers:

5,732,213; 5,953,404; 6,115,746; 6,167,129; 6,324,183; 6,327,350; 6,456,845; 6,606,379; 6,639,981; 6,647,113; 6,662,017; 6,735,441; 6,745,041; 6,765,990; 6,795,546; 6,819,932; 6,836,477; 6,839,423; 6,885,872; 6,901,262; 6,914,973; 6,940,866; 6,944,184; 6,954,526; 6,954,794; 6,959,076; 6,965,592; 6,967,956; 6,968,048; 6,970,542; 6,987,781; 6,987,849; 6,990,089; 6,990,347; 6,993,038; 7,002,988; 7,020,707; 7,031,340; 7,035,239; 7,035,387; 7,043,000; 7,043,001; 7,043,002; 7,046,667; 7,050,456; 7,050,562; 7,054,422; 7,068,773; 7,072,678; 7,075,331; 7,079,524; 7,088,728; 7,092,505; 7,108,468; 7,110,780; 7,113,581; 7,113,781; 7,117,411; 7,123,710; 7,127,057; 7,133,420; 7,136,477; 7,139,388; 7,145,875; 7,146,181; 7,155,206; 7,155,243; 7,155,505; 7,155,512; 7,181,194; 7,190,702; 7,190,772; 7,190,959; 7,197,036; 7,206,394; 7,215,748; 7,219,264; 7,222,192; 7,227,927; 7,231,024; 7,242,695; 7,254,391; 7,260,086; 7,260,207; 7,283,969; 7,286,516; 7,286,647; 7,286,839; 7,295,579; 7,299,050; 7,301,910; 7,304,957; 7,318,091; 7,319,857; 7,327,670

### Foreign Patent Numbers:

EP1062792; EP1308054; EP1247378; EP1303994; EP1252788; EP1161819; EP1177660; EP1169829; EP1135905; EP1364520; EP1192758; EP1240772; EP1173969; CA2352246

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Your Tekelec Sales Representative can provide you with information about how to order additional discs.

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# Chapter 1

## Introduction

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### Topics:

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This chapter contains a brief description of 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)

The chapter also includes the scope, audience, and organization of the manual; how to find related publications; and how to contact Tekelec for assistance.

## 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 EAGLE 5 Integrated Signaling System (EAGLE 5 ISS). 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.

## Scope and Audience

This manual is intended for anyone responsible for installing, maintaining, and using the MO SMS features of the EAGLE 5 ISS. Users of this manual must have a working knowledge of telecommunications and network installations.

## Manual Organization

This document is organized into the following chapters:

- *Introduction* on page 1 contains general information about the Mobile Originated Short Message Service (MO SMS) documentation, the organization of this manual, and how to request technical assistance.
- *Feature Description* on page 9 provides a functional description of the MO SMS features which include: MO-Based GSM SMS NP, MO-Based IS41 SMS NP, MO SMS IS41-to-GSM Migration, and Portability Check for MO SMS. The chapter also includes MO SMS feature options, considerations, and call flows.
- *Commands* on page 41 describes the commands that support the MO SMS features.
- *Configuration of Features* on page 57 contains procedures to configure the MO SMS features.
- *Maintenance and Measurements* on page 69 describes maintenance and measurements for MO SMS features: status and alarms, hardware verification messages, system status reports and commands, code and application data loading, and alarms.

## Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

**Table 1: Admonishments**

	<p><b>DANGER:</b> (This icon and text indicate the possibility of <i>personal injury</i>.)</p>
	<p><b>WARNING:</b> (This icon and text indicate the possibility of <i>equipment damage</i>.)</p>
	<p><b>CAUTION:</b> (This icon and text indicate the possibility of <i>service interruption</i>.)</p>

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After a CSR is issued, the Customer Care Center determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, information regarding the serial number of the system, Common Language Location Identifier (CLLI), initial problem symptoms (includes outputs and messages) is recorded. A primary Customer Care Center engineer is also assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

The Tekelec Customer Care Center is available 24 hours a day, 7 days a week at the following locations:

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1-919-460-2150 (outside continental USA and Canada)

TAC Regional Support Office Hours:

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- **Central and Latin America (CALA)**

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USA access code +1-800-658-5454, then 1-888-FOR-TKLC or 1-888-367-8552 (toll-free)

TAC Regional Support Office Hours (except Brazil):

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A critical situation is defined as a problem with an EAGLE 5 ISS that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical problems affect service and/or system operation resulting in:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with the Tekelec Customer Care Center.

## Related Publications

For information about additional publications that are related to this document, refer to the *Related Publications* document. The *Related Publications* document is published as a part of the *Release Documentation* and is also published as a separate document on the Tekelec Customer Support Site.

## Documentation Availability, Packaging, and Updates

Tekelec provides documentation with each system and in accordance with contractual agreements. For General Availability (GA) releases, Tekelec publishes a complete EAGLE 5 ISS documentation set. For Limited Availability (LA) releases, Tekelec may publish a documentation subset tailored to specific feature content or hardware requirements. Documentation Bulletins announce a new or updated release.

The Tekelec EAGLE 5 ISS documentation set is released on an optical disc. This format allows for easy searches through all parts of the documentation set.

The electronic file of each manual is also available from the Tekelec Customer Support site. This site allows for 24-hour access to the most up-to-date documentation.

Printed documentation is available for GA releases on request only and with a lead time of six weeks. The printed documentation set includes pocket guides for commands and alarms. Pocket guides may also be ordered as a set or individually. Exceptions to printed documentation are:

- Hardware or Installation manuals are printed only without the linked attachments found in the electronic version of the manuals.
- The Release Notice is available only on the Customer Support site.

### Note:

Customers may print a reasonable number of each manual for their own use.

Documentation is updated when significant changes are made that affect system operation. Updates resulting from Severity 1 and 2 PRs are made to existing manuals. Other changes are included in

the documentation for the next scheduled release. Updates are made by re-issuing an electronic file to the customer support site. Customers with printed documentation should contact their Sales Representative for an addendum. Occasionally, changes are communicated first with a Documentation Bulletin to provide customers with an advanced notice of the issue until officially released in the documentation. Documentation Bulletins are posted on the Customer Support site and can be viewed per product and release.

## Locate Product Documentation on the Customer Support Site

Access to Tekelec's Customer Support site is restricted to current Tekelec customers only. This section describes how to log into the Tekelec Customer Support site and locate a document. Viewing the document requires Adobe Acrobat Reader, which can be downloaded at [www.adobe.com](http://www.adobe.com).

1. Log into the Tekelec **new** Customer Support site at [support.tekelec.com](http://support.tekelec.com).

**Note:** If you have not registered for this new site, click the **Register Here** link. Have your customer number available. The response time for registration requests is 24 to 48 hours.

2. Click the **Product Support** tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.



# Chapter

# 2

## Feature Description

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### Topics:

- [Introduction Page 10](#)
- [MO SMS Considerations Page 12](#)
- [MO-Based GSM SMS NP Page 13](#)
- [MO-Based IS41 SMS NP Page 21](#)
- [MO SMS IS41-to-GSM Migration Page 26](#)
- [Portability Check for Mobile Originated SMS Page 30](#)
- [Prepaid Short Message Service Intercept Page 32](#)

This chapter describes the Mobile Originated Short Message Service (MO SMS) features which include: MO-Based GSM SMS NP, MO-Based IS41 SMS NP, MO SMS IS41-to-GSM Migration, and Portability Check for MO SMS.

## 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 in a number portability environment for GSM and IS41 and in the IS41-to-GSM Migration environment. The EAGLE 5 ISS MO SMS features apply number portability database lookup to SMS messages for IS41 and GSM networks.

The MO SMS 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)

The MO SMS features are based on the EAGLE 5 ISS platform with EPAP.

### 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 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 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 ForwardSM SMS MSUs with ITU TCAP/MAP 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)
- 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 TCAP/MAP and ANSI transport (MTP and SCCP) messages.

### **MO SMS IS41-to-GSM Migration**

The MO SMS IS41-to-GSM Migration feature allows IS41 to GSM migration to occur with or without number portability. This feature also allows the IS412GSM Migration Prefix to be used for lookup 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**

The Portability Check for Mobile Originated SMS (MNP SMS) feature is an enhancement to the Prepaid Short Message Service Intercept (PPSMS) feature. When this 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 is based on the GSM Mobile Number Portability (G-Port) feature and applies only to 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 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, and the message routed to the SMSC, or if the MSISDN belongs to a prepaid subscriber, and the message diverted to a third-party IN platform for a credit check before allowing the message to be delivered to the SMSC.

### 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 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 rejected.

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

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.

### 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.

## 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.
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 5 ISS 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.
8. The MO SMS features require Service Module cards running the VSCCP application.
9. The MO SMS features cannot be enabled if TSM cards running the SCCP application are provisioned. If any of the MO SMS features is enabled, TSM cards cannot be provisioned.
10. 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. Service Module cards include DSM cards and E5-SM4G cards.

## 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.

## 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

## 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.

## System Options for MO-Based GSM SMS NP

The system level options that control the MO-Based GSM SMS NP feature are stored in the GSMSMSOPTS database table. The MO-Based GSM SMS NP feature must be enabled before the GSMSMSOPTS table can be provisioned.

The content of the GSMSMSOPTS table is used to help perform number conditioning, response generation, and other feature-specific options. [Table 2: MO-Based GSM SMS NP Options](#) on page 14 shows the options stored in the GSMSMSOPTS table, their possible values, and the action taken for each value.

**Table 2: MO-Based GSM SMS NP Options**

GSMSMSOPTS	Value	Action in the EAGLE 5 ISS
MOSMSDNFMT	RN	Format of outgoing digits is Routing Number
	RNDN (default)	Format of outgoing digits is Routing Number + Directory Number
	CCRNDN	Format of outgoing digits is Country Code + Routing Number + Directory Number
MOSMSTYPE	SP	When the lookup in the NPDB has entitytype=SP, then the lookup is considered successful.
	RN	When the lookup in the NPDB has entitytype=RN, then the

GSMMSOPTS	Value	Action in the EAGLE 5 ISS
		lookup is considered successful.
	SPRN (default)	When the lookup in the NPDB has entitytype=SP or RN, then the lookup is considered successful.
	ALL	When the lookup in the NPDB has entitytype=SP or RN or no_entity, then the lookup is considered successful.
MOSMSNAI	NAT	The CdPN is treated as National number for lookup in the NPDB. When SNAI=NAT, the CC will be added to the DN before lookup in the NP database
	INTL (default)	When SNAI=INTL, no number conditioning is required before lookup in the database.
	UNKNOWN	When this value is set, the NAI will be treated as Unknown for the purposes of Number Conditioning
	NAI	<p>The NAI from the MO_SMS message is used for conditioning before lookup in database.</p> <ul style="list-style-type: none"> <li>• If the NAI is INTL, then NP 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 NP lookup is performed.</li> </ul>
MOSMSSA	YES	The subaddress is searched in the B party number. If the subaddress (identified by "#" being present in the B party number) is found, it is removed before NPDB lookup is performed.

GSM SMS OPTS	Value	Action in the EAGLE 5 ISS
	NO (default)	No subaddress is searched for in the B party number from the TCAP part.
MOSMSDNNAI	None (default)	The NAI is same as the NAI in the incoming message.
	0-15	The value to be encoded in the outgoing message.
MOSMSFWD	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 identified in the MOSMSGTA field.  This option cannot be set to YES unless the MOSMSGTA option has a valid value specified.
	NO (default)	No MO-SMS forward will be performed.
MOSMSGTA	5-21 digits	This field 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 the 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 Manual - GTT</i> .
MOSMSDIGMAT	EXACT	When the HomeSMSC Match with Digits option is set to EXACT, an exact match must be made of the incoming SCCP CdPA digits in the Home SMSC table.
	BESTFIT	When the HomeSMSC Match with Digits option is set to

GSMSMSOPTS	Value	Action in the EAGLE 5 ISS
		<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.
MOSMSTCAPSEG	ON	Mobile Originated Segmented TCAP messages are supported.
	OFF	Mobile Originated Segmented TCAP messages are not supported.

## 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 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 NPDB.
  - If MOSMSNAI=INTL, then the number is treated like an international number: this number is used for lookup in the NPDB.
  - If MOSMSNAI=NAI, then the conditioning is based on the NAI value from the TCAP part.
  - If MOSMSNAI=NAI and TCAP NAI is not INTL, then the number is considered to be international.

- 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, MOSMSDNFMT=RN, and the NPDB lookup has no entity assigned to the DN, then the MO\_SMS message is not modified.
- 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 NPDB lookup with entity\_type=RN and portability-type=0 to be entity\_type=SP, if the IS41-GSM Migration feature is enabled. When the IS41-GSM Migration feature is enabled, entity\_type=RN, and portability-type=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.
- 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.

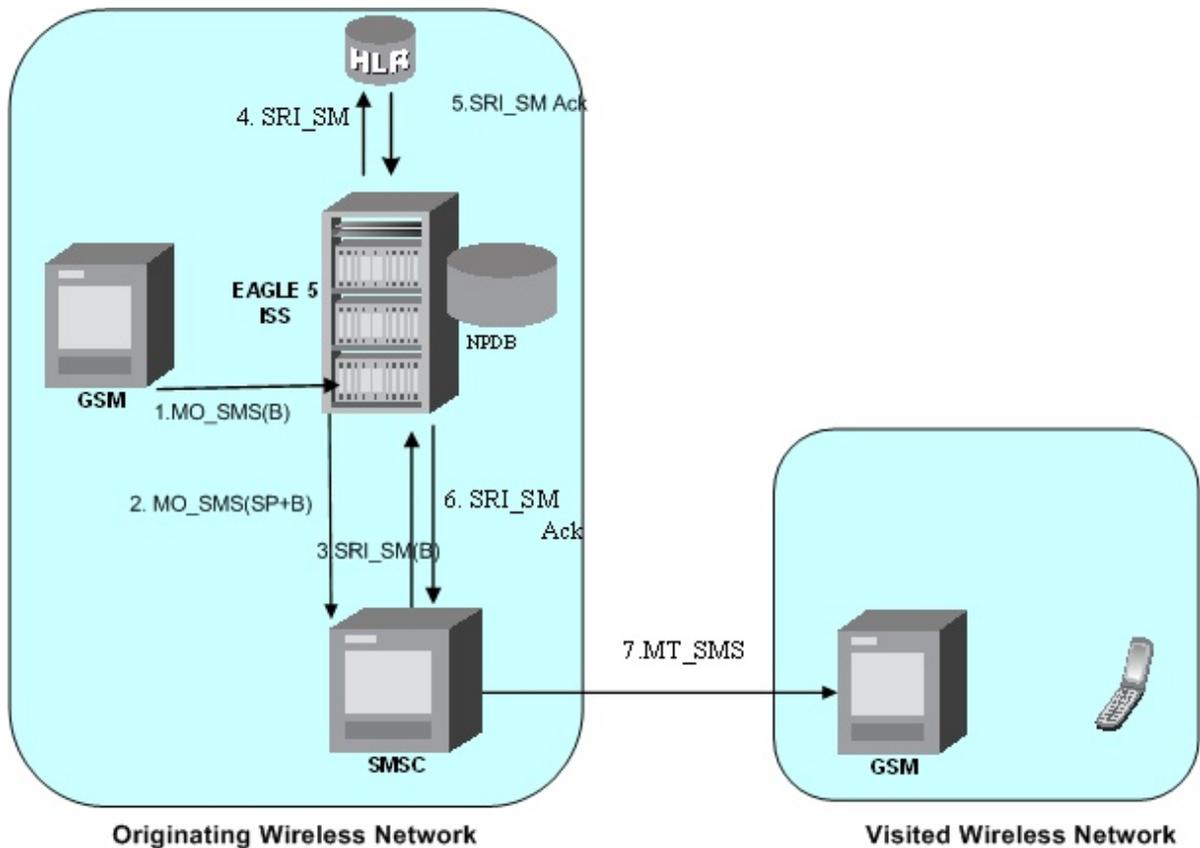
## MO-Based GSM SMS NP Call Flows

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 1: MO-Based GSM SMS NP Call Flow for In-Network Subscriber



#### Call considerations:

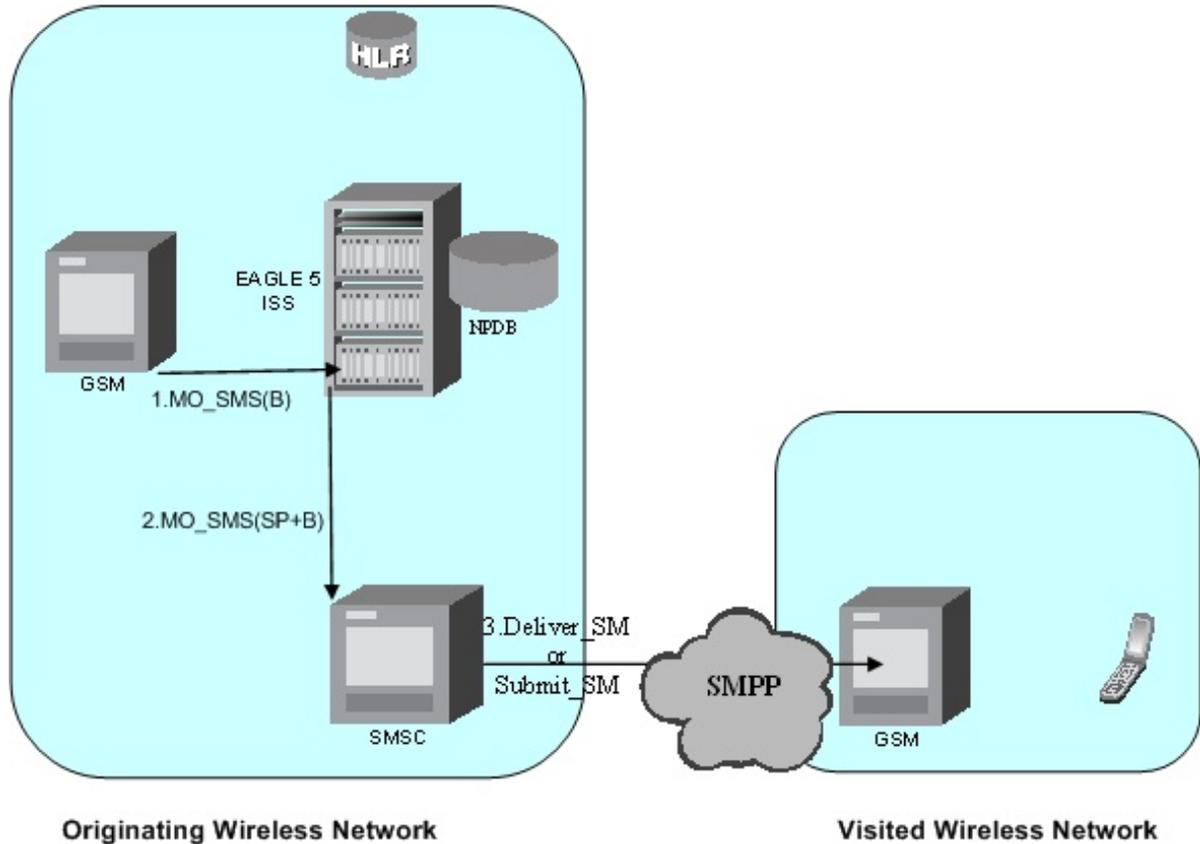
- The TCAP calling party is a wireless GSM subscriber.
- The TCAP called party is a non-ported or ported-in wireless subscriber that belongs to the same carrier as the TCAP calling party.
- The call type is SMS.
- The SMSC (Short Message Service Center) has to remove the prefix that indicates that the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

#### Message Flow:

1. MO\_SMS(B) - EAGLE 5 ISS 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 5 ISS.
6. SRI\_SM Ack - EAGLE 5 ISS routes message to SMSC.

7. MT\_SMS - Deliver message to in-network subscriber.

Figure 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 5 ISS 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.

## 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 ANSI TCAP/MAP and ANSI or ITU transport (MTP and SCCP) messages.

### 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

### 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.

### System Options for MO-Based IS41 SMS NP

The system level options that control the MO-Based IS41 SMS NP feature are stored in the IS41SMSOPTS database table. The MO-Based IS41 SMS NP feature must be enabled before the IS41SMSOPTS table can be provisioned.

The content of the IS41SMSOPTS table is used to help perform number conditioning, response generation, and other feature-specific options. The following table shows the options stored in the IS41SMSOPTS table, their possible values, and the action taken for each value.

Table 3: MO-Based IS41 SMS NP Options

IS41SMSOPTS Option	Value	Action in the EAGLE 5 ISS
MOSMSDNFMT	RN	MO-based SMS directory number format; same as A-Port general action.
	RNDN (default)	
	CCRNDN	
MOSMSTYPE	SP	When the lookup in the NPDB has entitytype=SP, then the lookup is considered successful.
	RN	When the lookup in the NPDB has entitytype=RN, then the lookup is considered successful.
	SPRN	When the lookup in the NPDB has entitytype=SP or RN, then the lookup is considered successful.
	ALL	When the lookup in the NPDB has entitytype=SP or RN or no_entity, then the lookup is considered successful.
MOSMSNAI	NAT	The CdPN is treated as National number for lookup in the NPDB. DEFCC will be added to the DN before lookup in the NP database.
	INTL (default)	When SNAI=INTL, no number conditioning is required before lookup in the database.
	UNKNOWN	When this value is set, the NAI is treated as Unknown for the purposes of Number Conditioning
	NAI	<p>The NAI from the SMDPP (short message delivery point to point) message is used for conditioning before lookup in database.</p> <ul style="list-style-type: none"> <li>• If the NAI is INTL, then NP lookup is performed immediately.</li> <li>• If the NAI is any other value, then the number is</li> </ul>

IS41SMSOPTS Option	Value	Action in the EAGLE 5 ISS
		considered to be in national format. DEFCC is added before NP lookup is performed.
MOSMSDNNAI	NONE (default)	This option controls the NAI in the outgoing message. <i>NONE</i> indicates that the NAI is the same as the NAI in the incoming message.
	0-15	The value to be encoded in the outgoing message.
MODAPARAM	DA	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.
MOSMSDIGMAT	EXACT	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.
	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.

## 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 3: MO-Based IS41 SMS NP Options](#) on page 22), 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 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 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 SCCP CDPA.
- The MO-Based IS41 SMS NP feature considers a successful RTDB lookup with entity\_type=RN and portability-type=0 to be entity\_type=SP, if the IS41-GSM Migration feature is enabled. When the IS41-GSM Migration feature is enabled, entity\_type=RN, and portability-type=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.

## MO-Based IS41 SMS NP Call Flows

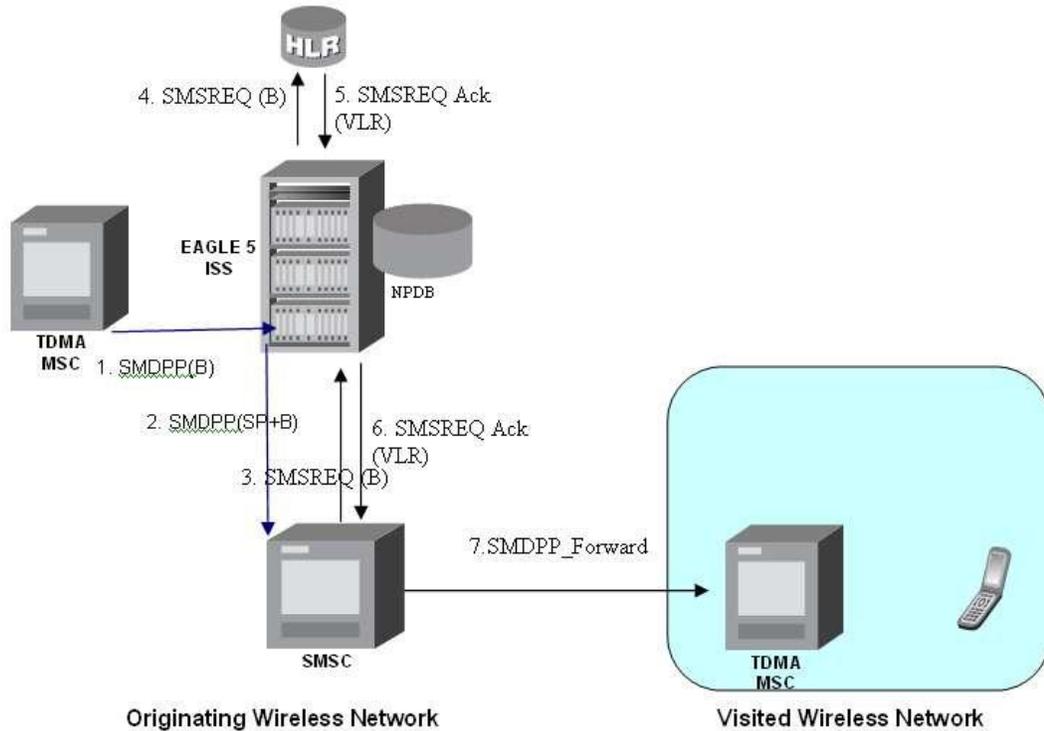
This section illustrates the sequence of messages that occur when a mobile operator delivers SMS messages in a number portability environment to:

- 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 3: MO-Based IS41 SMS NP Call Flow for In-Network Subscriber on page 25 depicts the message and control flows for a called subscriber who is in the same network as the calling subscriber.

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



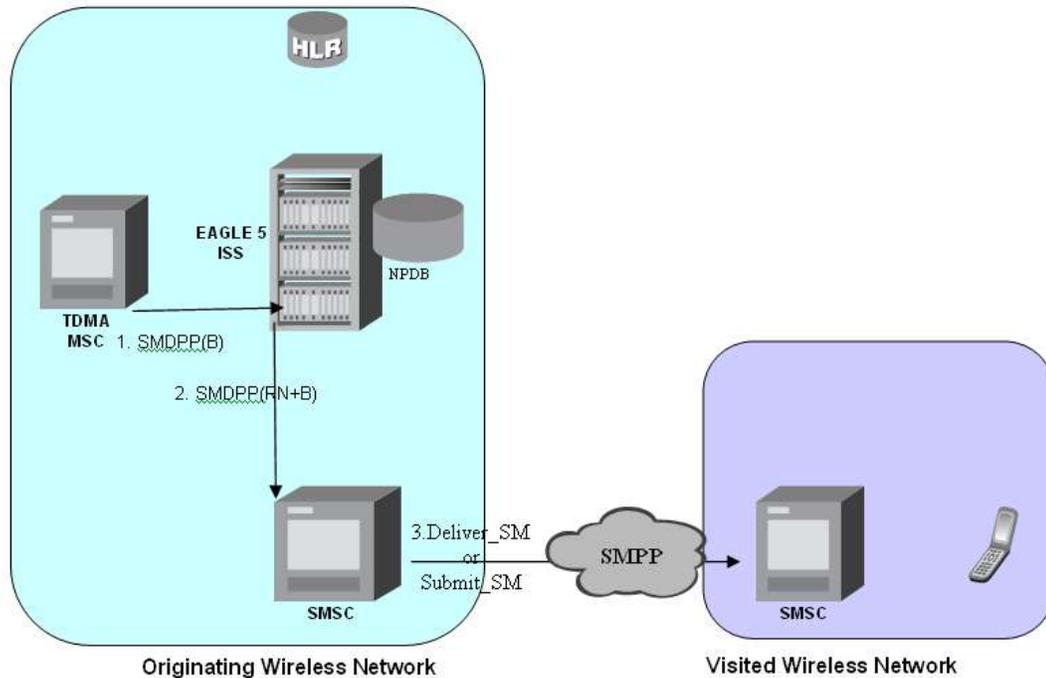
Call considerations:

- The TCAP calling party is a wireless IS41 subscriber.
- The TCAP called party is a non-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.
- 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 4: MO-Based IS41 SMS NP Call Flow for Other-Network Subscriber on page 25 depicts the message and control flows for a called subscriber who is in a different network from the calling subscriber.

**Figure 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 EAGLE IS41-to-GSM NP feature ensures that the message is delivered in the TDMA network.

## 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.

### 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

### 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.

### System Options for MO-Based IS41 SMS NP

The system level options that control the MO SMS IS41-to-GSM Migration feature are stored in the IS41SMSOPTS database table. The MO-Based IS41 SMS NP or MO SMS IS41-to-GSM Migration feature must be enabled before the IS41SMSOPTS table can be provisioned.

The content of the IS41SMSOPTS table is used to help perform number conditioning, response generation, and other feature-specific options. The following table 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.

**Table 4: MO-Based IS41 SMS NP Options**

IS41SMSOPTS Option	Value	Action in the EAGLE 5 ISS
MOSMSDNFMT	RN	MO-based SMS directory number format; same as A-Port general action.
	RNDN (default)	
	CCRNDN	
MOSMSNAI	NAT	The CdPN is treated as National number for lookup in the NPDB. DEFCC will be

IS41SMSOPTS Option	Value	Action in the EAGLE 5 ISS
		added to the DN before lookup in the NP database.
	INTL (default)	When SNAI=INTL, no number conditioning is required before lookup in the database.
	NAI	<p>The NAI from the SMDPP (short message delivery point to point) message is used for conditioning before lookup in database.</p> <ul style="list-style-type: none"> <li>• If the NAI is INTL, then NP 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 NP lookup is performed.</li> </ul>
MOSMSDNNAI	NONE (default)	This option controls the NAI in the outgoing message. <i>NONE</i> indicates that the NAI is the same as the NAI in the incoming message.
	0-15	The value to be encoded in the outgoing message.
MODAPARAM	DA	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.
MOSMSDIGMAT	EXACT	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.
	BESTFIT	When the HomeSMSC Match with Digits option is set to

IS41SMSOPTS Option	Value	Action in the EAGLE 5 ISS
		<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.
MOIGMPRX	NE	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
	IS412GSM	IS412GSM digits are used as a prefix to modify the destination address in the outgoing SMDPP

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

After the MO SMS IS41-to-GSM Migration feature has been enabled and turned on, it 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.

## 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.

### HomeSMSC Match with Digits option (HomeSMSC Match)

The HomeSMSC Match with Digits option for Portability Check for Mobile Originated SMS (HomeSMSC Match) enhances the ability of the EAGLE 5 ISS to compare the Home Short Message Service Center (HomeSMSC) digits in the SCCP CdPA of incoming GSM MAP Mobile Originated Forward Short Messages (MO\_FSM) 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 rejected. The Portability Check for Mobile Originated SMS feature must be turned on before the HomeSMSC Match with Digits option can be provisioned.

### 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 [List item](#). on page 31).
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 [List item](#). on page 31).
4. If the PPSMS feature is on, the message falls through to PPSMS processing (#8 [List item](#). on page 31). 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 [List item](#). on page 31).
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 [List item](#). on page 31). If the portability type is in the range of *Prepaid1 (3) to Prepaid32 (35)*, the message falls through to GTT (#12 [List item](#). on page 31).
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 [List item](#). on page 32. If the message is not on the list, the message falls through to GTT (#12 [List item](#). on page 31).
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 [List item](#). on page 32). 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 [List item](#). on page 31).
10. Check the portability type of the subscriber. If the Portability Type matches the range of *Prepaid1 (3) to Prepaid32 (35)*, go to #14 [List item](#). on page 32; 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 [List item](#). on page 31. 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.

## Prepaid Short Message Service Intercept

Prepaid Short Message Service Intercept (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 5 ISS route-on-gt. The EAGLE 5 ISS 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 ([List item](#) on page 33) indicates PPSMS is required, and the message is not a UDTS generated by EAGLE 5 ISS, the EAGLE 5 ISS performs PPSMS service.
3. If the message is a UDTS generated by the EAGLE 5 ISS, then regular GTT is performed on the message.
4. If the EAGLE 5 ISS 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 5 ISS 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 ([List item](#) on page 33), 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 ([List item](#) on page 33) 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 ([List item](#) on page 33), the message falls through to GTT.

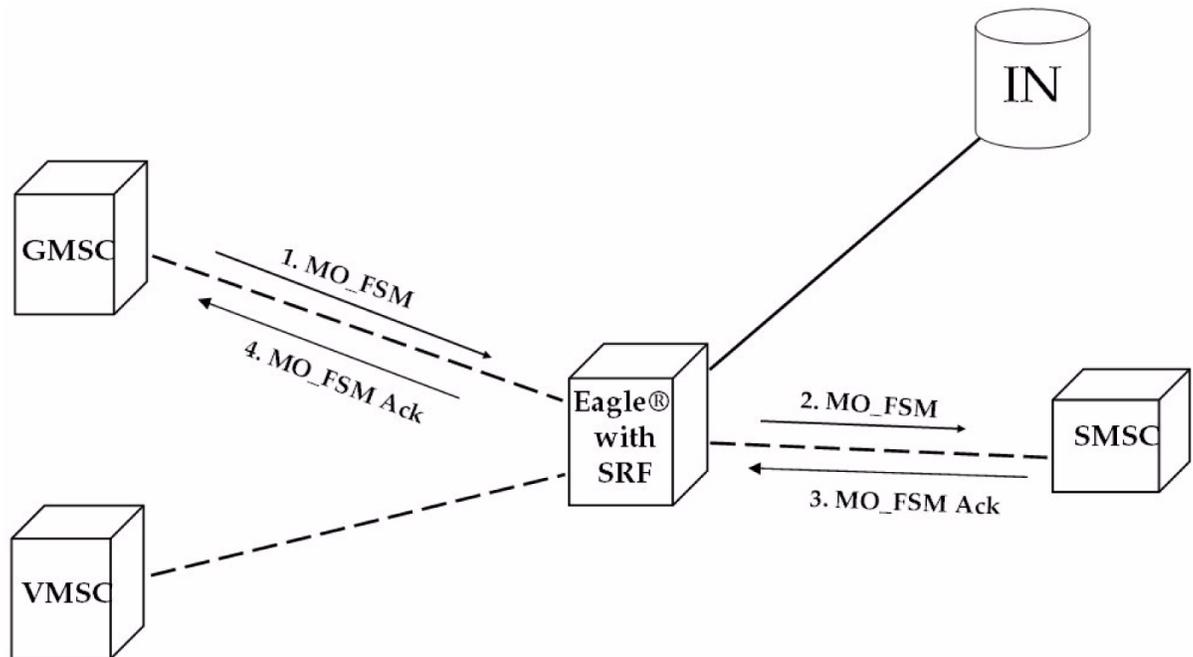
## Prepaid Short Message Service Intercept Call Flows

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 5: Successful Delivery of MO\\_FSM from Contract Subscriber](#) on page 34 for the steps in the flow for this call.

### Figure 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 5 ISS with PPSMS (TCBEGIN).

Based on MTP DPC = EAGLE 5 ISS 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 CgPA GTA 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 5 ISS queries the DB using the sender's MSISDN from the OA field in the MAP portion of message.

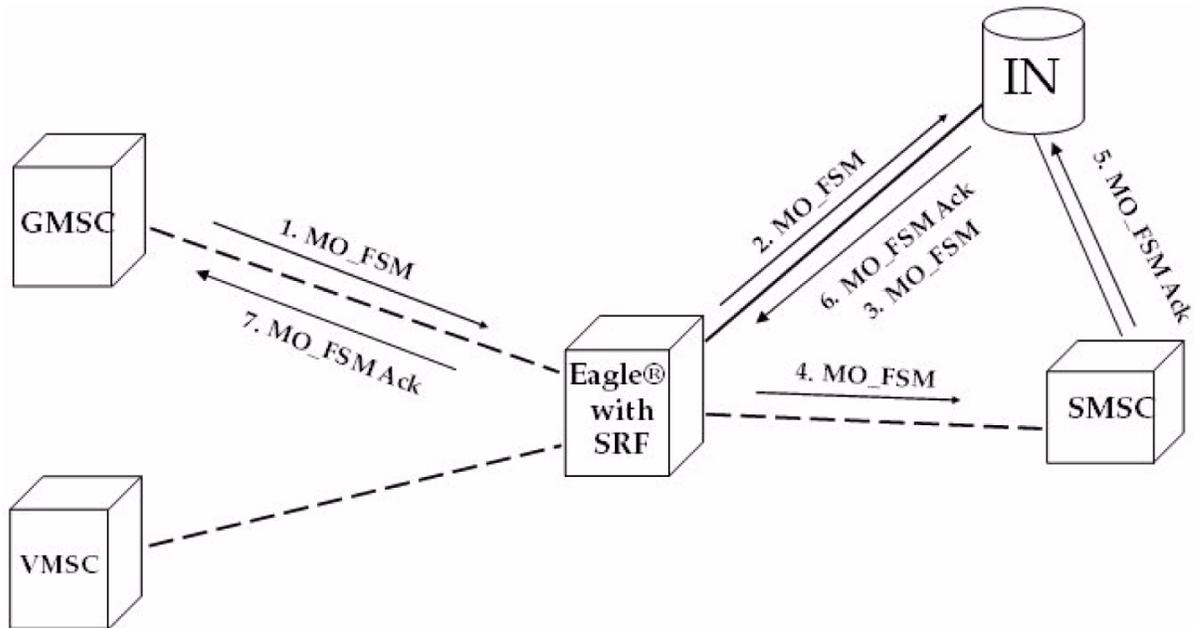
MSISDN is present in the database, but Portability Type is not in the range of *prepaid1* to *prepaid32*, meaning the sender is not a prepaid subscriber.

2. The EAGLE 5 ISS 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 6: Successful Delivery of Mobile Originated FSM from Prepaid Subscriber](#) on page 36 for the steps in the flow for this call.

Figure 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 5 ISS with PPSMS (TC BEGIN).

Based on MTPDPC = EAGLE 5 ISS's 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 5 ISS 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 5 ISS forwards the MO\_FSM to the IN Platform (TCBEGIN) associated with *prepaid1*, after checking mated application or mated relay node table

**Note:**

The Portability Types *prepaid1* through *prepaid32* are used to select which of the IN platforms the message should be sent.

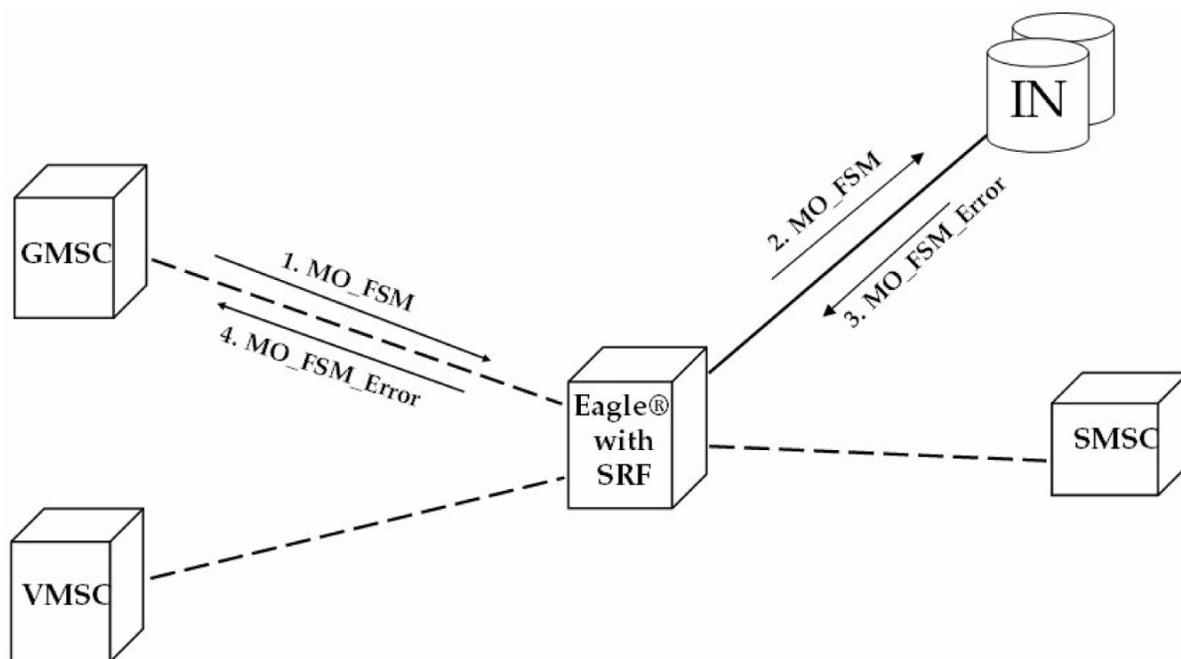
3. The IN Platform checks the account, finds there is enough credit to send the message, opens a new TCAP dialogue, and returns the MO\_FSM to the SRF (TCBEGIN-2).

4. The message arrives at EAGLE 5 ISS 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 7: Unsuccessful Delivery of Mobile Originated FSM from Prepaid Subscriber at SCP](#) on page 37 for the steps in the flow for this call.

#### **Figure 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 5 ISS with PPSMS (TCBEGIN).

Based on MTPDPC = EAGLE 5 ISS's 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 5 ISS 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 5 ISS forwards the MO\_FSM to the IN Platform (TCBEGIN) associated with *prepaid1*.

**Note:**

The Portability Types *prepaid1* through *prepaid32* are used to select which of the IN platforms the message should be sent to.

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.



# Chapter 3

## Commands

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### Topics:

- [EAGLE 5 ISS STP System Options Commands Page 42](#)
- [EAGLE 5 ISS GSM System Options Commands Page 42](#)
- [EAGLE 5 ISS IS41 System Options Commands Page 44](#)
- [EAGLE 5 ISS GSM SMS Options Commands Page 44](#)
- [EAGLE 5 ISS IS41 SMS Options Commands Page 47](#)
- [EAGLE 5 ISS Feature Control Commands Page 49](#)
- [EAGLE 5 ISS Service Selector Commands Page 50](#)
- [Maintenance Commands Page 53](#)

This chapter contains brief descriptions of the EAGLE 5 ISS commands that are used for the configuration, control, maintenance, and measurements of the Mobile Originated Short Message Service (MO SMS) features.

## EAGLE 5 ISS STP System Options Commands

The STP system options commands (*stpopts*) change and display the STP node level processing options in the EAGLE 5 ISS database. The following sections describe the two variations: *chg-stpopts* and *rtrv-stpopts*. For further details on these commands, refer to the *Commands Manual*.

### 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 5: chg-stpopts Parameters - Class = DATABASE**

Parameter	Optional/ Mandatory	Range	Description
defcc	Optional	1-3 digits, none	Default country code
defndc	Optional	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.

## EAGLE 5 ISS GSM System Options Commands

The GSM system options (*gsmopts*) commands change and display GSM system options in the EAGLE 5 ISS database. The following sections describe the two variations: *chg-gsmopts* and *rtrv-gsmopts*. For details about these commands, refer to the *Commands Manual*.

**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 6: chg-gsmopts Parameters - Class = DATABASE**

Parameter	Optional/ Mandatory	Range	Description
multcc	Optional	1 to 3 digits (0-9, a-f, or A-F)	Multiple Country Code. The G-Port, IGM, MO-based GSM SMS NP, MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration, or V-Flex feature must be enabled before this parameter can be specified.
nmultcc	Optional	1 to 3 digits (0-9, a-f, A-F, or NONE)	New Multiple Country Code. This parameter changes the multcc value to the specified nmultcc value or deletes the multcc value if nmultcc=none is specified. The G-Port, IGM, MO-based GSM SMS NP, MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration, or V-Flex feature must be enabled before this parameter can be specified.

Command example:

- `chg-gsmopts:multcc=011:nmultcc=11`

**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-based IS41 SMS NP, MO SMS IS41-to-GSM Migration,

or V-Flex feature must be enabled or G-Flex feature must be turned on before the command output is displayed.

## EAGLE 5 ISS IS41 System Options Commands

The IS41 system options (*is41opts*) commands are used to change and report on the IS41 system options in the EAGLE 5 ISS database. The following sections describe the two variations: *chg-is41opts* and *rtrv-is41opts*. For details about these commands, refer to the *Commands Manual*.

### **chg-is41opts**

**Change IS41 system options command** - The *chg-is41opts* command changes IS41 system options in the database. This command updates the IS41OPTS table. The default parameter values are always overwritten when specified.

**Table 7: *chg-is41opts* Parameters - Class = DATABASE**

Parameter	Optional/ Mandatory	Range	Description
smsreqbypass	Optional	yes, no	This parameter specifies whether a received SMSREQ that passes the MNP Service Selector will be subject to A-Port message processing.

### **rtrv-is41opts**

**Retrieve IS41 system options command** - The *rtrv-is41opts* command displays the IS41 option indicators maintained in the IS41OPTS table.

## EAGLE 5 ISS GSM SMS Options Commands

The GSM SMS options (*gsmsmsopts*) commands change and display specific SMS options in the EAGLE 5 ISS database for the MO-based GSM SMS NP and Portability Check for MO SMS features. The following sections describe the two variations: *chg-gsmsmsopts* and *rtrv-gsmsmsopts*. For details about these commands, refer to the *Commands Manual*.

The MO-based GSM SMS NP feature must be enabled to specify the parameters: *mosmsdnfmt*, *mosmsdnai*, *mosmsfwd*, *mosmsgta*, *mosmsnai*, *mosmssa*, *mosmstype*.

The Portability Check for MO SMS feature or the MO-based GSM SMS NP feature must be turned on to specify the *mosmstcapseg* 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 8: chg-gsmsmsopts Parameters - Class = DATABASE**

Parameter	Optional/ Mandatory	Range	Description
mosmsdigmat	Optional	exact, bestfit	MO-based SMS HomeSMSC match. The Portability Check for MO SMS feature must be turned on or the MO-based GSM SMS NP feature must be enabled to specify the parameter value <code>mosmsdigmat=bestfit</code> . This parameter applies to only messages that are processed by the Portability Check for MO SMS feature or MO-based GSM SMS NP features.
mosmsdnfmt	Optional	rn, rndn, ccrndn	MO-based SMS directory number format. This parameter applies to only messages that are modified by the MO-based GSM SMS NP feature.
mosmsdnnai	Optional	0-7, none	MO-based SMS directory number NAI. This parameter applies to only messages that are modified by the MO-based GSM SMS NP feature.
mosmsfwd	Optional	yes, no	MO-based SMS forward. This parameter applies to only messages that are modified by the

Parameter	Optional/ Mandatory	Range	Description
			MO-based GSM SMS NP feature.
mosmsgta	Optional	5-21 digits	MO-based SMS GTA. This parameter applies to only messages that are modified by the MO-based GSM SMS NP feature.
mosrnsnai	Optional	intl, nai, nat, unknown	MO-based SMS NAI, This parameter applies to only messages that are modified by the MO-based GSM SMS NP feature.
mosmssa	Optional	yes, no	MO-based SMS sub-address. This parameter applies to only messages that are modified by the MO-based GSM SMS NP feature.
mosmstcapseq	Optional	on, off	MO-based SMS TCAP Segmentation for GSM. This parameter applies to only messages that are processed by the Portability Check for MO SMS feature or modified by the MO-based GSM SMS NP feature.
mosmstype	Optional	sp, rn, sprn, all	MO-based SMS type. This parameter applies to only messages that are modified by the MO-based GSM SMS NP feature.

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

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

- `chg-gsmsmsopts:mosmsdnnai=none:mosmsfwd=no:mosmsgta=987654321`

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

- `chg-gsmsmsopts:mosmsdigmat=bestfit`

**rtrv-gsmsmsopts**

**Retrieve GSM SMS Options Command**

The `rtrv-gsmsmsopts` command displays all GSM SMS options from the database.

**EAGLE 5 ISS IS41 SMS Options Commands**

The IS41 SMS options (`is41smsopts`) commands change and display SMS options in the EAGLE 5 ISS database for the 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`. For details about these commands, refer to the Commands Manual.

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

The MO-based IS41 SMS NP feature must be enabled to specify the `mosmsnai=unknown` or `mosmstype` parameters.

The MO SMS IS41-to-GSM Migration feature must be enabled to specify the `moigmpfx` 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 9: `chg-is41smsopts` Parameters - Class = DATABASE**

Parameter	Optional/ Mandatory	Range	Description	Applies to
<code>modaparam</code>	Optional	da, oda	Specifies whether the <code>SMS_DestinationAddress</code> or <code>SMS_OriginalDestinationAddress</code> from the IS41 SMDPP message is used for conditioning, lookup, and modification.	MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration

Parameter	Optional/ Mandatory	Range	Description	Applies to
moigmpfx	Optional	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 is412gsm parameter as a prefix to modify the destination address in the outgoing SMDPP.	MO SMS IS41-to-GSM Migration
mosmsdigmat	Optional	exact, bestfit, bypass	HomeSMSC Match with Digits search option.	MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration
mosmsdnfmt	Optional	rn, rndn, ccrndn	MO-based SMS directory number format.	MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration
mosmsdnnai	Optional	0-15, none	MO-based SMS directory number NAI.	MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration
mosmsnai	Optional	intl, nai, nat, unknown	MO-based SMS Nature Address Indicator.	MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration with the exception of the value unknown which applies to only the MO-based IS41 SMS NP feature.
mosmstype	Optional	sp, rn, sprn, all	MO-based SMS Type.	MO-based IS41 SMS NP

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

- `chg-is41smsopts:mosmsdnfmt=rn:mosmstype=sp:mosmsnai=intl`
- `chg-is41smsopts:mosmsdnnai=7`

Command example for setting the IS41 SMS options when the MO SMS IS41-to-GSM Migration feature is enabled:

- `chg-is41smsopts:mosmsdignat=exact:moigpfx=is412gsm:mosmsdnfmt=rdh:mosmsdnai=none:modaparam=da`

### **rtrv-is41smsopts**

**Retrieve IS41 SMS Options Command** - The `rtrv-is41smsopts` command displays all IS41 SMS options from the database.

## **EAGLE 5 ISS 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.

Refer to *Commands Manual* for details of these commands.

### **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 and that no TSM cards running the SCCP application are provisioned before enabling the MO-Based GSM SMS NP, MO-Based IS41 SMS NP, MO SMS IS41-to-GSM Migration, and Portability Check for MO SMS features.

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 display the on/off status of the features and to show the remaining trial period if features are temporarily enabled.

## EAGLE 5 ISS 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`. Refer to the *Commands Manual* for further details on the EAGLE 5 ISS service selector commands

The `smsnr` value for the `nsrv` 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)

**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 10: chg-srvsel Parameters - Class = DATABASE**

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gtii, gtin, gtin24	Mandatory	2, 4	Global Title Indicator
ssn	Mandatory	0-255, *	Subsystem Number
tt	Mandatory	0-255	Translation Type
nai	Optional	sub, rsvd, natl, intl	Nature of Address Indicator
naiv	Optional	0-127	NAI Value
np	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan

Parameter	Optional/ Mandatory	Range	Description
npv	Optional	0-15	Numbering Plan Value
nserv	Optional	eir, gflex, gport, inpq, inpmr, smsmr, idpr, idps, mnp, vflex, atinp	New service
nsnai	Optional	sub, natl, intl, rmidn, rnrndn, rnsdn, ccrndn, none	New Service Nature of Address Indicator
nsnp	Optional	e164, e212, e214, none	New Service Numbering Plan

**dlt-srvsel**

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

**Table 11: dlt-srvsel Parameters - Class = DATABASE**

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gtii, gtin, gtin24	Mandatory	2, 4	Global Title Indicator
ssn	Mandatory	0-255, *	Subsystem Number
tt	Mandatory	0-255	Translation Type
nai	Optional	sub, rsvd, natl, intl	Nature of Address Indicator
naiv	Optional	0-127	NAI Value
np	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
npv	Optional	0-15	Numbering Plan Value

**ent-srvsel**

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

Table 12: ent-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gtii, gtin, gtin24	Mandatory	2, 4	Global Title Indicator
serv	Mandatory	eir, gflex, gport, inpq, inpmr, smsmr, idps, idpr, mnp, vflex, atinp	DSM service
ssn	Mandatory	0-255, *	Subsystem Number
tt	Mandatory	0-255	Translation Type
nai	Optional	1sub, rsvd, natl, intl	Nature of Address Indicator
naiv	Optional	0-127	NAI Value
np	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
npv	Optional	10-15	Numbering Plan Value
snai	Optional	1sub, natl, intl, rnidn, rnrndn, rnsdn, ccrndn	Service Nature of Address Indicator
snp	Optional	1e164, e212, e214	Service Numbering Plan

**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.

Table 13: rtrv-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gtii, gtin, gtin24	Optional	2, 4	Global Title Indicator

Parameter	Optional/ Mandatory	Range	Description
nai	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
naiv	Optional	0-127	NAI Value
np	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
npv	Optional	0-15	Numbering Plan Value
serv	Optional	eir, gflex, gport, inpq, inpnr, smsmr, idps, idpr, mnp, vflex, atinp	DSM service
snai	Optional	sub, natl, intl, rmidn, rnrndn, rnsdn, ccrndn	Service Nature of Address Indicator
snp	Optional	e164, e212, e214	Service Numbering Plan
ssn	Optional	0-255, *	Subsystem Number
tt	Optional	0-255	Translation Type

## Maintenance Commands

The maintenance commands provide system status, measurement information, and database management. Command parameter descriptions, valid parameter values, and output examples for these commands and additional commands needed for EAGLE 5 ISS maintenance are fully described in the *Commands Manual*.

### rept-stat-sys

This command displays a summary report of the status of the main system entities. This summary report is used to determine the location of troubles in the system. The display shows the number of items that are in service (IS-NR) or in another state (IS-ANR, OOS-MT, OOS-MT-DSBLD).

### rept-stat-sccp

This command displays the status of the Service Module cards (DSM and E5-SM4G), the TSM cards running the SCCP application and the services executing on those cards: ANSI-41 Mobile Number Portability (A-Port), ATI Number Portability Query (ATINPQ), Equipment Identity

Register (EIR), GSM Flexible Numbering (G-Flex), GSM Mobile Number Portability (G-Port), Global Title Translation (GTT), INAP-based Number Portability (INP), Prepaid IDP Query Relay (IDP Relay), IS41 GSM Migration (IGM), MO-based GSM SMS NP, MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration, Prepaid Short Message Service Intercept (PPSMS), and Voice Mail Router (V-Flex). This command also displays any cards that are denied SCCP service.

If the MO-based GSM SMS NP, MO-based IS41 SMS NP, MO SMS IS41-to-GSM Migration, Portability Check for Mobile Originated SMS (MNP SMS), or Prepaid Short Message Service Intercept (PPSMS) feature is turned on, the display title for the statistic status is *SMSMR*.

### **rept-meas**

This command generates measurements reports on demand. The reports are displayed on the user interface terminal and are not transferred to the FTP server when the Measurements Platform is enabled.

### **chg-measopts / rtrv-measopts**

The `chg-measopts` command enables or disables the automatic generation and FTP transfer of scheduled measurement reports to the FTP server.

The `rtrv-measopts` command displays the enabled or disabled status of all FTP scheduled reports.

### **rept-stat-meas**

This command reports the status of the Measurements Subsystem, including card location and state, alarm level, and subsystem state.

### **rept-ftp-meas**

This command manually initiates generation and FTP transfer of a measurements report from the MCPM to the FTP server.

### **rept-stat-trbl**

This command displays a summary report of all device trouble notifications logged in the OAM RAM storage area.

### **rept-stat-db**

This command displays a report of various status indicators for the active and standby OAM database, and the status of the database on each network card. The status of the MPS databases and Service Module cards is displayed if specific features are enabled and turned on.

### **dlt-card / ent-card / rtrv-card**

The `dlt-card` command removes a card entry from the system database.

The `ent-card` command adds a card entry to the database. The card type and application specifies the function assigned to the card.

The `rtrv-card` command displays information about a card. This command displays card type, application the card is running, linkset name, signaling link code, and ports.

**dlt-home-smsc / ent-home-smsc / rtrv-home-smsc**

One of these features must be enabled to enter any of the home-smsc commands:

- MO-based GSM SMS NP
- MO-based IS41 SMS NP
- MO SMS IS41-to-GSM Migration
- MT-based GSM SMS NP
- MT-based IS41 SMS NP
- Portability Check for MO SMS (enabled and turned on)

The `dlt-home-smsc` command deletes Home Short Message Service Center (SMSC) specific addresses from the database. This command updates the HOME SMSCADDR table.

The `ent-home-smsc` command enters Home SMSC specific addresses in the database. This command updates the HOME SMSCADDR table which can contain a maximum of 500 entries.

The `rtrv-home-smsc` command displays Home SMSC specific addresses in the database. This command reads the HOME SMSCADDR table.



# Chapter 4

## Configuration of Features

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### Topics:

- *Introduction Page 58*
- *MO-Based GSM SMS NP Feature Activation Procedure Page 59*
- *MO-Based IS41 SMS NP Feature Activation Procedure Page 60*
- *MO SMS IS41-to-GSM Migration Feature Activation Procedure Page 62*
- *Portability Check for MO SMS Activation Procedure Page 64*
- *Prepaid Short Message Service Intercept Activation Procedure Page 66*

This chapter provides procedures for configuring the Mobile Originated Short Message Service (MO SMS) features of the EAGLE 5 ISS 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)

## Introduction

This chapter contains feature activation procedures for the following 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)

### Summary of Feature Activation

This table summarizes activation information about the features.

**Table 14: 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	No	No, the feature can be turned on or turned off with the <code>chg-ctrl-feat</code> command.
PPSMS	893006701	Yes, a temporary feature access key can be used with the <code>enable-ctrl-feat</code> command to enable the feature for a 30-day trial period.	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.

- 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.

**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 Tekelec before turning on this or any feature. If you are not sure whether you have purchased a specific feature, contact your Tekelec Sales or Account Representative.

The MO SMS features require Service Module cards running the VSCCP application. Systems with TSM cards running the SCCP application need to be upgraded to Service Module cards (DSM cards or E5-SM4G cards) before enabling an MO SMS feature. Contact the Customer Care Center before replacing the TSM cards running the SCCP application. Refer to [Customer Care Center](#) on page 3 for contact information.

Refer to *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module database capacity requirements.

## MO-Based GSM SMS NP Feature Activation Procedure

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

For details about the commands used in this procedure, see the *Commands Manual*.

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:mosmsdnfmt=ccrndn:mosmstype=all:mosmsnai=nat:mosmsdnnai=7
```

where:

**mosmsdnfmt**

Specifies the format of a dialed number.

**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.

**mosmsdnnai**

Indicates the value to be encoded in the outgoing message.

For details about all of the options that can be changed using the `chg-gsmsmsopts` command, see the *Commands Manual*.

6. Verify the changes using the `rtrv-gsmsmsopts` command.  
This command displays all GSM SMS options from the database.
7. 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 now enabled, turned on, and operating in the system. The MO-Based GSM SMS NP feature cannot be turned off and cannot be disabled.

## MO-Based IS41 SMS NP Feature Activation Procedure

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

For details about the commands used in this procedure, see the *Commands Manual*.

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 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:mosmsdnfmt=rn:mosmstype=sp:mosmsnai=nat:mosmsdnai=7
```

where:

**mosmsdnfmt**

Specifies the format of a dialed number.

**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.

**mosmsdnnai**

Indicates the value to be encoded in the outgoing message.

For details about all of the options that can be changed using the `chg-is41smsopts` command, see the *Commands Manual*.

7. Verify the changes using the `rtrv-is41smsopts` command.  
This command displays all IS41 SMS options from the database.
8. 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 now enabled, turned on, and operating in the system. The MO-Based IS41 SMS NP feature cannot be turned off and cannot be disabled.

## 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.

For details about the commands used in this procedure, see the *Commands Manual*.

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 `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: mosmsdnfmt=rndn: moigmpfx=is412gsm: modaparam=da
```

where:

**mosmsnai**

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

**mosmsdnfmt**

Specifies the format of a dialed number

**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

For details about the options that can be changed using the `chg-is41smsopts` command, see the *Commands Manual*.

7. Verify the changes using the `rtrv-is41smsopts` command.  
This command displays all IS41 SMS options from the database.

Output example:

```
tekelecstp 08-04-16 11:49:33 EST EAGLE 40.0.0
```

```

IS41 SMS OPTIONS
-----

MOSMSNAI      = NAT
MOSMSDIGMAT   = EXACT
MOIGMPFX      = IS412GSM
MOSMSDNFMT    = RNDN
MOSMSDNNAI    = NONE
MODAPARAM     = DA

```

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

## 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.

For details about the commands used in this procedure, see the *Commands Manual*.

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. Enter the `chg-ctrl-feat` command to turn on the Portability Check for MO SMS feature.  
`chg-ctrl-feat:partnum=893009301:status=ON`
3. 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

4. Enter the `rtrv-gsmsmsopts` command to view the values of the GSMSMSOPTS table options.
5. 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

For details about the options that can be changed using the `chg-gsmsmsopts` command, see the *Commands Manual*.

6. Verify the changes using the `rtrv-gsmsmsopts` command.  
This command displays all GSM SMS options from the database.

Output example:

```
tekelecstp 08-04-16 11:49:33 EST EAGLE 39.0.0
GSM SMS OPTIONS
-----
MOSMSTCAPSEG = ON
MOSMSTDIGMAT = BESTFIT
;
```

7. 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

8. 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 now 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.

## 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.

For details about the commands used in this procedure, see the *Commands Manual*.

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

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

3. 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 5 ISS Service Selector Commands](#) on page 50 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

4. 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=2-2-2:gta=555648309
```

where:

**:ppt**

Specifies the prepaid portability type

**:ri**

Specifies the routing indicator

**:pci**

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

**:gta**

Specifies the global title address

5. 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.

6. 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.



# Chapter 5

## Maintenance and Measurements

---

### Topics:

- [Hardware Requirements Page 70](#)
- [Alarms Page 70](#)
- [UIMs Page 70](#)
- [Measurements Page 71](#)

This chapter describes the maintenance and measurements information available from the EAGLE 5 ISS for the MO SMS features. The information includes status, alarms (UAMs), information messages (UIMs), and reports from the Measurements Platform.

## Hardware Requirements

EPAP-based features require Service Module cards (DSM cards or E5-SM4G cards) running the VSCCP application. The EAGLE 5 ISS can be equipped with from 1 to 25 Service Module cards to support EPAP-based features.



### CAUTION:

Having a mix of Service Module cards running the VSCCP application and TSM cards running the SCCP application is not permitted when EPAP-based features are enabled. All TSM cards that are running the SCCP application must be removed from the system before EPAP-based features can be enabled.

EPAP-based features require EPAP operating on a T1000 AS MPS system .

## Alarms

Refer to *Unsolicited Alarm and Information Messages* for descriptions and corrective procedures for alarms related to EAGLE 5 ISS. Refer to *MPS Platform Software and Maintenance Manual - EAGLE 5 ISS with T1000 AS* for descriptions and corrective procedures for MPS-related alarms.

## UIMs

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

**Table 15: 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	The message and outbound digits formatting should be analyzed to determine the error, and the originating node or the

UIM	Text	Description	Action
		message exceeded system limits.	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 modified to correct the encoding error.

## Measurements

Refer to *Measurements* manual for detailed measurement usage information.

### OAM and Measurements Platform

Both the OAM and Measurements Platform (MP) collect measurement pegs for the MO SMS features. The measurement pegs track events on the basis of system total and Service Switching Point (SSP).

Both System Total (SYSTOT) pegs and Service Switching Point (SSP) pegs are updated as described in the following table.

**Table 16: Measurements Pegs for MO SMS Features**

Event Name	Description	Feature	Unit
SMSMOGRCV	Total number of MO-SMS messages received that result in a modification of the outgoing MO-SMS	MO-based GSM SMS NP	Peg count
SMSMOGERR	Total number of MO-SMS messages received that result in an error	MO-based GSM SMS NP	Peg count

Event Name	Description	Feature	Unit
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	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	Peg count

### Measurement Reports

Scheduled and on-demand measurements reports are available by the following administrative commands. Refer to *Commands Manual* for detailed usage information.

#### For Measurements Platform:

- *chg-measopts* - used to enable or disable the automatic generation and FTP transfer of scheduled measurement reports to the FTP server
- *rept-stat-meas* - reports the status of the measurements subsystem including card location and state, Alarm level, and Subsystem State
- *rept-ftp-meas* - manually initiates generation and FTP transfer of a measurements report from the MCPM to the FTP server
- *rtrv-measopts* - generates a user interface display showing the enabled/disabled status of all FTP scheduled reports

**Daily** `rept-ftp-meas:type=mtcd:enttype=np`

**Hourly** `rept-ftp-meas:type=mtch:enttype=np`

#### For OAM Platform:

- *chg-meas* - used to change both the report and collecting status of the OAM-based measurement subsystem
- *rept-meas* - used to generate on-demand measurement reports which are displayed on the user interface terminal and are not transferred to the customer FTP server

**Daily** `rept-meas:type=mtcd:enttype=np`

**Hourly** `rept-meas:type=mtch:enttype=np`

# Glossary

## A

ANSI-41 Mobile Number Portability

A feature that enables IS-41 subscribers to change their service provider while retaining the same Mobile Dialed Number (MDN).

A-Port

ANSI-41 Mobile Number Portability

ATINPQ

ATI Number Portability Query (Name of the local subsystem)

## C

CdPA

Called Party Address

The portion of the MSU that contains the additional addressing information of the destination of the MSU. Gateway screening uses this additional information to determine if MSUs that contain the DPC in the routing label and the subsystem number in the called party address portion of the MSU are allowed in the network where the EAGLE 5 ISS is located.

CgPA

Calling Party Address

The point code and subsystem number that originated the MSU. This point code and subsystem number are contained in the calling party address portion of the signaling information field of the MSU. Gateway screening uses this information to determine if MSUs that contain this point code and subsystem number area allowed in the network where the EAGLE 5 ISS is located.

## C

CLLI

Common Language Location Identifier

The CLLI uniquely identifies the STP in terms of its physical location. It is usually comprised of a combination of identifiers for the STP's city (or locality), state (or province), building, and traffic unit identity. The format of the CLLI is:

The first four characters identify the city, town, or locality.

The first character of the CLLI must be an alphabetical character.

The fifth and sixth characters identify state or province.

The seventh and eighth characters identify the building.

The last three characters identify the traffic unit.

CSR

Customer Service Request

## D

DB

Database

Daughter Board

Documentation Bulletin

DEFCC

Default Country Code

DN

Directory number

A DN can refer to any mobile or wireline subscriber number, and can include MSISDN, MDN, MIN, or the wireline Dialed Number.

DPC

Destination Point Code

DPC refers to the scheme in SS7 signaling to identify the receiving signaling point. In the SS7 network,

**D**

the point codes are numeric addresses which uniquely identify each signaling point. This point code can be adjacent to the EAGLE 5 ISS, but does not have to be.

DSM

Database Service Module.

The DSM provides large capacity SCCP/database functionality. The DSM is an application card that supports network specific functions such as EAGLE Provisioning Application Processor (EPAP), Global System for Mobile Communications (GSM), EAGLE Local Number Portability (ELAP), and interface to Local Service Management System (LSMS).

**E**

EIR

Equipment Identity Register

A network entity used in GSM networks, as defined in the 3GPP Specifications for mobile networks. The entity stores lists of International Mobile Equipment Identity (IMEI) numbers, which correspond to physical handsets (not subscribers). Use of the EIR can prevent the use of stolen handsets because the network operator can enter the IMEI of these handsets into a 'blacklist' and prevent them from being registered on the network, thus making them useless.

**F**

FAK

Feature Access Key

The feature access key allows the user to enable a controlled feature in the system by entering either a permanent feature access key or a temporary feature access key. The

**F**

feature access key is supplied by Tekelec.

FSM

Finite State Machine

FTP

File Transfer Protocol

A client-server protocol that allows a user on one computer to transfer files to and from another computer over a TCP/IP network.

**G**

G-Flex

GSM Flexible numbering

A feature that allows the operator to flexibly assign individual subscribers across multiple HLRs and route signaling messages, based on subscriber numbering, accordingly.

GMSC

Gateway MSC

G-Port

GSM Mobile Number Portability

A feature that provides mobile subscribers the ability to change the GSM subscription network within a portability cluster, while retaining their original MSISDN(s).

GSM

Global System for Mobile Communications

GTA

Global Title Address

GTI

Global Title Indicator

GTT

Global Title Translation

**G**

A feature of the signaling connection control part (SCCP) of the SS7 protocol that the EAGLE 5 ISS uses to determine which service database to send the query message when an MSU enters the EAGLE 5 ISS and more information is needed to route the MSU. These service databases also verify calling card numbers and credit card numbers. The service databases are identified in the SS7 network by a point code and a subsystem number.

**H**

HLR Home Location Register

**I**

IGM IS41 GSM Migration

IN Intelligent Network

A network design that provides an open platform for developing, providing and managing services.

INP INAP-based Number Portability

Tekelec's INP can be deployed as a stand-alone or an integrated signal transfer point/number portability solution. With Tekelec's stand-alone NP server, no network reconfiguration is required to implement number portability. The NP server delivers a much greater signaling capability than the conventional SCP-based approach.

Intelligent Network (IN) Portability

**I**

IS41 GSM Migration

A feature that adds GSM IS-41 migration functions to the existing IS-41 to GSM feature. This enhancement provides flexibility in the encoding and decoding of parameters of LOCREQ messages and responses to number migration from one mobile protocol to another.

IS-ANR

In Service - Abnormal

The entity is in service but only able to perform a limited subset of its normal service functions.

IS-NR

In Service - Normal

ISS

Integrated Signaling System

**M**

MAP

Mobile Application Part

MCPM

Measurement Collection and Polling Module

The Measurement Collection and Polling Module (MCPM) provides comma delimited core STP measurement data to a remote server for processing. The MCPM is an EDSM with 2 GB of memory running the MCP application.

MNP SMS

Portability Check for Mobile Originated SMS

MO

Magneto Optical  
Managed Object  
Mobile Originated

## M

	<p>Refers to a connection established by a mobile communication subscriber. Everything initiated by the mobile station is known as mobile originated.</p>
MP	<p>Measurement Platform</p> <p>Message Processor</p> <p>The role of the Message Processor is to provide the application messaging protocol interfaces and processing. However, these servers also have OAM&amp;P components. All Message Processors replicate from their System OAM's database and generate faults to a Fault Management System.</p>
MSC	<p>Mobile Switching Center</p>
MSISDN	<p>Mobile Station International Subscriber Directory Number</p> <p>The MSISDN is the network specific subscriber number of a mobile communications subscriber. This is normally the phone number that is used to reach the subscriber.</p>
MSU	<p>Message Signaling Unit</p> <p>The SS7 message that is sent between signaling points in the SS7 network with the necessary information to get the message to its destination and allow the signaling points in the network to set up either a voice or data connection between themselves. The message contains the following information:</p> <ul style="list-style-type: none"><li>• The forward and backward sequence numbers assigned to</li></ul>

**M**

the message which indicate the position of the message in the traffic stream in relation to the other messages.

- The length indicator which indicates the number of bytes the message contains.
- The type of message and the priority of the message in the signaling information octet of the message.
- The routing information for the message, shown in the routing label of the message, with the identification of the node that sent message (originating point code), the identification of the node receiving the message (destination point code), and the signaling link selector which the EAGLE 5 ISS uses to pick which link set and signaling link to use to route the message.

MTP

The levels 1, 2, and 3 of the SS7 protocol that control all the functions necessary to route an SS7 MSU through the network.

**N**

NAI

Nature of Address Indicator  
Standard method of identifying users who request access to a network.

NP

Number Plan

NPDB

Number Portability Database

**O**

OOS-MT

Out of Service - Maintenance

**O**

The entity is out of service and is not available to perform its normal service function. The maintenance system is actively working to restore the entity to service.

**P**

PPSMS

Prepaid Short Message Service  
Prepaid Short Message Service Intercept

PPSMS

Prepaid Short Message Service Intercept

Prepaid IDP Query Relay

A feature (IDP Relay) that provides a mechanism to insure correct charging for calls from prepaid subscribers in a portability environment.

**R**

RTDB

Real Time Database

**S**

SCCP

Signaling Connection Control Part

SMS

Short Message Service

SMSC

Short Message Service Center

SSN

Subsystem Number

The subsystem number of a given point code. The subsystem number identifies the SCP application that should receive the message or the subsystem number of the destination point code to be assigned to an X.25 address or the LNP subsystem of the EAGLE 5 ISS.

## S

A value of the routing indicator portion of the global title translation data commands indicating that no further global title translation is required for the specified entry.

STP

Signal Transfer Point

STPs are ultra-reliable, high speed packet switches at the heart of SS7 networks, which terminate all link types except F-links. STPs are nearly always deployed in mated pairs for reliability reasons. Their primary functions are to provide access to SS7 networks and to provide routing of signaling messages within and among signaling networks.

Subsystem Number

See SSN.

## T

TC

Table Copy

Transaction Capabilities

TCAP

Transaction Capabilities  
Application Part

TSM

Translation Services Module

Provides SCCP functionality or GLS functionality for Local Number Portability (LNP)/SCCP (GTT). The SCCP software allows the TSM to be used as a memory board for Global Title Translation (GTT).

TT

Translation Type.

Resides in the Called Party Address (CdPA) field of the MSU

**T**

and determines which service database is to receive query messages. The translation type indicates which Global Title Translation table determines the routing to a particular service database.

**U**

UDT

Unit Data Transfer

**V**

V-Flex

Voicemail Flexible Routing

An advanced database application based on the industry proven EAGLE 5 ISS. Deployed as a local subsystem on the EAGLE platform, V-Flex centralizes voicemail routing.



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