

**Oracle® Communications  
EAGLE**

IS41 GSM Migration User's Guide

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Oracle® Communications IS41 GSM Migration User's Guide

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# Chapter 1

## Introduction

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This chapter provides a brief description of the IS41GSM Migration (IGM) feature of the Oracle Communications EAGLE. The chapter also includes the scope, audience, and organization of the manual; how to find related publications; and how to contact Oracle for assistance.



## Overview

This manual provides feature descriptions, commands, maintenance, measurements, and configuration details associated with the IS41 GSM Migration (IGM) feature deployed on an EAGLE that is also performing the STP function. The IGM feature applies to ITU and ANSI networks.

The IGM feature provides the mobile wireless service provider a way to migrate subscribers from IS-41 to GSM and GSM to IS-41. After the subscriber is marked as *migrated*, the GSM handset is fully functional, and the migrated subscriber has the option whether to continue to receive calls on the IS-41 or GSM handset.

Number lengths vary between countries and may vary within a country. As a result, the database structure supports numbers of varying length in a flexible way without requiring software modifications. A maximum number length of 15 digits for ported numbers is supported.

IGM is an optional feature on the EAGLE, and can be enabled and turned on, but not off, via a feature access key. The IGM feature requires the Global Title Translation (GTT) feature. The IGM feature and North American Local Number Portability (LNP) are mutually exclusive on an EAGLE node, unless the Dual ExAP Configuration feature is enabled.

## Scope and Audience

This manual is intended for anyone responsible for installing, maintaining, and using the IGM feature of Oracle Communications EAGLE. Users of this manual and the other manuals in the EAGLE family of documents must have a working knowledge of telecommunications and network installations.

## Manual Organization





This document is organized into the following chapters:

- *Introduction* contains general information about the IGM documentation, the organization of this manual, and how to request technical assistance.
- *Feature Description* provides a functional description of the IGM feature, including network perspectives, assumptions and limitations, database overview, Service Module card provisioning and reloading, and IGM user interface.
- *Commands* describes the commands that support the IGM feature and explanations of appropriate command usage.
- *Feature Configuration* describes how to activate the IGM feature.
- *Measurements* describes the measurements available for IGM.
- *Maintenance* describes IGM maintenance information, including Oracle Communications EAGLE Application Processor Provisioning (EPAP) 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**

Icon	Description
 DANGER	<b>Danger:</b> (This icon and text indicate the possibility of <i>personal injury</i> .)
 WARNING	<b>Warning:</b> (This icon and text indicate the possibility of <i>equipment damage</i> .)
 CAUTION	<b>Caution:</b> (This icon and text indicate the possibility of <i>service interruption</i> .)
 TOPPLE	<b>Topple:</b> (This icon and text indicate the possibility of <i>personal injury and equipment damage</i> .)

## My Oracle Support (MOS)

MOS (<https://support.oracle.com>) is your initial point of contact for all product support and training needs. A representative at Customer Access Support (CAS) can assist you with MOS registration.

Call the CAS main number at **1-800-223-1711** (toll-free in the US), or call the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select **2** for New Service Request
2. Select **3** for Hardware, Networking and Solaris Operating System Support
3. Select **2** for Non-technical issue

You will be connected to a live agent who can assist you with MOS registration and provide Support Identifiers. Simply mention you are a Tekelec Customer new to MOS.

MOS is available 24 hours a day, 7 days a week, 365 days a year.

## Emergency Response

In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at **1-800-223-1711** (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- 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 Oracle.

## Related Publications

For information about additional publications that are related to this document, refer to the *Related Publications Reference* document, which is published as a separate document on the Oracle Technology Network (OTN) site. See [Locate Product Documentation on the Oracle Technology Network Site](#) for more information.

## 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, including the latest versions of Feature Notices.

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 separately. Exceptions to printed documentation are:

- Hardware or Installation manuals are printed 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 Problem Reports (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 Oracle Technology Network Site

Oracle customer documentation is available on the web at the Oracle Technology Network (OTN) site, <http://docs.oracle.com>. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at [www.adobe.com](http://www.adobe.com).

1. Log into the Oracle Technology Network site at <http://docs.oracle.com>.
2. Under **Applications**, click the link for **Communications**.  
The **Oracle Communications Documentation** window opens with Tekelec shown near the top.
3. Click **Oracle Communications Documentation for Tekelec Products**.
4. Navigate to your Product and then the Release Number, and click the **View** link (the **Download** link will retrieve the entire documentation set).
5. To download a file to your location, right-click the PDF link and select **Save Target As**.

# Chapter 2

## Feature Description

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### Topics:

- *Introduction.....14*
- *IGM Protocol.....18*
- *General Numbering Requirements.....38*
- *Hardware Requirements.....39*
- *MPS/EPAP Platform.....39*

This chapter describes the IS41 GSM Migration (IGM) feature.

## Introduction

The IS41 GSM Migration (IGM) feature supports call termination for customers to migrate from IS-41 to GSM and GSM to IS-41 wireless technology. This is referred to as Portability Type = 5 (PT = 5). This feature provides the mobile wireless service provider a way to migrate subscribers from IS-41 to GSM and GSM to IS-41. Once the subscriber is marked as migrated, the GSM handset is fully functional, and the migrated subscriber has the option whether to continue to receive calls on the IS-41 or GSM handset.

IGM provides the ability for subscribers to change service providers while retaining their Mobile Dialed Number (MDN). IGM uses the EPAP Real Time Database (RTDB) to maintain subscriber portability and migration information. Subscriber information in the EPAP RTDB is keyed by Mobile MDNs for ANSI-41 subscribers and Mobile Station International ISDN Number (MSISDNs) for GSM subscribers.

IGM treats only those DN entries assigned with SP/PT= 5, No NE/PT=5, or assigned with RN/PT= 0 as migrated subscribers. Any other types of NE/PT assignments are not considered as migrated or ported subscribers.

Two types of subscriber entries, migrated and non-migrated subscribers, are supported. For migrated subscribers, the subscriber entries are entered with No NE/PT=5, SP/PT=5, and RN/PT=0. All other entries are non-migrated subscribers. IGM also supports DN block entries.

The ETSI standards are defined so that GSM carriers can choose to implement either Signaling Relay Function (SRF)-based (using MAP protocol) MNP or IN-based (using INAP protocol) MNP. IGM supports only the SRF-based solution for MNP. (INAP-based MNP processing is similar to wireline networks; this function is supported by the INP feature.)

### Message Interception

SRF-based MNP processing involves the “intercepting” of existing MAP messages to check for ported numbers. For call-related messages, IGM acts as an “NP HLR” in the case where the number has been exported, by responding to the switch with an SRI, SRI-SM, LOCREQ, and SMSREQ ack messages. For non-migrated calls, IGM performs message relay.

### Routing Options

The ETSI standards for SRF-based MNP define two routing options, direct routing and indirect routing. IGM supports both options:

- With direct routing, the network where the call is originated is responsible for determining whether the called party has ported and routing the call to the new subscription network.
- With indirect routing, this is the responsibility of the network that originally owned the number.

### Number Lengths

Number lengths vary among countries and may even vary within a country. As a result, IGM supports numbers of varying length in a flexible way without necessitating software modifications. A maximum number length of 15 digits for ported numbers is supported.

### Supported Messages

IGM uses the EPAP RTDB to derive the portability status of a subscriber.

IGM supports LOCREQ messages as well as SMSREQ messages, if the option is selected, for number portability handling. LOCREQ messages generate a LOCREQ response if the mobile dialed number (MDN) is migrated and relays the LOCREQ if the MDN is not ported (non-porting or porting in are handled the same way).

SMSREQ messages generate a SMSREQ NAK if access is denied and relays the SMSREQ if SMSREQ BYPASS is set to false. SRI generates an ACK if the MSISDN is migrated, and relays the message if the dialed number is not migrated. SRI-SM generates an ACK if the dialed number is migrated, and relays the message if it is not.

### MTP Routed SCCP Traffic

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

### MNP Circular Route Prevention

The MNP Circular Route Prevention (MNPCR) feature detects circular routing caused by incorrect information in one or more of the network number portability databases. For example, a subscriber may have ported from network A to network B. Network A has the correct routing information, indicating the subscriber now belongs to network B. However, network B may have incorrect routing information, indicating that the subscriber still belongs to network A. In this case, network A routes the call to network B, based on its portability data, but network B routes the call back to network A, based on its incorrect data. The result is a circular route. The MNPCR feature provides logic to prevent the circular routing from occurring.

MNP Circular Route Prevention is not valid when only IS41 GSM Migration (IGM) is turned on. ANSI-41 Mobile Number Portability (A-Port) or GSM Mobile Number Portability (G-Port) must be turned on for MNP Circular Route Prevention processing to be valid. Circular route prevention for only ITU MAP messages is supported when only IGM is turned on.

The MNP Circular Route Prevention feature (MNPCR) allows Circular Route Prevention based on the Translation Type (TT) of the SCCP CdPA to be performed for SRI messages when a Home Routing Number (HomeRN) is not present. For the Circular Route Prevention on Translation Type processing to be performed, the `crptt` parameter of the `chg-gsmopts` command must be set to a value between 0 and 255. If the `crptt` parameter of the `chg-gsmopts` command is set to the default value of `none`, then no Circular Route Prevention on Translation Type processing is performed. The MNP Circular Route Prevention feature cannot be turned off if the `crptt` parameter is provisioned to any value other than `none`. If a message is processed for Circular Route Prevention based on HomeRN, then Circular Route Prevention on Translation Type processing does not occur.

SRI messages must meet these criteria to be eligible for Circular Route Prevention on Translation Type:

- The message is selected for G-Port or IS41 GSM Migration processing.
- The message is not identified as G-Port SRI Query for Prepaid.
- The message is not MTP-routed. (The CdPA is Route-on-GT.)

- The translation type of the SCCP CdPA matches the provisioned translation type (`crptt`).
- The ITU TCAP Package type is ITU Begin.
- The OpCode is an SRI (hexadecimal 16).
- The Optimal Routing Interrogation Parameter (Tag = 0x04) is not present.
- The MSISDN is not assigned to the subscriber's network provider.

### DigitAction Expansion

The DigitAction Expansion feature provides more flexibility to formulate the SCCP Called Party Address (SCCP) Global Title Address (GTA) field of the MAP messages relayed by IGM.

DigitAction Expansion is provisioned via the PDBI Enter Network Entity or Update Network Entity commands. DigitAction Expansion can also be modified via the Add an NE and Update an NE GUI screens.

### Digit Action DELCCPREFIX

The Digit Action to delete country code if present and prefix database entity feature allows the DELCCPREFIX Digit Action to be applied to the Called Party Global Title Address (CdPA GTA) when the GTA has a National format, as well as when the GTA has an International format. The DELCCPREFIX option in the SCCPOPTS table specifies how the DELCCPREFIX digit action is applied to a Called Party Global Title Address (CdPA GTA).

- When the SCCPOPTS:DELCCPREFIX option is set to PFXWCC, the DELCCPREFIX digit action is applied to the CdPA GTA only when the address has a International format. The Country Code is deleted and the GTA is prefixed with the Entity ID.
- When the SCCPOPTS:DELCCPREFIX option is set to PFX4ALL, the DELCCPREFIX digit action is applied to the CdPA GTA in all cases. For an International format, the Country Code is deleted and the GTA is prefixed with the Entity ID. For a National format, the GTA is prefixed with the Entity ID.

The `chg-sccpopts` command is used to specify the `delccprefix` parameter value to configure the DELCCPREFIX Digit Action functionality.

### MNP SCCP Service Re-Route

The MNP SCCP Service Re-Route feature is used when the IGM subscriber database is incoherent with MPS data and the GTT data is valid. The MNP SCCP Service Re-Route feature provides the capability to re-route the traffic from the EAGLE 5 ISS to other IGM subscriber database nodes and inform the originating nodes to re-route the IGM service related traffic to other IGM service nodes.

The MNP SCCP Service Re-Route feature is designed to handle and control re-routing of IGM traffic from an affected node to alternate nodes within an operators network. This feature is an optional feature and does not affect the normal IGM function. This feature also provides the option to mark IGM `offline` to perform a controlled re-routing during this state.

### ROP Support

The IS41 GSM Migration (IGM) feature allows Small Geographic Areas (CNLs) to be grouped into Large Geographic Areas (ROPs). This grouping simplifies the routing and allows a call to be delivered as close to the interconnection destination as possible. ROP information is stored in the generic routing



number (GRN) field. Both CNL and ROP information can be provisioned for a single subscriber entry; however, only one of the CNL or ROP fields can be selected for the outgoing message

The G-Port, G-Port SRI Query for Prepaid, GSM MAP SRI Redirect, AINPQ, INP, and ATINP features also support ROP.

#### **Include Optional CUG Parameter in SRI Ack Messages**

The Include Optional CUG Parameter in SRI Ack Messages functionality allows an existing Closed User Group-CheckInfo (CUG-CheckInfo) parameter in an incoming SRI message to be included in the outgoing SRI Ack message.

The Include Optional CUG Parameter in SRI Ack Messages functionality is controlled by the `encodecug` option of the `chg-gsmopts` command `off` and `on` parameters. The `encodecug` option of the `chg-gsmopts off/on` parameter can be changed only if the G-Port or IGM feature is enabled.

The CUG-CheckInfo parameter in an incoming SRI message is copied in the original sequence to the outgoing SRI Ack message when these conditions are met:

- The `encodecug` option of the `chg-gsmopts` command is set to `on`.
- The CUG-CheckInfo parameter is present in an incoming SRI message.
- The CUG-CheckInfo parameter in an incoming SRI message is encoded in definite length format that is less than or equal to 30 bytes.

If the three conditions described above are met, the original CUG-CheckInfo sequence from the incoming SRI message is copied into the SRI Ack message. If encoded in the SRI Ack message, the CUG-CheckInfo parameter is located after the MSRN (Tag = 0x04) and before the MSISDN (Tag = 0x8C) or NPS parameter (Tag = 0x8D), if either MSISDN or NPS parameter is present. The CUG-CheckInfo parameter in an SRI Ack message uses Tag = 0xA3.

If the CUG-CheckInfo parameter is greater than 30 bytes and all other conditions for encoding are met, then only the CUG-Interlock and CUG-OutgoingAccess parameters are copied from an incoming SIR message to the outgoing SRI Ack message. The ExtensionContainer is omitted.

When the `encodecug` option is set to `off`, the CUG-CheckInfo parameter is not encoded in the SRI Ack message.

If the `encodecug` option is set to `on` but the CUG-CheckInfo parameter in an incoming SRI message uses an indefinite length format, the CUG-CheckInfo parameter is not encoded in the SRI Ack message.

#### **Route SRI\_SM and ReportSMSDeliveryStatus for Non-local or Ported-out Subscribers using GTT**

The Route SRI\_SM and ReportSMSDeliveryStatus for Non-local or Ported-out Subscribers using GTT functionality modifies SRI\_SM and ReportSMSDeliveryStatus messages to allow routing of the message to an alternate network using Global Title Translation (GTT). This functionality allows processing to occur when the Directory Number (DN) in the database is associated with both the Service Point (SP) and Generic Routing Number (GRN) network elements and the GRN is not present in the EAGLE 5 ISS HomeRN table, or when the subscriber is ported out and associated with the Routing Number (RN).

The message is altered by changing the SCCP Called Party Address (CdPA) to the Country Code (CC) + GRN + DN or to CC + RN + DN. This alteration allows GTT to redirect the query to an alternate network. If a CC is not located in the DN, then the SCCP CdPA is converted to a GRN + DN or RN + DN format.

This conversion is performed only on ITU TCAP Begin MSUs with Op Code of SRI\_SM or ReportSMSDeliveryStatus delivered to the GPort or MNP service selector for processing. If the MT-Based GSM SMS NP or the IS41 GSM Migration (IGM) feature generates a response for the SRI\_SM message, then this functionality is not applicable.

The Route SRI\_SM and ReportSMSDeliveryStatus for Non-local or Ported-out subscribers using GTT functionality is controlled by the `srismgttrtg` option of the `chg-gsmopts` command `off` and `on` parameters. The `srismgttrtg` option of the `chg-gsmopts off/on` parameter can be changed only if the G-Port or IGM feature is enabled.

#### Option to Suppress NumberPortabilityStatusIndicator in SRI Ack

The Option to Suppress NumberPortabilityStatusIndicator in SRI Ack functionality allows the Number Portability Status Indicator (NPSI) to be omitted from all SRI Ack messages.

The Option to Suppress NumberPortabilityStatusIndicator in SRI Ack functionality is controlled by the `encodenps` option of the `chg-gsmopts` command `off` and `on` parameters. The `encodenps` option of the `chg-gsmopts off/on` parameter can be changed only if the G-Port or IGM feature is enabled.

The NumberPortabilityStatusIndicator parameter is encoded in an SRI Ack message when these conditions are met:

- The `encodenps` option of the `chg-gsmopts` command is set to `on`.
- SRI is considered MAP Phase 2+.
- DN Portability Type is 0, 1, 2, or 36. (Portability Type = 36 is encoded as Portability Type = 0.)

**Note:** MAP Phase is set based on either data in the dialog portion or `GSMOPTS:DEFMAPVR` if the dialog portion does identify.

The NumberPortabilityStatusIndicator parameter is not encoded in any SRI Ack message if the `encodenps` option of the `chg-gsmopts` command is set to `off`.

## IS412GSM Migration Changes

For systems that are upgraded to the IGM feature, the upgrade process sets an SCCP option to `on` if the G-Port feature is turned on and the IS412GSM prefix is defined. If the G-Port feature is turned on and the IS412GSM prefix is not defined, the upgrade process sets the SCCP option to `off`. The default setting for new systems is `off` (disabled).

The EAGLE 5 ISS populates a new `GSM2IS41` prefix following the same mechanism that is used for the existing IS412GSM prefix. The EAGLE 5 ISS returns a `GSM2IS41` prefix in the SRI Ack message if a received SRI message is destined for a non-migrated IS41 or GSM migrated IS41 subscriber (a data entry is found with RN and PT=0).

## IGM Protocol

IGM provides the following main functions:

### Message Discrimination

Because IGM provides translation of migrated and non-migrated numbers, it provides a method to identify which messages need migration handling versus GTT. This task of identification is provided via a service selector table where the user defines the service for a combination of selectors.

### Operation Code Discrimination

IGM handles ANSI Loc\_Req, SMSREQ, GSM SRI, and SRI\_SM differently than other ANSI/GSM operation codes. The Portability type field is only considered for these operation codes. Message relay is performed for all other operation codes based on IGM Translation data.

### Number Conditioning

The RTDB stores International MSISDN only. IGM provides the capability to condition incoming numbers to be international MSISDN (Insert CC or/and NDC) for the database look up. IGM removes the GSM prefix from GSM SRI messages and then conditions the non-international numbers to international numbers, if needed, before performing any database lookup.

### IS412GSM

IGM generates a Loc\_Req Return Result Response, when the MDN in the Loc\_Req is a *Migrated with one handset* subscriber. When formulating a Loc\_Req response, IGM uses the IS412GSM prefix in GSMOPTS to build the Routing Digits. If the IS412GSM prefix is not provisioned, IGM issues UIM 1130 IS412GSM not provisioned and falls through to GTT.

### GSM2IS41

The GSM2IS41 prefix is used in the SRI Ack message if the message received is SRI and DN lookup has RN and PT = 0 assigned. If MIGRPFX = MULTIPLE, then the RN from the RTDB is used as the prefix in the SRI Ack message. If MIGRPFX = SINGLE and GSM2IS41 prefix is NONE, then the SRI Ack message issues UIM 1341 SRI rcvd GSM2is41 prefix not provisioned and the message falls through to GTT.

### Database Lookup

IGM performs the RTDB database lookup using the international MSISDN.

The individual number database is searched first:

- If the number is not found, the number range database is searched.
- If a match is not found in the individual and range-based database, the GTT is performed on the message.

In the event of the MSISDN numbers in the RTDB database being odd and CDPA GTI of the incoming message being '2', and the last digit of the number is 'zero':

- IGM first performs database lookup one time using the even number.
- If no match is found, IGM again performs the database lookup, using the odd number (without last digit).

Since a DN may be the target of the A-Port, G-Port, or IGM message processing in a hybrid network (where an operator owns both GSM and IS41 network), message processing call disposition is based

on what applications are in service. [Table 2: IGM Customer Message Processing](#) through [Table 5: IGM, A-Port, and G-Port Customer Message Processing](#) show call dispositions for the following configurations:

- IGM Only ([Table 2: IGM Customer Message Processing](#))
- IGM and G-Port ([Table 3: IGM and G-Port Customer Message Processing](#))
- IGM and A-Port ([Table 4: IGM and A-Port Message Processing](#))
- A-Port, G-Port, and IGM ([Table 5: IGM, A-Port, and G-Port Customer Message Processing](#))

The following notations apply to [Table 2: IGM Customer Message Processing](#) through [Table 5: IGM, A-Port, and G-Port Customer Message Processing](#).

PT = Portability Type for the DN

Values:

- 0 – Not known to be ported
- 1 – Own number ported out
- 2 – Foreign number ported to foreign network
- 3 – Prepaid 1 (used by PPSMS)
- 4 – Prepaid 2 (used by PPSMS)
- 5 – Migrated with one handset
- 6 – Prepaid 3 (used by PPSMS)

through

- 32 – Prepaid 35 (used by PPSMS)
- 36 – Not identified to be ported
- FF – No status, No Portability Type

NE = Network Entity

PPSMSPT = Prepaid1 through Prepaid 35 used by PPSMS

RN = Routing Number

SP = Signaling Point

SRI = Send Routing Information

SP\* : This row refers to DN is assigned with SP, with or without PT. SP\*\* : This row refers to DN is assigned with SP without PT. DN blocks are commonly assigned with SP and without PT.

**Table 2: IGM Customer Message Processing**

NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
RN and PT = 0	MIGRPFX = single: ACK, use GSM2IS41 prefix MIGRPFX = multiple: ACK, RN from RTDB	Based on provisioned option: a) SRI_SM_NACK with Return	Relay	Relay	Relay	Relay

NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
		Error Component b) Relay to configured default CDMA SMSC				
RN and PT $\neq$ 0	GTT	GTT	GTT	GTT	GTT	GTT
SP and PT = 5	Relay	Relay	Relay	ReturnResult with IS412GSM prefix	If SMSREQBYPASS = true, then Relay; else ReturnResult with SMS Access Denied Reason = 5	Relay
SP and PT $\neq$ 5	Relay	Relay	Relay	Relay	Relay	Relay
No NE and PT = 0	ACK (no NE)	GTT	GTT	GTT	GTT	GTT
No NE and PT=1, 2, 36, or No PT	GTT	GTT	GTT	GTT	GTT	GTT
No NE and PT = 5	GTT	GTT	GTT	ReturnResult with IS412GSM prefix	If SMSREQBYPASS = true, then GTT; else ReturnResult with SMS Access Denied Reason = 5	GTT
No NE and PT = PPSMSPT	GTT	GTT	GTT	GTT	GTT	GTT
No DN entry found	GTT	GTT	GTT	GTT	GTT	GTT

Table 3: IGM and G-Port Customer Message Processing

NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
RN and PT = 0	MIGRPFX = single: ACK, use GSM2IS41 prefix  MIGRPFX = multiple: ACK, RN from RTDB	Based on provisioned option:  a) SRI_SM_NACK with Return Error Component  b) Relay to configured default CDMA SMSC	Relay	Relay	Relay	Relay
RN and PT ≠ 0 or No PT	ACK (RN from RTDB)  for PT = 0, 1, 2: Existing Encode NPS  for PT = 36: maps to 0	Relay	Relay	GTT	GTT	GTT
SP and PT = 5	Relay	Relay	Relay	ReturnResult with IS412GSM prefix	If SMSREQBYPASS = true, then Relay; else ReturnResult with SMS Access Denied Reason = 5	Relay
SP and PT ≠ 5	Relay	Relay	Relay	Relay	Relay	Relay
No NE and PT = 5	GTT	GTT	GTT	ReturnResult with IS412GSM prefix	If SMSREQBYPASS = true, then GTT; else ReturnResult with SMS Access Denied Reason = 5	GTT
No NE and PT= 0, 1, 2, 36, or No PT	ACK (no NE)	GTT	GTT	GTT	GTT	GTT

NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
	for PT = 0: Existing Encode NPS  for PT = 36: maps to 0 if needed					
No NE and PT = PPSMSPT	GTT	GTT	GTT	GTT	GTT	GTT
No DN entry found	GTT	GTT	GTT	GTT	GTT	GTT

**Table 4: IGM and A-Port Message Processing**

NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
RN and PT = 0	MIGRPFX = single: ACK, use GSM2IS41 prefix  MIGRPFX= multiple: ACK, RN from RTDB	Based on provisioned option:  a) SRI_SM_NACK with Return Error Component  b) Relay to configured default CDMA SMSC	Relay	Relay	Relay	Relay
RN and PT≠ 0	GTT	GTT	GTT	ReturnResult with RN from RTDB	Relay	Relay
SP and PT= 5	Relay	Relay	Relay	ReturnResult with IS412GSM prefix	If SMSREQBYPASS = true, then Relay; else ReturnResult with SMS Access Denied Reason = 5	Relay
SP and PT≠ 5	Relay	Relay	Relay	Relay	Relay	Relay

NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
No NE and PT = 5	GTT	GTT	GTT	ReturnResult with IS412GSM prefix	If SMSREQBYPASS = true, then GTT; else ReturnResult with SMS Access Denied Reason = 5	GTT
No NE and PT = 0	ACK (no NE)	GTT	GTT	ReturnResult (no NE)	GTT	GTT
No NE and PT = 1, 2, 36, or No PT	GTT	GTT	GTT	ReturnResult (no NE)	GTT	GTT
No NE and PT = PPSMSPT	GTT	GTT	GTT	GTT	GTT	GTT
No DN entry found	GTT	GTT	GTT	GTT	GTT	GTT

Table 5: IGM, A-Port, and G-Port Customer Message Processing

NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
RN and PT = 0	MIGRPFX = single: ACK, use GSM2IS41 prefix MIGRPFX = multiple: ACK, RN from RTDB	Based on provisioned option: a) SRI_SM_NACK with Return Error Component b) Relay to configured default CDMA SMSC	Relay	Relay	Relay	Relay
RN and PT ≠ 0	ACK (RN from RTDB) for PT = 0, 1,2: Existing Encode NPS	Relay	Relay	ReturnResult with RN from RTDB	Relay	Relay



NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
	for PT = 36: mps to 0					
SP and PT = 5	Relay	Relay	Relay	ReturnResult with IS412GSM prefix	If SMSREQBYPASS = true, then Relay; else ReturnResult with SMS Access Denied Reason = 5	Relay
SP and PT ≠ 5	Relay	Relay	Relay	Relay	Relay	Relay
No NE and PT = 5	GTT	GTT	GTT	ReturnResult with IS412GSM prefix	If SMSREQBYPASS = true, then GTT; else ReturnResult with SMS Access Denied Reason = 5	GTT
No NE and PT = 0 or 36	ACK (no NE) for PT = 0: Existing Encode NPS for PT = 36: maps to 0	GTT	GTT	ReturnResult (no NE)	GTT	GTT
No NE and PT = 1, 2 or No PT	ACK (no NE)	GTT	GTT	ReturnResult (no NE)	GTT	GTT
No NE and PT = PPSMSPT	GTT	GTT	GTT	GTT	GTT	GTT
No DN entry found	GTT	GTT	GTT	GTT	GTT	GTT

Database lookup results in the following:

1. Applying normal routing or
2. Relaying the message to the destination as noted in the database or
3. Returning an acknowledge message to the originating switch.

### Message Relay

The rules for formatting the SCCP CdPA GTA field are based on the value specified in the DigitAction field. In the case where a received IS41 message is relayed, the EAGLE formulates the SCCP CdPA GTA field of the outgoing message according to DigitAction specified. If DigitAction = none, the EAGLE 5 ISS does not overwrite the SCCP CdPA GTA. For all other values, the EAGLE 5 ISS formats the SCCP CdPA GTA according to the value assigned to DigitAction. [Table 6: DigitAction Applications](#) identifies the required DigitAction options as well as the samples of how the SCCP CdPA GTA of an outgoing message is formatted for each of the options. The illustration assumes the RN/SP ID is 1404 and default country code is 886.

**Table 6: DigitAction Applications**

DigitAction	Value in Incoming CdPA GTA	Value in Outgoing CdPA GTA	Meaning
none	886944000213	886944000213	No change to the Called Party GTA (default)
prefix	886944000213	1404886944000213	Prefix Called Party GTA with the entity id
replace	886944000213	1404	Replace Called Party GTA with the entity id
insert	886944000213	8861404944000213	Insert entity id after country code. (CC + Entity Id + NDC + SN)
delccprefix	886944000213	1404944000213	Delete country code and add prefix (No action is taken if country code is not present.)
delcc	886944000213	944000213	Delete country code
spare1	886944000213	treated as none	No change to the Called Party GTA (default)
spare2	886944000213	treated as none	No change to the Called Party GTA (default)

### Returning Acknowledgement

When a LOCREQ Ack is returned, the EAGLE 5 ISS follows the LOCREQ encoding rules along with the following enhancements for added flexibility:

1. Allow users to specify which TCAP LOCREQ parameter (TCAP Outgoing Called Party parameter) shall encode the RN (and/or DN) information
2. Allow users to specify the DigitType value to encode the TCAP Outgoing Called Party parameter
3. Allow users to specify the value to encode the Nature of Number field of the TCAP Outgoing Called Party parameter

4. Allow users to specify the value to encode the Numbering Plan field of the TCAP Outgoing Called Party parameter
5. Allow users to specify the digit encoding format of the locreq TCAP Outgoing Called Party parameter
6. Allow users to specify the MSCID values to be encoded in the locreq message
7. Allow users to specify the ESN values to be encoded in the locreq message
8. Allow users to specify how the digits of the locreq MIN parameter shall be encoded.

The following encoding rules are followed when an SRI Ack is returned:

1. When an SRI Ack is returned, the EAGLE 5 ISS follows the SRI Ack encoding rules along with the following enhancements for added flexibility
2. Allow users to specify which SRI parameter (the TCAP MSRN parameter) encodes the RN (and/or DN) information
3. Allow users to specify the value to encode the Nature of Address field of the TCAP MSRN parameter
4. Allow users to specify the value to encode the Numbering Plan field of the TCAP MSRN parameter.

### **MNP SCCP Service Re-Route Capability**

This feature is designed to handle and control re-routing of MNP traffic from an affected node to alternate nodes within an operators network. This feature is an optional feature and does not affect the normal MNP functionality. This feature consists of the following main functions:

- *Service State*
- *MNP Re-Routing*
- *MNP Capability Point Codes*

#### **Service State**

Service state is part of the MNP SCCP Service Re-Route Capability. Service state is used to indicate the current state of MNP, either `ONLINE` or `OFFLINE`. Service state also gives the user the option to mark MNP as `OFFLINE` or `ONLINE` based on the current behavior. If a MNP problem is identified, MNP can be marked `OFFLINE` to initiate the re-routing procedure. When the Service Module cards need to be reloaded, MNP can be marked `OFFLINE` until enough cards are in-service and then bring MNP `ONLINE` in a controlled fashion. This feature also provides the option to mark MNP `OFFLINE` to perform a controlled re-routing during this state.

#### **MNP Re-Routing**

MNP Re-Routing is an optional feature and is enabled by defining a list of alternate PCs or by defining the GTT option. MNP re-routing is activated by marking MNP `OFFLINE`. When MNP is `OFFLINE` and alternate PCs are provisioned, any messages destined for MNP are re-routed to the available alternate PCs that are defined for MNP. If alternate PCs are not provisioned or none are available, then the GTT option is used. If the GTT option is set to `YES`, then messages destined for MNP will fall through to GTT as part of the re-routing procedure.

Re-Routing is applied to all MNP messages (based on SRVSEL). There is no distinction of DPC of the messages. The DPC of the message can be either True, Secondary, or Capability Point code.

### MNP Capability Point Codes

Capability Point Codes (CPC) are also supported for MNP. The use of MNP capability point code aids the adjacent nodes in knowing about MNP outages. When MNP is brought down through administrative commands, all traffic destined to this MNP node will generate a Transfer Prohibited (TFP) message to the adjacent node about the MNP CPC. The TFP response to the adjacent node causes the traffic originating nodes to stop sending MNP traffic to this node. All MNP traffic coming into this node is sent to the alternate MNP nodes. Adjacent nodes will initiate route-set-test procedures after receipt of the TFP response.

If the messages are destined to the EAGLE 5 ISS true point code, then TFP messages are not generated when the MNP service is OFFLINE. The originator would not be aware of the outage.

Once MNP is back in service on the EAGLE 5 ISS, a Transfer Allowed (TFA) message is sent to the traffic adjacent nodes in response to route-set-test message. The traffic originating nodes will then start sending MNP traffic to the original MNP node.

MNP Capability point codes can be provisioned when the MNP feature is ON. There can be more than one Capability Point Code assigned to MNP CPCType.

When the MNP feature is turned ON and the MNP service state is set to OFFLINE, the user can change the service to ONLINE at any point. Once the feature is turned ONLINE, MNP will start processing messages if at least one Service Module card is IS-NR.

The MNP service can be set to OFFLINE at any point. This causes the EAGLE 5 ISS to stop processing MNP traffic and re-routing is performed.

The MNP service state is persistent. Booting the OAM or all the Service Module cards will not change the service state. Commands must be used to change the service state.

MNP supports up to seven alternate PCs per domain. All six domains (ANSI, ITU-I, ITU-N, ITU-N spare, ITU-I spare, and ITU-N24) are supported. An entire set of alternate PCs is considered as a re-route set. A GTT option is supported for MNP re-route. When the MNP service is OFFLINE, MNP messages fall through to GTT based on the GTT option. This option is set to YES by default.

### MNP SCCP Service Re-Route Capability Summary

If the MNP service is not normal (because the RTDB is not in sync with MPS or if cards are misrouting MNP messages) then the MNP service state should be changed to OFFLINE.

Before changing MNP service to OFFLINE, it should be decided what kind of re-routing will be used during the outage. The EAGLE 5 ISS supports re-routing data to alternate point codes or falling through to GTT as two possible options. Re-routing to alternate point code has priority over falling through to GTT. Examples of the two options follow:

#### *Option 1*

Define alternate point codes to re-route MNP traffic. This is the recommended option. Up to 7 alternate MNP nodes can be provisioned to re-route all the incoming MNP traffic. Once provisioned, the MNP service can be changed to OFFLINE. This example has any incoming being MNP traffic being load-shared to point codes based on the relative cost.

```
chg-sccp-serv:serv=mnp:pci1=1-1-1:rc1=10:pci2=2-2-2:rc2=10:pci3=3-3-3:rc3=10:pci4=4-4-4:rc4=10
chg-sccp-serv:serv=mnp:pci1=1-1-1:rc1=10:pci2=2-2-2:rc2=10:pci3=3-3-3:rc3=10:pci4=4-4-4:rc4=10
```

```
chg-sccp-serv:serv=mnp:pci1=5-5-5:rc1=10:pci2=6-6-6:rc2=10:pci3=7-7-7:rc3=10:pci4=8-8-8:rc4=10
```

```
chg-sccp-serv:serv=mnp:state=offline
```

### Option 2

With this option default GTT translations are provisioned for MNP service. Then the chg-sccp-serv command is used to provision GTT=YES. All MNP messages will fall through to GTT. An example command follows:

```
chg-sccp-serv:serv=mnp:gtt=yes (it is yes by default)
```

Once the MNP re-routing data is provisioned, MNP service can be changed to OFFLINE . At this point all MNP traffic will be re-routed. The user can take necessary steps to correct the MNP service on the node. Until all the cards or enough cards are in active state with valid MNP subscriber database, MNP service should not be changed to ONLINE .

[Table 7: MNP SCCP Service Re-Route Capability Summary](#) shows the actions taken when the MNP service is offline, a message arrives at the affected node requiring MNP service, and the Service Module cards are available.

**Table 7: MNP SCCP Service Re-Route Capability Summary**

Result of service selector	DPC	Alternate point code defined and available	GTT to be performed as fall through	Message Handling	Network Management
MNP	MNP Capability PC	Yes	N/A	Re-Route to alternate point code based on relative cost	TFP concerning CPC
MNP	MNP Capability PC	No	Yes	Fall through to GTT and perform GTT	TFP concerning CPC
MNP	MNP Capability PC	No	No	Generate UDTS (return cause = network failure)	TFP concerning CPC
MNP	MNP Capability PC	Not Defined	Yes	Fall through to GTT and perform GTT	TFP concerning CPC
MNP	MNP Capability PC	Not Defined	No	Generate UDTS (return cause = no xlation for this addr)	TFP concerning CPC
Not MNP	MNP Capability PC	N/A	N/A	Perform appropriate Service/GTT	None
MNP	True or Secondary PC or non-MNP CPC	Yes	N/A	Re-Route to alternate point code based on relative cost	None

Result of service selector	DPC	Alternate point code defined and available	GTT to be performed as fall through	Message Handling	Network Management
MNP	True or Secondary PC or non-MNP CPC	No	No	Generate UDTS (return cause = network failure)	None
MNP	True or Secondary PC or non-MNP CPC	No	Yes	Fall through to GTT and perform GTT	None
MNP	True or Secondary PC or non-MNP CPC	Not Defined	Yes	Fall through to GTT and perform GTT	None
MNP	True or Secondary PC or non-MNP CPC	Not Defined	No	Generate UDTS (return cause = no xlation for this addr)	None
Not MNP	True or Secondary PC or non-MNP CPC	N/A	N/A	Perform appropriate Service/GTT	None
*Alternate point codes are defined and unavailable (prohibited or congested).					

## LOCREQ Query Response

The LOCREQ Query Response feature allows EAGLE 5 ISS to respond to LOCREQ query messages with a LOCREQ response message containing routing information for both ported and non-ported subscribers. Service Portability (S-Port) processing is used to control whether Generic Routing Number (GRN) or default Routing Number (RN) digits are used for the routing information in the LOCREQ response message.

The LOCREQ Query Response feature is applied to LOCREQ query messages received by EAGLE 5 ISS for local subsystem processing; however, EAGLE 5 ISS does not provide true subsystem support for these queries. Any LOCREQ query message to a True, Secondary, or Capability Point Code of the EAGLE 5 ISS is considered a potential candidate for LOCREQ Query Response feature. The query message is selected for LOCREQ Query Response processing if all of these conditions are met:

- The MTP DPC is a True, Secondary, or Capability Point Code of EAGLE 5 ISS.
- The message is a UDT or non-segmented XUDT message.
- The SCCP Called Party Address RI = SSN.
- The SCCP Called Party Address GTI is 0, 2, or 4. (GTI=4 is supported for only ITU SCCP messages.)
- The SCCP Calling Party Address RI = SSN.
- The TCAP variant is ANSI.

- The TCAP Operation Code is LocReq.

If all conditions are met and the MNP service state is `online`, then the LOCREQ query message is delivered to the MNP service handler for LOCREQ Query Response processing. If any of the conditions is not true, the LOCREQ query message is processed without LOCREQ Query Response processing.

If all conditions are met but the MNP service state is `offline`, then these actions occur:

- A UIM is issued.
- A TFP concerning the CPC is returned if the DPC in the original message was an MNP CPC.
- (X)UDTS:Subsystem Unavailable is returned, if Return on Error is set.
- The message is discarded.

### LOCREQ Query Response Processing

For LOCREQ Query Response processing to occur, the LOCREQ Query Response feature must be enabled and turned on and the IS41OPTS option LOCREQRSPND must be set to `on`. The LOCREQ Query Response feature processes only ANSI TCAP Query with Permission messages with an Operation Code of LocReq.

LOCREQ Query Response processing functions include:

- The DN is retrieved from the TCAP portion.
- The NAI is determined based on the MTPLOCREQNAI value provisioned in the IS41OPTS table.
- A-Port or IGM number conditioning (for example, HomeRN Deletion and IEC/NEC Deletion) is applied to the DN.
- MNP Circular Route Prevention is not applied to LOCREQ query messages processed by the LOCREQ Query Response feature.
- Every LOCREQ query message processed by the LOCREQ Query Response feature is acknowledged with a response message.

*Figure 1: LOCREQ Query Reponse RN Determination* shows the logic to determine the RN digits used in the LOCREQ query response.

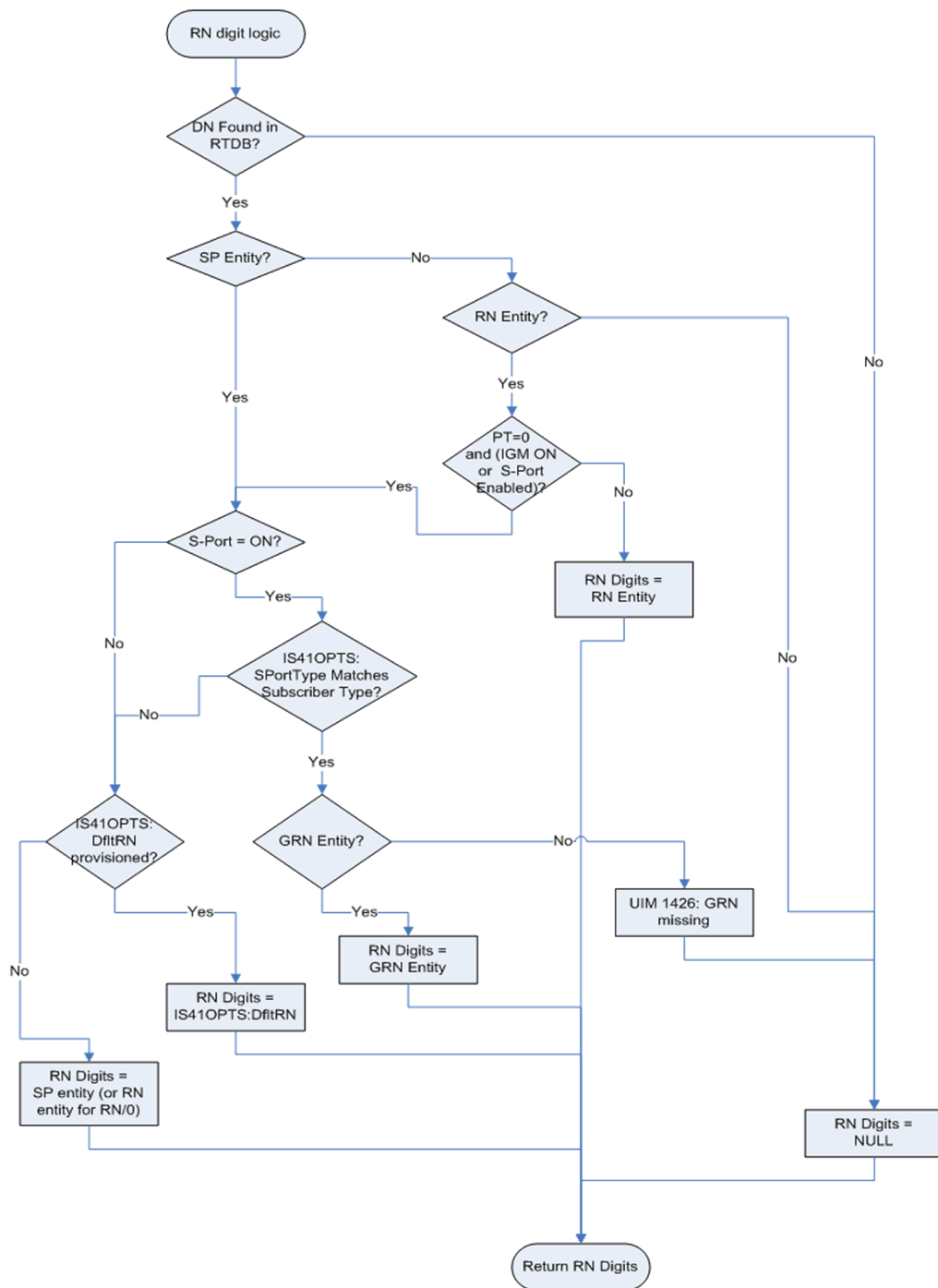


Figure 1: LOCREQ Query Reponse RN Determination

**LOCREQ Query Response Errors**

The LOCREQ Query Response feature responds to LOCREQ queries unless one of these errors occurs.

**Decode Errors**



*Error result* - (X)UDTS:Unqualified is generated; UIM is issued; MSU is discarded.

- The TCAP message is incorrectly formatted (invalid parameter tag or length).
- Called Party Number or Dialed Digits parameter does not exist.
- Digits parameter is less than 4 bytes.
- Number of digits is greater than 21.
- Encoding scheme is not BCD.
- Numbering Plan is not Telephony or ISDN.

#### **Number Conditioning Errors**

*Error result* - (X)UDTS:Unqualified is generated; UIM is issued; MSU is discarded.

- Default country code (DEFCC) parameter is required, but is not provisioned.
- Default Network Destination Code (DEFNDC) parameter is required, but is not provisioned.
- International (conditioned) digits are less than 5 or greater than 15.

#### **Encode Errors**

*Error result* - No response message is generated; UIM is issued; MSU is discarded.

- CgPA PC/OPC is not in the route table. CgPA PC is used if present in message, otherwise OPC is used.
- CgPA PC/OPC is an Alias. No conversion is allowed.

#### **LOCREQ Query Response Maintenance and Measurements**

The LOCREQ Query Response feature increments counters against MNP service in the `rept-stat-sccp` output.

- *Failure* counter is incremented if a Return Result cannot be generated because of decode errors, number conditioning errors or encode errors.
- *Failure* counter is incremented if a message is received and MNP service state is `offline`.
- *Warning* counter is incremented if GRN was required but was missing, and the Return Result was sent.
- *Success* counter is incremented if a Return Result is generated, except if the Warning counter was incremented for missing GRN.

LOCREQ Query Response feature increments these Measurement registers, also used by A-Port and IGM features, if a LOCREQ query response message generates successfully:

- IS41LRMRCV
- IS41LRRTRN
- APLRACK (per SSP)

LOCREQ Query Response feature increments these Measurement registers, also used by A-Port and IGM features, if a LOCREQ query response message fails to be generated:

- IS41LRMRCV
- IS41LRERR

### Service Portability for LOCREQ Query Response

Service Portability (S-Port) processing supports LOCREQ Query Response by controlling whether Generic Routing Number (GRN) or default Routing Number (RN) digits are used for the RN in the LOCREQ response message. Parameter SPORTTYPE (Service Portability Type) is provisioned in IS41OPTS table to specify the application of Service Portability that is to be applied to the associated feature. Parameter DFLTRN (Default Routing Number) is provisioned in IS41OPTS table to provide the RN digits if Service Portability is not turned on or the SPORTTYPE does not match the subscriber type.

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

When Service Portability is applied, the LOCREQ response message is prefixed with the Generic Routing Number associated with the DN, instead of the Network Entity Type (RN/SP) that is used by number portability. The GRN digits can indicate the protocol (IS41 or GSM), calling area, and Operator network as defined by individual operators.

*Table 8: Service Portability vs Number Portability by Destination Subscriber Type* shows whether Service Portability or Number Portability is applied when Service Portability is turned on and RTDB lookup is successful based on the value of the IS41OPTS parameters SPORTTYPE and DFLTRN.

**Table 8: Service Portability vs Number Portability by Destination Subscriber Type**

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

## MTP Routed SCCP Traffic

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

### MTP Msgs for SCCP Apps

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

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

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

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

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

If the message has ANSI TCAP, then:

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

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

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

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

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

### **MTP Routed GWS Stop Action**

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

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

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

- A-Port
- G-Flex
- Info Analyzed Relay ASD
- Info Analyzed Relay Base
- Info Analyzed Relay GRN
- Info Analyzed Relay NP
- IS41 GSM Migration (IGM)
- ITUN-ANSI SMS Conversion
- MNP Circular Route Prevention
- MO-Based IS41SMS NP
- MO SMS ASD
- MO SMS B-Party Routing
- MO SMS GRN
- MO SMS IS41 to GSM Migration
- MTP MAP Screening
- MT-Based IS41 SMS NP

Refer to *Database Administration Manual – Gateway Screening* for additional information and provisioning procedures for the MTP Routed GWS Stop Action feature.

### SMSREQ Handling for Migrated or Ported Subscribers

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

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

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

**Table 9: Subscriber Portability Type**

Network Entity Type (NE)	Portability Type (PT)	Subscriber Type
RN	0	Own-network subscriber, if IGM or Service Portability is on Otherwise, Other Licensed Operator (OLO) subscriber
RN	any value other than 0	OLO subscriber
SP	any	Own-network subscriber
No entity, or any entity other than RN or SP	0, 1, 2, 36, or none (255)	OLO subscriber
No entity, or any entity other than RN or SP	any value other than 0, 1, 2, 36, or none (255)	Own-network subscriber

## IGM SRI-SM Relay to Default IS41 SMSC

The IGM SRI-SM Relay to Default IS41 SMSC enhancement supports relaying of SRI-SM messages to Default IS41 SMSC for Own Network subscribers (NE=RN, PT=0). The configurable option GSMSMSOPTS:IGMSMSRELAY specifies whether the IGM responds with a Return Error message to the originator (option value = NO) or relays the SRI-SM message to the Default IS41 SMSC Own Network IS41 subscribers (option value = YES). The SRI-SM message is relayed to the Default IS41 SMSC based on GTT translation in the GTTSET defined in the GSMSMSOPTS:IS41SMSCGTTSN option. The Default IS41 SMSC address is a 15-digit hexadecimal character string specified in the GSMSMSOPTS:DEFIS41SMSC option.

Because the SRI-SM message is always GT-routed to the EAGLE 5 ISS, the MTP OPC of the message is always replaced by the True Point Code of the EAGLE 5 ISS.

**Table 10: Changes in SRI-SM Relayed to Default IS41 SMSC**

	RI=GT	RI=DPCSSN
MTP DPC	Translated PC	Translated PC
CdPA	Change only when PC conversion is required	Translated PC if present in incoming message
CdPA SSN	No change	Translated SSN
CdPA RI	GT	SSN
CdPA Digits	No change	No change
CgPA PC	Change only when PC conversion is required	Change only when PC conversion is required

## General Numbering Requirements

Incoming called party numbers, from the SCCP portion, destined for IGM processing are conditioned to fit the GDB requirements where possible. The following factors are used to condition the SCCP numbers.

- Based on provisioning: If the GTT selectors available in the incoming message match an entry in the IGM selector table, then the service numbering plan from the selector table entry uses that number's numbering plan. Further conditioning is applied based on this new numbering plan.
- Based on configurable options: If the GTT selectors available in the incoming message match an entry in the IGM selector table, then the service nature of address from the selector table entry uses that number's nature of address. Further conditioning is applied based on this new nature of address.
- If the nature of address is Subscriber, the default CC + default NC (network code for E.164) are prepended to the number. The default codes to be used by the EAGLE 5 ISS must be previously

provisioned by the EAGLE 5 ISS operator. If not, a UIM is issued, and the message falls through to GTT.

Numbers with fewer than five digits after the above conditioning are not used for IGM. In this case, a UIM is issued, and the message falls through to GTT.

Numbers with more than fifteen digits after the above conditioning are not used for IGM. In this case, a UIM is issued, and the message falls through to GTT.

## Hardware Requirements

EPAP-related features that perform an RTDB lookup require Service Module cards (DSM cards, E5-SM4G cards, or E5-SM8G-B cards) running the VSCCP application. The EAGLE 5 ISS can be equipped with up to 32 (31+1) Service Module cards.

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

## MPS/EPAP Platform

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

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

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

In this manual, Service Module card refers to a DSM card, an E5-SM4G card, or an E5-SM8G-B card unless a specific card is required. For more information about the supported cards, refer to *Hardware Reference*. DSM cards are not supported with Oracle Communications EAGLE Application B Card (E5-APP-B) based EPAP systems.

# Chapter 3

## Commands

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### Topics:

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This chapter provides brief descriptions of the EAGLE 5 ISS commands that are used for the configuration, control, maintenance, and measurements of the IS41 GSM Migration (IGM) feature.



## Introduction

This chapter describes the EAGLE 5 ISS commands used to administer the IGM feature. The command descriptions include parameters that are used with the IGM feature. Refer to *Commands Manual* for complete command descriptions including parameter names, valid parameter values, examples, and dependencies.

## EAGLE 5 ISS GSM System Options Commands

The GSM system options (`chg/rtrv-gsmopts`) commands change and display GSM system options in the EAGLE 5 ISS database.

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

- **chg-gsmopts: Change GSM System Options Command** – The `chg-gsmopts` command changes GSM system options in the GSMOPTS table. The default or currently provisioned parameter value is overwritten when a parameter is specified.

**Table 11: chg-gsmopts Parameters**

Parameter	Range	Description
crptt	0-255, none	Circular Route Prevention Translation Type  The MNP Circular Route Prevention feature must be turned on before this parameter can be provisioned to any value other than none. The MNP Circular Route Prevention feature cannot be turned off if this parameter is provisioned to any value other than none. The default value is none.
defmapvr	1-3	Default MAP version
defmcc	1-3 digits, none	E212 default mobile country code
defmnc	1-4 digits, none	E212 default mobile network code
gsm2is41	1-15 digits, none	GSM to IS-41 migration prefix
is412gsm	1-15 digits, none	IS-41 to GSM migration prefix
mccmnc	4-7 digits, none	E212 mobile country code and mobile network code
migrpfx	single, multiple	Migration prefix

Parameter	Range	Description
msisdntrunc	1 digit (0-5)	MS ISDN Truncation digits
msrndig	rn, rndn, ccrndn, rnccdn, rnasd, asdrn, rnasddn, asdrndn, ccrnasddn, ccasdrndn, rnasdecdn, asdrnccdn, rngrn, grnrn, rngrndn, grnrndn, ccrngrndn, ccgrnrndn, rngnccdn, grnrccdn	RN used "as is" or with MSISDN
msrnnai	1-7	NAIV for the MSRN
msrnp	0-15	Numbering plan for the MSRN
multcc	1 to 3 digits (0-9, a-f, A-F)	Multiple Country Code
nmultcc	1 to 3 digits (0-9, a-f, A-F), none	New Multiple Country Code
off	encdnpsdnotfound, encdnpsptnone, encodecug, encodenps, srismgttrtg	<p>This parameter turns off specified options. Up to 8 comma-separated unique options can be specified.</p> <ul style="list-style-type: none"> <li>encdnpsdnotfound - NPSI for DN not found option This option specifies whether the NPSI is included in SRI Ack messages when the DN is not found. The default setting is <code>off</code>.</li> <li>encdnpsptnone - NPSI for PT = none This option specifies whether the NPSI is included in SRI Ack messages when the Portability Type = none. The default setting is <code>off</code>.</li> <li>encodecug - Closed User Group (CUG) option This option specifies whether the Closed User Group (CUG) Checkinfo from the SRI message is included in the SRI ack message. The default setting is <code>off</code>.</li> <li>encodenps - Number Portability Status Indicator (NPSI) option This option specifies whether the Number Portability Status Indicator (NPSI) is omitted from all SRI Ack messages. The default setting is <code>on</code>.</li> <li>srismgttrtg - SRI_SM Routing option</li> </ul>

Parameter	Range	Description
		This option specifies whether the SRI_SM routing feature is on. The default setting is <code>off</code> .
<code>on</code>	<code>encdnpsdnnotfound, encdnpsptnone, encodecug, encodenps, srismgttrtg</code>	This parameter turns on specified options. Up to 8 comma-separated unique options can be specified. Refer to <code>off</code> parameter for option descriptions.
<code>serverpfx</code>	1-4 digits, none	Server SRI prefix
<code>srfaddr</code>	1-15 digits	Entity address of MNP_SRF node
<code>srfnai</code>	0-127	NAIV of the MNP_SRF
<code>srfnp</code>	0-15	Numbering plan value of the MNP_SRF Network Code
<code>sridn</code>	<code>tcap, sccp</code>	Send Routing Information Dialed Number location
<code>sridnnotfound</code>	<code>ggt, srinack</code>	When G-Port encounters an RTDB query result that indicates that the given DN is not known, SRIDNNOTFOUND parameter value determines further processing.

- **rtrv-gsmopts: Retrieve GSM System Options Command** – The `rtrv-gsmopts` command displays the GSM option values that are provisioned in the GSMOPTS table.

## EAGLE 5 ISS GSM SMS Options Commands

The GSM SMS options (`chg/rtrv-gsmsmsopts`) commands change and display specific SMS and MMS options in the EAGLE 5 ISS database. The `chg-gsmsmsopts` command parameters associated with IS41 GSM Migration feature are shown in [Table 12: chg-gsmsmsopts Parameters](#).

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

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

Table 12: chg-gsmsmsopts Parameters

Parameter	Range	Description
defis41smc	1-15 digits, none	Default IS41 short message service center
igmsmsrelay	yes, no	IGM-based SMS relay
is41smcgttsn	ayyyyyyyy	IS41 SMSC GTT Set name

- **rtrv-gsmsmsopts: Retrieve GSM SMS Options Command** - The `rtrv-gsmsmsopts` command displays all GSM SMS and MMS options from the database.

## EAGLE 5 ISS IS41 Options Commands

The IS41 options (`chg/rtrv-is41opts`) commands are used to change and display the values of one or more of the system-level processing option values maintained in the IS41OPTS table. All values are assigned initially to system defaults at STP installation. The values can be updated using the `chg-is41opts` command.

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

- **chg-is41opts: Change IS41 Options** - The `chg-is41opts` command changes IS41-specific options in the database. This command updates the IS41OPTS table. The default or currently provisioned parameter values are overwritten when a parameter is specified.

Table 13: chg-is41opts Parameters - Class = DATABASE

Parameter	Range	Description
dfltrn	1-15 hexadecimal digits (0-9, a-f, A-F), none	Default Routing Number. This parameter specifies the routing digits when Service Portability is not applicable. This parameter can be modified only when the LOCREQ Query Response feature is enabled. Default value is none.
esnmfg	0-255	TCAP LOCREQ ESN Manufacturer code. This parameter specifies the value to be encoded in the TCAP LOCREQ ESN parameter in the manufacturer code section.
esnsn	0-16777215	TCAP LOCREQ ESN Serial Number. This parameter specifies the value to be encoded in the TCAP LOCREQ ESN parameter in the serial number section.
iec	digit string 1-5 digits, none	International Escape Code

Parameter	Range	Description
locreqdn	tcap, sccp	LOCREQ DN. This parameter specifies whether to obtain the Called Party, used for database lookup, from the SCCP layer or the TCAP layer of a received LOCREQ message.
locreqrmhrn	yes, no	LOCREQ Remove HomeRN. This parameter specifies whether to remove the HomeRN from the TCAP Outgoing Called party for a relayed LOCREQ message. This parameter cannot be specified in the same command entry as the <code>on</code> and <code>off</code> parameters.
mscmktid	0-65535	LOCREQ MSCID Market ID. This parameter specifies the value to be encoded in LOCREQ MSCID parameter for Market ID.
mscswitch	0-255	LOCREQ MSCID Market ID Switch. This parameter specifies the value to be encoded in LOCREQ MSCID parameter in the market id switch section.
mtplocreqnai	ccrndn, frmmsg, intl, natl, rridn, rrndn, rnsdn, sub, locreqlen	Message Translation Part LOCREQ nature of address indicator. Used to define how Called Party obtained from the TCAP layer of a received MTP-routed LOCREQ message is interpreted.
nec	digit string 1-5 digits, none	National Escape Code
off	locreqrmhrn, locreqrspnd, smsreqbypass	<p>This parameter turns off the specified options. Up to 8 comma-separated unique options can be specified.</p> <ul style="list-style-type: none"> <li>locreqrmhrn - LOCREQ Remove HomeRN. This option specifies whether to remove the HomeRN from the TCAP Outgoing Called party for a relayed LOCREQ message. Option default is <code>off</code>.</li> <li>locreqrspnd - LOCREQ Query Response. This option specifies whether to always respond to a LOCREQ query. This option can be changed only if the LOCREQ Query Response feature is turned on. Option default is <code>off</code>.</li> <li>smsreqbypass - SMSREQ Bypass. This option specifies whether a received SMSREQ message that passes the MNP Service Selector (<code>serv=mnp</code> parameter of <code>chg-sccp-serv</code>) will undergo A-Port message processing. Option default is <code>off</code>.</li> </ul> <p>This parameter cannot be specified in the same command entry as the <code>locreqrmhrn</code> and <code>smsreqbypass</code> parameters.</p>

Parameter	Range	Description
on	locreqrmhrn, locreqrspnd, smsreqbypass	This parameter turns on the specified options. Up to 8 comma-separated unique options can be specified. See <code>off</code> parameter for option descriptions. This parameter cannot be specified in the same command entry as the <code>locreqrmhrn</code> and <code>smsreqbypass</code> parameters.
rspcdpari	frmsg, gt, ssn	Response Called Party Routing Indicator. This parameter specifies the value of the Routing Indicator bit to encode the SCCP CdPA GTA of a returned LOCREQ message.
rspcgpanai	0-127, none	Response Calling Party Nature of Address Indicator (NAI). This parameter specifies a new NAI value to override the NAI value specified in the SCCP CdPA of a received LOCREQ/SMSREQ if the message is to be relayed after database lookup.
rspcgpanp	0-15, none	Response Calling Party Numbering Plan. This parameter specifies a new Numbering Plan value to override the Numbering Plan value specified in the SCCP CdPA of a received LOCREQ/SMSREQ if the message is to be relayed after database lookup.
rspcgpapcp	frmsg, on, off	Response Calling Party Point Code Present. This parameter specifies the value of the Point Code Present bit to encode the SCCP CgPA GTA of a returned LOCREQ message
rspcgpari	frmsg, gt, ssn	Response Calling Party Routing Indicator. This parameter specifies the value of the Routing Indicator bit to encode the SCCP CgPA GTA of a returned locreq message.
rspcgpatt	0-255, none	Response Calling Party Translation Type (TT). This parameter specifies a new TT value to override the TT value specified in the SCCP CdPA of a received LOCREQ/SMSREQ if the message is to be relayed after database lookup.
rspdig	ccrndn, hrnrndn, rn, rndn	Routing Number. This parameter specifies the digit encoding format of the TCAP Outgoing Called Party parameter for a LOCREQ response message on a per EAGLE 5 ISS node basis.
rspdigtype	0-255	Response Digit Type. This parameter specifies the value that will encode the DigitType field in the TCAP Outgoing Called Party parameter of a LOCREQ response message.
rspmin	homern, nothomern, tendelhomern, tenhomern, tenzero	Response LOCREQ MIN Parameter Encoding. This parameter specifies how the digits of the LOCREQ MIN parameter will be encoded.

Parameter	Range	Description
rspnon	0-255, none	MSRN Nature of Number. This parameter specifies the Nature of Number value of the TCAP Outgoing Called Party parameter.
rspnp	0-15, none	MSRN Numbering Plan. This parameter specifies the Numbering Plan values of the TCAP Outgoing Called Party parameter.
rspparm	ddigit, rtdigit, tlist	Response Parameter. This parameter specifies which TCAP LOCREQ parameter (TCAP Outgoing Called Party) will encode the RN and/or DN information.
smsreqbypass	yes, no	SMSREQ Bypass. This parameter specifies whether a received SMSREQ message that passes the MNP Service Selector ( <i>serv=mnp</i> parameter of <i>chg-sccp-serv</i> ) will undergo IS41 GSM Migration (IGM) message processing. This parameter cannot be specified in the same command entry as the <i>on</i> and <i>off</i> parameters.  The MT-Based IS41 SMS NP feature does not consider the value of this parameter. If <i>smsreqbypass</i> has a value of <i>yes</i> , the IGM processing will not be applied but the message will be considered for MT-Based IS41 SMS NP processing.
sporttype	none, gsm, is41, all	Service Portability Type. This parameter specifies the application of Service Portability that is applied to the associated feature. This parameter can be modified only when the Service Portability and LOCREQ Query Response features are enabled. Default value is none.
tcapsnai	ccrndn, frmsg, intl, natl, rnidn, rnndn, rnsdn, sub	This parameter specifies how the Called Party from the TCAP layer of a received LOCREQ message is interpreted.

- **rtrv-is41opts: Retrieve IS41 Options** – The *rtrv-is41opts* command displays the IS41 option values that are provisioned in the IS41OPTS table.

## EAGLE 5 ISS Service Selector Commands

The service selector (*ent/chg/dlt/rtrv-srvsel*) commands are used to provision, delete, change, and display the applicable service selectors required to change a service entry for SCCP services. .

Refer to the *Commands Manual* for complete descriptions of the ommands, including parameters and valid values, rules for using the commans correctly, and output examples.

- **ent-srvsel: Enter Service Selectors** – The parameters of the `ent-srvsel` command can be used to specify the applicable service selectors that indicate that IGM feature processing is required. The IGM feature must be enabled before entering this command.

Table 14: `ent-srvsel` Parameters

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	SCCP 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, rnndn, rnsdn, ccrndn	Service Nature of Address Indicator
snp	Optional	1e164, e212, e214	Service Numbering Plan

- **chg-srvsel: Change Service Selector** – The `chg-srvsel` command can be used to specify the applicable selectors required to change an existing IGM selector entry.

Table 15: `chg-srvsel` Parameters

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



Parameter	Optional/ Mandatory	Range	Description
np	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
npv	Optional	0-15	Numbering Plan Value
nserv	Mandatory	eir, gflex, gport, inpq, inpmr, smsmr, idpr, idps, mnp, vflex, atinp	New SCCP 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** – The `dlt-srvsel` command deletes a service selector entry..

Table 16: dlt-srvsel Parameters

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

- **rtrv-srvsel: Retrieve Service Selector** – The `rtrv-srvsel` command displays a list of administered service selector combinations. Output is sorted first by service, then by global title domain (ANSI first, followed by ITU), GTI, translation type, numbering plan, and by the nature of address indicator. The output can be filtered by specifying any optional parameter.

Table 17: rtrv-srvsel Parameters

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, inpmr, smsmr, idpr, idps, mnp, vflex, atinp	SCCP service
snai	Optional	sub, natl, intl, rmidn, rmdn, rnsdn, ccrndn	Service Nature of Address Indicator
snp	Optional	e164, e212, e214	Service Numbering Plan
ssn	Mandatory	0-255, *	Subsystem number
tt	Optional	0-255	Translation Type

## EAGLE 5 ISS Feature Control Commands

The `ent/chg/rtrv-ctrl-feat` commands are used to enable, turn on, and display the feature status of the IS41 GSM Migration (IGM) feature. A Feature Access Key is used to enable the IGM feature. The feature must be purchased to receive a Feature Access Key for the feature.T

No temporary key is associated with the IGM feature. After the feature is turned on, it cannot be turned off.

Additional verifications are performed to ensure the correct hardware is present in the system. T

The feature part number 893017301 is used to enable the IGM feature on the EAGLE 5 ISS.

Refer to the *Commands Manual* for a complete description of these commands.

- **enable-ctrl-feat: Enable Control Feature Command**

The `enable-ctrl-feat` command is used for the permanent enabling of the IGM feature.

```
enable-ctrl-feat:partnum=893017301:fak=<Feature Access Key>
```

- **chg-ctrl-feat: Change Control Feature Command**

The `chg-ctrl-feat` command is used to turn on the IGM feature. The IGM feature must be enabled before it can be turned on.

```
chg-ctrl-feat:partnum=893017301:status=on
```

- **rtrv-ctrl-feat: Retrieve Control Feature Command**

The `rtrv-ctrl-feat` command is used display the status of the feature.

## EAGLE 5 ISS SCCP Service Commands

The `chg/dlt/rtrv-sccp-serv` commands allow for services to be taken online and offline, and for the service processing loads to be shifted to other designated nodes. These commands also support the assignment of PCs to PC groups used for MNP re-route assignment.

The `chg-sccp-serv` command is used to provision entries in the SCCP-SERV table. The provisioned entries are shown in the `rtrv-sccp-serv` command output. The maximum number of entries that the MRN table can contain is reduced by the number of entries shown in the `rtrv-sccp-serv` command output. For more information on provisioning MRN tables, refer to the *Database Administration Manual - Global Title Translations*.

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

- **chg-sccp-serv: Change SCCP Service** – The `chg-sccp-serv` command is used to add point codes to an existing service group, or to change the Relative Cost (RC) of existing point codes in a group. SCCP Service groups are organized by service (G-Flex, G-Port, MNP) and point code network type (ANSI, ITU-I, ITU-I Spare, ITU-N, ITU-N Spare, or ITU-N24). Up to 7 PCs may be in a network type grouping for service re-route load sharing. This command allows for additions and modifications of up to 4 PCs at once. The point code parameters support the Spare Point Code subtype prefix *s-* for ITU-I and ITU-N point codes.

**Table 18: chg-sccp-serv Parameters**

Parameter	Optional/ Mandatory	Range	Description
serv	Mandatory	gport, gflex, mnp	Service
state	Optional	offline, online	Status
gtt	Optional	no, yes	Global Title Translation
pc1, pca1, pci1, pcn1, pcn241	Optional	Refer to <i>Commands Manual</i>	Post GTT-translated PC
rc1	Optional	00-99	Relative Cost
pc2, pca2, pci2, pcn2, pcn242	Optional	Refer to <i>Commands Manual</i>	Post GTT-translated PC
rc2	Optional	00-99	Relative Cost
pc3, pca3, pci3, pcn3, pcn243	Optional	Refer to <i>Commands Manual</i>	Post GTT-translated PC
rc3	Optional	00-99	Relative Cost

Parameter	Optional/ Mandatory	Range	Description
pc4, pca4, pci4, pcn4, pcn244	Optional	Refer to <i>Commands Manual</i>	Post GTT-translated PC
rc4	Optional	00-99	Relative Cost

- **dlt-sccp-serv: Delete SCCP Service** – The `dlt-sccp-serv` command is used remove entries from the SCCP-SERV table. A single command may remove either a PC from a group, or remove the entire group.

Table 19: dlt-sccp-serv Parameters

Parameter	Optional/ Mandatory	Range	Description
serv	Mandatory	gport, gflex, mnp	Service
pc1, pca1, pci1, pcn1, pcn241	Optional	Refer to <i>Commands Manual</i>	Post GTT-translated PC
pc2, pca2, pci2, pcn2, pcn242	Optional	Refer to <i>Commands Manual</i>	Post GTT-translated PC
pc3, pca3, pci3, pcn3, pcn243	Optional	Refer to <i>Commands Manual</i>	Post GTT-translated PC
pc4, pca4, pci4, pcn4, pcn244	Optional	Refer to <i>Commands Manual</i>	Post GTT-translated PC
all	Optional	No, Yes	Yes will delete the entire group

- **rtrv-sccp-serv: Retrieve SCCP Service** – The `rtrv-sccp-serv` command is used to display the SCCP Service application relationship information maintained by the EAGLE 5 ISS. Point codes are grouped by service.

## Feature Configuration

---

### Topics:

- *Introduction.....54*
- *EPAP Entity Provisioning.....55*
- *Prerequisites.....55*
- *EAGLE 5 ISS HLR Destinations Configuration.....56*
- *IGM Feature Activation Procedure.....62*
- *LOCREQ Query Response Activation Procedure.....66*
- *Service Portability Activation Procedure.....68*
- *MTP Routed Messages for SCCP Applications Activation Procedure.....70*

This chapter describes the prerequisites, considerations, and steps to activate the IS41 GSM Migration (IGM) feature. This chapter also includes feature activation procedures for these features:

- 1100 TPS/DSM for ITU NP
- E5-SM4G Throughput Capacity
- MTP Msgs for SCCP Apps

## Introduction

This chapter identifies prerequisites for the IS41 GSM Migration (IGM) feature activation procedure and provides the feature activation procedures for these features:

- IS41 GSM Migration (IGM)
- 1100 TPS/DSM for ITU NP
- E5-SM4G Throughput Capacity
- Service Portability
- LOCREQ Query Response
- MTP Msgs for SCCP Apps

These feature activation procedures are performed at the EAGLE 5 ISS.

The IGM feature and other related features are optional and are purchased from Tekelec. Contact your Tekelec Sales or Account Representative to determine whether you have purchased a specific feature or for additional information. These features are related to the IGM feature:

- Global Title Translation (GTT)
- Enhanced Global Title Translation (EGTT)
- Variable-Length Global Title Translation (VGTT)
- Mobile Number Portability Circular Route Prevention (MNPCRCP)

**Note:** After a permanently-on feature has been turned on with the `enable-ctrl-feat` command, the feature cannot be turned off. Because this feature may affect other features or system databases, confirm that a feature license and technical support from Tekelec are available before turning on this feature. Contact your Tekelec Sales or Account Representative to verify whether the feature has been purchased.

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

### Summary of Feature Activation

This table summarizes the feature activation attributes for the features in this chapter.

**Table 20: Feature Activation Summary**

Feature Name	Part Number	Temporary FAK Available?	Permanently On?
IS41 GSM Migration (IGM)	893017301	No	Yes
MNP Circular Route Prevention (MNPCRCP)	893007001	Yes	No
1100 TPS/DSM for ITU NP	893018001	No	No

Feature Name	Part Number	Temporary FAK Available?	Permanently On?
E5-SM4G Throughput Capacity	893019101 893019102	No	Yes
Service Portability	893034301	No	No
LOCREQ Query Response	893038501	No	Yes
MTP Msgs for SCCP Apps	893017401	No	No

### Feature Activation Considerations

- 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 this feature may affect other features or system databases, confirm that a feature license and technical support from Tekelec are available before turning on this feature. Contact your Tekelec Sales or Account Representative to verify whether the feature has been purchased.
- Refer to *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information about the dimensioning rules and the Service Module database capacity requirements.

## EPAP Entity Provisioning

It is recommended that EPAP entity (SP or RN) administration not be done until after the point code and/or subsystem number has been entered into the EAGLE 5 ISS MAP table.

- EPAP-administered entity data can possibly become out-of-sync with the EAGLE 5 ISS MAP table when the creation of point codes and/or subsystem numbers in the MAP table is performed after EPAP database administration.
- If this mismatch is discovered in real-time operations, a UIM (such as `SCCP did not route - DPC not in MAP tbl` or `SCCP did not route - SS not in MAP tbl`) is sent to the EAGLE 5 ISS maintenance terminal.

## Prerequisites

The IGM feature activation assumes that Global Title Translation (GTT), Enhanced Global Title Translation (EGTT), or Variable-Length Global Title Translation (VGTT) is already provisioned. Refer to *Database Administration Manual - Global Title Translation* for provisioning procedures.

The IGM feature activation assumes that the EPAP software is already configured; refer to EPAP Software Configuration in *EPAP Administration Manual*.

The NT serial number (`ent-serial-num`) must be entered and locked before IGM can be enabled and turned on.

The IGM feature requires a Service Module card running the VSCCP application prior to turning on the IGM feature. The IGM feature cannot be turned on if any of the Service Module cards have less than 4 GB of memory installed.

The IGM feature activation assumes that the Service Module cards to be installed are identified.

- Note installed Service Module card locations, if any.
- Note available odd-even card slots for Service Module card installation.
- Determine Service Module card IP addresses and have them available during the activation procedure.

For in-service systems, schedule Service Module card replacement in maintenance window that allows the reboot of Service Module cards (`init-card:loc=<Service Module card location>`) one at a time.

For in-service systems that already have another EPAP-related feature enabled, perform only [IGM Feature Activation Procedure](#) to turn on the IGM feature. With another EPAP-related feature enabled, the Service Module cards already contain the Real Time Database (RTDB).

For new systems, Service Module cards may be rebooted all at one time using the `init-card:appl=vsccp` command. For new systems, GTT, EGTT, or VGTT features must be turned on prior to the reboot of all Service Module cards.

## EAGLE 5 ISS HLR Destinations Configuration

This procedure configures the EAGLE 5 ISS system for Home Location Register (HLR) destinations before activating the EPAP-related feature. This procedure assumes that the EAGLE 5 ISS is an existing system in which an EPAP-related feature is being activated. The route to the HLR database may already be configured. Perform this procedure to verify that all HLR destinations for the feature are provisioned and to configure changes, as needed.

Refer to *Commands Manual* for detailed descriptions of the commands used in this procedure.

### Procedure Overview

- Display current PCs, CPCs, DPCs, routes, and linksets using [Step 1](#) through [Step 6](#).
- Change current PCs, CPCs, DPCs, routes, linksets, and LIM cards using [Step 7](#) through [Step 25](#).

For detailed information about specific configuration activities in this procedure, refer to these topics in *Database Administration Manual - SS7*:

- Point Code Formats
- Adding a Point Code to the Self-Identification of the EAGLE 5 ISS
- Changing the Self-Identification of the EAGLE 5 ISS
- Adding a Destination Point Code
- Adding an SS7 Linkset
- Adding an SS7 Signaling Link
- Adding a Route Containing an SS7 DPC



1. Display the current self-identification characteristics (PC and CPC) of the system using the `rtrv-sid` command.

The self-identification characteristics of the system displayed by the `rtrv-sid` command include the point code (PC) assigned to the system, the CLLI code of the system, the capability point code of the STP (CPC), and the type of point codes supported by the system.

If the ITUDUPPC (ITU national duplicate point code) feature is on, the ITU national point code also contains a group code. The group code is a two-character field from *aa* to *zz* that is entered as the last subfield of an ITU national point code, *nnnnn-gc* (for example, 2112-aa).

2. Display the current destination point codes (DPC) in the Destination point code table using the `rtrv-dstn` command.
3. Display the current route and linkset configuration using the `rtrv-rte` command.
4. If the system point code (`pci/pcn`) or capability point code to be configured in this procedure is shown in [Step 1](#), [Step 2](#), or [Step 3](#), choose another point code to configure with this procedure. If configuring an ITU-N network, continue to [Step 5](#). If configuring a mated application but not configuring an ITU-N network, proceed to [Step 6](#). Otherwise, proceed to [Step 7](#).
5. Use the `rtrv-stpopts` command to display the PC or CPC format when configuring the system point code or capability point code of an ITU-N network.

The ITU-N point code format option `npcfmt i` determines the format of the ITU-N point code in the database and how it is displayed in all system outputs. The defined value is shown in the `NPCFMTI` field displayed in the output of the `rtrv-stpopts` command.

To change the format of the ITU-N point code, refer to "Point Code Formats" in *EAGLE 5 ISS Database Administration Manual - SS7*.

Continue to [Step 6](#) to display mated applications in the database. Otherwise, proceed to [Step 7](#).

6. Display the mated applications in the database using the `rtrv-map` command.
  - a) If the point code of the system is displayed in the `rtrv-map` command output, remove the system point code from the mated application table. Refer to procedure "Removing a Mated Application" in *EAGLE 5 ISS Database Administration Manual - Features*.
  - b) If the point code of the system or capability point code is a destination point code of a route, select a point code that is not in the destination point code table (refer to output in [Step 2](#)) and not the destination point code of a route (refer to output in [Step 3](#)).
7. Change the point code of the system and capability point code by network type using procedures "Adding a Point Code to the Self-Identification of the EAGLE 5 ISS" and "Changing the Self-Identification of the EAGLE 5 ISS" in *Database Administration Manual - SS7*.
8. Enter a destination point code for the HLR location in the Destination table by network type using the `ent-dstn` command.

Command examples:

```
ent-dstn:dpci=2-100-2
```

```
ent-dstn:dpcn=21112
```

where:

**:dpc/dpca/dpci/dpcn**

Destination point code to add to the database

9. Verify the changes using the `rtrv-dstn` command and specifying the DPC entered in [Step 8](#).

Command examples:

```
rtrv-dstn:dpci=2-100-2
```

```
rtrv-dstn:dpcn=21112
```

Example of possible output for the **DPCI** command example:

```
tekelecstp51 09-08-24 21:16:37 GMT EAGLE 41.0.0
DPCI          CLLI          BEI  ELEI  ALIASA          ALIASN/N24  DMN
2-100-2      -----          no   ---  -----          -----     SS7
```

Example of possible output for the **DPCN** command example:

```
tekelecstp51 09-08-24 21:16:37 GMT EAGLE 41.0.0
DPCN          CLLI          BEI  ELEI  ALIASA          ALIASI  DMN
21112        -----          no   ---  -----          -----  SS7
```

10. Enter a linkset with the `ent-ls` command and assign the linkset to the destination point code by network type.

Command examples:

```
ent-ls:apci=2-200-2:lsn=ls400001:lst=a
```

```
ent-ls:apcn=21122:lsn=ls500001:lst=a
```

where:

**:apc/apca/apci/apcn**

Adjacent point code - the DPC of the adjacent signaling node at the far end of the linkset

**:lsn**

Linkset name

**:lst**

Linkset type

11. Verify the changes using the `rtrv-ls` command and specifying the linkset name.

Command example:

```
rtrv-ls:lsn=ls400001
```

```
rtrv-ls:lsn=ls500001
```

Example of possible output for **lsn400001** command example:

```
tekelecstp51 09-08-24 21:16:37 GMT EAGLE 41.0.0
LSN          APCI  (SS7)  SCRN  SET  SET  BEI  LST  LNKS  ACT  MES  DIS  SLSCI  NIS
ls400001    2-200-2  scr1  1    2    no   a    0    on   off  off  no    on
CLLI        TFATCABMLQ  MTPRSE  ASL8
RLGHNCXA03W  1          no      no
LOC  PORT  SLC  TYPE  L2T  L1  PCR  PCR
SET  BPS  MODE  TSET  ECM  N1  N2
```

Example of possible output for `lsn500001` command example:

```
tekelecstp51 09-08-24 21:16:37 GMT EAGLE 41.0.0

LSN          APCN   (SS7)  SCRN   L3T SLT          GWS GWS GWS
ls500001     21122          scr3   1  2  no  a   0  on  off  off no   on
CLLI        TFATCABMLQ  MTPRSE ASL8
RLGHNCXA03W 1          no     no

LOC  PORT SLC TYPE      L2T      L1          PCR PCR
SET BPS  MODE TSET ECM    N1  N2
```

12. Add the LIM cards to the database using the `ent-card` command.

Command examples:

```
ent-card:appl=ccs7itu:loc=1105:type=lime1
```

```
ent-card:appl=ccs7itu:loc=1106:type=lime1
```

where:

**:appl**

Specifies that the application is CCS7ITU.

**:loc**

Specifies the slot number for the card.

**:type**

Specifies that the card is a LIME1 card.

13. Enter the E1 interface using the `ent-e1` command.

Command examples:

```
ent-t1:loc=1105:e1port=1
```

```
ent-t1:loc=1106:e1port=1
```

where:

**:loc**

Card location or slot as stenciled on the shelf

**:e1port**

E1 card port number

14. Verify the changes using the `rtrv-card` command with the card location specified.

Command examples:

```
rtrv-card:loc=1105
```

```
rtrv-card:loc=1106
```

Example of possible output for command example:

```
tekelecstp51 09-08-24 21:16:37 GMT EAGLE 41.0.0

CARD  TYPE      APPL      LSET NAME      LINK SLC LSET NAME      LINK SLC
```

1105	LIME1	CCS7ITU	1s400001	A	00	-----	B	--
1106	LIME1	CCS7ITU	1s500001	A	00	-----	B	--

15. Assign signaling links to the LIM cards using the `ent-slk` command.

Command example:

```
ent-slk:l2tset=1:link=a:loc=1105:lsn=1s400001:slc=0:e1port=1:ts=1
```

```
ent-slk:l2tset=1:link=a:loc=1106:lsn=1s500001:slc=0:e1port=1:ts=1
```

where:

**:l2tset**

Level 2 timer set. A signaling link can be assigned to any of the thirty timer sets.

**:link**

Signaling link assigned on the card specified in the `loc` parameter

**:loc**

Card location to which the signaling link is assigned

**:lsn**

Unique linkset name

**:slc**

Signaling link code. The `slc` must be unique within the linkset, and must be the same at both the system location and the distant node.

**e1port**

Port for E1 interface on the E1 card to which the signaling link and timeslot are being assigned

**ts**

E1 timeslot for the assigned signaling link

Signaling links are the only elements in the database supported directly by a hardware device. When a link is added to a linkset, the link remains in Out-of-Service-Maintenance-Disabled (OOS-MT-DSBLD) state until it is activated; see [Step 23](#).

16. Verify the changes using the `rtrv-slk` command, specifying the card location and ID of the signaling link entered in [Step 15](#).

Command examples:

```
rtrv-slk:loc=1105:link=a
```

```
rtrv-slk:loc=1106:link=a
```

17. Add a route for the new DPC by network type using the `ent-rte` command.

Command examples:

```
ent-rte:dpci=2-100-2:lsn=1s400001:rc=10
```

```
ent-rte:dpcn=21112:lsn=1s500001:rc=10
```

where:

**:dpc/dpca/dpci/dpcn**

Destination point code of the node to which the traffic is bound

**:lsn**

Linkset name associated with this route

**:rc**

Relative cost or priority of this route

18. Verify the changes using the `rtrv-rte` command and specifying the destination point code of the route.
19. Add a mated application by network type to the database using the `ent-map` command.

Command examples:

```
ent-map:grp=grp03:materc=99:mpci=3-200-1:mssn=50:pci=2-100-1:ssn=12:rc=20
```

```
ent-map:grp=grp07:materc=99:mpcn=11114:mssn=250:pcn=11112:ssn=12:rc=10
```

where:

**:grp**

Concerned point code broadcast list (CSPC) group name. This parameter specifies the name of a group of point codes that should be notified of the subsystem status. A different CSPC group can be assigned to each mated PC/SSN.

**:materc**

Mate relative cost

**:mpc/mpca/mpci/mpcn**

Mate remote point code.

**:mssn**

Mate subsystem number – the subsystem address of the backup point code that is to receive the message

**:pci/pcn**

ITU international/national point code

**:rc**

Relative cost

**:ssn**

Subsystem number – the subsystem address of the primary point code that is to receive the message

20. Verify the changes using the `rtrv-map` command.
21. Allow the LIM cards that were entered in [Step 12](#) using the `alw-card` command.

Command examples:

```
alw-card:loc=1105
```

```
alw-card:loc=1106
```

This message appears:

```
tekelecstp51 09-08-24 21:16:37 GMT EAGLE 41.0.0
Card has been allowed.
```

22. Verify In-Service-Normal (IS-NR) state of the cards using the `rept-stat-card` command.
23. Activate the signaling links entered in [Step 15](#) using the `act-slk` command.

Command examples:

```
act-slk:loc=1105:link=a
```

```
act-slk:loc=1106:link=a
```

The link changes state from Out-of-Service-Maintenance-Disabled (OOS-MT-DSBLD) to In-Service-Normal (IS-NR). The output confirms the activation.

```
tekelecstp51 09-08-24 21:16:37 GMT EAGLE 41.0.0
Activate Link message sent to card
```

24. Verify In-Service-Normal (IS-NR) state of the signaling link using the `rept-stat-slk` command.

Command examples:

```
rept-stat-slk:loc=1105
```

```
rept-stat-slk:loc=1106
```

25. Display the new LIM cards in the database using the `rtrv-card` command.

Example of a possible output:

```
tekelecstp51 09-08-24 21:16:37 GMT EAGLE 41.0.0
CARD   TYPE     APPL     LSET NAME     LINK SLC LSET NAME     LINK SLC
1105   LIME1    CCS7ITU  ls400001      A    00  -----      B    --
1106   LIME1    CCS7ITU  ls500001      A    00  -----      B    --
```

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

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

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

The HLR destinations are now configured and ready for activation of the EPAP-related feature.

## IGM Feature Activation Procedure

Use this procedure to enable, turn on, and configure the IS41 GSM Migration (IGM) feature.

Refer to the *Commands Manual* for complete descriptions of the commands that are used in this procedure, including parameters and valid values, rules for using the commands correctly, and output examples.

**CAUTION**

**Caution:** Before starting this procedure, contact the [My Oracle Support \(MOS\)](#) for assistance in performing the feature activation procedure. Do not proceed without consulting with Technical Services.

1. Enter the `enable-ctrl-feat` command to enable the IGM feature:  
`enable-ctrl-feat:partnum=893017301:fak=<Feature Access Key>`
2. Enter the `chg-ctrl-feat` command to turn on the IGM feature:  
`chg-ctrl-feat:partnum=893017301:status=on`
3. Enter the default country code and default network destination code to convert the nature of address indicator (NAI) of MSISDNs to the international format (`nai=intl`), by entering the `chg-stpopts` command.

For example:

```
chg-stpopts:defcc=1:defndc=38:dsmad=on:npcfnti=2-9-2-1
```

where:

**:defcc**

Default country code

**:defndc**

Default network destination code

**:dsmad**

Service Module card checksum audit running state (*on* or *off*)

**:npcfnti**

ITU National Point Code Format Identifier, which identifies how the ITU national point code is entered into the database and how it is displayed in all EAGLE 5 ISS outputs. The ITU national point code is a 14-bit integer.

4. Verify the new country code and network destination code, using the `rtrv-stpopts` command.
5. Change the GSM system options in the database, using the `chg-gsmopts` command.

For example:

```
chg-gsmopts:defmapvr=2:is412gsm=34:msrndig=ccrndn:srfaddr=23448:srfnai=7:srfnp=15
```

where:

**:defmapvr**

Default MAP version

**is412gsm**

IS41 to GSM migration prefix

**:msrndig**

Routing Number to be used as is or to be concatenated with the MSISDN

**:srfaddr**

Entity address of the MNP\_SRF node

**:srfnai**

Nature of Address Indicator value of the MNP\_SRF

**:srfnp**

Numbering Plan value of the MNP\_SRF

6. Verify the changes, using the `rtrv-gsmopts` command to display all GSM system option values from the database.
7. Change the IS41 system options in the database, using the `chg-is41opts` command.
8. Verify the changes using the `rtrv-is41opts` command to display all IS41 system option values from the database.
9. Add Routing Number prefixes for the operating network, using the `ent-homern` command. Add Home RNs that are prefixed to DNs for incoming INPMR messages. Up to 100 Routing Number prefixes for the operating network can be added to the HOMERN table.

For example:

```
ent-homern:rn=34
```

where:

**:rn**

Home routing number prefix. Parameter value is 1 to 15 hex digits (0-F).

10. Verify the changes using the `rtrv-homern` command to retrieve a list of Routing Number prefixes that belong to the operating network.
11. Display the list of administered service selector combinations, using the `rtrv-srvsel` command. Avoid lengthy output by using various parameter combinations to filter the list. The Service Selector table can have over 1,000 entries.
12. Enter the IGM service selectors by network type, if necessary, using the `ent-srvsel` command. This command assigns applicable service selectors required to specify the service entry for Service Module card services.

For example:

```
ent-srvsel:gtii=4:nai=intl:np=e164:serv=mnp:snai=intl:snp=e164:ssn=9:tt=1
```

where:

**:gtii**

Global title indicator, ITU international

**:nai**

Nature of address indicator

**:np**

Numbering plan

**:serv**

Service feature



<b>:snai</b>	International Service Nature of Address Indicator
<b>:snp</b>	Service numbering plan
<b>:ssn</b>	Subsystem number
<b>:tt</b>	Translation type

13. Verify the changes, using the `rtrv-srvsel` command to retrieve the list of administered service selector combinations.

Avoid lengthy output by using various parameter combinations to filter the list . The Service Selector table can have over 1,000 entries.

For example:

```
rtrv-srvsel:gtii=2
```

```
rtrv-srvsel:gtii=4
```

where:

**gtii**

Global title indicator, ITU international



**Caution:** GTT, EGTT, and VGTT traffic is routed based on the global titles in the OAM database while G-Flex, G-Port, A-Port, and INP traffic is routed based on the global title in the RTDB. Rebooting a Service Module card running the VSCCP application causes both the OAM databases and the RTDB on the Service Module card to reload.

14. Verify that the Service Module card returns to In-Service-Normal (IS-NR) state, using the `rept-stat-card` command.



**Warning:** Do not proceed until In-Service-Normal (IS-NR) state of the Service Module card is restored.

15. After In-Service-Normal (IS-NR) state of the Service Module card is restored and verified using the `rept-stat-card` command, repeat [Step 14](#) for each Service Module card in the system.
16. Set the IGM service state online using `chg-sccp-serv:serv=mp:state=online`.
17. Confirm that the activation steps were successful by performing the following verifications:
- Verify that all Service Module cards are loaded and are in In-Service-Normal (IS-NR) state, using the `rept-stat-sccp` command.
  - Verify that all Service Module cards and the EPAP are connected and operational, using the `rept-stat-mps` command.
  - Verify that database levels are identical for the EPAP PDB and RTDB. Display the RTDBs on the Service Module cards, using `rept-stat-db:display=all` .

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

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

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

The IS41 GSM Migration (IGM) feature is now enabled, turned on, and operating in the system.

## LOCREQ Query Response Activation Procedure

This procedure is used to enable and turn on the LOCREQ Query Response feature in the EAGLE 5 ISS.

### Prerequisites

- A-Port or IS41 GSM Migration (IGM) must be enabled and turn on before the LOCREQ Query Response feature can be enabled.
- The LOCREQ Query Response feature is optional and must be purchased from Tekelec. The feature must be purchased to receive the Feature Access Key (FAK) that is required to enable the feature. Contact your Tekelec Sales Representative or Account Representative to determine whether the LOCREQ Query Response feature has been purchased and for additional information.

The LOCREQ Query Response feature is enabled using part number 893038501 and the Feature Access Key (FAK). The LOCREQ Query Response feature cannot be disabled after it is enabled and cannot be enabled with a temporary FAK. After the LOCREQ Query Response feature is enabled and turned on, the LOCREQ Query Response feature cannot be turned off.

Some parameters and options used with the LOCREQ Query Response feature can be provisioned after the LOCREQ Query Response feature is enabled, but before the LOCREQ Query Response feature is turned on. The `locreqrspnd` option of the `chg-is41opts` command can be modified only if the LOCREQ Query Response feature is enabled and turned on. The `dfiltrn` parameter of the `chg-is41opts` command can be modified only if the LOCREQ Query Response feature is enabled. The `sporttype` parameter of the `chg-is41opts` command can be modified only if both the Service Portability feature and the LOCREQ Query Response feature are enabled.

LOCREQ Query Response processing cannot occur until:

- The LOCREQ Query Response feature is enabled and turned on.
- The `locreqrspnd` option of the `chg-is41opts` command is set to on.

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

1. Display the status of features controlled by Feature Access Keys (FAKs). The resulting output displays the features that are enabled in the system and the `on/off` status for each feature.

Command example:

```
rtrv-ctrl-feat
```

Output example:

```
rlghncxa03w 10-06-29 16:40:40 EST EAGLE5 42.0.0
The following features have been permanently enabled:
Feature Name          Partnum    Status    Quantity
HC-MIM SLK Capacity  893012707 on         64
APORT                 893016601 on         ----
Service Portability  893034301 on         ----
;
```

The output shows the enabled features and the on/off status for each enabled feature in the EAGLE 5 ISS.

- If the LOCREQ Query Response entry appears in the `rtrv-ctrl-feat` output with status = on, this procedure does not need to be performed.
  - If an entry for either APORT or IGM with a status of on does not appear in the `rtrv-ctrl-feat` output, then this procedure cannot be performed until either the A-Port or IS41 GSM Migration (IGM) feature is enabled and turned on.
  - If the LOCREQ Query Response entry appears in the `rtrv-ctrl-feat` output with status = off, go to [Step 4](#) to turn on the LOCREQ Query Response feature.
  - To enable and turn on the LOCREQ Query Response feature, continue to [Step 2](#).
2. Enable the LOCREQ Query Response feature.

Command example:

```
enable-ctrl-feat:partnum=893038501:fak=<Feature Access Key>
```

3. Verify that the LOCREQ Query Response feature is enabled.

Command example:

```
rtrv-ctrl-feat
```

```
rlghncxa03w 09-06-29 16:40:40 EST EAGLE5 41.1.0
The following features have been permanently enabled:
Feature Name          Partnum    Status    Quantity
HC-MIM SLK Capacity  893012707 on         64
APORT                 893016601 on         ----
Service Portability  893034301 on         ----
LOCREQ Query Response 893038501 off         ----
;
```

Some parameters and options can be provisioned after the feature is enabled but is turned off. LOCREQ Query Response processing cannot occur until the feature is enabled and turned on and the `thelocreqrspnd` option of the `chg-is41opts` command is set to on.

4. Turn on the LOCREQ Query Response feature.

Command example:

```
chg-ctrl-feat:partnum=893038501:status=on
```

5. Verify that the LOCREQ Query Response is enabled and turned on.

Command example:

```
rtrv-ctrl-feat
```

```
rlghncxa03w 09-06-29 16:40:40 EST EAGLE5 41.1.0
The following features have been permanently enabled:
```

Feature Name	Partnum	Status	Quantity
HC-MIM SLK Capacity	893012707	on	64
APORT	893016601	on	----
Service Portability	893034301	on	----
LOCREQ Query Response	893038501	on	----

;

LOCREQ Query Response processing cannot occur until the `locreqrspnd` option of the `chg-is41opts` command is set to `on`.

- Specify the parameters `dfltrn` and `sporttype` used with LOCREQ Query Response and .Service Portability features

Command example:

```
chg-is41opts:dfltrn=48607:sporttype=is41
```

- Set the `locreqrspnd` option of the `chg-is41opts` command to `on`.

Command example:

```
chg-is41opts:on=locreqrspnd
```

- Verify that the `IS41OPTS` parameter setting are correct.

Command example:

```
rtrv-is41opts
```

The LOCREQ Query Response feature is now enabled, turned on, and operating in the system. The feature cannot be disabled and cannot be turned off. LOCREQ Query Response processing can be halted by setting the `locreqrspnd` option of the `chg-is41opts` command to `off`.

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

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

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

## Service Portability Activation Procedure

This procedure is used to enable and turn on the Service Portability (S-Port) feature in the EAGLE 5 ISS.

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

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

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

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

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

Command example:

```
rtrv-ctrl-feat
```

The output shows the enabled features and the on/off status for each enabled feature in the EAGLE 5 ISS. If the `rtrv-ctrl-feat` output shows an LNP ported TNs quantity entry, this procedure cannot be performed. If the Service Portability entry appears in the `rtrv-ctrl-feat` output with status = on, this procedure does not need to be performed. If the Service Portability entry appears in the `rtrv-ctrl-feat` output with status = off, go to [Step 4](#) to turn on the S-Port feature. To enable and turn on the S-Port feature, continue to [Step 2](#).

2. Enable the S-Port feature.

Command example:

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

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

Command example:

```
rtrv-ctrl-feat
```

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

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

4. Turn on the S-Port feature.

Command example:

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

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

Command example:

```
rtrv-ctrl-feat
```

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

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

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

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

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

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

## MTP Routed Messages for SCCP Applications Activation Procedure

This procedure is used to enable and turn on the MTP Routed Messages for SCCP Applications (MTP Msgs for SCCP Apps) feature in the EAGLE 5 ISS.

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

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

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

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

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

Command example:

```
rtrv-ctrl-feat
```

The output shows the enabled features and the on/off status for each enabled feature in the EAGLE 5 ISS.

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

2. Enable the MTP Msgs for SCCP Apps feature.

Command example:

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

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

Command example:

```
rtrv-ctrl-feat
```

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

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

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

Command example:

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

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

Command example:

```
rtrv-ctrl-feat
```

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

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

6. Back up the database changes using the `chg-db:action=backup:dest=fixed` command. The following messages appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

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

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

# Chapter 5

## Measurements

---

### Topics:

- [IGM Measurements.....73](#)

This chapter describes the measurements information available from the EAGLE 5 ISS for the IS41 GSM Migration (IGM) feature.



## IGM Measurements

Refer to *EAGLE 5 ISS Measurements* for information about measurement systems and reporting.

Refer to *EAGLE 5 ISS Commands Manual* for descriptions of commands used to generate, schedule, and transfer measurements reports.

Refer to *Database Administration Manual - System Management* for provisioning information and procedures for these measurement systems:

- OAM-based Measurements - IGM measurements are available using the File Transfer Area (FTA) feature and not directly by EAGLE 5 ISS terminals.
- Measurements Platform
- E5-OAM Integrated Measurements

[Table 21: Pegs for Per System IGM Measurements](#) describes the peg counts of Message Signalling Units (MSUs) supported per-system for the A-Port feature/IGM feature.

**Table 21: Pegs for Per System IGM Measurements**

Event Name	Description	Type	Unit
APSMSRCV	Number of SMS Request messages received <ul style="list-style-type: none"> <li>• If the MT-Based IS41 SMS NP feature is not turned on and the <code>is41opts:smsreqbypass</code> option is set to yes, this count will not be updated.</li> <li>• If neither the MT-Based IS41 SMS NP feature nor the IGM feature is turned on, this count will not be updated.</li> </ul>	System	Peg count
APSMSREL	Number of SMS Request messages relayed <ul style="list-style-type: none"> <li>• If the MT-Based IS41 SMS NP feature is not turned on and the <code>is41opts:smsreqbypass</code> option is set to yes, this count will not be updated.</li> <li>• If neither the MT-Based IS41 SMS NP feature nor the IGM feature is turned on, this count will not be updated.</li> </ul>	System	Peg count
APSMRQREP	Number of SMSREQ messages received that result in SMSREQ ACK or SMSREQ NACK responses  This count will include any SMSREQ NACKs generated by the IGM feature.	System	Peg count
APSMRQERR	Number of SMSREQ messages received that resulted in error	System	Peg count

Event Name	Description	Type	Unit
	This count is applicable only when the incoming message is SMSREQ . The peg count is incremented only when the MT-Based IS-41 SMS NP feature is turned on. If the IGM feature is also turned on and the IGM feature handles the message resulting in an error, this peg count is incremented.		
GPSRRCV	Number of call-related SRI messages received	System	Peg count
GPSRGTT	Number of call-related SRI messages that fell through to GTT	System	Peg count
GPSRREP	Number of call-related SRI messages that received A-Port service	System	Peg count
GPSRERR	Number of call-related messages that cause errors and SRI Negative ACK	System	Peg count
IS41LRERR	Number of IS-41 Location Request - Error response messages sent	System	Peg count
IS41LRMRCV	Number of IS-41 Location Request messages received.	System	Peg count
IS41LRRTN	Number of IS-41 Location Request - Return Result messages sent	System	Peg count

*Table 22: Pegs for Per SSP IGM Measurements* describes the peg counts of Message Signalling Units (MSUs) supported per-SSP for the IGM feature.

**Table 22: Pegs for Per SSP IGM Measurements**

Event Name	Description	Type	Unit
APLRACK	Number of call related LOCREQ messages acknowledged	Point Code	Peg count
APLRRLY	Number of call related LOCREQ messages relayed	Point Code	Peg count
APNOCL	Number of non-call non-LOCREQ related messages relayed	Point Code	Peg count
APNOCLGT	Number of non-call non-LOCREQ related messages that fell through to GTT	Point Code	Peg count
GPSRACK	Number of call-related SRI responses	Point Code	Peg count
GPSRRLY	Number of call-related SRI messages relayed	Point Code	Peg count

*Table 23: Pegs for Per System and Per SSP IGM Measurements* describes the peg counts of Message Signalling Units (MSUs) supported both per-system and per-SSP for the IGM feature.

**Table 23: Pegs for Per System and Per SSP IGM Measurements**

Event Name	Description	Type	Unit
GPNOCCL	Number of non-call-related messages relayed by G-Port	System, Point Code	Peg count
GPNOCCLGT	Number of non-call-related messages that fell through to GTT	System, Point Code	Peg count

# Chapter 6

## Maintenance

---

### Topics:

- *IGM Related Alarms.....77*
- *IGM UIMs.....78*
- *Maintenance Commands.....81*
- *EAGLE 5 ISS Debug Commands.....82*
- *EPAP Status and Alarm Reporting.....82*
- *IGM System Status Reports.....85*

This chapter describes the maintenance information available from the EAGLE 5 ISS for the IS41 GSM Migration (IGM) feature. The information includes status, alarms (UAMs), and information messages (UIMs).

## IGM Related Alarms

All IGM related UAMs are output to the Maintenance Output Group. *Unsolicited Alarm and Information Messages* contains a complete description of all UAMs. [Table 24: IGM Related UAMs](#) contains a listing of UAMs used to support the IGM feature.

Refer to *Unsolicited Alarm and Information Messages* for more information and corrective procedures for the EAGLE 5 ISS related alarms. Refer to *MPS Platform Software and Maintenance Manual* for information and corrective procedures for the MPS related alarms.

**Table 24: IGM Related UAMs**

UAM	Severity	Message Text	MPS or EAGLE 5 ISS
0013	Major	Card is isolated from system	EAGLE 5 ISS
0084	Major	IP Connection Unavailable	EAGLE 5 ISS
0085	None	IP Connection Available	EAGLE 5 ISS
0099	Major	Incompatible HW for provisioned slot	EAGLE 5 ISS
0250	None	MPS available	MPS
0261	Critical	MPS unavailable	MPS
0328	None	SCCP is available	EAGLE 5 ISS
0329	None	SCCP capacity normal, card(s) abnormal	EAGLE 5 ISS
0330	Major	SCCP TPS Threshold exceeded	EAGLE 5 ISS
0331	Critical	SCCP is not available	EAGLE 5 ISS
0335	None	SCCP is removed	EAGLE 5 ISS
0336	Major	LIMs have been denied SCCP service	EAGLE 5 ISS
0370	Critical	Critical Platform Failures	MPS
0371	Critical	Critical Application Failures	MPS
0372	Major	Major Platform Failures	MPS
0373	Major	Major Application Failures	MPS
0374	Minor	Minor Platform Failures	MPS
0375	Minor	Minor Application Failures	MPS
0422	Major	Insufficient extended memory	EAGLE 5 ISS
0423	None	Card reload attempted	EAGLE 5 ISS

UAM	Severity	Message Text	MPS or EAGLE 5 ISS
0441	Major	Incorrect MBD - CPU	EAGLE 5 ISS
0442	Critical	RTDB database capacity is 95% full	EAGLE 5 ISS
0443	Major	RTDB database is corrupted	EAGLE 5 ISS
0444	Minor	RTDB database is inconsistent	EAGLE 5 ISS
0445	None	RTDB database has been corrected	EAGLE 5 ISS
0446	Major	RTDB database capacity is 80% full	EAGLE 5 ISS
0447	None	RTDB database capacity alarm cleared	EAGLE 5 ISS
0448	Minor	RTDB database is incoherent	EAGLE 5 ISS
0449	Major	RTDB resynchronization in progress	EAGLE 5 ISS
0451	Major	RTDB reload is required	EAGLE 5 ISS
0526	None	Service is available	EAGLE 5 ISS
0527	Minor	Service abnormal	EAGLE 5 ISS
0528	Critical	Service is not available	EAGLE 5 ISS
0529	Critical	Service is disabled	EAGLE 5 ISS
0530	None	Service is removed	EAGLE 5 ISS

## IGM UIMs

*Unsolicited Alarm and Information Messages* contains a complete description of all UIM text and formats. [Table 25: IGM Related UIMs](#) lists UIMs used to support the IGM feature.

**Table 25: IGM Related UIMs**

UIM	Text	Description	Action	Output Group (UI Output Direction)
1035	SCCP rsp did not route - invalid GTI	The SCCP response did not route due to an invalid GTI	Use a valid GTI in the CGPA part of the query	gtt
1036	SCCP rsp did not route - invalid TT	The SCCP response did not route due to an invalid TT	Provision the CGPA TT in the GTT TT table	gtt

UIM	Text	Description	Action	Output Group (UI Output Direction)
1037	SCCP rsp did not route - bad Xlation	The SCCP response did not route due to a bad translation	Provision the CGPA GTA address in the GTT database	gtt
1038	SCCP rsp did not route - SSP not True PC	The SCCP response did not route due to SSP is not true point code	Use the true point code in the CGPA point code or OPC of the query	gtt
1039	SCCP rsp did not route - bad Selectors	The SCCP response did not route due to invalid selectors	Provision the CGPA GTI, TT, NP, and NAI in the EGTT selector table	gtt
1130	IS412GSM not provisioned	The IS-41 to GSM Migration prefix specified by the IS412GSM parameter is not provisioned on this system.	The IS412GSM prefix must be specified in the GSMOPTS table.	gtt
1131	Invalid digits in IS41 MAP Digits parms	The EAGLE 5 ISS encountered an error in decoding the digits parameter in the LocationRequest message.	Correct the digits parameter	gtt
1169	SCCP rcvd inv TCAP portion	This indicates that SCCP discarded a message because the TCAP provided in the called party address is invalid in the EAGLE 5 ISS.	No action is necessary.	application subsystem
1227	SCCP did not route - DPC not in MAP tbl	This message indicates that SCCP did not route a message because the destination point code was not in the mated application (MAP) table. The message was discarded.	If the DPC indicated in the message should not be routed to, no further action is necessary.	gtt
1230	SCCP did not route - SS not in MAP tbl	This message indicates that SCCP did not route a message because the destination subsystem was not in the Mated Application (MAP) table. The message was discarded.	No action is necessary.	gtt

UIM	Text	Description	Action	Output Group (UI Output Direction)
1242	Conv to intl num - Dflt CC not found	Conversion to international number failed because default CC was not found	Define the default CC with <code>chg-stpopts :defcc=xxx</code>	application subsystem
1243	Conv to intl num - Dflt NC not found	Conversion to international number failed because default NC was not found	Define the default NDC with <code>chg-stpopts :defndc=xxxxx</code>	application subsystem
1246	Invalid length of conditioned digits	Invalid length of conditioned digits (length of conditioned international number is less than 5 or greater than 15)	Use an international number with length in the acceptable range	application subsystem
1256	MNP Circular Route Detected	This message indicates the network has incorrect number portability data for a subscriber.	Verify and update number portability data.	application subsystem
1294	Invalid digits in MAP MSISDN parameter	No digits found in MAP MSISDN parameter	Specify valid digits in the MSISDN	application subsystem
1295	Translation PC is Eagle's	PC translation is invalid because it is one of EAGLE 5 ISS's PCs	Change the point code	application subsystem
1297	Invalid length of prefix/suffix digits	Attempted digit action of prefixing entity ID is invalid because combined length of entity ID and GT digits was greater than 21 digits	Change the attempted digit action or decrease the length of the entity ID and/or GT digits	application subsystem
1341	SRI rcvd - GSM2IS41 not provisioned	MIGRPFX=SINGLE and GSM2IS41 prefix is NONE. The GSM to IS-41 Migration prefix is not provisioned on this system.	The GSM2IS41 prefix must be specified in the GSMOPTS table.	gtt
1432	IGM Relay Failed - Bad IS41 SMSC Xlation	GTT translation lookup on DEFIS41SMSC digits failed. Message falls through to SCCP CDPA GTT.	The DEFIS41SMSC digits must be provisioned.	gtt



## Maintenance Commands

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

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

**Table 26: Maintenance Commands**

Command	Description
rept-stat-sys	Reports the status of system entities, including cards. The output includes the number of Service Module cards that are in service (IS-NR) and how many are in another state (IS-ANR, OOS-MT, OOS-MT-DSBLD).
rept-stat-sccp	Reports operating status of services and subsystems, CPU usage, and Service Module card status. When the loc parameter is specified, the command displays detailed card traffic statistics, including cards that are denied SCCP service. See the section in this manual that describes the use of the <code>rept-stat-sccp</code> command.
rept-stat-mps	Displays the overall status of the EPAP application running on the MPS (multi-purpose server). Command output for the various reports of this command include overall MPS alarm status and card status, and status for a specific Service Module card when a feature is on.
rept-stat-trbl	Includes a summary of any trouble notifications (UAMs) for local subsystems, cards, and linksets. The severity of each alarm is indicated in the output report.
rept-stat-alm	Displays the alarm counts and totals for local subsystems and Service Module card/EPAP IP links.
rept-stat-db	Displays the status information for the EAGLE 5 ISS databases. This includes the level information for each Service Module card, and for the active and standby EPAP RTDB. The command reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birth dates and levels. It shows the status of each PDB and RTDB when an EPAP-related feature is enabled.
rtrv-tbl capacity	Retrieves table use capacity summary information. For each table listed, the number of table entry elements in use and the total allowed number of table elements is presented, along with a percent (%) full value. Information is shown for some tables only if the feature that uses the table is enabled.
inh-card/alw-card	<p>The <code>inh-card</code> command is used to change the operating state of the card from In-Service Normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD). A craftsperson then can test the card or physically remove it from the shelf.</p> <p>The <code>alw-card</code> command is used to change the card from OOS-MT-DSBLD (Out-of-Service Maintenance-Disabled) to IS-NR (In-Service Normal) if card loading is successful.</p>

Command	Description
inh-alm/unhb-alm	Used to allow and inhibit reporting of alarms for a given device, including the Service Module card ports. The commands allow both Port A and Port B to be specified. Inhibited alarms will not generate UAMs or cause alarm indicators to be turned on. All <code>rept-stat-xxx</code> commands continue to display the alarms with an indication that the device has its alarms inhibited.
rtrv-data-rtdb	Retrieves Entity data, DN data, IMEI data, IMSI data, TN data, NPANXX data, and LRN data from the RTDB on an active Service Module card.  If the <code>loc</code> parameter is specified and the target card is an active Service Module card, the RTDB data is retrieved from that card.  If the <code>loc</code> parameter is not specified, the RTDB data is retrieved on the active Service Module card that has the lowest IMT address.  The RTDB status on the active Service Module card can be coherent or incoherent.

### rept-stat-sccp

The `rept-stat-sccp` command displays the status of the Service Module cards and the statistics of the services running on the Service Module cards. The command also displays any cards that are denied SCCP service. An MSU is considered to be an A-Port MSU after service selection. Statistics are displayed under MNP Service Statistics for A-Port, G-Port, and IGM features.

## EAGLE 5 ISS Debug Commands

Chapter 6 of the *Commands Manual* contains descriptions of commands that can be used in assessing and modifying system status and operation. The debug commands are used only under the direction of Tekelec support personnel.

The `ent-trace` command traps A-Port MSUs (Message Signaling Units) based on the point code of the switch that generated the MSU (SSP), a particular DN and entity ID. For MDN and entity ID, the comparison is based on the search key built from the CdPA GTAI (Global Title Address Information) after any conditioning. The existing GT SCCP trigger also applies to A-Port messages.

## EPAP Status and Alarm Reporting

Because EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 ISS terminals, EPAP maintenance, measurements, and status information are routed through a Service Module card. EPAP sends two types of messages to the Service Module card: *EPAP Maintenance Blocks* and *DSM Status Requests and DSM Status Messages*. Each message type is discussed in the following sections.

### EPAP Maintenance Blocks

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

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

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

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

### DSM Status Requests and DSM Status Messages

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

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

- The Service Module card is booted.
- The Service Module card receives a DSM Status Request message from the EPAP
- The Service Module card determines that it needs to download the entire RTDB; for example, the Service Module card determines that the RTDB needs to be downloaded because it is totally corrupted, or a craftsperson requests that the RTDB be reloaded. The Service Module card sends a Full Download Request message to the EPAP
- The Service Module card starts receiving RTDB downloads or updates. When a Service Module card starts downloading the RTDB or accepting updates, it sends a DSM Status Message informing the EPAP of the first record received. This helps the EPAP keep track of downloads in progress.

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

- **DSM Memory Size.** When the Service Module card is initialized, it determines the amount of memory present. The EPAP uses the value to determine if the Service Module card has enough memory to hold the RTDB.

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

- **Load Mode Status.** This indicator indicates whether or not a sufficient number of the IS-NR (In-Service Normal) LIMs have access to SCCP services.

## DSM Status Requests

When the EPAP needs to know the status of a Service Module card, it sends a DSM status request to that Service Module card. Because status messages are sent over UDP, the EPAP broadcasts the DSM status request (to all Service Module cards) and each Service Module card returns its status to the EPAP.

### DSM Status Reporting to the EPAP

The sections that follow describe the DSM status reporting for the EPAP.

#### DSM Status Messages – When Sent

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

- The Service Module card is booted.
- The Service Module card receives a DSM Status Request message from the EPAP
- The Service Module card determines that it needs to download the entire database, for example, if the Service Module card determines that the RTDB needs to be downloaded (for instance, if the database is totally corrupted), or if a craftsperson requests that the database be reloaded.
- The Service Module card starts receiving database downloads or database updates. When a Service Module card starts downloading the RTDB or accepting database updates, it sends a DSM Status Message informing the EPAP of the first record received. This helps the EPAP keep track of downloads in progress.

### DSM Status Messages Fields

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

- **DSM Memory Size.** When the Service Module card is initialized, it determines the amount of memory present. The EPAP uses the value to determine if the Service Module card has enough memory to hold the RTDB.

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

- **Load Mode Status.** This indicator indicates whether or not 80% of the IS-NR (In-Service Normal) LIMs have access to SCCP services.

## IGM System Status Reports

Status reporting described here includes the following:

- System status
- IGM status
- Service Module card memory capacity status
- Loading mode support status

### System Status Reporting

The `rept-stat-sys` command supports the Service Module cards running the VSCCP application.

The `rept-stat-sccp` command supports the Service Module cards running the VSCCP application and reports IGM statistics.

### IGM Status Reporting

The `rept-stat-mps` command supports IGM system reporting. `rept-stat-mps` concentrates on reporting the status of the provisioning system. See "Maintenance and Measurements User Interface Commands", for more details. IGM statistics are placed in the `rept-stat-sccp` command.

### Service Module card Memory Capacity Status Reporting

As described in the [DSM Status Messages Fields](#), the Service Module card sends a message to the EPAP containing the amount of memory on the Service Module card. The EPAP determines whether the Service Module card has enough memory to store the RTDB and sends an ack or nak back to the Service Module card indicating whether or not the Service Module card has an adequate amount of memory. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module card database capacity requirements.

When the EPAP sends database updates to the Service Module cards, the update messages include a field that contains the new database memory requirements. Each Service Module card monitors the DB size requirements, and issues a minor alarm if the size of the DB exceeds 80% of its memory. If a database increases to the point that there is insufficient Service Module card memory, a major alarm is issued.

The `rept-stat-mps:loc=xxxx` command shows the amount of memory used by the RTDB as a percent of available Service Module card memory.

### Loading Mode Support Status Reporting

The OAM application determines whether or not the system is in an unstable loading mode since it knows the state of all LIM and Service Module cards in the system. When the loading mode is unstable, the `rept-stat-sys` command reports the existence of the unstable loading mode and the specific conditions that caused it.

## A

A-Port	<p>ANSI-41 Mobile Number Portability</p> <p>A feature that enables IS-41 subscribers to change their service provider while retaining the same Mobile Dialed Number (MDN).</p>
ACK	Data Acknowledgement
ANSI	<p>American National Standards Institute</p> <p>An organization that administers and coordinates the U.S. voluntary standardization and conformity assessment system. ANSI develops and publishes standards. ANSI is a non-commercial, non-government organization which is funded by more than 1000 corporations, professional bodies, and enterprises.</p>
ANSI-41 Mobile Number Portability	See A-Port.

## C

CC	<p>Connection Confirmed</p> <p>Country Code</p> <p>Composite Clock</p>
CCS7ITU	<p>The application for the ITU SS7 signaling links that is used with card types <code>limds0</code>, <code>limch</code>, <code>lime1</code>, and <code>limt1</code>.</p>

## C

CdPA	Called Party Address - The field in the SCCP 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 is located.
Circular Route Prevention	See CRP.
CLLI	<p>Common Language Location Identifier</p> <p>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:</p> <p>The first four characters identify the city, town, or locality.</p> <p>The first character of the CLLI must be an alphabetical character.</p> <p>The fifth and sixth characters identify state or province.</p> <p>The seventh and eighth characters identify the building.</p> <p>The last three characters identify the traffic unit.</p>
CNL	Small Geographic Area
CPC	<p>Capability Point Code</p> <p>A capability point code used by the SS7 protocol to identify a group of</p>

## C

functionally related STPs in the signaling network.

CPU Central Processing Unit

CUG Closed User Group

## D

DB Database  
Daughter Board  
Documentation Bulletin  
Data bus

Destination The node to which the signaling link traffic is routed. This destination is identified by a point code, either a full point code or a cluster point 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, the point codes are numeric addresses which uniquely identify each signaling point. This point code can be adjacent to the EAGLE, but does not have to be.

DPCI Destination Point Code International



## D

DPCN Destination Point Code National

## E

EGTT Enhanced Global Title Translation

A feature that is designed for the signaling connection control part (SCCP) of the SS7 protocol. The EAGLE uses this feature to determine to which service database to send the query message when a Message Signaling Unit (MSU) enters the system.

Enhanced Global Title Translation See EGTT.

EPAP EAGLE Provisioning Application Processor

EPAP-related features Features that require EPAP connection and use the Real Time Database (RTDB) for lookup of subscriber information.

- ANSI Number Portability Query (AINPQ)
- ANSI-41 Analyzed Information Query – no EPAP/ELAP (ANSI41 AIQ)
- Anytime Interrogation Number Portability (ATI Number Portability, ATINP)
- AINPQ, INP, G-Port SRI Query for Prepaid, GSM MAP SRI Redirect, IGM, and ATINP Support for ROP
- A-Port Circular Route Prevention (A-Port CRP)
- Equipment Identity Register (EIR)
- G-Flex C7 Relay (G-Flex)
- G-Flex MAP Layer Routing (G-Flex MLR)

## E

- G-Port SRI Query for Prepaid
- GSM MAP SRI Redirect to Serving HLR (GSM MAP SRI Redirect)
- GSM Number Portability (G-Port)
- IDP A-Party Blacklist
- IDP A-Party Routing
- IDP Relay Additional Subscriber Data (IDPR ASD)
- IDP Relay Generic Routing Number (IDPR GRN)
- IDP Service Key Routing (IDP SK Routing)
- IDP Screening for Prepaid
- INAP-based Number Portability (INP)
- Info Analyzed Relay Additional Subscriber Data (IAR ASD)
- Info Analyzed Relay Base (IAR Base)
- Info Analyzed Relay Generic Routing Number (IAR GRN)
- Info Analyzed Relay Number Portability (IAR NP)
- INP Circular Route Prevention (INP CRP)
- IS41 Mobile Number Portability (A-Port)
- IS41 GSM Migration (IGM)
- MNP Circular Route Prevention (MNPCRCP)
- MO-based GSM SMS NP
- MO-based IS41 SMS NP
- MO SMS Generic Routing Number (MO SMS GRN)
- MO- SMS B-Party Routing
- MO SMS IS41-to-GSM Migration
- MT-based GSM SMS NP
- MT-based GSM MMS NP
- MT-based IS41 SMS NP
- MTP Routed Messages for SCCP Applications (MTP Msgs for SCCP Apps)

**E**

- MTP Routed Gateway Screening Stop Action (MTPRTD GWS Stop Action)
- Portability Check for MO SMS
- Prepaid IDP Query Relay (IDP Relay, IDPR)
- Prepaid SMS Intercept Phase 1 (PPSMS)
- Service Portability (S-Port)
- S-Port Subscriber Differentiation
- Triggerless ISUP Framework Additional Subscriber Data (TIF ASD)
- Triggerless ISUP Framework Generic Routing Number (TIF GRN)
- Triggerless ISUP Number Portability (TIF NP)
- Triggerless ISUP Framework Number Substitution (TIF NS)
- Triggerless ISUP Framework SCS Forwarding (TIF SCS Forwarding)
- Triggerless ISUP Framework Simple Number Substitution (TIF SNS)
- Voice Mail Router (V-Flex)

ESN

Electronic Serial Number

ETSI

European Technical Standards Institute

**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 feature access key is supplied by Tekelec.

**F**

FTA	<p>File Transfer Area</p> <p>A special area that exists on each OAM hard disk, used as a staging area to copy files to and from the EAGLE using the Kermit file-transfer protocol.</p>
-----	--

**G**

G-Flex	<p>GSM Flexible numbering</p> <p>A feature that allows the operator to flexibly assign individual subscribers across multiple HLRs and route signaling messages, based on subscriber numbering, accordingly.</p>
G-Port	<p>GSM Mobile Number Portability</p> <p>A feature that provides mobile subscribers the ability to change the GSM subscription network within a portability cluster, while retaining their original MSISDN(s).</p>
GRN	<p>Generic Routing Number</p>
GSM	<p>Global System for Mobile Communications</p> <p>A second generation digital PCS mobile phone standard used in many parts of the world.</p>
GT	<p>Global Title Routing Indicator</p>
GTA	<p>Global Title Address</p>
GTI	<p>Global Title Indicator</p>

**G**

GTT

Global Title Translation

A feature of the signaling connection control part (SCCP) of the SS7 protocol that the EAGLE uses to determine which service database to send the query message when an MSU enters the EAGLE 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.

GUI

Graphical User Interface

The term given to that set of items and facilities which provide the user with a graphic means for manipulating screen data rather than being limited to character based commands.

**H**

HLR

Home Location Register

A component within the Switching Subsystem of a GSM network. The HLR database is the central database within the GSM architecture. This is where information about the mobile communications subscribers who are assigned to a specific location area is stored. The subscriber data is used to establish connections and control services. Depending on the network size, the number of subscribers and the network organization, a number of HLRs can exist within a GSM network.

HOMERN

Home Network Routing Number Prefix

**H**

HW Hardware

**I**

ID Identity, identifier

IGM See IS41 GSM Migration  
Internally generated message

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

INAP Intelligent Network Application Part  
A standardized interface for intelligent networks (IN). This interface allows Service Providers to offer their own 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

IP Intelligent Peripheral  
Internet Protocol  
IP specifies the format of packets, also called datagrams, and the addressing scheme. The network

## I

layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.

IS-41

Interim Standard 41

Same as and interchangeable with ANSI-41. A standard for identifying and authenticating users, and routing calls on mobile phone networks. The standard also defines how users are identified and calls are routed when roaming across different networks.

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-NR

In Service - Normal

ISDN

Integrated Services Digital Network

Integrates a number of services to form a transmission network. For example, the ISDN network integrates, telephony, facsimile, teletext, Datex-J, video telephony and data transfer services, providing users with various digital service over a single

**I**

interface: voice, text, images, and other data.

ISS

Integrated Signaling System

ITU

International Telecommunications Union

An organization that operates worldwide to allow governments and the private telecommunications sector to coordinate the deployment and operating of telecommunications networks and services. The ITU is responsible for regulating, coordinating and developing international telecommunications, and for harmonizing national political interests.

ITUDUPPC

ITU National Duplicate Point Code

This feature applies only to 14-bit ITU national point codes. This feature allows an EAGLE mated pair to route traffic for two or more countries that may have overlapping point code values.

**L**

LIM

Link Interface Module

Provides access to remote SS7, IP and other network elements, such as a Signaling Control Point (SCP) through a variety of signaling interfaces (DS0, MPL, E1/T1 MIM, LIM-ATM, E1-ATM, IPLIMx, IPGWx). The LIMs consist of a main assembly and possibly, an interface appliqué board. These appliqué boards provide level one and some level two functionality on SS7 signaling links.



**L**

LOCREQ	Location Request Message A TDMA/CDMA MSC query to an HLR for retrieving subscription/location information about a subscriber to terminate a voice call.
--------	--

**M**

MAP	Mated Application Part Mobile Application Part An application part in SS7 signaling for mobile communications systems.
Mated Application	The point codes and subsystem numbers of the service databases that messages are routed to for global title translation.
MDN	Mobile Dialed Number Mobile Directory Number
MIN	Mobile Identification Number
MNP	Mobile Number Portability Allows a user to keep his or her mobile phone number despite changing provider. The subscriber also keeps the network carrier code.
MNP Circular Route Prevention	A G-Port MNP feature that detects instances of circular routing caused by incorrect information in one or more of the network number portability databases. If a circular route has been detected, a message will be generated by the EAGLE and returned to the originator.

**M**

MPS

Multi-Purpose Server

The Multi-Purpose Server provides database/reload functionality and a variety of high capacity/high speed offboard database functions for applications. The MPS resides in the General Purpose Frame.

Messages Per Second

A measure of a message processor's performance capacity. A message is any Diameter message (Request or Answer) which is received and processed by a message processor.

MR

Message Relay

MRN

Message Reference Number

An unsolicited numbered message (alarm or information) that is displayed in response to an alarm condition detected by the system or in response to an event that has occurred in the system.

Mated Relay Node

A mated relay node (MRN) group is provisioned in the database to identify the nodes that the traffic is load shared with, and the type of routing, either dominant, load sharing, or combined dominant/load sharing.

MSISDN

Mobile Station International  
Subscriber Directory Number

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.

Mobile Subscriber Integrated  
Services Digital Network [Number]

**M**

Mobile Station International Subscriber Directory Number. The unique, network-specific subscriber number of a mobile communications subscriber. MSISDN follows the E.164 numbering plan; that is, normally the MSISDN is the phone number that is used to reach the subscriber.

MSRN

Mobile Station Roaming Number

MTP

Message Transfer Part

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

Module Test Plan

MTP Msgs for SCCP Apps

MTP Routed Messages for SCCP Applications feature

A feature that supports MTP-routed SCCP message processing for features that normally do not MTP route messages. The feature supports both LOCREQ and SMSREQ messages.

**N**

NAI

Nature of Address Indicator

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

Network Access Identifier

The user identity submitted by the client during network authentication.

## N

NAK	Negative Acknowledgment
NC	Network Cluster Network Code Not Compliant North Carolina
NDC	Network destination code Network Data Collection
NE	Network Element  An independent and identifiable piece of equipment closely associated with at least one processor, and within a single location.  In a 2-Tiered DSR OAM system, this includes the NOAM and all MPs underneath it. In a 3-Tiered DSR OAM system, this includes the NOAM, the SOAM, and all MPs associated with the SOAM.  Network Entity
NP	Number Plan  Numbering Plan Number Portability A capability that permits telecommunications users to maintain the same telephone access number as they change telecommunication suppliers.
OAM	Operations, Administration, and Maintenance  The application that operates the Maintenance and Administration

## O

**O**

Subsystem which controls the operation of many products.

OOS-MT-DSBLD

Out of Service - Maintenance Disabled

The entity is out of service and the maintenance system is preventing the entity from performing its normal service function.

OPC

Originating Point Code

Within an SS7 network, the point codes are numeric addresses which uniquely identify each signaling point. The OPC identifies the sending signaling point.

own-network

Belonging to or assigned to this operator.

**P**

PC

Point Code

The identifier of a signaling point or service control point in a network. The format of the point code can be one of the following types:

- ANSI point codes in the format network indicator-network cluster-network cluster member (**ni-nc-ncm**).
- Non-ANSI domestic point codes in the format network indicator-network cluster-network cluster member (**ni-nc-ncm**).
- Cluster point codes in the format network indicator-network cluster-\* or network indicator-\*-\*.

**P**

- ITU international point codes in the format **zone-area-id**.
- ITU national point codes in the format of a 5-digit number (**nnnnn**), or 2, 3, or 4 numbers (members) separated by dashes (**m1-m2-m3-m4**) as defined by the Flexible Point Code system option. A group code is required (**m1-m2-m3-m4-gc**) when the ITUDUPPC feature is turned on.
- 24-bit ITU national point codes in the format main signaling area-subsignaling area-service point (**msa-ssa-sp**).

PDB

Provisioning Database

PDBI

Provisioning Database Interface

The interface consists of the definition of provisioning messages only. The customer must write a client application that uses the PDBI request/response messages to communicate with the PDDBA.

PPSMS

Prepaid Short Message Service  
Prepaid Short Message Service Intercept

PT

Portability Type

**R**

RC

Relative Cost  
Restriction Criteria

RN

Routing Number

**R**

The number provided by the Freephone Service Provider (FSP) to the Access Service Provider (ASP) to enable a pre-determined routing of traffic to a specific network/carrier/customer.

ROP	Large Geographic Area (Groups of CNLs)
Route	A signaling path from an LSP to an RSP using a specified Link Set
RTDB	Real Time Database

**S**

SCCP	Signaling Connection Control Part The signaling connection control part with additional functions for the Message Transfer Part (MTP) in SS7 signaling. Messages can be transmitted between arbitrary nodes in the signaling network using a connection-oriented or connectionless approach.
Service Module card	DSM, E5-SM4G, or E5-SM8G-B card that contains the Real Time Database (RTDB) downloaded from an EPAP or ELAP system.
Service Nature of Address Indicator	See SNAI.
Service Portability	See S-Port.
SM	Short Message

## S

SMS	<p>Short Message Service</p> <p>A communication service component of the GSM mobile communication system that uses standard communications protocols to exchange short text messages between mobile phone devices. See also GSM.</p>
SMSREQ	<p>SMS Request Message</p>
S-Port	<p>Service Portability</p> <p>A number portability extension which allows a subscriber to retain the same subscriber number when moving from one network type or service technology to another within the network of a single operator. Service Portability provides different routing number digits for formats that require routing numbers. Service Portability does not affect message flows.</p>
SP	<p>Service Provider</p> <p>Signaling Point</p> <p>A set of signaling equipment represented by a unique point code within an SS7 domain.</p>
Spare Point Code	<p>The EAGLE ITU International/National Spare Point Code feature allows a network operator to use the same Point Codes across two networks (either ITU-I or ITU-N). The feature also enables National and National Spare traffic to be routed over the same linkset. The EAGLE uses the MSU Network Indicator (NI) to</p>



## S

differentiate the same point code of one network from the other. In accordance with the SS7 standard, unique Network Indicator values are defined for Point Code types ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare.

## SRF

## Signaling Relay Function

The SRF determines the HLR of the destination mobile station. If the mobile station is not ported, the original HLR is queried. If the mobile station is ported, the recipient HLR is queried.

## Service Resource Function

Provide resources to a call, such as announcements, voice prompting, and voice recognition. An example of a SRF is a Voice Recognition Unit (VRU).

## SRI

## Send Routing Information

Send\_Route\_Information Message

## SS

## Subsystem

Supplementary Services

## SSP

Subsystem Prohibited network management message.

Subsystem Prohibited SCCP (SCMG) management message. (CER)

Service Switching Point (SS7 Network)

## Signal Switching Point

Signal Switching Points are switches that originate, terminate, or tandem calls. An SSP sends signaling messages to other SSPs

## S

to setup, manage, and release voice circuits required to complete a call.

## STP

Signal Transfer Point

The STP is a special high-speed switch for signaling messages in SS7 networks. The STP routes core INAP communication between the Service Switching Point (SSP) and the Service Control Point (SCP) over the network.

Spanning Tree Protocol

## T

## TCAP

Transaction Capabilities Application Part - A protocol in the SS7 protocol suite that enables the deployment of advanced intelligent network services by supporting non-circuit related information exchange between signaling points using the Signaling Connection Control Part connectionless service. TCAP also supports remote control - ability to invoke features in another remote network switch.

## TFA

TransFer Allowed (Msg)

## TFP

TransFer Prohibited (Msg)

A procedure included in the signaling route management (functionality) used to inform a signaling point of the unavailability of a signaling route.

## TPS

Transactions Per Second

A method of measuring how quickly a network can transmit and receive data. Capacities listed with "TPS" units involve the maximum

**T**

of the receive rate and the transmit rate, and the worst-case assumption is that the transmit and receive rates are the same. Under the TU model, transaction units per second are calculated with the total transaction unit value and the advertised card capacity.

Translation Type

See TT.

TT

Translation Type

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

UAM

Unsolicited Alarm Message

A message sent to a user interface whenever there is a fault that is service-affecting or when a previous problem is corrected. Each message has a trouble code and text associated with the trouble condition.

UDT

Unitdata Transfer

UDTS

Unitdata Transfer Service

An error response to a UDT message.

**V**

VGTT

Variable Length GTT

## V

A feature that provides the ability to provision global title entries of varying lengths to a single translation type or GTT set. Users are able to assign global title entries of up to 10 different lengths to a single translation type or GTT set.

## VSCCP

VxWorks Signaling Connection Control Part

The application used by the Service Module card to support EPAP-related features and LNP features. If an EPAP-related or LNP feature is not turned on, and a Service Module card is present, the VSCCP application processes normal GTT traffic.

## X

## XUDT

Extended Unit Data

Extended User Data

## XUDTS

Extended Unitdata Service message

An error response to an XUDT message.