Oracle® Communications EAGLE

IS41 GSM Migration User's Guide

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Oracle Communications EAGLE IS41 GSM Migration User's Guide, Release 46.7

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1
Introduction

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.

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 1-1 Admonishments

Icon	Description
	Danger: (This icon and text indicate the possibility of *personal injury*.)
	Warning: (This icon and text indicate the possibility of *equipment damage*.)
	Caution: (This icon and text indicate the possibility of *service interruption*.)
	Topple: (This icon and text indicate the possibility of *personal injury* and *equipment damage*.)

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.

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 one of the following options:
   - For Technical issues such as creating a new Service Request (SR), Select 1
   - For Non-technical issues such as registration or assistance with MOS, Select 2

You will be connected to a live agent who can assist you with MOS registration and opening a support ticket.

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 related to this document, refer to the Oracle Help Center site. See Locate Product Documentation on the Oracle Help Center Site for more information on related product publications.

Customer Training

Oracle University offers training for service providers and enterprises. Visit our web site to view, and register for, Oracle Communications training:

http://education.oracle.com/communication

To obtain contact phone numbers for countries or regions, visit the Oracle University Education web site:

www.oracle.com/education/contacts

Locate Product Documentation on the Oracle Help Center Site

Oracle Communications customer documentation is available on the web at the Oracle Help Center (OHC) 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 http://www.adobe.com.

1. Access the Oracle Help Center site at http://docs.oracle.com.
2. Click `Industries`.
3. Under the Oracle Communications subheading, click the `Oracle Communications documentation` link.

   The Communications Documentation page appears. Most products covered by these documentation sets will appear under the headings "Network Session Delivery and Control Infrastructure" or "Platforms."
4. Click on your Product and then the Release Number.

   A list of the entire documentation set for the selected product and release appears.
5. To download a file to your location, right-click the `PDF` link, select `Save target as` (or similar command based on your browser), and save to a local folder.

2
Feature Description

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-ported or ported 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** (**MNPCRP**) 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 MNPCRP 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 (MNPCRP) 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 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 Area**s (**CNL**s) to be grouped into **Large Geographic Area**s (**ROP**s). 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 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 populates a new GSM2IS41 prefix following the same mechanism that is used for the existing IS412GSM prefix. The EAGLE 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 = MULTPLE, 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 2-1 through Table 2-4 show call dispositions for the following configurations:

- IGM Only (Table 2-1)
- IGM and G-Port (Table 2-2)
- IGM and A-Port (Table 2-3)
- A-Port, G-Port, and IGM (Table 2-4
  The following notations apply to Table 2-1 through Table 2-4.

  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 2-1 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 Error Component b) Relay to configured default CDMA SMSC	Relay	Relay	Relay	Relay
RN and PT ≠ 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 ≠ 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 2-2 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) for PT = 0: Existing Encode NPS for PT = 36: maps to 0 if needed	GTT	GTT	GTT	GTT	GTT
No NE and PT = PPSMSPT	GTT	GTT	GTT	GTT	GTT	GTT
No DN entry found	GTT	GTT	GTT	GTT	GTT	GTT

Table 2-3 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
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 2-4 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 for PT = 36: mps to 0	Relay	Relay	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
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

Table 2-4 (Cont.) IGM, A-Port, and G-Port Customer Message Processing

NE/PT	SRI	SRI_SM	Other GSM	LOCREQ	SMSREQ	Other IS41
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** does not overwrite the SCCP CdPA GTA. For all other values, the **EAGLE** formats the SCCP CdPA GTA according to the value assigned to DigitAction. Table 2-5 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 2-5 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 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** 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 though 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** 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**, 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** 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 though 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** 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 though 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 use 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 2-6 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 2-6 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

Table 2-6 (Cont.) 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
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
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 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 for local subsystem processing; however, EAGLE does not provide true subsystem support for these queries. Any LOCREQ query message to a True, Secondary, or Capability Point Code of the EAGLE 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.
- 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

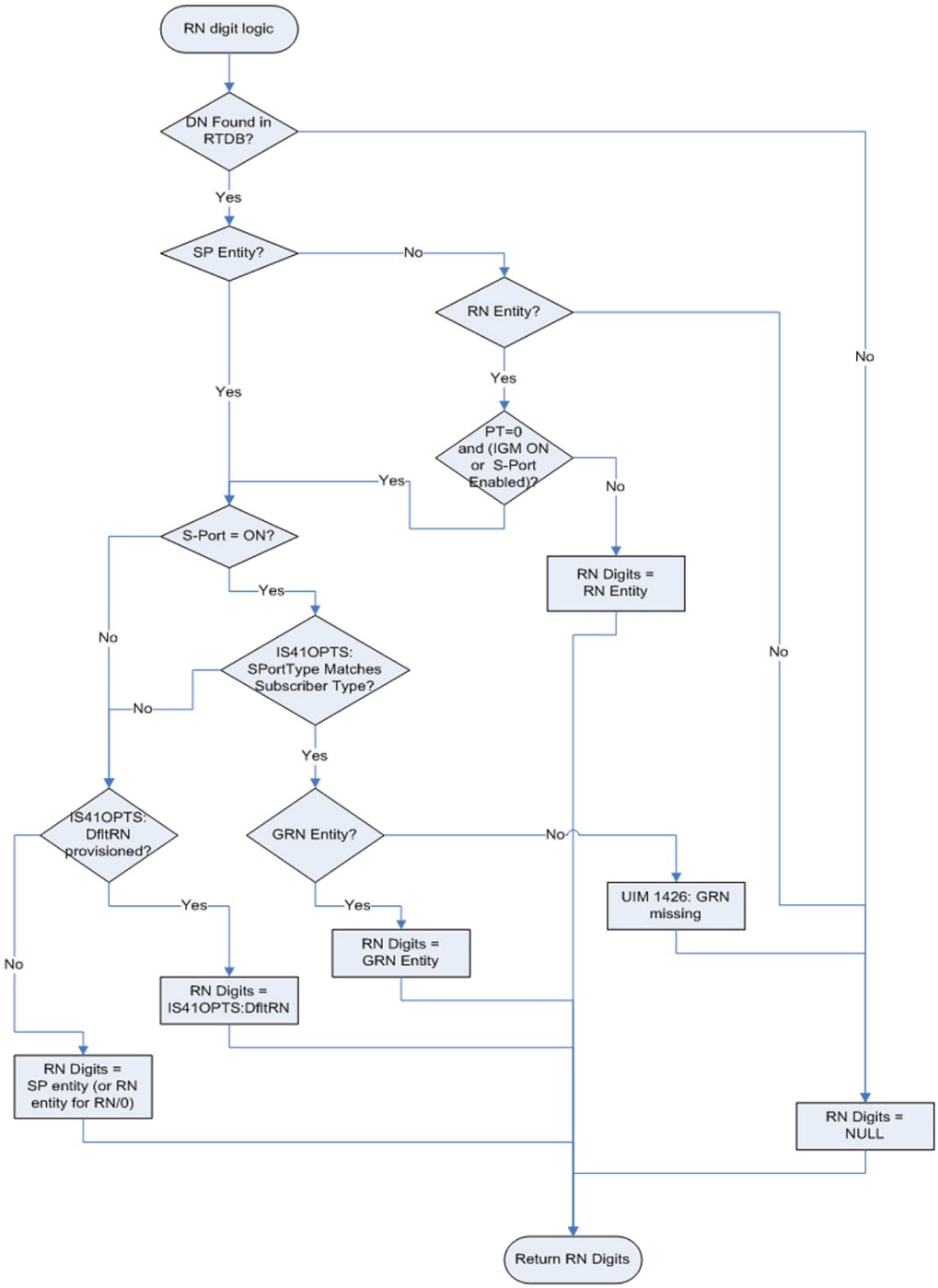
For LOCREQ Query Response processing to occur, the LOCREQ Query Response feature must be enabled and turned on and the IS41OPTS option LOCREQRSPND must be set to `on`. The LOCREQ Query Response feature processes only ANSI TCAP Query with Permission messages with an Operation Code of LocReq.

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 2-1 shows the logic to determine the RN digits used in the LOCREQ query response.

Figure 2-1 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 2-7 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 2-7 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 card**s. The SCCP messages forwarded by either feature are processed in the same way on the Service Module cards. The difference between the two features is that the MTP Routed GWS Stop Action feature filters messages based on provisioned **Gateway Screening** rules on a per **linkset** basis and forwards only **UDT**, **UDTS**, **XUDT** and **XUDTS** SCCP messages to Service Module cards, while the MTP Msgs for SCCP Apps feature forwards all MTP routed SCCP messages to the Service Module card without filtering. Because the MTP Routed GWS Stop Action feature selectively forwards the messages to the Service Module card, the feature has less impact on SCCP performance than the MTP

Msgs for SCCP Apps feature. The features can coexist, which means that both features can be turned on in the same system.

MTP Msgs for SCCP Apps

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

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

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

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

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

If the message has ANSI TCAP, then:

- General TCAP/MAP verification for A-Port is performed if the A-Port or IGM feature is turned on. Only LOCREQ and SMSREQ messages are handled by A-Port or IGM for MTP routed messages.
- When GTI ≠ 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 ≠ 0, then:

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

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

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

MTP Routed GWS Stop Action

The MTP Routed GWS Stop Action feature (part number 893-0356-01) provides a Gateway Screening (GWS) stop action: `sccp`. This stop action allows IS41-based features to process MTP routed traffic. GWS rules are used to filter MTP routed SCCP messages (UDT, UDTS, 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 – GWS User's Guide* for additional information and provisioning procedures for the MTP Routed GWS Stop Action feature.

SMSREQ Handling for Migrated or Ported Subscribers

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

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

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

Table 2-8 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 charater string specified in the GSMSMSOPTS:DEFIS41SMSC option.

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

Table 2-9 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 must be previously provisioned by the EAGLE 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 (E5-SM4G, E5-SM8G-B, or SLIC cards) running the SCCPHC application. The EAGLE can be equipped with up to 32 (31+1) Service Module cards.

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

MPS/EPAP Platform

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

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

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

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

3
Commands

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

Introduction

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

EAGLE GSM System Options Commands

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

- **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 3-1 `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
msisdntrunc	1 digit (0-5)	MS ISDN Truncation digits

Table 3-1 (Cont.) `chg-gsmopts` Parameters

Parameter	Range	Description
msrndig	rn, rndn, ccrndn, rnccdn, rnasd, asdrn, rnasddn, asdrndn, ccrnasddn, ccasdrndn, rnasdccdn, asdrnccdn, rngrn, grnrn, rngrndn, grnrndn, ccrngrndn, ccgrnrndn, rngrnccdn, grnrnccdn	RN used "as is" or with MSISDN
msrnnai	1-7	NAIV for the MSRN
msrnnp	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	encdnpsdnnotfound, encdnpsptnone, encodecug, encodenps, srismgttrtg	This parameter turns off specified options. Up to 8 comma-separated unique options can be specified. – encdnpsdnnotfound - 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 `off`. – 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 `off`. – 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 `off`. – 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 `on`. – srismgttrtg - SRI_SM Routing option This option specifies whether the SRI_SM routing feature is on. The default setting is `off`.
on	encdnpsdnnotfound, encdnpsptnone, encodecug, encodenps, srismgttrtg	This parameter turns on specified options. Up to 8 comma-separated unique options can be specified. Refer to `off` parameter for option descriptions.
serverpfx	1-4 digits, none	Server SRI prefix
srfaddr	1-15 digits	Entity address of MNP_SRF node
srfnai	0-127	NAIV of the MNP_SRF

Table 3-1 (Cont.) `chg-gsmopts` Parameters

Parameter	Range	Description
srfnp	0-15	Numbering plan value of the MNP_SRF Network Code
sridn	tcap, sccp	Send Routing Information Dialed Number location
sridnnotfound	gtt, srinack	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 GSM SMS Options Commands

The GSM SMS options (`chg/rtrv-gsmsmsopts`) commands change and display specific SMS and MMS options in the EAGLE database. The `chg-gsmsmsopts` command parameters associated with IS41 GSM Migration feature are shown in Table 3-2.

- **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 3-2 chg-gsmsmsopts Parameters

Parameter	Range	Description
defis41smsc	1-15 digits, none	Default IS41 short message service center
igmsmsrelay	yes, no	IGM-based SMS relay
is41smscgttsn	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 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.

- **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 3-3 `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
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 `on` and `off` 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, frmsg, intl, natl, rnidn, rnndn, 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

Table 3-3 (Cont.) `chg-is41opts` Parameters - Class = DATABASE

Parameter	Range	Description
off	locreqrmhrn, locreqrspnd, smsreqbypass	This parameter turns off the specified options. Up to 8 comma-separated unique options can be specified. – 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 `off`. – 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 `off`. – smsreqbypass - SMSREQ Bypass. This option specifies whether a received SMSREQ message that passes the MNP Service Selector (`serv=mnp` parameter of `chg-sccp-serv`) will undergo A-Port message processing. Option default is `off`. This parameter cannot be specified in the same command entry as the `locreqrmhrn` and `smsreqbypass` parameters.
on	locreqrmhrn, locreqrspnd, smsreqbypass	This parameter turns on the specified options. Up to 8 comma-separated unique options can be specified. See `off` parameter for option descriptions. This parameter cannot be specified in the same command entry as the `locreqrmhrn` and `smsreqbypass` 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.

Table 3-3 (Cont.) `chg-is41opts` Parameters - Class = DATABASE

Parameter	Range	Description
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 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.
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.
rsppparm	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 (`serv=mnp` parameter of `chg-sccp-serv`) will undergo IS41 GSM Migration (IGM) message processing. This parameter cannot be specified in the same command entry as the `on` and `off` parameters. The MT-Based IS41 SMS NP feature does not consider the value of this parameter. If `smsreqbypass` has a value of `yes`, 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 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.

- **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 3-4 `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 3-5 `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
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, rnidn, rnndn, 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 3-6 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 3-7 rtrv-srvsel Parameters

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

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.

- **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 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 reduces by the number of entries shown in the `rtrv-sccp-serv` command output. For more information on provisioning MRN tables, refer to *Database Administration - GTT User's Guide*.

- **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 seven PCs may be in a network type grouping for service re-route load sharing. This command allows for additions and modifications of up to four PCs at once. The point code parameters support the **Spare Point Code** subtype prefix *s-* for ITU-I and ITU-N point codes.

Table 3-8 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 *Commands ser's Guide*	Post **GTT**-translated **PC**
rc1	Optional	00-99	Relative Cost

Table 3-8 (Cont.) chg-sccp-serv Parameters

Parameter	Optional/ Mandatory	Range	Description
pc2, pca2, pci2, pcn2, pcn242	Optional	Refer to *Commands ser's Guide*	Post GTT-translated PC
rc2	Optional	00-99	Relative Cost
pc3, pca3, pci3, pcn3, pcn243	Optional	Refer to *Commands ser's Guide*	Post GTT-translated PC
rc3	Optional	00-99	Relative Cost
pc4, pca4, pci4, pcn4, pcn244	Optional	Refer to *Commands ser's Guide*	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 3-9 dlt-sccp-serv Parameters

Parameter	Optional/ Mandatory	Range	Description
serv	Mandatory	gport, gflex, mnp	Service
pc1, pca1, pci1, pcn1, pcn241	Optional	Refer to *Commands ser's Guide*	Post GTT-translated PC
pc2, pca2, pci2, pcn2, pcn242	Optional	Refer to *Commands ser's Guide*	Post GTT-translated PC
pc3, pca3, pci3, pcn3, pcn243	Optional	Refer to *Commands ser's Guide*	Post GTT-translated **PC**
pc4, pca4, pci4, pcn4, pcn244	Optional	Refer to *Commands ser's Guide*	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. Point codes are grouped by service.

4

Feature Configuration

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:

- 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)
- E5-SM4G Throughput Capacity
- Service Portability
- LOCREQ Query Response
- MTP Msgs for SCCP Apps

These feature activation procedures are performed at the EAGLE. Refer to *Commands User's Guide* for complete descriptions of the commands used in these procedures.

The IGM feature and other related features are optional and are purchased from Oracle. Contact your 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 (MNPCRP)**

Summary of Feature Activation

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

Table 4-1 Feature Activation Summary

Feature Name	Part Number	Temporary FAK Available?	Permanently On?
IS41 GSM Migration (IGM)	893017301	No	Yes
MNP Circular Route Prevention (MNPCRP)	893007001	Yes	No
E5-SM4G Throughput Capacity	893019101 893019102	No	Yes

Table 4-1 (Cont.) Feature Activation Summary

Feature Name	Part Number	Temporary FAK Available?	Permanently On?
Service Portability	893034301	No	No
LOCREQ Query Response	893038501	No	Yes
MTP Msgs for SCCP Apps	893017401	No	No

Feature Activation Consideration

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 purchased feature license and technical support from My Oracle Support (MOS) are available before turning on this feature. Contact your Sales or Account Representative to verify whether the feature has been purchased.

EPAP Entity Provisioning

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

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

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 - GTT User's Guide* for provisioning procedures.

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

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 IGMfeature. 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 HLR Destinations Configuration

This procedure configures tche EAGLE system for Home Location Register (HLR) destinations before activating the EPAP-related feature. This procedure assumes that the EAGLE 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.

Procedure Overview

- Display current **PC**s, **CPC**s, **DPC**s, routes, and linksets using 1 through 6.
- Change current PCs, CPCs, DPCs, routes, linksets, and **LIM** cards using 7 through 25.

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

- Point Code Formats
- Adding a Point Code to the Self-Identification of the EAGLE
- Changing the Self-Identification of the EAGLE
- 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 code**s (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 1, 2, or 3, choose another point code to configure with this procedure. If configuring an ITU-N network, continue to 5. If configuring a mated application but not configuring an ITU-N network, proceed to 6. Otherwise, proceed to 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 `npcfmti` 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 *Database Administration - SS7 User's Guide*.

   Continue to 6to display mated applications in the database. Otherwise, proceed to 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 *Database Administration - Features User's Guide*.
   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 2) and not the destination point code of a route (refer to output in 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" and "Changing the Self-Identification of the EAGLE" in *Database Administration - SS7 User's Guide*.
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 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

                                    L3T  SLT              GWS GWS GWS
    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
                        L2T       L1              PCR PCR
    LOC  PORT SLC TYPE  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

                                    L3T SLT              GWS GWS GWS
    LSN          APCN   (SS7)  SCRN  SET SET BEI LST LNKS ACT MES DIS SLSCI NIS
    ls500001     21122         scr3  1   2  no  a   0 on   off  off no    on
    CLLI         TFATCABMLQ  MTPRSE  ASL8
    RLGHNCXA03W  1           no      no
                        L2T       L1              PCR PCR
    LOC  PORT SLC TYPE  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   ls400001      A    00  ------------  B    --
    1106   LIME1     CCS7ITU   ls500001      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=ls400001:slc=0:e1port=1:ts=1
    ```

    ```
    ent-
    slk:l2tset=1:link=a:loc=1106:lsn=ls500001: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 23.

16. Verify the changes using the `rtrv-slk` command, specifying the card location and ID of the signaling link entered in 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=ls400001:rc=10
    ```

    ```
    ent-rte:dpcn=21112:lsn=ls500001: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 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 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.

> **Caution:**
>
> Before starting this procedure, contact 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:dsmaud=on:npcfmti=2-9-2-1
```

    where:

    :defcc
    Default country code

    :defndc
    Default network destination code

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

:npcfmti
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 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:msrsndig=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:ss
    n=9:tt=1
    ```

    where:

    :gtii
    Global title indicator, ITU international

    :nai
    Nature of address indicator

    :np
    Numbering plan

    :serv
    Service feature

    :snai
    International **Service Nature of Address Indicator**

    :snp
    Service numbering plan

    :ssn
    Subsystem number

    :tt
    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 SCCPHC 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 14 for each Service Module card in the system.
16. Set the IGM service state online using `chg-sccp-serv:serv=mnp: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.

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 to receive the Feature Access Key (FAK) that is required to enable the feature. Contact your Sales Representative or Account Representative to determine whether you are entitled to use 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 `dfltrn` 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 Portabilty 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`.

1. Display the status of controlled 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  EAGLE 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.

   - 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 4 to turn on the LOCREQ Query Response feature.
- To enable and turn on the LOCREQ Query Response feature, continue to 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  EAGLE 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 `locreqrspnd` 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  EAGLE 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`.

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

   Command example:

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

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

Command example:

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

8. 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`.

9. 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.

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

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

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

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

   Command example:

   ```
   rtrv-ctrl-feat
   ```

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

2. Enable the S-Port feature.

Command example:

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

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

   Command example:

   ```
   rtrv-ctrl-feat
   ```

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

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

4. Turn on the S-Port feature.

   Command example:

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

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

   Command example:

   ```
   rtrv-ctrl-feat
   ```

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

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

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

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

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

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

MTP Routed Messages for SCCP Applications Activation Procedure

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

- Before the MTP Msgs for SCCP Apps feature can be enabled, GTT must be on.

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

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

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

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

   Command example:

   ```
   rtrv-ctrl-feat
   ```

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

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

2. Enable the MTP Msgs for SCCP Apps feature.

   Command example:

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

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

   Command example:

   ```
   rtrv-ctrl-feat
   ```

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

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

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

   Command example:

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

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

   Command example:

```
rtrv-ctrl-feat

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

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

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

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

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

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

5
Measurements

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

IGM Measurements

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

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

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

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

Table 5-1 describes the peg counts of Message Signalling Units (MSUs) supported per-system for the A-Port featureIGM feature.

Table 5-1 Pegs for Per System IGM Measurements

Event Name	Description	Type	Unit
APSMSRCV	Number of **SMS** Request messages received • If the MT-Based IS41 SMS NP feature is not turned on and the `is41opts:smsreqbypass` option is set to yes, this count will not be updated. • If neither the MT-Based IS41 SMS NP feature nor the IGM feature is turned on, this count will not be updated.	System	Peg count
APSMSREL	Number of SMS Request messages relayed • If the MT-Based IS41 SMS NP feature is not turned on and the is41opts:smsreqbypass option is set to yes, this count will not be updated. • If neither the MT-Based IS41 SMS NP feature nor the IGM feature is turned on, this count will not be updated	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

Table 5-1 (Cont.) Pegs for Per System IGM Measurements

Event Name	Description	Type	Unit
APSMRQERR	Number of SMSREQ messages received that resulted in error 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.	System	Peg count
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
IS41LRRTRN	Number of IS-41 Location Request - Return Result messages sent	System	Peg count

Table 5-2 describes the peg counts of Message Signalling Units (MSUs) supported per-SSP for the IGM feature.

Table 5-2 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 5-3 describes the peg counts of Message Signalling Units (MSUs) supported both per-system and per-SSP for the IGM feature.

Table 5-3 Pegs for Per System and Per SSP IGM Measurements

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

6
Maintenance

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

IGM Related Alarms

All **IGM** related Unsolicited Alarm Messages (UAMs) are output to the Maintenance Output Group. *Unsolicited Alarm and Information Messages Reference* contains a complete description of all UAMs. Table 6-1 contains a listing of UAMs used to support the IGM feature.

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

Table 6-1 IGM Related UAMs

UAM	Severity	Message Text	MPS or EAGLE
0013	Major	Card is isolated from system	EAGLE
0084	Major	IP Connection Unavailable	EAGLE
0085	None	IP Connection Available	EAGLE
0099	Major	Incompatible **HW** for provisioned slot	EAGLE
0250	None	MPS available	MPS
0261	Critical	MPS unavailable	MPS
0328	None	**SCCP** is available	EAGLE
0329	None	SCCP capacity normal, card(s) abnormal	EAGLE
0330	Major	SCCP **TPS** Threshold exceeded	EAGLE
0331	Critical	SCCP is not available	EAGLE
0335	None	SCCP is removed	EAGLE
0336	Major	**LIM**s have been denied SCCP service	EAGLE
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
0423	None	**Card** reload attempted	EAGLE
0441	Major	Incorrect **MBD - CPU**	EAGLE

Table 6-1 (Cont.) IGM Related UAMs

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

IGM UIMs

Unsolicited Alarm and Information Messages Reference contains a complete description of all Unsolicited Information Message (UIM) text and formats. Table 6-2 lists UIMs used to support the IGM feature.

Table 6-2 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
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

Table 6-2 (Cont.) IGM Related UIMs

UIM	Text	Description	Action	Output Group (UI Output Direction)
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 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.	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
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 `chg-stpopts :defcc=xxx`	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 `chg-stpopts :defndc=xxxxx`	application subsystem
1246	Invalid length of conditioned digits	Invalid length of condition- ed 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

Table 6-2 (Cont.) IGM Related UIMs

UIM	Text	Description	Action	Output Group (UI Output Direction)
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 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 User's Guide* for complete descriptions of the commands, including parameters, valid parameter values, rules for using the commands, and output examples.

Table 6-3 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 `rept-stat-sccp` 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.

Table 6-3 (Cont.) Maintenance Commands

Command	Description
rept-stat-trbl	Includes a summary of any trouble notifications (**UAM**s) 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 databases. This includes the level information for each Service Module card, and for the active and standby EPAP RTDB. The command reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birth dates and levels. It shows the status of each PDB and RTDB when an EPAP-related feature is enabled.
rtrv-tbl capacity	Retrieves table use capacity summary information. For each table listed, the number of table entry elements in use and the total allowed number of table elements is presented, along with a percent (%) full value. Information is shown for some tables only if the feature that uses the table is enabled.
inh-card/alw-card	The `inh-card` command is used to change the operating state of the card from In-Service Normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD). A craftsperson then can test the card or physically remove it from the shelf. The `alw-card` command is used to change the card from OOS-MT-DSBLD (Out-of-Service Maintenance-Disabled) to IS-NR (In-Service Normal) if card loading is successful.
inh-alm/unhb-alm	Used to allow and inhibit reporting of alarms for a given device, including the Service Module card ports. The commands allow both Port A and Port B to be specified. Inhibited alarms will not generate UAMs or cause alarm indicators to be turned on. All `rept-stat-xxx` 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 `loc` parameter is specified and the target card is an active Service Module card, the RTDB data is retrieved from that card. If the `loc` 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. Statistics are displayed under SMSMR Service Statistics for MO SMS IS41-to-GSM Migration, MO-Based GSM SMS NP, MO-Based IS41SMS NP, and PPSMS features.

EAGLE Debug Commands

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

Status Reporting and Problem Identification

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

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

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

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

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

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

Table 6-4 Status Reporting for EPAP-Related Features

Reports, Status, and Statistics	Command
EAGLE	
Maintenance Status Report - indicates whether Maintenance, Routing, and SCCP Baselines have been established.	`rept-stat-sys`
Alarms and operating state for system devices, including Service Module ("SCCP") cards.	`rept-stat-sys`
Unsolicited Alarm Messages (UAMs) and Unsolicited Information Messages (UIMs)	`rept-stat-alm` `rept-stat-trbl`
EPAP/MPS (from the EAGLE)	
EPAP code version and operating state for each EPAP.	`rept-stat-mps`
MPS hexadecimal alarm strings for the active and standby EPAPs.	`rept-stat-mps`
Operating state and alarm status of equipped Service Module cards and their DSM ports and IP connections.	`rept-stat-mps` `rept-stat-mps:loc=<Service Module card location>`
Amount of memory used by the RTDB on the specified card, as a percent of available Service Module card memory.	`rept-stat-mps:loc=<Service Module card location>`
EPAP Provisioning Database (PDB), EPAP Real Time Database (RTDB), and Service Module card RTDB status information - Coherent, birthdate (date and time of creation), and exception (condition when a problem was detected).	`rept-stat-db` `rept-stat-db:db=mps`
Service Module Cards, EPAP-Related Features, Services, Local Subsystems	

Table 6-4 (Cont.) Status Reporting for EPAP-Related Features

Reports, Status, and Statistics	Command
Status of the Service Module cards, and the services executing on the cards for EPAP-related features that are turned on. Includes Service Report, Subsystem Report, and Alarm Status; Total Service Statistics.	`rept-stat-sccp`
Operating state and alarm status of equipped Service Module cards and their DSM ports and IP connections; EPAP-related feature status per card.	`rept-stat-mps:loc=<Service Module card location>`
Alarms and operating state for Service Module ("SCCP") cards.	`rept-stat-sys` `rept-stat-mps`
Any cards that are denied SCCP service.	`rept-stat-sccp`
Detailed view of the status of SCCP services provided by the specified Service Module card. Includes Card Alarm Status, Card Service Statistics	`rept-stat-sccp:loc=<Service Module card location>`
General SCCP traffic performance for Service Module cards. Message rates for TVG performance.	`rept-stat-sccp:mode=perf`
Statistics for EPAP-related feature local subsystems - Subsystem Report	`rept-stat-sccp`
Statistics for EPAP-related features	`rept-stat-sccp`

EPAP Status and Alarm Reporting

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

EPAP Maintenance Blocks

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

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

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

- Status of EPAP A - actual states are active, standby, and down (inoperative). Maintenance blocks include a field for this information so that it can be available for the output of the `rept-stat-mps` command.

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

DSM Status Requests and DSM Status Messages

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

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

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

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

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

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