Oracle® Communications EAGLE IS41 GSM Migration User's Guide





Oracle Communications EAGLE IS41 GSM Migration User's Guide, Release 48.0

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Acronyms

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

Table Acronyms

| Acronym | Definition |
|---------|--|
| CdPA | Called Party Address |
| EPAP | EAGLE Application Processor Provisioning |
| GRN | Generic Routing Number |
| GTA | Global Title Address |
| GTT | Global Title Translation |
| IGM | IS41 GSM Migration |
| LNP | Local Number Portability |
| MDN | Mobile Dialed Number |
| MNPCRP | MNP Circular Route Prevention |
| NPSI | Number Portability Status Indicator |
| RTDB | Real Time Database |
| SRF | Signaling Relay Function |
| TFA | Transfer Allowed |
| TFP | Transfer Prohibited |

What's New in This Guide

This section introduces the documentation updates for Release 48.0 in Oracle Communications EAGLE IS41 GSM Migration User's Guide.

Release 48.0 -G48915-01, December 2025

There are no updates in the document for this release.

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.

References

For more information, refer to the following documents:

- Database Administration GWS User's Guide
- Application B Card Hardware and Installation Guide
- Hardware Reference
- EPAP Administration Guide
- Commands User's Guide
- Database Administration GTT User's Guide
- Database Administration SS7 User's Guide



- Database Administration -Features User's Guide
- Measurements Reference
- Database Administration System Management User's Guide
- Unsolicited Alarm and Information Messages Reference
- EPAP Alarms and Maintenance Guide

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 <code>crptt</code> parameter of the <code>chg-gsmopts</code> command must be set to a value between 0 and 255. If the <code>crptt</code> parameter of the <code>chg-gsmopts</code> command is set to the default value of <code>none</code>, then no Circular Route Prevention on Translation Type processing is performed. The MNP Circular Route Prevention feature cannot be turned off if the <code>crptt</code> parameter is provisioned to any value other than <code>none</code>. 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 Areas** (**CNL**s) to be grouped into **Large Geographic Areas** (**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 <code>encodecug</code> option is set to <code>off</code>, the CUG-CheckInfo parameter is not encoded in the SRI Ack message.

If the <code>encodecug</code> 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 <code>srismgttrtg</code> option of the <code>chg-gsmopts</code> command off and on parameters. The <code>srismgttrtg</code> option of the <code>chg-gsmopts</code> 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 <code>encodenps</code> option of the <code>chg-gsmopts</code> command <code>off</code> and on parameters. The <code>encodenps</code> option of the <code>chg-gsmopts</code> <code>off/on</code> 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.)



MAAD Dhaan in ant based on sither

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. <u>Table 2-1</u> through <u>Table 2-4</u> show call dispositions for the following configurations:

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

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 | Othe r IS41 |
|---------------------------------------|---|---|--------------|---|---|-------------------|
| RN and PT = 0 | MIGRPFX = single: ACK, use GSM2IS41 prefix | option: | Relay | Relay | Relay | Relay |
| | MIGRPFX = multiple: ACK, RN from RTDB | a) SRI_SM_NACK with Return Error Component | | | | |
| | | b) Relay to configured default CDMA SMSC | | | | |
| RN and PT ≠ 0 | GTT | GTT | GTT | GTT | GTT | GTT |
| SP and PT = 5 | Relay | Relay | Relay | ReturnResul t 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 | ReturnResul t 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 | ReturnResul t 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 | ReturnResul t 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 | | Relay | Relay | Relay | Relay |
| | | b) Relay to configured default CDMA SMSC | | | | |
| RN and PT≠ 0 | GTT | GTT | GTT | ReturnResul t with RN from RTDB | Relay | Relay |
| SP and PT= 5 | Relay | Relay | Relay | ReturnResul t 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 | ReturnResul t 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 | ReturnResul t (no NE) | GTT | GTT |
| No NE and PT = 1, 2, 36, or No PT | GTT | GTT | GTT | ReturnResul t (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 | ReturnResul t with RN from RTDB | Relay | Relay |
| SP and PT = 5 | Relay | Relay | Relay | ReturnResul t 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 | ReturnResul t 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 | ReturnResul t (no NE) | GTT | GTT |
| No NE and PT = 1, 2 or No PT | ACK (no NE) | GTT | GTT | ReturnResul t (no NE) | GTT | GTT |
| No NE and PT = PPSMSPT | GTT | GTT | GTT | GTT | GTT | GTT |
| No DN entry found | GTT | GTT | GTT | GTT | GTT | GTT |

Database lookup results in the following:



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

Message Relay

The rules for formatting the SCCP CdPA GTA field are based on the value specified in the DigitAction field. In the case where a received IS41 message is relayed, the EAGLE formulates the SCCP CdPA GTA field of the outgoing message according to DigitAction specified. If DigitAction = none, the EAGLE 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
- Allow users to specify the DigitType value to encode the TCAP Outgoing Called Party parameter
- Allow users to specify the value to encode the Nature of Number field of the TCAP Outgoing Called Party parameter
- Allow users to specify the value to encode the Numbering Plan field of the TCAP Outgoing Called Party parameter



- 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 locred message
- Allow users to specify the ESN values to be encoded in the locreq message
- 8. Allow users to specify how the digits of the locreg 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
- Allow users to specify which SRI parameter (the TCAP MSRN parameter) encodes the RN (and/or DN) information
- Allow users to specify the value to encode the Nature of Address field of the TCAP MSRN parameter
- 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:pcil=1-1-1:rc1=10:pci2=2-2-2:rc2=10:pci3=3-3-3:rc3=10:pc
i4=4-4-4:rc4=10

chg-sccp-
serv:serv=mnp:pcil=1-1-1:rc1=10:pci2=2-2-2:rc2=10:pci3=3-3-3:rc3=10:pc
i4=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:pc
i4=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 .

<u>Table 2-6</u> 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 |
| 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 |



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 |
|----------------------------|---|--|--|---|-----------------------|
| 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.

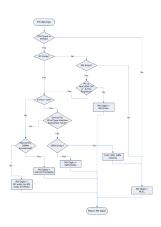


Figure 2-1 LOCREQ Query Reponse RN Determination

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 guery 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.

<u>Table 2-7</u> 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 cards. The SCCP messages forwarded by either feature are processed in the same way on the Service Module cards. The difference between the two features is that the MTP Routed GWS Stop Action feature filters messages based on provisioned Gateway Screening rules on a per linkset basis and forwards only UDT, UDTS, XUDT and XUDTS SCCP messages to Service Module cards, while the MTP Msgs for SCCP Apps feature forwards all MTP routed SCCP messages to the Service Module card without filtering. Because the MTP Routed GWS Stop Action feature selectively forwards the messages to the Service Module card, the feature has less impact on SCCP performance than the MTP Msgs for SCCP Apps feature. The features can coexist, which means that both features can be turned on in the same system.

MTP Msgs for SCCP Apps

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

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



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

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

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 \neq 0, then:

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

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

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

MTP Routed GWS Stop Action

The MTP Routed GWS Stop Action feature (part number 893-0356-01) provides a Gateway Screening (GWS) stop action: sccp. This stop action allows IS41-based features to process MTP routed traffic. GWS rules are used to filter MTP routed SCCP messages (UDT, UDTS, 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.
- 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.
- 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.
- 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*.

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 |
| srfnp | 0-15 | Numbering plan value of the MNP_SRF Network Code |



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

| Parameter | Range | Description |
|---------------|--------------|---|
| 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 | аууууууу | 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 chq-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. |
| 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. |



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

| Parameter | Range | Description |
|--------------|---|---|
| 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. |
| rspparm | ddigit, rtdigit, tlist | Response Parameter. This parameter specifies which TCAP LOCREQ parameter (TCAP Outgoing Called Party) will encode the RN and/or DN information. |
| smsreqbypass | yes, no | SMSREQ Bypass. This parameter specifies whether a received SMSREQ message that passes the MNP Service Selector (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 https://docs.pic.com/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 |
| pc2, pca2, pci2, pcn2, pcn242 | Optional | Refer to Commands ser's Guide | Post GTT-translated PC |



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

| Parameter | Optional/ | Range | Description |
|-------------------------------|-----------|-------------------------------|------------------------|
| | Mandatory | | |
| 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.

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 | No | Yes |
| | 893019102 | | |
| Service Portability | 893034301 | No | No |



Table 4-1 (Cont.) Feature Activation Summary

| Feature Name | Part Number | Temporary FAK Available? | Permanently On? |
|------------------------|-------------|--------------------------------|--------------------|
| 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 <u>IGM Feature Activation Procedure</u> 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 PCs, CPCs, DPCs, 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 <u>5</u>. 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
```

:apc/apca/apci/apcn

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

:Isn

where:

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 **Isn400001** command example:

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

| | | | | L3T | SLI | ı | | | GWS | GWS | GWS | | |
|--------------|---------|-------|--------|------|------|-----|-----|-------|-----|-----|-----|-------|----|
| LSN | APCI | (SS7) | SCRN | SET | SET | BEI | LST | LNKS | ACT | MES | DIS | SLSCI | |
| NIS | | | | | | | | | | | | | |
| ls400001 | 2-200-2 | 2 | scr1 | 1 | 2 | no | a | 0 | on | off | off | no | on |
| CLLI | TFATCAE | BMLQ | MTPRSE | ASI | 18 | | | | | | | | |
| RLGHNCXA03W | 1 | | no | no | | | | | | | | | |
| | | L2T | | L1 | | | PCI | R PCR | | | | | |
| LOC PORT SLO | C TYPE | SET | BPS | MODE | TSET | ECM | N1 | N2 | | | | | |

Example of possible output for **Isn500001** command example:

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

```
GWS GWS GWS
                              L3T SLT
           APCN
                  (SS7) SCRN SET SET BEI LST LNKS ACT MES DIS SLSCI NIS
LSN
ls500001
           21122
                         scr3
                              1
                                  2 no a
                                            0 on
                                                 off off no
CLLI
           TFATCABMLO MTPRSE ASL8
RLGHNCXA03W 1
                       no
                             no
                   L2T
                                           PCR PCR
                            L1
LOC PORT SLC TYPE
                   SET BPS
                            MODE TSET ECM
```

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:elport=1
ent-t1:loc=1106:elport=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 | | | В | |
| 1106 | T.TMF.1 | CCS7TTII | 1s500001 | Δ | 0.0 | | | R | |

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:elport=1:ts=1
ent-slk:l2tset=1:link=a:loc=1106:lsn=ls500001:slc=0:elport=1:ts=1
where:
```

:I2tset

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

:Isn

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:

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
```

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.
- Add Routing Number prefixes for the operating network, using the ent-homern command. Add Home RNs that are prefixed to DNs for incoming INPMR messages. Up to 100 Routing Number prefixes for the operating network can be added to the HOMERN table.

For example:

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

where:

:rn

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



- 10. Verify the changes using the rtrv-homern command to retrieve a list of Routing Number prefixes that belong to the operating network.
- 11. Display the list of administered service selector combinations, using the rtrv-srvsel command.

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

12. Enter the IGM service selectors by network type, if necessary, using the ent-srvsel command.

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

For example:

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

where:

:gtii

Global title indicator, ITU international

:nai

Nature of address indicator

:np

Numbering plan

:serv

Service feature

: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:
```



Global title indicator, ITU international



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

- 15. After In-Service-Normal (IS-NR) state of the Service Module card is restored and verified using the rept-stat-card command, repeat step 14 for each Service Module card in the system.
- 16. Set the IGM service state online using chq-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-is4lopts command can be modified only if the LOCREQ Query Response feature is enabled and turned on. The dfltrn parameter of the chg-is4lopts command can be modified only if the LOCREQ Query Response feature is enabled. The sporttype parameter of the chg-is4lopts 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 LOCREO Query Response feature is enabled and turned on.
- The locreqrspnd option of the chg-is41opts command is set to on.
- 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 $\frac{4}{2}$ 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 thelocregraph option of the chq-is4lopts command is set to on.

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 chq-is4lopts 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-is4lopts command to on.

Command example:

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

8. Verify that the IS410PTS parameter setting are correct.

Command example:



```
rtrv-is41opts
```

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

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

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

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.

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

BACKUP (FIXED): MASP A - Backup starts on standby MASP.

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

Service Portability Activation Procedure

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

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.

 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 $\frac{4}{2}$ to turn on the S-Port feature. To enable and turn on the S-Port feature, continue to $\frac{2}{2}$.

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.

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.

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.

 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

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 chq-ctrl-feat command, but cannot be disabled.

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

<u>Table 5-1</u> 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 | Туре | 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 | Туре | Unit |
|-------------------|--|--------|-----------|
| APSMRQERR | Number of SMSREQ messages received that resulted in error | System | Peg count |
| | This count is applicable only when the incoming message is SMSREQ. The peg count is incremented only when the MT-Based IS-41 SMS NP feature is turned on. If the IGM feature is also turned on and the IGM feature handles the message resulting in an error, this peg count is incremented. | | |
| GPSRRCV | Number of call-related SRI messages received | System | Peg count |
| GPSRGTT | Number of call-related SRI messages that fell through to GTT | System | Peg count |
| GPSRREP | Number of call-related SRI messages that received A-Port service | System | Peg count |
| GPSRERR | Number of call-related messages that cause errors and SRI Negative ACK | System | Peg count |
| IS41LRERR | Number of IS-41 Location Request - Error response messages sent | System | Peg count |
| IS41LRMRCV | Number of IS-41 Location Request messages received. | System | Peg count |
| IS41LRRTRN | Number of IS-41 Location Request - Return Result messages sent | System | Peg count |

<u>Table 5-2</u> 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 | Туре | 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 |

<u>Table 5-3</u> describes the peg counts of Message Signalling Units (MSUs) supported both persystem and per-SSP for the IGM feature.



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

| Event Name | Description | Туре | 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 |

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. <u>Table 6-1</u> 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 | LIMs 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 |
| 0442 | Critical | RTDB database capacity is 95% full | EAGLE |
| 0443 | Major | RTDB database is corrupted | EAGLE |



Table 6-1 (Cont.) IGM Related UAMs

| UAM | Severity | Message Text | MPS or 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 |
| 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 |



Table 6-2 (Cont.) IGM Related UIMs

| UIM | Text | Description | Action | Output Group (UI Output Direction) |
|------|---|--|--|---|
| 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 revd 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=x xx | 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 |
| 1294 | Invalid digits in MAP MSISDN | No digits found in MAP MSISDN | Specify valid digits in the MSISDN | application subsystem |
| | parameter | parameter | | |
| 1295 | Translation PC is EAGLE's | PC translation is invalid because it is one of EAGLE PCs | Change the point code | application subsystem |



Table 6-2 (Cont.) IGM Related UIMs

| UIM | Text | Description | Action | Output Group (UI Output Direction) |
|------|---|--|--|---|
| 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. |
| 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. |



Table 6-3 (Cont.) Maintenance Commands

| Command | Description |
|-------------------|---|
| 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 \log parameter is specified and the target card is an active Service Module card, the RTDB data is retrieved from that card. |
| | If the \log 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. | <pre>rept-stat-mps rept-stat-mps:loc=<service card="" location="" module=""></service></pre> | | | |
| Amount of memory used by the RTDB on the specified card, as a percent of available Service Module card memory. | <pre>rept-stat-mps:loc=<service card="" location="" module=""></service></pre> | | | |
| 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:db=mps | | | |
| Service Module Cards, EPAP-Related Features, Services, Local Subsystems | | | | |
| 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. | <pre>rept-stat-mps:loc=<service card="" location="" module=""></service></pre> | | | |
| Alarms and operating state for Service Module | rept-stat-sys | | | |
| ("SCCP") cards. | rept-stat-mps | | | |
| Any cards that are denied SCCP service. | rept-stat-sccp | | | |



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

| Reports, Status, and Statistics | Command |
|---|---|
| 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 card="" location="" module=""></service> |
| 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 highprovisioning 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.