

# *Tekelec EAGLE<sup>®</sup> 5*

## *Integrated Signaling System*

### **Feature Manual - G-Port<sup>®</sup>**

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## Overview

This manual provides an overview of the G-PortMNP feature of the EAGLE 5 ISS (Integrated Signaling System). The G-Port MNP feature implements Mobile Number Portability for GSM networks according to ETSIGSM 03.66. In response to governmental mandates for telecommunication networks, this feature focuses on service provider number portability on GSM networks.

G-PortMNP minimizes the challenges for GSM network operators while enabling them to meet their regulatory obligations. G-Port supports the Signaling Relay Function (SRF) for direct and indirect routing. SRF-based MNP processing examines MAP messages for ported numbers. For call-related messages, G-Port acts as an “NPHLR” for exported number by responding with a MAPSRI message; G-Port performs a message relay function for calls to imported numbers and non-call related messages.

G-Port is an optional feature on the EAGLE 5 ISS, and can be enabled and turned on, but not turned off, via a feature access key (FAK). Note that requires the Global Title Translation (GTT) feature. G-Port and North American LNP (Local Number Portability) are mutually exclusive on an EAGLE 5 ISS node.

## Scope and Audience

This manual is intended for anyone responsible for installing, maintaining, and using the G-Port feature in the EAGLE 5 ISS. Users of this manual and the others in the EAGLE 5 ISS family of documents must have a working knowledge of telecommunications and network installations.

# Manual Organization

This document is organized into the following chapters:

- [Chapter 1 Introduction](#) contains general information about the G-Port documentation, the organization of this manual, and how to request technical assistance.
- [Chapter 2 Feature Descriptions](#) provides a functional description of G-Port, including network perspectives, assumptions and limitations, database overview, DSM provisioning and reloading, G-Port user interface, SDS commands, and the G-Port relay function.
- [Chapter 3 EAGLE 5 ISS G-Port Commands](#) describes the user interface in detail.
- [Chapter 4 G-Port Feature Activation](#) describes how to activate the G-Port feature.
- [Chapter 5 Maintenance and Measurements](#) describes maintenance and measurements in detail, including EPAP status and alarms, hardware verification messages, TSM emulation mode, G-Port system status reports and commands, code and application data loading, and alarms.

## Related Publications

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

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Content changes are indicated with change bars, the revision of the manual part number is incremented, and the month of publication is updated.

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- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
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# 2

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## Introduction

Throughout the world, an increasing number of governments are mandating that telecommunications network operators support service provider number portability. This is primarily intended to promote competition among service providers and applies to both wireline and mobile phone networks. In particular, the G-Port MNP (Mobile Number Portability) feature is focused on service provider portability in GSM (Global System for Mobile communications) networks.

Service provider portability allows a consumer to change service providers while retaining his phone number. While the advent of number portability is good news for consumers, its implementation can present many challenges for network operators. G-Port MNP minimizes those challenges for GSM network operators, while enabling them to efficiently meet their regulatory obligations.

G-Port MNP implements Mobile Number Portability for GSM networks according to the ETSI GSM 03.66 standard. The focus is on service provider portability among GSM networks in a defined portability cluster, usually

a country. With service provider portability, subscribers can change operators while retaining their MSISDN (Mobile Station international ISDN number) number. The MSISDN is the number dialed by someone trying to reach the subscriber. Their IMSI (International Mobile Station Identifier) number is not portable. The IMSI identifies the SIM (Subscriber Identity Module) card, which modularly plugs into the GSM handset.

The G-Port MNP feature is based on the EAGLE 5 ISS platform. It is deployed in a node that is also performing the STP function. G-Port MNP uses the Real Time Database (RTDB) to derive the portability status of subscribers.

## MNP Circular Route Prevention

The MNP Circular Route Prevention (MNPCRP) feature is an extension of the G-Port MNP feature which helps in cases of 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 this scenario.

## DigitAction Expansion

The DigitAction Expansion feature provides more flexibility to formulate the SCCP Called-Party Address - Global Title Address (GTA) field of the MAP messages relayed by G-Port. Without DigitAction Expansion, G-Port supports four options (none, insert, prefix, and replace) to overwrite the SCCP CdPA GTA field. With DigitAction Expansion, four additional options (delcc, delccprefix, spare1, and spare2) are included to overwrite the SCCP CdPA GTA field.

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.

## G-Port SCCP Service Re-Route

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

The G-Port SCCP Service Re-Route feature is designed to handle and control re-routing of G-Port traffic from an affected node to alternate nodes within an operators network. This feature is an optional feature and doesn't affect the normal G-Port functionality. This feature also provides the option to mark G-Port *OFFLINE* to perform a controlled re-routing during this state.

## Prepaid Short Message Service

The Prepaid Short Message Service (PPSMS) Intercept feature is based on the G-Port MNP feature and applies only to mobile originated SMS, those messages sent from a mobile handset through an Mobile Switching Center (MSC) to the Short Message Service Center (SMSC). PPSMS Intercept screens incoming messages from MSC based on the MAP operation code. Message Discrimination determines whether the sender's MSISDN is retrieved and a database lookup performed. Database lookup determines if the MSISDN belongs to a contract subscriber, and the message routed to the SMSC, or if the MSISDN belongs to a prepaid subscriber, and the message diverted to a third-party IN platform for a credit check before allowing the message to be delivered to the SMSC.

## MNP Check for Mobile-Originated SMS

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

## Multiple Country Code

The Multiple Country Code (MULTCC) feature supports up to 10 MULTCCs for customers having one MNP node servicing several countries, or areas with differing country codes. The MULTCCs are not used for conditioning of non-International numbers to International format for database lookup. The MULTCCs are used for the construction of the Mobile Station Roaming Number (MSRN) parameter in the case of a Send Routing Information acknowledgement (SRI-ack) response from G-Port, and in certain cases for the formulation of the SCCP CdPA. The DEFCC parameter in STPOPTS is used for conditioning of numbers to International format when necessary, and also for constructing the MSRN and SCCP CdPA parameters in addition to a MULTCC list. The MULTCC list is optional. If no values are provisioned, G-Port uses the DEFCC to process messages. If values are provisioned, G-Port automatically utilizes both the DEFCC and the MULTCC to process messages. The **chg-gsmopts** command along with the MULTCC and NMULTCC parameters are used to provision Multiple Country Code list entries.

## MSISDN Truncation Support for G-Port MNP

The MSISDN Truncation Support for G-Port MNP feature, is an optional feature that allows an operator to specify a certain number of digits to be deleted from the beginning of the National MSISDN (MSISDN without Country Code prior to formulating the MSRN parameter of the SRI-ack response. This feature only changes the behavior of the encoding of the MAP MSRN parameter in a SRI-ack formulated by the EAGLE 5 ISS. It does not affect the encoding of any other parameters or any other messages processed by G-Port. The International MSISDN is 12 digits long, and the RN is 5 digits long. So when the RN is added to form the MSRN parameter, it will exceed 15 digits in length. Some carriers require MSISDN digits to be truncated when formulating MSRN parameter of SRI-ack response in G-Port in order to maintain max 15 digits length. This feature works in conjunction with the MULTCC Support feature. The MULTCC table is used to determine which digits are the CC and which digits are the National MSISDN. If a match is not found on the leading digits of the International MSISDN when searched against the MULTCC list, then the truncation is not performed, and standard G-Port processing is followed. The **chg-gsmopts** command along with the MISDNTRUNC parameter is used to set-up the MSISDN Truncation Support feature.

## ISUPNP with EPAP

The ISUPNP with EPAP feature enables the EAGLE 5 ISS to intercept ISUP Initial Address Message (IAM) and to perform the NP Database (NPDB) lookup based on the Called Party Number (CdPN) of the IAM. The EAGLE 5 ISS prepends a Routing Number (RN) to the CdPN if the CdPN is a ported out number or prepends a SubNet prefix if the CdPN is ported-in or never been ported number before relaying the IAM message to its destination.

The purpose of the ISUP NP with EPAP feature is to prepend a prefix (a SubNet prefix or RN) to the CdPN of an IAM message if the CdPN is a ported in (including never been ported) or a ported out DN before relaying the message to its destination. The prefix provides the recipient switch a means to differentiate a call so that different billing rates or routing can be applied to the call.

The ISUP NP with EPAP feature is enabled and turned-on with a Feature Activation Key.

## Mobile-Originated Based GSM SMS Number Portability

The MO-Based GSM SMS NP feature provides network information to the short message service center (SMSC) for subscribers using the GSM network. This information allows the SMSC to select a protocol to deliver SMS messages to the called party.

The MO-Based GSM SMS NP feature:

- Intercepts SMS messages after they have undergone Prepaid SMS (PPSMS) and Portability Check for Mobile Originated SMS (MNPSMS) processing and before they reach the SMSC.  
**NOTE: The MO-Based GSM SMS NP feature does not require the PPSMS or MNPSMS features to be enabled.**
- Decodes the TCAP/MAP message destination address and performs lookup in the number portability (NP) database
- Modifies the destination address in the TCAP message with dialed number (DN) porting information, and
- Relays the message to the SMSC

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

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

## Mobile-Terminated Based GSM SMS Number Portability

The Mobile Terminated (MT)-Based GSM SMS NP feature allows wireless operators to route short message service (SMS) messages destined to mobile subscribers within a number portability (NP) environment. If the MT-Based GSM SMS NP feature is not enabled and turned on, then messages are processed by the G-Port feature.

In general, there are two kinds of messages of concern to number portability: call related and non-call related. The call-related messages query the HLR in real time for delivering the call to the subscriber. The G-port feature handles these.

Non-call related messaging involves the Short Message Service Center (SMSC) querying the HLR for the destination subscriber for SMS delivery. For SMS, these query messages are called SRI\_SM. The HLR responds to these messages with routing information that can be used by the querying node (SMSC) to deliver the SMS message. In this feature, the Eagle 5 ISS intercepts SRI\_SM messages destined to the HLR and replies with routing information for out-of-network destination subscribers.

The MT-Based GSM SMS NP feature intercepts SRI\_SM messages and replies with routing information for out-of-network destination subscribers using the following process:

1. An SRI\_SM message from the SMSC is intercepted by the Eagle 5 ISS before the message reaches the home location register (HLR).

2. The message destination address (SCCP Called Party GTA), is extracted, the digits are conditioned, and lookup is performed in the Real-Time Database (RTDB).
3. If the destination address/subscribers belongs to a foreign network, then a reply message is sent to the SMSC with routing information. If the destination address/subscribers belongs to a local network, then the SRI\_SM message is relayed to the HLR according to the options set for normal G-Port processing.

The feature provides configurable options for controlling processing of SRI\_SM messages and the content of the response:

- Selecting the SMSC response message type and digit format
- Specifying when an RTDB lookup is considered to be successful
- Specifying the format of digits encoded in the response message.

## Mobile-Terminated Based GSM MMS Number Portability

The MT-Based GSM MMS NP feature provides routing information to the Multimedia Message Service Center (MMSC) for subscribers using the GSM network. This information can be used by the MMSC to route the MMS messages to the called party.

**NOTE: The MT-Based GSM MMS NP feature can be used only in conjunction with the MT-Based GSM SMS NP feature.**

The MT-Based GSM MMS NP feature intercepts SRI\_SM messages and replies with routing information for out-of-network destination subscribers using the following process:

1. An SRI\_SM message from the MMSC is intercepted by the Eagle 5 ISS before the message reaches the home location register (HLR).
2. The message destination address (SCCP Called Party GTA), is extracted, the digits are conditioned, and lookup is performed in the RTDB.
3. If the destination address/subscribers belongs to a foreign network, then a reply message is sent to the MMSC with routing information. If the destination address/subscribers belongs to a local network, then the SRI\_SM message is relayed to the HLR according to the options set for normal G-Port processing.

The feature provides the following configurable options for controlling processing of SRI\_SM messages and the content of the response:

- Selecting the MMSC response message type and digit format
- Specifying when an RTDB lookup is considered to be successful
- Specifying the format of digits encoded in the response message.

## Routing Options

The ETSI standards for SRF-based MNP define two routing options, direct routing and indirect routing. G-Port 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.

## Dialed Number Lengths

Number lengths vary between countries and may even vary within a country. As a result, the G-Port MNP subscriber database structure 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. This length is based on the maximum length for MSISDN numbers as defined in the ETSI GSM 03.03 standard.

## SRF vs INAP Mobile Number Portability

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. G-Port 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.)

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

## G-Port Considerations

- G-Port is turned on, but not turned off, using a Feature Access Key (FAK).
- The G-Port MNP, A-Port, IGM, G-Flex C7 Relay, INP, and AINPQ features can run concurrently on an EAGLE 5 ISS node.
- When G-Port and G-Flex are run on the same node, interactions between the two features must be addressed.
- G-Port MNP and North American LNP are mutually exclusive on an EAGLE 5 ISS node.
- G-Port SCCP Service Re-Route Capability is not supported for the Prepaid SMS Intercept feature.
- When G-Port MNP and A-Port or IGM features run concurrently on the same EAGLE 5 ISS node, the service name is changed to MNP.

## MPS/EPAP Platform

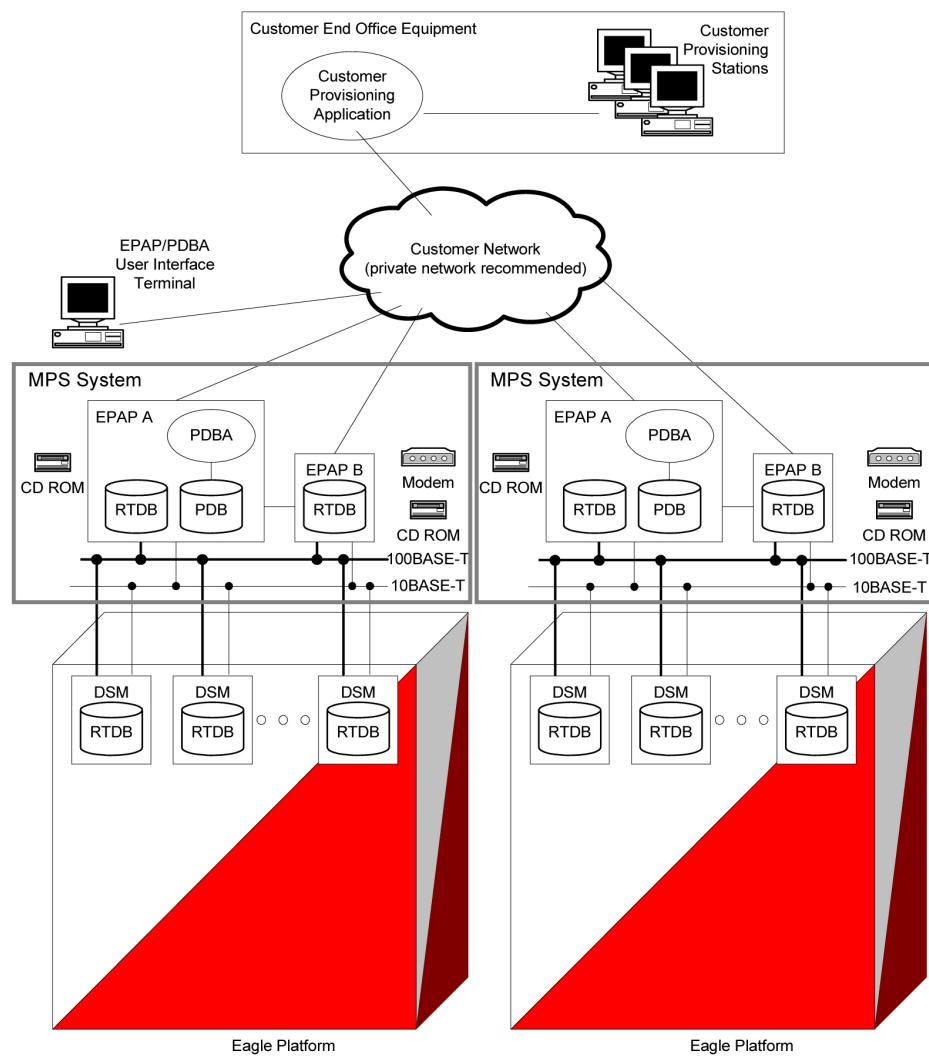
Tekelec provides the MPS (Multi-Purpose Server) platform as a subsystem of the EAGLE 5 ISS. The MPS provides support for the AINPQ, A-Port, EIR , G-Flex, G-Port, IGM, and INP features.

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 the *Tekelec 1000 Application Server Hardware Manual*.) The MPS provides the means of interfacing the customer provisioning application with the EAGLE 5 ISS. It connects the customer with the EAGLE 5 ISS and accepts the customer number portability data, while accommodating numbers of varying lengths.

The EAGLE Provisioning Application Processor (EPAP) is software that runs on the MPS hardware platform. It collects and organizes customer provisioning data, and forwards it to the EAGLE 5 ISS DSM cards. [Figure 2-1](#) shows the overall system architecture, providing a graphic overview of MPS/EPAP platform from customer provisioning through the MPS subsystem to the EAGLE 5 ISS DSM databases.

**NOTE:** The EAGLE 5 ISS supports more than one type of hardware card that provides the DSM function. The cards differ in the size of database and the transactions/second rate that they support. In this manual, the term DSM is used to mean any hardware card that supports the DSM function, unless a specific card (such as E5-SM4G) is mentioned. For more information about the hardware cards that support the DSM function, refer to the *Hardware Manual - EAGLE 5 ISS*.

**Figure 2-1.** MPS/EPAP Platform Architecture



## Design Overview and System Layout

**Figure 2-1** illustrates the overall system architecture and identifies the different tasks, databases and interfaces involved. The system consists of two mated MPS servers. Each MPS contains two EPAP platforms, EPAP A and EPAP B, each containing a RealTime Database (RTDB), a Provisioning Database (PDB), servers, optical media, modems, and network hubs. Each MPS and its EPAPs may be thought of as an 'EPAP system'; the EPAP system and the mated EAGLE 5 ISS is referred to as the 'mated EPAP system'. Each EPAP system is a T1000 AS system with a total of four Ethernet interfaces: one from each EPAP to the 100Base-T Ethernet and one from each EPAP to the 10Base-T Ethernet.

On the EAGLE 5 ISS platform side, a set of DSM cards, which hold the RTDB database, is part of the STP. Two high-speed Ethernet links connect the DSM cards and the EPAPs. One of the links is a 100BASE-T Ethernet bus, and the other is a 10BASE-T Ethernet bus.

The RTDB database is provisioned and maintained through the EPAPs. EPAP A and EPAP B act as the active EPAP and the standby EPAP. One link serves as the active link, and the other as the standby link. At any given time, there is only one active EPAP and one active link. The database is provisioned through the active link by the active EPAP; the other EPAP provides redundancy.

In case of failure of the active EPAP, the standby EPAP takes over the role of active EPAP and continues to provision the subscriber database. In the case where the active link fails, the active EPAP switches to the standby link to continue provisioning the DSM cards. The two Ethernet links are part of the DSM network.

Another 100BASE-T Ethernet link exists between the EPAPs; that link is called the EPAP sync network.

Major modules on the EPAP are the

- DSM provisioning module
- Maintenance module
- RTDB module
- PDB module

The DSM provisioning module is responsible for updating subscriber databases on the EAGLE 5 ISS DSM cards using the Reliable Multicast Transport Protocol (RMTP) multicast. The maintenance module is responsible for the proper functioning of the EPAP platform. The PDB module is responsible for preparing and maintaining the Real Time Database, which is the “golden copy” of the subscriber database. The PDB module can run on one of the EPAPs of either of the mated EAGLE 5 ISSs.

## Functional Overview

The main function of the MPS / EPAP platform is to provision the data from the customer network to the DSM cards on the EAGLE 5 ISS. Subscriber database records are continuously updated from the customer network to the PDB. The PDB module communicates with the maintenance module and the RTDB task over a TCP/IP connection to provision the DSM cards on the EAGLE 5 ISS. The maintenance module is responsible for the overall stability and performance of the system.

It is possible for the current copy of the RTDB database on the DSM cards to get out-of-sync due to missed provisioning or card rebooting. Therefore, the RTDB on the EPAP contains a coherent, current copy of the subscriber database. The EPAP-DSM provisioning task sends database information out on the provisioning link. The DSM cards act as the receivers and are reprovisioned.

## EPAP/PDBA Overview

The EAGLE Provisioning Application Processor (EPAP) platform and the Provisioning Database Application (PDBA), coupled with the Provisioning Database Interface (PDBI) facilitate the user database required for EAGLE 5 ISS EPAP-based features. The following functions are supported:

- Accept and store subscription data provisioned by the customer
- Update and reload subscriber databases on the DSM cards

The PDBA operates on the master Provisioning Database (PDB). The EPAP and PDBA are both installed on the MPS hardware platform.

The EPAP platform performs the following:

- maintains an exact copy of the real-time database (RTDB) on the EPAP
- distributes the subscription database to the DSM cards
- maintains a redundant copy of the RTDB database

The EPAP platform is a mated pair of processors (the upper processor, called EPAP A, and the lower processor, EPAP B) contained in one frame.

During normal operation, information flows through the EPAP/PDBA software with no intervention. Subscription data is generated at one or more operations centers and is delivered to the PDBA through a TCP socket interface (PDBI). The PDBA software stores and replicates data on EPAP A on the mated EPAP system. The data is then transmitted by the EPAPs across a private network to the DSM cards located in the EAGLE 5 ISS frame.

The primary interface to the PDBA consists of machine-to-machine messages. The interface is defined by Tekelec and is described in the Provisioning Database Interface Manual. Provisioning software compatible with the EPAP socket interface can be created or updated using the interface described in that manual.

Additionally, a direct user interface is provided on each EPAP to allow for configuration, maintenance, debugging, and platform operations. A direct user interface is also provided by the PDBA for configuration and database maintenance.

The MPS / EPAP is an open-systems platform and easily accommodates the required high provisioning rates. Compared to the traditional OAM platform, the persistent database and provisioning in an open systems platform provides these benefits:

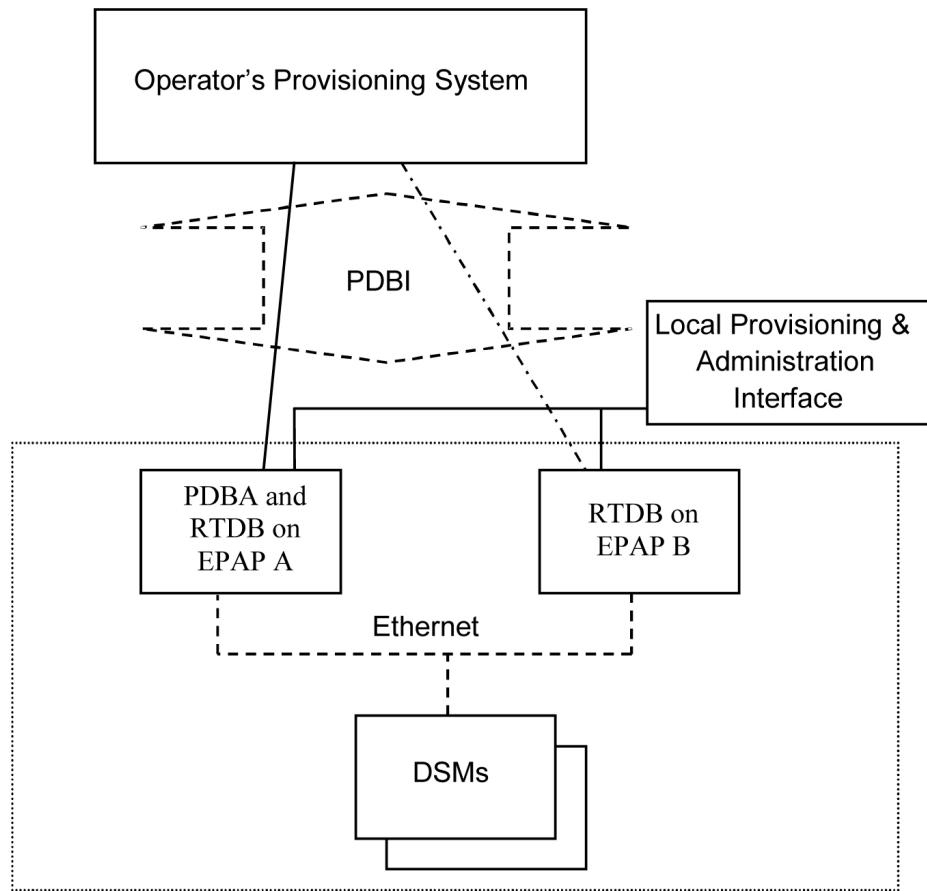
- Variety of hardware components and vendors
- Availability of third party communication and database tools
- Standard communication protocols
- Availability of personnel with related experience

Each EPAP server maintains a copy of the Real-Time Database (RTDB) in order to provision the EAGLE 5 ISS DSM cards. The EPAP server must comply with the hardware requirements in the *MPS Hardware Manual*. [Figure 2-1](#) illustrates the EPAP architecture contained in the MPS subsystem.

Each EPAP has a dedicated optical media drive. One EPAP per EAGLE 5 ISS platform has a modem capable of supporting remote diagnostics, configuration, and maintenance. These remote operations are performed through EPAP login sessions and are accessible across the customer network as well as through a direct terminal connection to the EPAP using an RS232 connection. Refer to the *Tekelec T1000 Application Server Hardware Manual* for details about the hardware devices and network connections.

## Subscriber Data Provisioning

[Figure 2-2](#) shows the current high-level view of the subscriber data provisioning architecture. Only those parts of the EAGLE 5 ISS platform that are relevant to subscriber data provisioning are shown. This section defines requirements for the PDBI (Provisioning Database Interface) between the EPAP and the operator's provisioning system (OPS). Provisioning clients connect to the EPAPs via the Provisioning Database Interface (PDBI). This interface contains commands that allow all of the provisioning and retrieving of subscription data. The PDBI is used for real-time provisioning of subscriber and network entity data only. Refer to the *Provisioning Database Interface Manual* for more details.

**Figure 2-2.** Subscriber Data Provisioning Architecture (High Level)

A pair of active/standby EPAP servers provides the interface between the Realtime Database (RTDB) of the EAGLE 5 ISS DSM cards and the OPS. EPAP A is equipped with both the PDB (Provisioning Database) and the RTDB database, and EPAP B has just the RTDB. An EPAP with just the RTDB must be updated by the EPAP that has the PDB.

For more information about the EPAP, refer to the *EPAP Administration Manual*. For more information about the MPS hardware, refer to the *Tekelec 1000 Application Server Hardware Manual*.

### **Distributed Administrative Architecture**

This section describes, at a high level, the distributed administrative architecture for the EAGLE 5 ISS, including the EPAP.

In general, EAGLE 5 ISS database updates are sent via an EAGLE 5 ISS terminal across an RS232 serial port to the active OAM (Operation Administration and Maintenance). The active OAM commits the update to TDM fixed disk and then sends the update control information to the standby OAM and to the rest of the network cards. When all databases are updated, the active OAM responds with a *Command Completed* indication to the user terminal. EAGLE 5 ISS database updates are generally considered to be EAGLE 5 ISS link, linkset, route, destination, mated application, gateway screening, and global title types of information.

Databases requiring high update and retrieval rates, (compared to the rates provided by the OAM) are not administered via EAGLE 5 ISS terminals. These databases, such as the EPAP RTDB, are populated using redundant Ethernet connections to DSM cards from an EPAPMPS platform.

An EPAP consists of a combined Provisioning (MySQL) and RTDB database. The Provisioning Database (PDB) responds to requests for updates by the active and standby RTDB databases on both mated EAGLE 5 ISSs. The active EPAPRTDB database is responsible for initiating multi-cast updates of changed database records to the DSM cards after the data has been committed to the EPAP disks. Furthermore, the PDB may accept and commit more database updates while the RTDB databases are completing their previous updates.

It is this overlapping of database updates, coupled with an RTDB transactional database engine and fast download time, that allows larger amounts of data at a time to be transferred from the PDB. Committing larger amounts of data at a time to the RTDB (versus a single update at a time) allows faster overall transaction rates to be achieved. The boundaries of the transaction rates become more closely related to cache size and disk cache flush time than the disk access time of a single update. Thus, successful completion of EPAP database updates only guarantees that the PDB has been updated, but it does *not* mean the RTDB has completed the update and sent the new subscription data to the DSM card.

The EPAP architecture contains a local provisioning terminal and a modem for remote access, as well as other functions. A backup device can be used to back up or restore the provisioning database. The local provisioning terminal is used to manually repair the standby EPAPRTDB database or to turn the subscriber database audit on or off. For additional information, refer to the *Tekelec T1000 Application Server Hardware Manual* and *EPAP Administration Manual*.

## EPAP (EAGLE Provisioning Application Processor)

As shown in [Figure 2-1](#), a single MPS system contains two EPAP (EAGLE Provisioning Application Processor) servers. At any given time, only one actively communicates with the DSM boards. The other EPAP server is in standby mode. In addition, two MPS systems can be deployed in a mated-pair configuration.

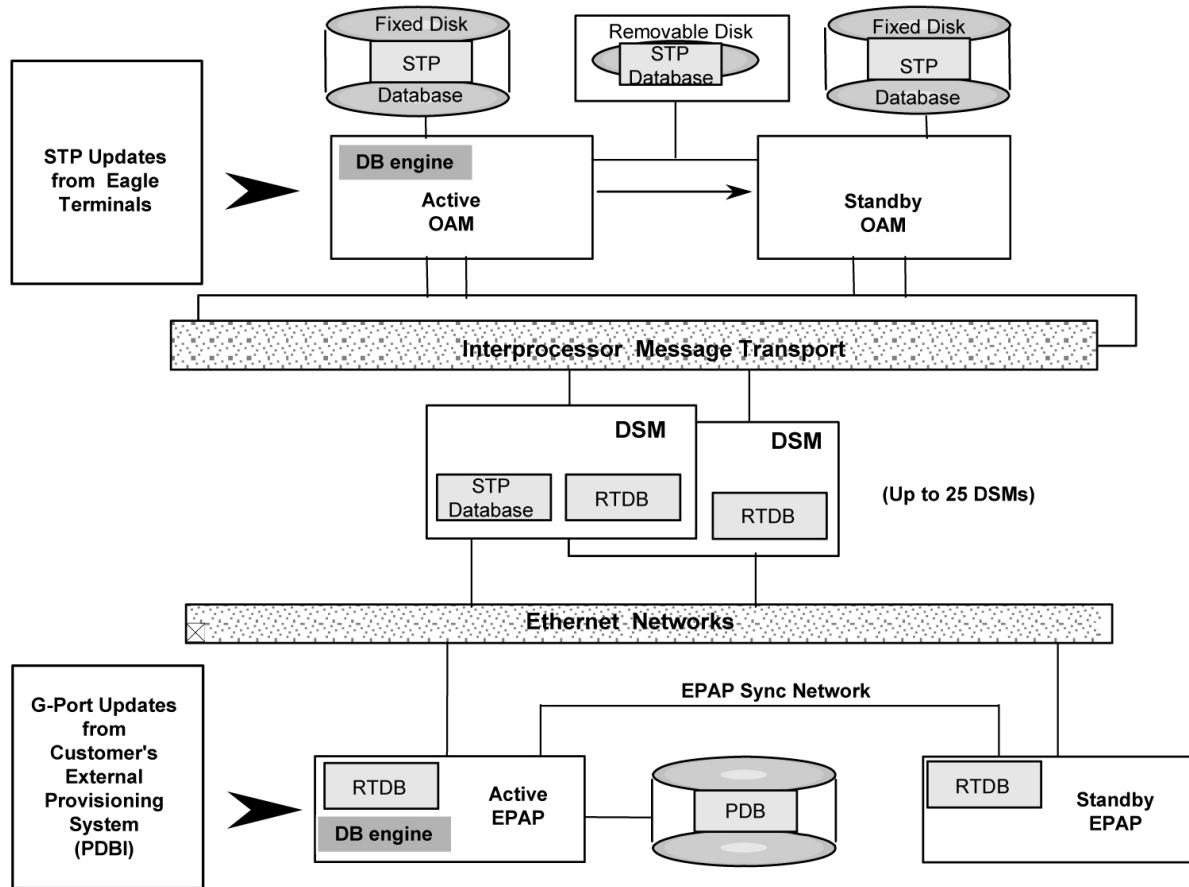
The primary purpose of the EPAP systems is to maintain the RTDB and PDB and to download copies of the RTDB to the DSM cards on the EAGLE 5 ISS.

The PDB on the active EPAP receives subscription data from the customer network through the PDBI, the external source of provisioning information. The PDBA continually updates the active EPAP's PDB. The PDB uses MySQL database software. Once an update is applied to the active PDB, it is sent to the RTDBs on the active and standby EPAPs.

Both the active and standby EPAPs maintain copies of the RTDB. Periodically, the DSM card polls the active EPAP RTDB for any new updates. The active EPAP downloads the updates to the DSM for its own resident copy of the RTDB database.

In a mated-pair configuration, there are two mated MPS Systems, as shown in [Figure 2-1](#). The PDB on the active EPAP automatically updates the PDB on the mate platform. The PDB on the mate platform then updates its EPAP RTDBs, which in turn update the RTDBs on the associated DSM cards.

Provisioning of the EAGLE 5 ISS's DSM cards is performed through two interfaces, using two different sets of commands. Provisioning is accomplished by the STP updates from EAGLE 5 ISS terminals and by updates from the customer's external provisioning system. This system of dual provisioning is illustrated in [Figure 2-3](#).

**Figure 2-3.** Database Administrative Architecture

## Database Service Module Cards

From 1 to 25 Service Module cards can be provisioned with the G-Port feature enabled. The G-Port feature requires that all Service Module cards contain 4 GB of memory. [Figure 2-3](#) illustrates each Service Module card having two Ethernet links, the main Service Module network on the 100BASE-T link and the backup Service Module network on the 10BASE-T link.

The extra memory holds a copy of the RTDB. The Service Module Ethernet ports are linked to the EPAP systems to receive the downloaded RTDBs. The Service Module cards run a version of the SCCP software application that has been ported to the VxWorks operating system. To differentiate the DSM-VxWorks-SCCP application from the SCCP that runs on Translation Services Module (TSM) cards, the DSM version is named 'VSCCP'.

Multiple Service Module cards provide a means of load balancing in high-traffic situations. The Service Module database is in a format that facilitates rapid lookups. Each Service Module card contains an identical database. Furthermore, all Service Module G-Port subscriber databases are identical to the RTDB maintained by the EPAPs.

However, the various databases may not be identical at all times for several reasons. First of all, when a DSM card is initialized, it downloads the current copy of the database from the EPAP. While that card is being loaded, it cannot receive new updates that have arrived at the EPAP since reload began. Another condition that can result in databases being out-of-sync occurs when the EPAP receives updates from its provisioning source, but it has not yet sent them down to the Service Module cards. Updates are applied to the Provisioning Database (PDB) as they are received.

Two possible scenarios contribute to a condition where a Service Module card may not have enough memory to hold the entire database. In the first case, the database is downloaded successfully to the Service Module card, but subsequent updates eventually increase the size of the database beyond the capacity of the Service Module memory. In this situation, it is desirable to continue processing G-Port transactions, even though the database may not be as up-to-date as it could be.

The other case occurs when a Service Module card is booted. If it is determined then that the card does not have enough memory for the entire database, the database is not loaded on that card. Each Service Module card is responsible for recognizing and reporting its out-of-memory conditions by means of alarms.

### ***Overview of EPAP to Service Module Communications***

Before discussing Service Module status reporting or EPAP status reporting, it is helpful to understand the communications between the Service Module cards and the EPAP in broad terms.

- UDP - sending Service Module status messages

The Service Module cards and EPAPs create a UDP (User Datagram Protocol) socket which is used for status messages. One of the last things a Service Module card does when it is initialized is to send a status message to the EPAP, containing the Service Module ID, database level, and memory size. The EPAP maintains tables containing the last known status of each Service Module card. EPAP uses these to determine whether or not the Service Module card needs to download the database.

- IP - reporting EPAP maintenance data

The Service Module cards create an TCP socket when they are initialized, and listen for connection requests. During initialization or after a loss of connectivity, the active EPAP chooses one of the Service Module cards and issues a *Connect* to establish the TCP/IP connection with that Service Module card (referred to as the primary Service Module). The purpose of this link is to provide a path for reporting EPAP alarms and to forward maintenance blocks to the Service Module.

- IP Multicast - downloading GSM database

Because of the large size of the database and the need to download it quickly on up to 25 Service Module cards, G-Port uses a technique known as IP multicasting. This technique is based on Reliable Multicast Transport Protocol-II (RMTPII), a product of Globalcast Communications. IP multicasting downloads the RTDB and database updates to all of the Service Module cards simultaneously.

The administration of IP multicasting is based on the concept of a “tree”, or stream of data, which is constantly being broadcast by the EPAP. Service Module cards that need to download the real time database or to receive database updates “join the tree”. Service Module cards can also “leave the tree”, typically when the database fills their available memory.

### ***Service Module Provisioning and Reload***

One of the core functions of the EPAP is to provision the Service Module cards with the RTDB database updates. In order to provide redundancy for this feature, separate RMTPII channels are created on each interface from each EPAP:

- EPAP A, Link A (on the main Service Module network, 100BASE-T)
- EPAP A, Link B (on the backup Service Module network, 10BASE-T)

- EPAP B, Link A (on the main Service Module network, 100BASE-T)
- EPAP B, Link B (on the backup Service Module network, 10BASE-T)

Provisioning and other data is broadcast on one of these channels to all of the Service Module cards. Provisioning is done by database level in order to leave Service Module tables coherent between updates.

The Service Module cards do the following:

- Detect the need for incremental updates and send a status message to the EPAP.
- Discriminate between the various streams according to the database level contained in each message and accept updates according to the Service Module card's current database level.

### ***DSM Reload Model***

DSM cards may require a complete database reload in the event of reboot or loss of connectivity for a significant amount of time. The EPAP provides a mechanism to quickly load a number of DSM cards with the current database. The database on the EPAP is large and may be updated constantly. The database sent to the DSM card or cards will likely be missing some of these updates making it corrupt, in addition to being "back level."

#### ***EPAP Continuous Reload***

It is important to understand how the EPAP handles reloading of multiple DSM cards from different starting points. Reload begins when the first DSM card requires it. Records are read sequentially from the real-time database from an arbitrary starting point, wrapping back to the beginning. If another DSM card requires reloading at this time, it uses the existing record stream and notifies the DSM provisioning task of the first record it read. This continues until all DSM cards are satisfied.

#### ***DSM Database Levels and Reloading***

The current database level when the reload started is of special importance during reload. When a DSM card detects that the last record has been received, it sends a status message back to the EPAP indicating the database level at the start of reload. This action starts incremental loading. The DSM card continues to reload until it is completely caught up with the current level of the RTDB. As database records are sent to the DSM cards during reload, normal provisioning can *change* those records. All records changed between the start and end of reloading must be incrementally loaded before the database is coherent and usable by the DSM card.

The following terminology is used here for the stages of database reload for a given DSM.

- **Stage 1 loading:** The database is being copied record for record from the golden RTDB in the EPAP to the DSM RTDB. The database is incoherent during stage 1 loading.
- **Incremental update:** The database is receiving all of the updates missed during stage 1 loading or some other reason (e.g., network outage, processor limitation, lost communication, etc.). The database is coherent, but back-level during incremental update.
- **Current:** The database is receiving current updates from the DSM provisioning task.
- **Coherent:** The database is at a whole database level, that is, not currently updating records belonging to a database level.

### ***DSM Reload Requirements***

DSM cards may require a complete database reload if there is a reboot or loss of connectivity for a significant amount of time. The EPAP provides a mechanism to quickly load a number of DSM cards with the current database. The RTDB on the EPAP is large and can be updated constantly from the customer's provisioning network.

The upload process is divided into two stages:

1. Sequentially send the initial database records.
2. Send any updates missed since the beginning of the first stage.

The DSM reload stream uses a separate RMTP channel from the provisioning and incremental update streams. This allows DSM multicast hardware to filter out the high volume of reload traffic for DSM cards that do not require it.

DSM cards do the following:

- Detect the need for stage 1 loading and send a status message to the EPAP.
- Identify the first record DSM was able to read in the above status message if a record stream is already in progress.
- Handle the record stream regardless of the starting point (that is, records starting with the middle record of the middle table).
- Expect tables to be sent in a particular order and therefore detect any gap in the record stream.
- Send a status message if a gap is detected. Stage 1 loading is essentially reset to the last update received.
- Handle wrapping from the last record from the last table to the first record of the first table of the last update received.
- Know when they have received all the required records to proceed to stage 2 loading.
- Send a status message when stage 1 loading is complete, indicating the database level at the beginning of stage 1.
- Detect when the master RTDB crosses a memory boundary during stage 1 loading; the card automatically reboots and then auto-inhibits.

### ***DSM Reload Requirements***

DSM cards may require a complete database reload if there is a reboot or loss of connectivity for a significant amount of time. The EPAP provides a mechanism to quickly load a number of DSM cards with the current database. The RTDB on the EPAP is large and can be updated constantly from the customer's provisioning network. As the RTDB is sent to the DSM cards, it can possibly miss some updates, making it inconsistent as well as back level.

The upload process is divided into two stages, one that sequentially sends the initial database records and another that sends any updates missed since the beginning of the first stage. The DSM reload stream uses a separate RMTP channel from the provisioning and incremental update streams. This allows DSM multicast hardware to filter out the high volume of reload traffic from DSM cards that do not require it.

DSM cards do the following:

- Detect the need for stage 1 loading and send a status message to the EPAP.
- Identify the first record DSM was able to read in the above status message if a record stream is already in progress.

- Handle the record stream regardless of the starting point (that is, accommodate records starting with the middle record of the middle table).
- Expect tables to be sent in a particular order and therefore detect any gap in the record stream.
- Send a status message if a gap is detected. Stage1 loading is essentially reset to the last update received.
- Handle wrapping from the last record from the last table to the first record of the first table.
- Know when they have received all the required records to proceed to stage 2 loading.
- Send a status message when stage 1 loading is complete, indicating the database level at the beginning of stage 1.
- Detect when the master RTDB crosses a memory boundary during stage 1 loading; the card automatically reboots and then auto-inhibits.

### ***EPAP Status and Error Reporting via Maintenance Blocks***

The EPAPs forward all status and error messages to the DSM cards in maintenance blocks. Maintenance blocks are asynchronously sent whenever the EPAP has something to report. The maintenance blocks eventually update EPAP Device Control Blocks (DCBs) located on the EAGLE 5 ISS. The DCBs provide the status information that is received when a **rept-stat-mps** command is issued.

## **Network Connections**

Several customer and Tekelec-installed private networks are *required* to support the provisioning of subscription data. These networks are:

- [Customer Provisioning Network](#)
- [EPAP Sync Network](#)
- [DSM Networks](#)
- [Dial-Up PPP Network](#)

The following discussion is an overview of these private networks. It expands on the networks in the architecture diagram shown in [Figure 2-4](#). (For details about configuring these networks, refer to the *EPAP Administration Manual*.)

### ***Customer Provisioning Network***

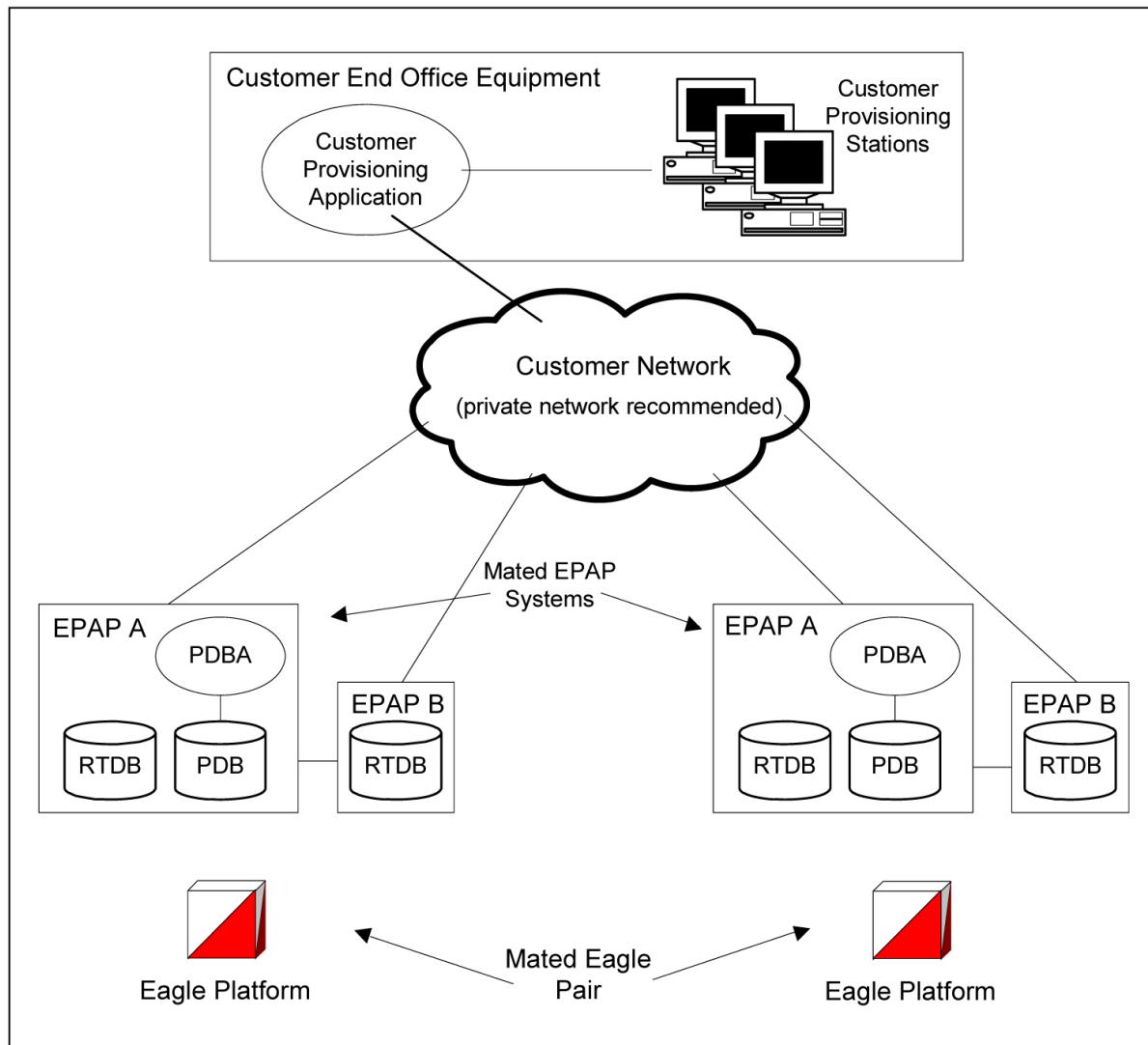
The customer network carries the following traffic:

- Customer queries and responses to the PDB via the PDBI from the customer provisioning network
- Updates between PDBs of a mated EAGLE 5 ISS pair
- Updates between a PDB on one EAGLE 5 ISS and RTDBs on a mated EAGLE 5 ISS
- PDRA import/export (file transfer) traffic

- Traffic from a PDBA reloading from its mate
- EPAP and PDBA user interface traffic.

A typical customer network is shown in [Figure 2-4](#).

**Figure 2-4.** Customer Provisioning Network



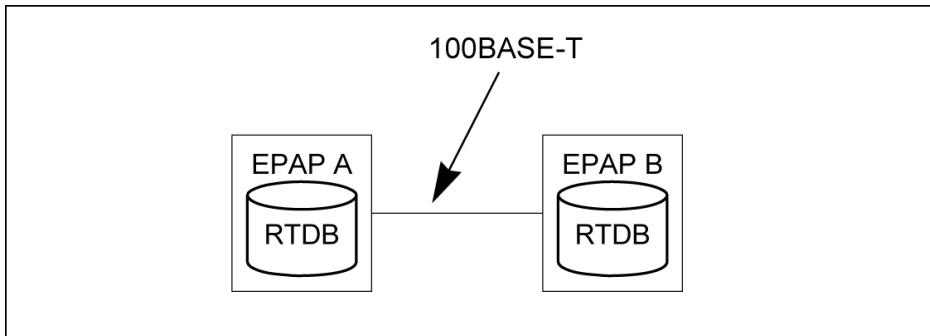
Although a dedicated network is recommended, it is possible that unrelated customer traffic can use the network as well. The determination, either to have a dedicated network or to allow other customer traffic, should be based on available external Ethernet bandwidth and network performance considerations.

### ***EPAP Sync Network***

The EPAP sync network carries RTDB and maintenance application traffic between active and standby EPAP servers on an MPS system. It synchronizes the contents of the RTDBs of both EPAP A and B. The EPAP Sync

network is a single Ethernet connection between EPAP A and EPAP B running at 100BASE-T, as shown in [Figure 2-5](#).

**Figure 2-5.** EPAP Sync Network

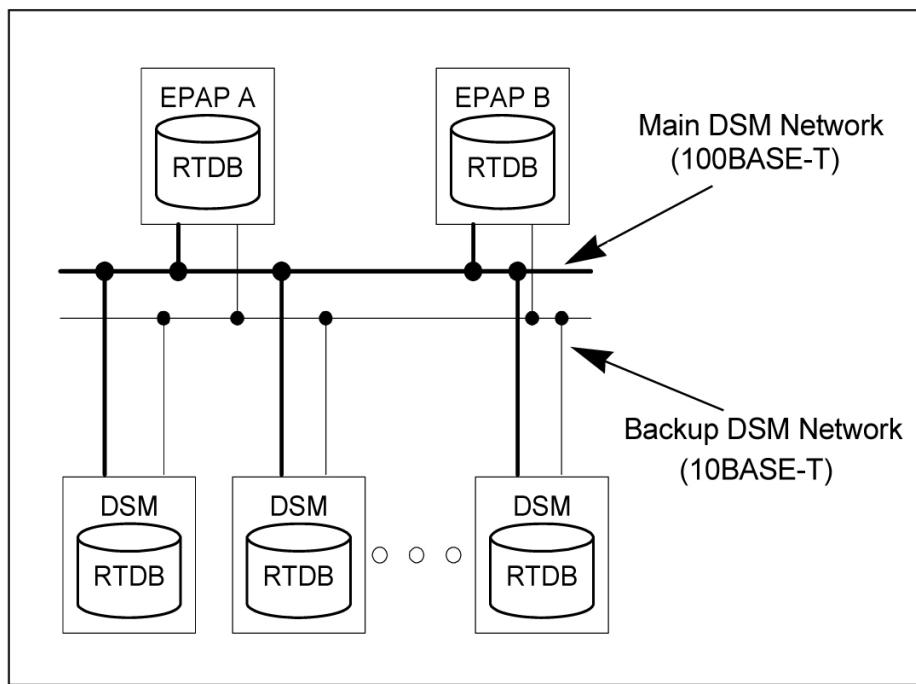


### DSM Networks

The DSM card networks are shown in [Figure 2-6](#). They carry provisioning data from the active EPAP RTDB to the DSM cards. They also carry reload and maintenance traffic to the DSM cards.

The DSM networks consist of two Ethernet networks: the main DSM network running at 100BASE-T, and the backup DSM network running at 10BASE-T. Both Ethernet networks connect EPAP A and EPAP B with every DSM card on a single EAGLE 5 ISS platform.

**Figure 2-6.** DSM Card Networks



Maintenance information is sent from the active EPAP to an arbitrarily selected DSM card. The selected DSM is known as the primary DSM. Static information is exchanged across this interface at initialization, and dynamic information is exchanged on occasion.

While much of the traditional OAM provisioning and database functionality is implemented on the EPAP, the maintenance reporting mechanism is still the OAM.

The first and second octets of the EPAP network addresses for this network are 192.168. (The first two octets for private class C networks are defined in RFC 1597.)

The third octet is a customer specifiable for each DSM network. It is important to select values that do not interfere with the customer's network addressing scheme.

The fourth octet of the address is specified as follows:

- If the EPAP is configured as "EPAP A", the fourth octet has a value of 100.
- If the EPAP is configured as "EPAP B", the fourth octet has a value of 200.

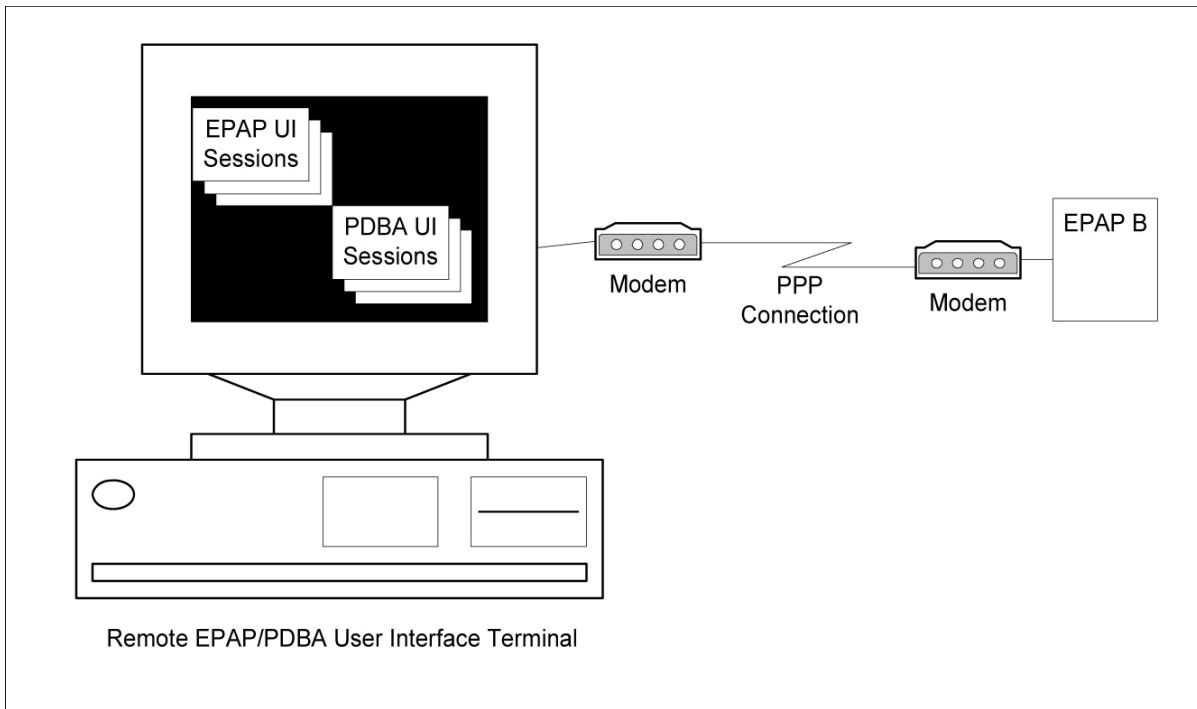
**Table 2-1** summarizes the contents of each octet.

**Table 2-1. EPAP IP Addresses in the DSM Network**

Octet	Value
1	'192'
2	'168'
3	One customer-provisioned value for DSM network A, and another for DSM network B
4	'100' for EPAP A '200' for EPAP B

### **Dial-Up PPP Network**

The dial-up PPP network allows multiple user-interface sessions to be established with the EPAP. The network connects a remote EPAP/PDBA user interface terminal with the EPAP in the EAGLE 5 ISS's MPS subsystem. The dial-up PPP network is illustrated in [Figure 2-7](#).

**Figure 2-7.** Dial-Up PPP Network

## Serviceability Hints

The following hints are offered to aid in the serviceability of G-Port databases:

- [Mated Application Considerations](#)
- [Entity Point Codes and Routes](#)

### ***Mated Application Considerations***

An EPAP-administered entity data can possibly become out-of-sync with the EAGLE 5 ISS mated application table because the creation of entity point codes (and/or subsystem numbers) in the mated application table is not performed at database administration time.

If this mismatch is discovered in real-time operations, a UIM message (such as “SCCP did not route - DPC not in MAP tbl” or “SCCP did not route - SS not in MAP tbl”) is sent to the EAGLE 5 ISS maintenance terminal. This message means the MSU was discarded.

For this reason, it is recommended that the entity (SP or RN) not be administered until the entity point code (and/or subsystem number) has been entered into the EAGLE 5 ISS mated application (MAP) table.

### ***Entity Point Codes and Routes***

Verification that an entity point code exists in the route table and has a route is not performed at database administration time. Therefore, it is possible for the EPAP entity data to be out-of-sync with the EAGLE 5 ISS route table.

If an out-of-sync condition is discovered during real-time operation, a UIM is sent to the EAGLE 5 ISS maintenance terminal, indicating one of these conditions:

- Destination point code is not in the route table.
- Destination point code exists in the route table but is not assigned a route.
- Destination point code exists in the route table and has been assigned a route, but it is out of service.

## Network Perspectives

GSM Mobile Number Portability (G-Port) provides the capability for a mobile subscriber to change the GSM subscription network within a portability cluster while retaining the original MSISDNs. Because the IMSI is not ported, the recipient network of the porting process issues a new IMSI for the ported subscriber.

In a Public Land Mobile Network (PLMN) that supports G-Port, SCCP messages that are sent to an HLR can be relayed by either:

- An MNP-SRF, or
- An EAGLE 5 ISS with G-Port depending on the type of message (call-related or non-call-related) and on the porting status of the called subscriber.

For call-related messages, MNP-SRF either generates an SRI\_ACK response with the routing number if the number is ported, or relays the message to an appropriate HLR if the number is not ported.

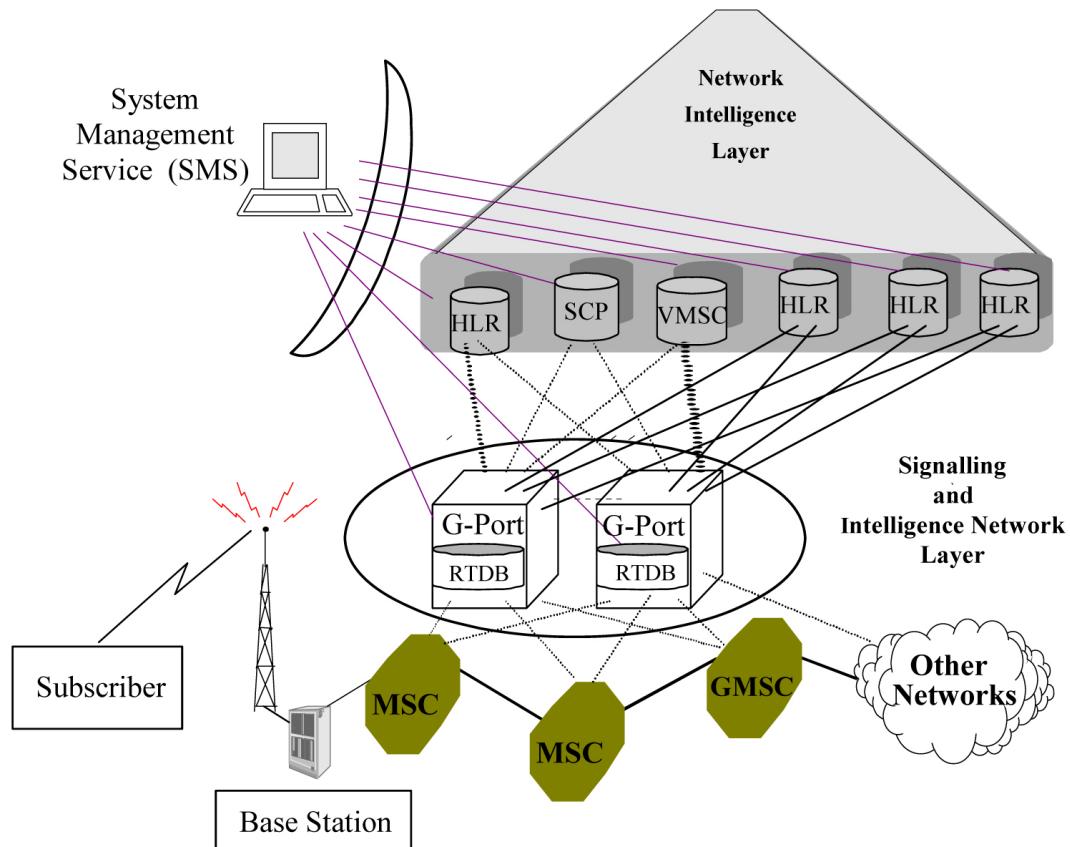
For non-call related messages, MNP-SRF can modify the SCCP called party address and route the message to the HLR of the recipient network or to the subscription network.

[\*\*Figure 2-8\*\*](#) shows the location of the G-Port in a GSM network. Note the basic functions G-Port performs:

- G-Port performs a query/response for call-related SRI messages when the number is ported-out or not known to be ported.
- G-Port performs a message relay function for non-call-related messages and, for call-related messages when the number is non-portable or ported-in.

G-Port performs the following actions based on the message received and number status:

- If the number is ported-out or not known to be ported and the message received is call-related SRI (not-SOR), G-Port sends the SRI ack to the MSC with the Routing Number information in the MAP portion of the message.
- If the number is ported-out and the message received is non-call related (non-SRI), G-Port performs a message relay function and forwards the translated message based on the Routing Number information.
- If the number is non-portable or ported-in and the message received, G-Port performs an HLR translation and forwards the translated message to the HLR.

**Figure 2-8.** G-Port Node in GSM Network

## G-Port Considerations

The following items must be considered before installing and operating the G-Port feature.

1. SRI responses are routed by both MTP and Global Title Translation.
2. The maximum length of the Application Context Name Object Identifier is 32 digits.
3. For G-Port Message Relay messages with E.164 numbers in the SCCP CdPA, it is assumed that no truncation occurred if and when the routing number was prepended and that SCCP CdPA has the full DN of the subscriber.
4. G-Port Message Relay to the EAGLE 5 ISS local subsystem is not supported.
5. Only the first 21 digits of the CdPA are decoded for G-Port Message Relay. For example, if the CdPA contains an RN prefixed to a DN, the RN is seven digits, and the DN is 15 digits, then the total is 22 digits, and the DN used for processing will be only 14 digits (21 total digits less 7 RN digits).
6. GTT currently handles decimal digits only. Thus, if an operator/country is using hexadecimal digits 'A' through 'F' in RNs and the operator is providing GTT to messages that have RN prefixes other than its own prefixes, the operator must enter the RN + DN number ranges as DN ranges in the G-Port database. The

only problem with this is that the beginning and ending DNs can only be 15 digits, which may not be enough for an RN + DN.

7. As discussed in this document, MNP applies within a single portability cluster. This is defined as a set of networks in a country or multi-country region having a common numbering plan and across which a subscriber, who is already inside the cluster, can port. Any individual G-Port node is required to support only an MNP within such a portability cluster.
8. The EAGLE 5 ISS examines the TCAP portion of the MAP message to determine the message type. Although GSM 03.66 defines a new translation type for SRI-MNP messages, G-Port MNP does not rely upon the use of this TT.
9. The routing number found in the NP database is either prefixed to the dialed number to form a new concatenated roaming number that is returned to the switch, or is sent on its own as the roaming number.
10. No MAP overload procedures, as defined in GSM 09.02, need to be supported by G-Port MNP.
11. All non-call related messages impacted by MNP contain the MSISDN number in the SCCP CdPA. In the case of the SRI message, G-Port may get the number from the MAP level.
12. TCAP operation codes uniquely distinguish MAP SRI messages and do not change from one phase (or version) of MAP to another.
13. PCs and/or PC + SSNs that are in the entity table of the database and referenced by subscriber entries do not necessarily have the required data present on the EAGLE 5 ISS to route messages to them. For example, the point code may not have a route or the PC + SSN may not be in the MAP table for a final GTT. In this event, a UIM is output only when a message is discarded because of the lack of data.
14. The parameters of the SRI ack message generated by G-Port are solely based on the provisioned data/options; they are not based on the MAP phase of the SRI message. For example, if the message received is phase 1 or 2, “MSRNDIG=RN”, and the portability status is “NotKnownToBePorted”, G-Port generates an SRI ack contains IMSI, MSRN, MSISDN, and NPS parameters, despite the MSISDN and NPS parameters not being defined for phase 1 or 2.
15. If SRFIMSI is not provisioned with an RN entity and an incoming message is an SRI message, G-Port sets IMSI parameter as zero digits when the MAP phase is 1 or 2.
16. G-Port uses the MTP route for the SRI ack response, even when the final GTT is performed on the response.
17. When the concatenated number (RN + MSISDN) option is selected for encoding the Routing Info (MSRN) in SRI ack, G-Port encodes the complete concatenated number because the concatenated number length may otherwise exceed 16 digits, which is the maximum allowed in MSRN.

## General Numbering Requirements

Incoming called party numbers, from the SCCP portion, destined for G-Port 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 G-Port 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 G-Port selector table, then the service nature of address from the selector table entry uses that number's nature of address. Further conditioning is applied based on this new nature of address.
- If the nature of address is Subscriber, the default CC + default NC (network code for E.164) are prepended to the number. The default codes to be used by the EAGLE 5 ISS must be previously provisioned by the EAGLE 5 ISS operator. If not, a UIM is issued, and the message falls through to GTT.

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

## Maintenance

### *Validation of G-Port Hardware Configuration*

DSM card loading has been modified to verify the validity of the hardware configuration for the DSM cards. Hardware verification includes the following.

- DSM Main Board Verification**

An AMD-K6 or better main board is required to support the G-PortVSCCP application on the DSM card. EAGLE 5 ISS maintenance stores the validity status of the main board configuration of the DSM card.

**NOTE: The system does not allow the G-Port feature to be turned on if the hardware configuration is invalid.**

- During initialization, the VSCCP application determines the main board type. The SCCP maintenance block is the mechanism used to relay the main board information to OAM. This requires that the application software be loaded to the DSM card and then the main board information received in the SCCP maintenance block must be verified. If the main board is determined to be invalid for the G-Port application, loading of the DSM card is automatically inhibited.

- DSM Applique Memory Verification**

The VSCCP application performs two types of memory validation to determine whether or not a DSM card has sufficient memory to run G-Port:



**CAUTION: G-Port cannot be enabled if any of the DSM cards have less than 4 GB of memory installed. Refer to the Dimensioning Guide for EPAP Advanced DB Features Technical Reference for important information on the dimensioning rules and the DSM database capacity requirements.**

- Local Memory Validation.** When the G-Port feature is first enabled, or any time the G-Port feature is enabled and the DSM card is initializing, VSCCP checks if the DSM card has at least 4GB of memory installed.
- Real-Time Memory Validation (during card initialization).** After communications between the DSM card and EPAP have been established, and the DSM has joined the RMTTP Tree, the EPAP starts downloading the RTDB to the DSM card. After the DSM card has downloaded the RTDB, it continues to receive database updates as necessary. The EPAP includes the size of the current RTDB in all records sent to the DSM. The DSM card compares the size required to the amount of memory installed, and issues a minor alarm once the database exceeds 80% of the DSM memory. If the database completely fills the DSM memory, a major alarm

is issued, the DSM leaves the RMTP tree, and the status of the DSM card changes to IS-ANR/Restricted. The DSM continues to carry traffic.

- **Actions Taken When Hardware Determined to be Invalid**

When the hardware configuration for a DSM card is determined to be invalid for the G-Port application, SCM automatically inhibits loading for that specific DSM card. A major alarm is generated indicating that card loading for that DSM card has failed and has been automatically inhibited (that is, prevented from reloading again). Refer to [G-Port Related Alarms](#) for the specific alarm that is generated. When card loading has been inhibited, the primary state of the card is set to **oos-mt-dsblD**, and the secondary state of the card is set to **MEA** (Mismatch of Equipment and Attributes).

The following actions apply to a DSM card determined to be invalid:

- The DSM card will not download the EAGLE 5 ISS databases
- The DSM card will not download the real-time RTDB from the EPAP.
- The DSM card will not accept RTDB updates (that is, add, change, delete) from the EPAP, nor will it accept STP database updates.

To activate loading of a DSM card that has been automatically inhibited, the craftsman must enter the **alw-card** command (**alw-card:loc=xxxx**).

- **Unstable Loading Mode**

At some point, having a number of invalid DSM cards results in some of the LIMs (Link Interface Module) being denied SCCP services. The threshold is monitored; if the number of valid DSM cards is insufficient to provide service to at least 80% of the IS-NRLIMs, the system is said to be in an unstable loading mode. For additional reasons an EAGLE 5 ISS might be in an unstable loading mode, refer to [Loading Mode Support](#).

#### *Maintenance Commands*

The following commands are used for G-Port maintenance.

- The debug command **ent-trace** traps G-Port MSUs (Message Signaling Unit) based on the point code of the switch that generated the MSU (SSP), a particular DN and entity ID. For MSISDN and entity ID, the comparison is based on the search key built from the CdPA GTAI (Global Title Address Information) after any conditioning. The existing GT SCCP trigger also applies to G-Port messages.
- The command **rept-stat-sccp** reports current MNP statistics. A MSU is considered to be a G-Port MSU after SRVSEL. This command reports G-Port statistics on the basis of a single TSM card running the SCCP application or on a G-Port system basis.

For more information, refer to [Chapter 5 Maintenance and Measurements](#).

#### *G-Port Loading Mode Support*

Loading mode support is not applicable for RTDB updates because DSM cards use incremental loading from the EPAP. STP Administrative updates are allowed while a DSM card is loading and the system is above the 80% card stability threshold. If it is below the 80% threshold, loading mode support allows STP administrative updates to be rejected while cards finish loading and cross the 80% or better threshold.

For G-Port, loading mode support is applicable for database updates originating from the EAGLE 5 ISS GPSM-II (General Purpose Service Module II cards) destined for the DSM cards.

### ***Audit Requirements***

The G-Port audit does not change EAGLE 5 ISS compliance to STP audit requirements, to which it currently adheres. New G-Port subscriber database tables residing on the EAGLE 5 ISS TDM fixed disks are audited by the existing STP audit, which only verifies tables on the EAGLE 5 ISS active and standby TDMs. There are new audit mechanisms for new G-Port tables residing on the EPAP platform that are downloaded to the DSM cards. The new audit mechanisms consist of the following.

- On each DSM card and on the standby EPAP, a background audit calculates checksums for each G-PortRTDB table record and compares the calculated checksum against the checksum value stored in each record. If they are not the same, then a *database corrupt* alarm is issued.
- A process that runs periodically on the active EPAP (approximately every five seconds or less) sends the latest RTDB database level to all the DSM cards and the standby EPAP. If the database levels do not match, the standby EPAP or DSM card issues a *diff level* alarm.

For more information on the audit mechanisms, refer to the *EPAP Administration Manual*.

## **G-Port Protocol**

### **Main Functions**

G-Port and MNPCR provide the following main functions:

### ***Message Discrimination***

Because G-Port provides translation of ported numbers, it provides a method to identify which messages should receive G-Port vs. GTT. This task of identification is provided via a service selector table where the user can define G-Port service for a combination of selectors. If a selector match is not found then, G-Port falls through to GTT.

### ***RN Prefix Deletion - SCCP***

The decoded SCCP CdPA digits can have a RN concatenated with the MSISDN number in two forms:

- RN + DN
- CC+RN+DN

When the SNAI is either RNIDN, RNNNDN, or RNLDN, G-Port compares the decoded MSISDN number with the list of provisioned home RN prefixes defined in the RTDB. If a match is found, G-Port removes the RN digits from the number.

Number conditioning, if required, is performed after deleting the RN.

When the SNAI is CCRNDN, G-Port first compares the CC to the DEFCC/MULTCC list:

- If CC is not equal to the DEFCC/MULTCC, G-Port falls through to GTT.

- If CC=DEFCC/MULTCC then, G-Port compares the digits after CC with the list of provisioned Home RN prefixes that are defined in the RTDB. If a match is found, then G-Port strips off the RN digits from the number. If no match is found, the no-prefix deletion is performed and G-Port processing continues.

### ***RN Prefix Deletion - TCAP***

The decoded MAPMSISDN digits can have a RN concatenated with the MSISDN number in two forms:

- RN + DN
- CC+RN+DN

The MAP NAI is used to determine the type: International, National or Subscriber. If MNPCRP is OFF, RN prefix deletion is not attempted. If MNPCRP is ON, then RN prefix deletion is attempted on all MSISDNs. If the MAPNAI indicates International, then a check is performed for the DEFCC/MULTCC prefix on the MSISDN. If DEFCC/MULTCC is detected, then HomeRN deletion is attempted using the CC+RN+DN format. All other MSISDNs will use the RN+DN format. G-Port compares the decoded MSISDN number with the list of provisioned home RN prefixes defined in the RTDB. If a match is found, the G-Port strips off the RN digits from the number.

Number conditioning (if required) is performed after deleting the RN.

If CC+RN+DN search is performed, G-Port compare the digits after CC with the list of provisioned home RN prefixes defined in the RTDB. If a match is found, G-Port strips off the RN digits from the number. If no match is found, then no prefix deletion is performed and G-Port processing continues.

### ***Number Conditioning***

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

When G-Port is required to be performed on a message and the number is not international (that is, the NAI of MSISDN number is “National (Significant) Number” or “Subscriber Number”, or the SNAI is NATL or SUB or RNNNDN or RNLDN), the National/Local to International number is triggered.

For a National (Significant) Number, the received CdPA/MAP MSISDN digits are prepended with the default country code; for a Subscriber number, the CdPA/MAP MSISDN digits are prepended with the default country code and the default network code.

### ***Database Lookup***

G-Port 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’:

- G-Port first performs database lookup one time using the even number.
- If no match is found, G-Port 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 Migration 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 turned on. [Table 2-2](#) shows call dispositions for the following configurations:

G-Port Only ([Table 2-2](#))

G-Port and IGM ([Table 2-3](#))

The following notations apply to [Table 2-2](#) and [Table 2-3](#).

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

RN = Routing Number

SOR = Support for Optimal Routing

SRI = Send Routing Information

SP = Signaling Point

NE = Network Entity

[Table 2-2](#) summarizes the actions taken based on the database result:

**Table 2-2. G-Port Database Lookup**

Message Type	MSISDN Found	Result	MNP/CRPON and HomeRN deleted from DN	Action
SRI	Yes	RN	No	SRI ack using RN prefix
SRI	Yes	RN	Yes	Issue UIM 1256 and fall through to GTT
SRI	Yes	SP	N/A	Forward SRI message to the destination using SP data
SRI	Yes	None	No	SRI ack using MSISDN
SRI	Yes	None	No	Fall through and perform GTT
SRI	Yes	None	Yes	Issue UIM 1256 and fall through to GTT
SRI	No	N/A	N/A	Fall through and perform GTT

Message Type	MSISDN Found	Result	MNPCRPN and HomeRN deleted from DN	Action
Non-SRI or SRI-SOR	Yes	RN	No	Forward the message to the next node using RN data
Non-SRI or SRI-SOR	Yes	RN	Yes	Issue UIM 1256 and fall through to GTT
Non-SRI or SRI-SOR	Yes	SP	N/A	Forward the message to the next node using SP data
Non-SRI or SRI-SOR	Yes	None	No	Fall through and perform GTT
Non-SRI or SRI-SOR	Yes	None	Yes	Issue UIM 1256 and fall through to GTT
Non-SRI or SRI-SOR	No	N/A	N/A	Fall through and perform GTT

**Table 2-3. IGM and G-Port Message Processing**

NE/PT	SRI	SRI_SM	Other GSM
RN and PT = 0	MIGRPFX = single: ACK (use GSM2IS41 prefix)  MIGRPFX = multiple: ACK (RN from EPAP)	SRI_SM_ACK with Return Error Component	Relay
RN and PT ≠ 0	ACK (RN from EPAP)	Relay	Relay
SP and PT = 5	Relay	Relay	Relay
SP and PT ≠ 5	Relay	Relay	Relay
No NE and PT = 5	GTT	GTT	GTT
No NE PT= 0, 1, 2, or No PT	ACK (no NE)	GTT	GTT
No DN entry found	GTT	GTT	GTT

Database lookup results in the following:

1. Fall through to GTT 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 describes how the EAGLE 5 ISS formulates a relayed message or a returned ACK.

## ***Message Relay***

The rules for formatting the SCCP CdPA GTA field are based on the value specified in the DigitAction field. If DigitAction = none, the EAGLE 5 ISS does not overwrite the SCCP CdPA GTA. For all other values, the EAGLE 5 ISS formats the SCCP CdPA GTA according to the value assigned to DigitAction. Refer to [Table 2-4](#) for examples of DigitAction Expansion on the SCCP CdPA GTA of an outgoing message when the Entity ID = 1404 and the default country code = 886...

**Table 2-4. DigitAction Applications**

DigitAction	Value in Incoming CdPAGTA	Value in Outgoing CdPAGTA	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
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***

The following encoding rules are followed when a SRI ack is returned:

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

## ***Determination of MAP Phase***

The phase or version of the MAP protocol is determined from the ACN.

If ACN received is found to be from SRI (in the form: map-ac-locInfo retrieval(s) version xx, such as '04000010005xx'), the last byte ('xx') of the ACN determines the version/phase of the MAP, as shown in [Table 2-5](#). (If the ACN does not match the one defined in ETSIGSM 03.18, the MAP version/phase is assumed to come from the **defmapvr** parameter of GSMOPTS specification.)

**Table 2-5. MAP Phase Determination**

Last Byte in ACN	MAP Phase
00	Specified by <b>defmapvr</b> parameter of a GSMOPTS command
01	Phase 1
02	Phase 2
03	Phase 2+
Greater than 3	Specified by <b>defmapvr</b> parameter of a GSMOPTS command

### **G-Port Message Handling**

G-Port performs message handling in the following steps.

1. The message arrives at the EAGLE 5 ISS*route-on-gt*. The EAGLE 5 ISS decodes the SCCP portion and uses the data to perform the G-Port selection based on the CDPA GT fields other than the ES and GTAI. The result of the selection provides a service indicator. The service indicator is G-Port if it is determined that MNP-SRF is required. If a G-Port selector does not match the incoming GT fields, the message is passed on for GTT selection.
2. MNP-SRF first decodes the Operation Code of the MAP message to distinguish the SRI message from the rest. If the Operation Code is SRI and the OR Interrogation indicator is absent, and the GSMOPTS parameter SRIDN=TCAP, the MSISDN parameter is decoded from the MAP message. If the GSMOPTS parameter SRIDN=SCCP, or the message is not SRI, the digits available in the CDPAGTAI are used for database lookup.
3. The decoded DN is conditioned to an international number before performing the RTDB lookup. The conditioning performed depends on whether the digits are obtained from TCAP or MAP part of the message.
  - If the digits are from the SCCP part, the number conditioning is based on SNAI value. First, RN prefix deletion is performed, and conversion to an international number, based on its value. Conversion to international format is based on DEFCC and DEFNDC, as required. If the incoming number is CCRNDN, DEFCC and MULTCC are used to determine the Best Match CC to locate the RN digits for RN prefix deletion
  - If the digits are from the MAP part, the number conditioning is based on NAI of MSISDN parameter. Prefix deletion is performed if MNPCRP is ON. The number is converted to an international number, if necessary. Conversion to international format is based on DEFCC and DEFNDC, as required. If the incoming number is international, DEFCC and MULTCC are used to determine if the format is CCRNDN or RNIDN. If a Best Match CC is located, then it is used to locate the RN digits for RN prefix deletion.
4. The RTDB database lookup is performed in two parts:
  - The exception or individual number database is searched for a match. If the match is found, the data associated with this entry is considered.

- If the conditioned number is absent in the exception database, the number range database is searched. If the match is found, the data associated with this range entry is considered. If the search is unsuccessful, the result is no match.
5. If the number is found and a RN prefix is present for this entry, the following is performed:
- If the message is SRI, and MNPCRP is OFF, or if MNPCRP is ON and a HomeRN was not present in the incoming DN (a HomeRN was not deleted from the SCCP CdPA/MAP MSISDN), then G-Port generates a SRI ack response with the RN prefix in the Routing Number parameter.
  - If the message is non-SRI, and MNPCRP is OFF, or if MNPCRP is ON and a HomeRN was not present in the incoming DN a HomeRN was not deleted from the SCCP CdPA), then G-Port uses the translation data for the number to alter the CdPA digits and route the message to the destination.
  - If the message is SRI or non-SRI, and MNPCRP is on, and a HomeRN was present in the incoming DN (a HomeRN was deleted from the SCCP CdPA/MAP MSISDN), then G-Port generates UIM #1256, and the message shall fall through to GTT. In most network implementations, since the message contains RN+DN, this should cause a GTT failure, which will result in the EAGLE 5 ISS sending a UDTs to the originator if the Return Message on Error flag was set in the incoming UDT.
6. If the number is found and a SP entity is present for this entry, G-Port uses the SP translation data as the number to route the message to the destination. This is true whether or not MNPCRP feature is ON.
7. If the number is found and neither SP nor RN data is associated with it (this is a direct routing case with number not known to be ported), the following occurs:
- If the message is SRI, and MNPCRP is off, or if MNPCRP is on and no HomeRN is present in the incoming DN(a HomeRN was not deleted from the SCCP CdPA/MAP MSISDN), and if the portability type associated with the DN entry is other than 3 or 4 (including "no status"), then G-Port generates a SRI ack response with the MSISDN in the Routing Number parameter. If the message is SRI, and MNPCRP is OFF, or if MNPCRP is on and no HomeRN was present in the incoming DN ( a HomeRN was not deleted from the SCCP CdPA/MAP MSISDN), and the portability type associated with the DN entry is either 3 or 4, then the SRI falls through to GTT (no SRI ack response is generated).
  - If the message is non-SRI, and MNPCRP is off, or if MNPCRP is on and no HomeRN is present in the incoming DN (a HomeRN was not deleted from the SCCP CdPA), then the message falls through to GTT.
  - If the message is SRI or non-SRI, and MNPCRP is on, and a HomeRN was present in the incoming DN (a HomeRN was deleted from the SCCP CdPA/MAP MSISDN), then G-Port generates UIM #1256, and the message falls through to GTT. In most network implementations, since the message contains RN+DN, this should cause a GTT failure, which results in the EAGLE 5 ISS sending a UDTs to the originator if the Return Message on Error flag was set in the incoming UDT.
8. GTT is performed on the message for any of these conditions:
- If G-Port is not required
  - If the number is not found in the RTDB (both range and exception database)

## G-Port Call Flows

This section contains several illustrative sample call flows: G-Port supports all call flows identified in GSM 03.66 other than noted exceptions. This section contains a mix of call flows using both indirect and direct routing.

These call flows, including calls to imported or non-ported numbers, show only one possible scenario regarding how messages are routed in the network and where various stages of GTT are performed. G-Port may perform intermediate or final GTT depending on the message received and provisioned data.

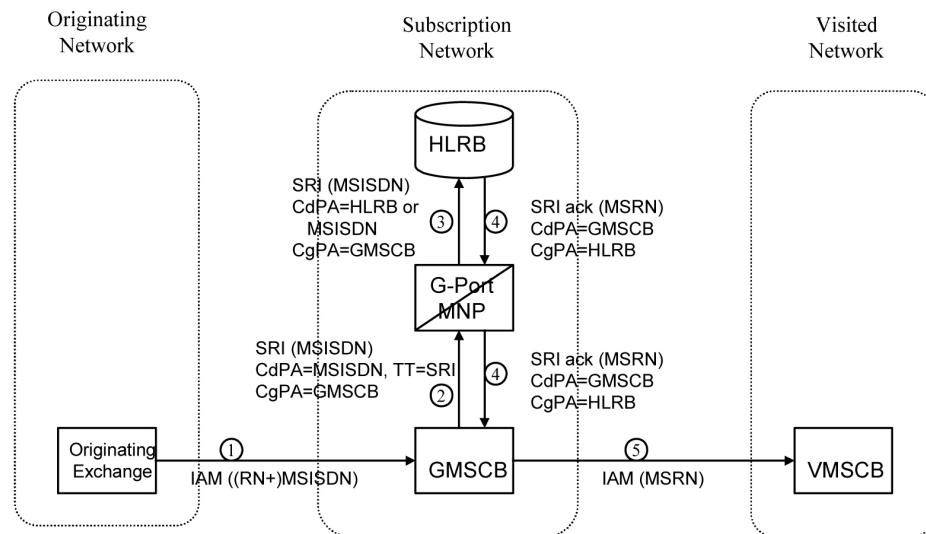
Several call flows refer to non-call related messages. Examples of non-call related messages are SRI for Short Message Service and SRI for Optimal Routing.

In all G-Port call flows, the MSISDN used for the database search is converted to an international number, if necessary, prior to the database search.

### **Mobile Terminated Call to Non-Ported or Imported Number (Indirect Routing)**

The first call flow example is for a mobile terminated call to a non-ported or imported number by indirect routing. Refer to [Figure 2-9](#) and see the steps in the flow for this call.

**Figure 2-9.** Mobile Terminated Call by Indirect Routing



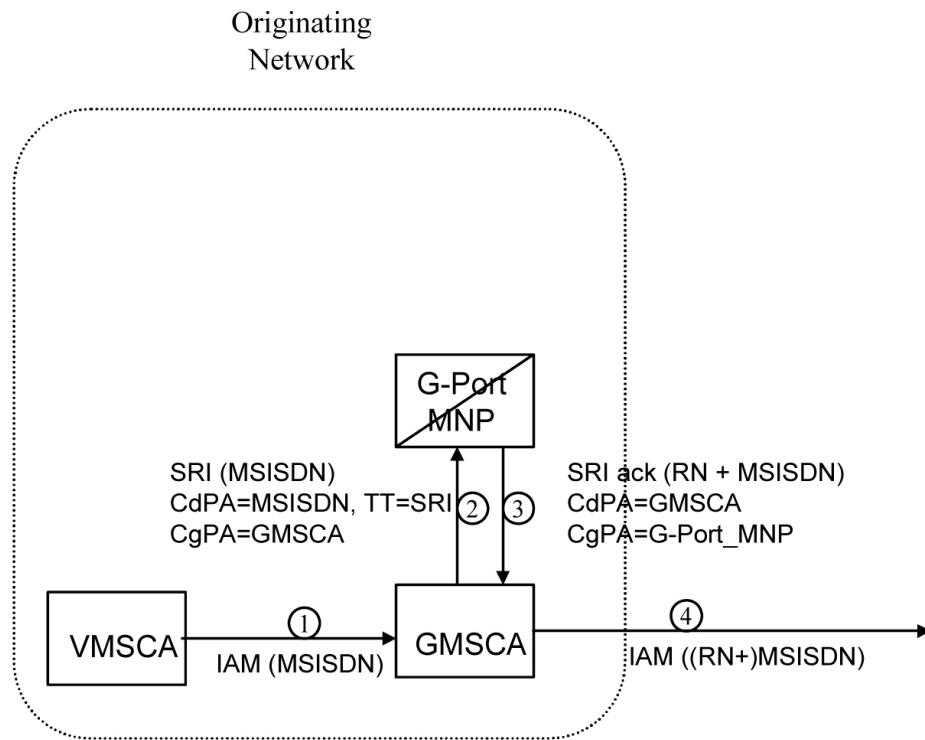
1. The originating exchange sends an IAM message to GMSCB in the subscription network. When the number is imported, the original number range owner network has already performed a NP database lookup and determined the new subscription network (Routing Number). As shown in the figure, this could be sent in the IAM along with the MSISDN.
2. GMSCB sends a SRI request to the MNP-SRF. This request may or may not contain the new TT = SRI. Global title information triggers G-Port processing. The MNP-SRF determines the message is an SRI and uses the MSISDN from the MAP message to search the G-Port Database (GPDB). A match is found with no Routing Number and a HLR GT address for HLRB, or no match is found and falls through to GTT, producing a routing to HLRB. Alternatively, GTT could route to another node, possibly in a different network, but that is not illustrated here.
3. The message is routed to HLRB.

4. HLRB responds to GMSCB with a SRI ack. This message can be GT routed through the STP or MTP routed.
5. GMSCB sends an IAM with the roaming number to the visited network.

### ***Mobile Originated/Terminated Call to an Exported Number (Direct Routing)***

This call flow example is for a call that is mobile originated or terminated to an exported number by direct routing. Refer to [Figure 2-10](#) and see the steps in the flow for this call.

**Figure 2-10.** Call to an Exported Number by Direct Routing



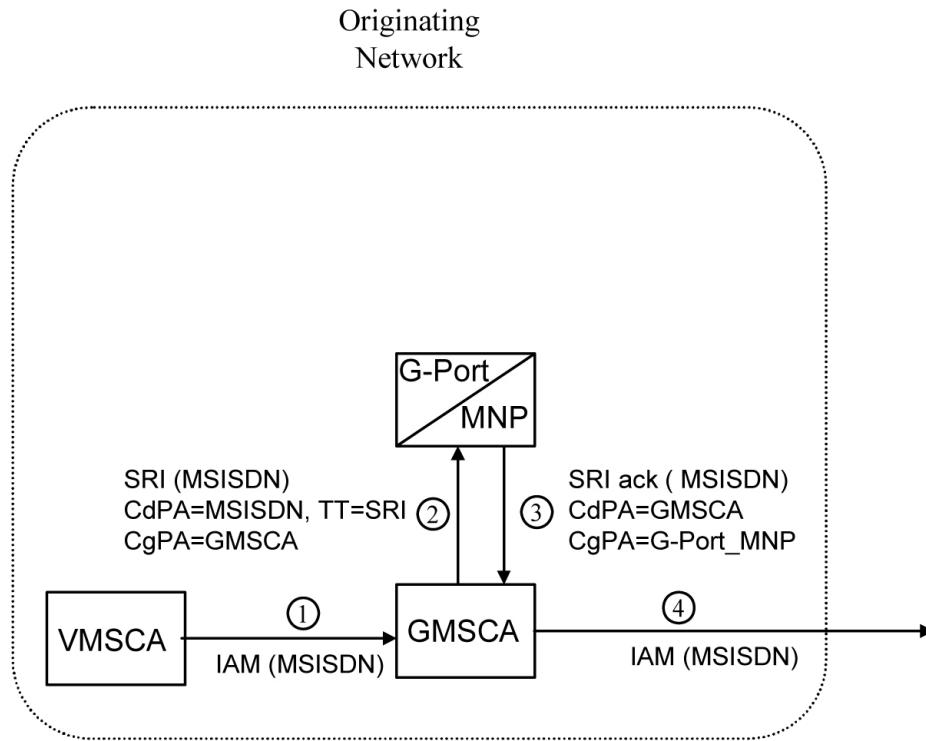
This call flow assumes the originating network is not the subscription network. If indirect routing were used in this example, the originating network would first route the call to the number range owner network, according to pre-portability rules, where the MNP-SRF and NPDB are accessed to locate the Routing Number.

1. When the call is originated, VMSCA sends an IAM message to GMSCA.
2. GMSCA sends a SRI request to the MNP-SRF. This may or may not contain the new TT = SRI. Global title information triggers G-Port processing. The MNP-SRF determines the message is an SRI and uses the MSISDN from the MAP message to search the GPDB. A match is found with the Routing Number field populated.
3. The MNP-SRF responds to GMSCA with a SRI ack containing the Routing Number prefixed to the MSISDN number as the Roaming Number.
4. GMSCA sends an IAM with the roaming number to the subscription network. The Routing Number is used by GMSCA and possibly by transit exchanges to route the call to the subscription network.

### ***MO/MT Call to a Number Not Known to be Ported (Direct Routing)***

This call flow example is for a call that is mobile originated (MO) or mobile terminated (MT) to a foreign number that is not known to be ported by direct routing. Refer to [Figure 2-11](#) and see the steps in the flow for this call.

**Figure 2-11.** MO/MT Call to Number Not Known to be Ported (Direct Routing)

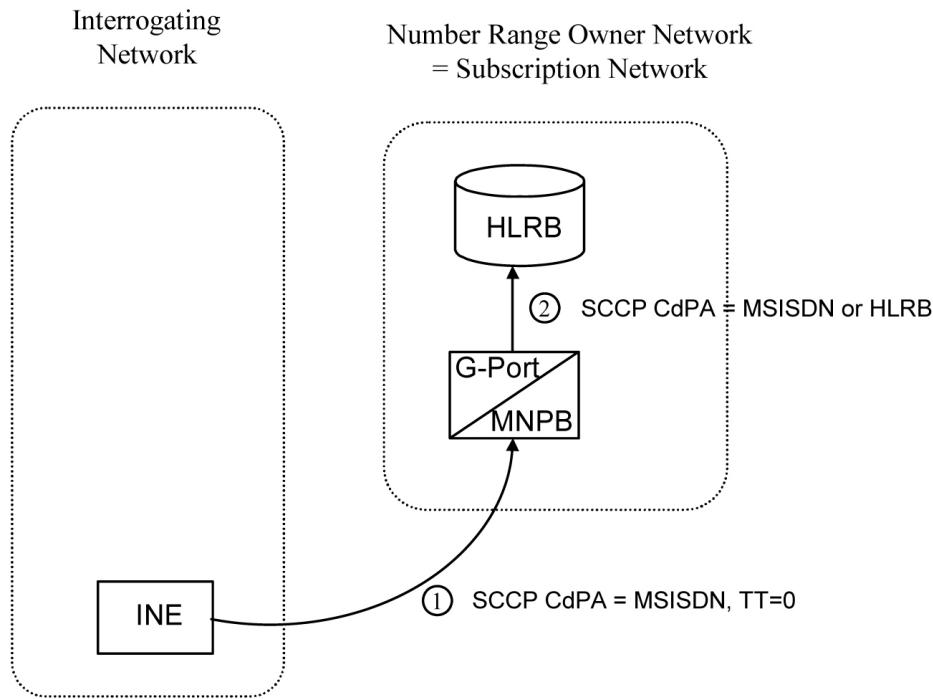


This call flow assumes the originating network is not the subscription network.

1. When the call is originated, VMSCA sends an IAM message to GMSCA.
2. GMSCA sends a SRI request to the MNP-SRF. This request may or may not contain the new TT = SRI. Global title information triggers G-Port processing. The MNP-SRF determines the message is an SRI and uses the MSISDN from the MAP message to search the GPDB. A match is found, but the Routing Number and HLR Address fields are not populated.
3. The MNP-SRF responds to GMSCA with a SRI ack containing the MSISDN number.
4. GMSCA sends an IAM with the roaming number to the subscription network.

### ***Non-Call Related Message for Non-Ported Number (Indirect Routing)***

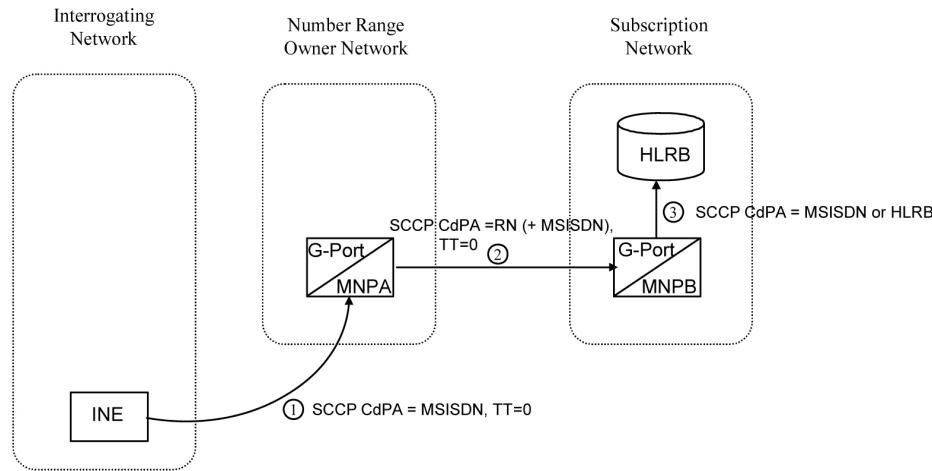
This call flow example is for a non-call related message for a non-ported number by indirect routing. Refer to [Figure 2-12](#) and see the steps in the flow for this call.

**Figure 2-12.** Non-Call Related Message for Non-Ported Number

1. The Interrogating Network Entity (INE) sends the non-call related message to MNP-SRFB in the number range owner network. The SCCP CdPA contains the MSISDN number of the subscriber and the TT. The TT may be either 0 as shown in the figure, or another value depending upon the service, such as TT=17 for CCBS service.
2. Global title information triggers G-Port processing. MNP-SRFB determines the message is non-call related (i.e. not an SRI that doesn't require Optimal Routing) and uses the MSISDN from the SCCP CdPA to search the GPDB. No match is found, so MNP-SRFB uses GTT to locate the GT address associated with the MSISDN to route the message to HLRB.

#### ***Non-Call Related Message for Ported Number (Indirect Routing)***

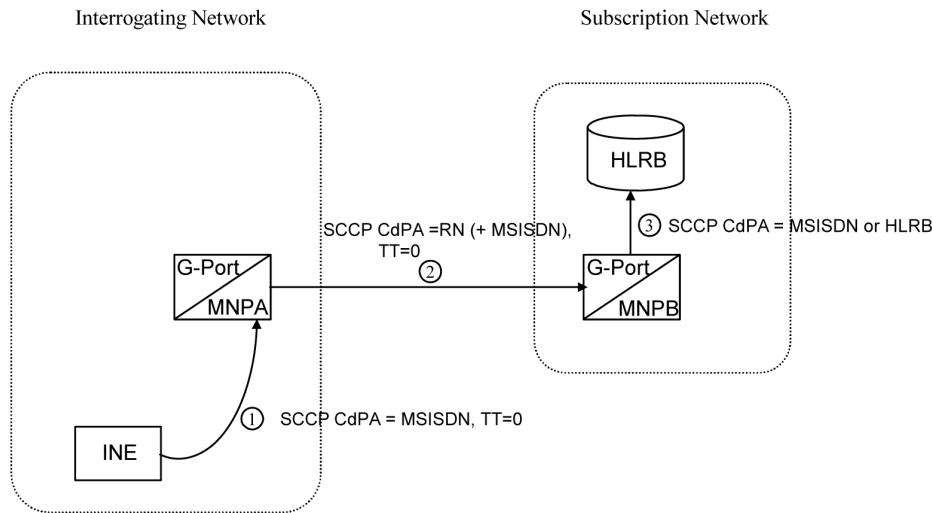
This call flow example is for a non-call related message for a ported number by indirect routing. Refer to [Figure 2-13](#) and see the steps in the flow for this call.

**Figure 2-13.** Non-Call Related Message for Ported Number

1. The Interrogating Network Entity (INE) sends a non-call related message to MNP-SRFA in the number range owner network. The SCCPCdPA contains the MSISDN number of the subscriber and the TT. The TT may be either 0 as shown in the figure, or another value depending upon the service, such as TT=17 for CCBS service.
2. Global title information triggers G-Port processing. MNP-SRFA determines the message is one requiring message relay (that is, not an SRI that doesn't require Optimal Routing) and uses the MSISDN from the SCCPCdPA to search the GPDB. A match is found, and MNP-SRFA uses the Message Relay GT address associated with the match to route the message to the subscription network.
3. MNP-SRFB receives the message and determines the message is one requiring message relay (that is, not an SRI that doesn't require Optimal Routing). It checks if the SCCPCdPA begins with a Prefixed RN. If so, it removes the prefix. Either way, it uses the MSISDN from the SCCPCdPA to search the GPDB. A match is found, and MNP-SRFB uses the HLRGT address associated with the match to route the message to HLRB.

### ***Non-Call Related Message for Ported or Non-Ported Number (Direct Routing)***

This call flow example is for a non-call related message for either a ported or non-portable number by direct routing. Refer to [Figure 2-14](#) and see the steps in the flow for this call.

**Figure 2-14.** Non-Call Related Message for Any Number

This call flow assumes the originating network is not the subscription network.

1. The Interrogating Network Entity (INE) sends the non-call related message to MNP-SRFA in the interrogating network. The SCCP CdPA contains the MSISDN number of the subscriber and the TT. The TT may be either 0 as shown in the figure, or another value depending upon the service, such as TT=17 for CCBS service.
2. Global title information triggers G-Port processing. MNP-SRFA determines the message is one requiring message relay (that is, not an SRI that doesn't require Optimal Routing) and uses the MSISDN from the SCCP CdPA to search the GPDB.
  - If a match is found (ported case), MNP-SRFA uses the Message Relay GT address associated with the match to route the message to the subscription network.
  - If a match is not found (non-ported case), MNP-SRFA uses GTT to route the message to MNP-SRFB.
3. MNP-SRFB receives the message and determines the message requires message relay (that is, not an SRI that doesn't require Optimal Routing). It checks to see if the SCCP CdPA begins with a Prefixed RN. If so, it removes the prefix. Either way, it uses the MSISDN from the SCCP CdPA to search the GPDB.
  - If a match is found (imported case), MNP-SRFB uses the HLR GT address associated with the match to route the message to HLRB.
  - If a match is not found, MNP-SRFB uses GTT to route the message to HLRB.

## G-Port SCCP Service Re-Route Capability

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

- [Service State](#)
- [MNP Re-Routing](#)
- [MNP Capability Point Codes](#)

G-Port SCCP Service Re-Route Capability is not supported for the Prepaid SMS Intercept feature. G-Port SCCP Service Re-Route Capability is supported for the IS-41 to GSM Migration feature.

## Service State

Service state is part of the G-Port SCCP Service Re-Route Capability. Service state is used to indicate the current state of G-Port, either *ONLINE* or *OFFLINE*. Service state also gives the user the option to mark G-Port as *OFFLINE* or *ONLINE* based on the current behavior. If a G-Port problem is identified, G-Port can be marked *OFFLINE* to initiate the re-routing procedure. In the case when TSM cards running the SCCP application need to be reloaded, G-Port can be marked *OFFLINE* until enough cards are in-service and then bring G-Port *ONLINE* in a controlled fashion. This feature also provides the option to mark G-Port *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. G-Port re-routing is activated by marking G-Port *OFFLINE*. When G-Port is *OFFLINE* and alternate PCs are provisioned, any messages destined for G-Port are re-routed to the available alternate PCs that are defined for G-Port. 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 G-Port will fall through to GTT as part of the re-routing procedure.

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

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

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

MNP Capability point codes can be provisioned when the G-Port feature is on. There can be more than one Capability Point Code assigned to G-Port CPC Type.

When the G-Port feature is turned on and the G-Port service state is set to offline, the user can change the service to online at any point. After the feature is turned online, G-Port starts processing messages if at least one TSM card running the SCCP application is IS-NR.

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

The G-Port service state is persistent. Booting the OAM or all the TSM cards running the SCCP application will not change the service state. Commands must be used to change the service state.

G-Port supports up to 7 alternate PCs per domain. All 6 domains (ANSI, ITU-I, ITUN14, ITUN14 spare , ITU-I spare and ITUN24) are supported. An entire set of alternate PCs are considered as a re-route set. A GTT option is supported for G-Port re-route. When the G-Port service is *OFFLINE*, G-Port messages fall though to GTT based on the GTT option. This option is set to *YES* by default.

## G-Port SCCP Service Re-Route Capability Summary

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

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

### *Option 1*

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

```
chg-sccp-serv:serv=gport:pci1=1-1-1:rc1=10:pci2=2-2-2:rc2=10:pc
i3=3-3-3:rc3=10:pci4=4-4-4:rc4=10
```

```
chg-sccp-serv:serv=gport:pci1=5-5-5:rc1=10:pci2=6-6-6:rc2=10:pc
i3=7-7-7:rc3=10:pci4=8-8-8:rc4=10
```

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

### *Option 2*

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

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

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

**Table 2-6** shows the actions taken when the G-Port service is offline, a message arrives at the affected node requiring G-Port service, and TSM cards running the SCCP application are available.

**Table 2-6. G-Port 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
G-Port	G-Port Capability PC	Yes	N/A	Re-Route to alternate point code based on relative cost	TFP concerning CPC
G-Port	G-Port Capability PC	No*	Yes	Fall through to GTT and perform GTT	TFP concerning CPC
G-Port	G-Port Capability PC	No*	No	Generate UDTS (return cause = network failure)	TFP concerning CPC
G-Port	G-Port Capability PC	Not Defined	Yes	Fall through to GTT and perform GTT	TFP concerning CPC
G-Port	G-Port Capability PC	Not Defined	No	Generate UDTS (return cause = no xlation for this addr)	TFP concerning CPC
Not G-Port	G-Port Capability PC	N/A	N/A	Perform appropriate Service/GTT	None
G-Port	True or Secondary PC or non-G-Port CPC	Yes	N/A	Re-Route to alternate point code based on relative cost	None
G-Port	True or Secondary PC or non-G-Port CPC	No*	No	Generate UDTS (return cause = network failure)	None
G-Port	True or Secondary PC or non-G-Port CPC	No*	Yes	Fall through to GTT and perform GTT	None
G-Port	True or Secondary PC or non-G-Port CPC	Not Defined	Yes	Fall through to GTT and perform GTT	None
G-Port	True or Secondary PC or non-G-Port CPC	Not Defined	No	Generate UDTS (return cause = no xlation for this addr)	None
Not G-Port	True or Secondary PC or non-G-Port CPC	N/A	N/A	Perform appropriate Service/GTT	None

\* Alternate point codes are defined and unavailable (prohibited or congested).

**Table 2-7** shows the actions of LIM re-route functionality when TSM cards running the SCCP application are unavailable or down.

**Table 2-7. G-Port LIM Re-Route Message Handling Summary**

Routing Indicator in Incoming Message	DPC	Full or Partial Failure	G-Port Service Status	Message Handling	Network Management
rt-on-gt	G-Port Capability PC	Full	N/A	Generate UDTS	TFP concerning CPC, UPU
rt-on-gt	Non G-Port Capability PC	Full	N/A	Generate UDTS	TFP concerning CPC, UPU
rt-on-gt	True PC	Full	N/A	Generate UDTS	UPU
rt-on-gt	G-Port Capability PC	Partial*	ONLINE	Generate UDTS	None
rt-on-gt	True PC or non G-Port Capability PC	Partial*	ONLINE	Generate UDTS	None
rt-on-gt	G-Port CPC	Partial*	OFFLINE	Generate UDTS	TFP concerning CPC, UPU
rt-on-gt	True PC or non-G-Port CPC	Partial*	OFFLINE	Generate UDTS	None

\* It is considered a partial failure if some TSM cards running the SCCP application are available but overloaded.

## Prepaid SMS Intercept Protocol

Prepaid SMS Intercept performs the following main functions:

### Message Discrimination

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

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

### Number Conditioning

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

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

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

## Prepaid Screening

Once the number is conditioned, the PPSMS feature performs a database search to determine if the MSISDN belongs to a prepaid subscriber. This is determined by the pt field associated with the database entry for the MSISDN. PPSMS performs the database lookup using the international MSISDN. The individual number database is searched first, and if the number is not found, then the number range database is searched. If a match is not found in individual nor range-based database, then GTT is performed on the message. In case of MSISDN numbers in the PPSMS database being odd and the last digit of the decoded MSISDN from the FSM being 'zero', PPSMS first performs a database lookup once using the even number. If no match is found, then PPSMS performs the database lookup again, now using the odd number (without last digit).

## Message Relay to IN Platform

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

## SMS Prepaid Intercept Message Handling

PPSMS performs message handling in the following steps.

1. The message arrives at the EAGLE 5 ISS<sub>route-on-gt</sub>. The EAGLE 5 ISS decodes the SCCP portion and uses the data to perform the G-Port selection based on the CdPA NP, NAI, TT, SSN, and GTI. The result of the selection provides a service indicator. The service indicator is SMSMR if PPSMS is required. If a SMSMR selector does not match the incoming GT fields, the message is passed on for GTT selection.
2. If Item 1 indicates PPSMS is required, and the message is not a UDTs generated by EAGLE 5 ISS, the EAGLE 5 ISS performs PPSMS service.
3. If the message is a UDTs generated by the EAGLE 5 ISS, then regular GTT is performed on the message.
4. If the EAGLE 5 ISS receives a UDTs message from another node, it is treated in the same manner as any other message. If GTT is indicated, then the UDTs translation is based on the CdPAGTA, and the message is routed to the translated address. If GTT is not indicated, the UDTs is through switched via MTP routing. The one exception is that if translation fails on the UDTs, the EAGLE 5 ISS will not generate another UDTs to send to the originator of the UDTs that failed.
5. The TCAP/MAP portion of the message is decoded by PPSMS. If the message is not a TC\_BEGIN, the message falls through to GTT.

6. If the message is a TC-BEGIN, PPSMS decodes the Operation Code of the MAP message to distinguish MO\_FSMs from the rest. If the OpCode is not FSM (MAP version 1 or 2) or MO\_FSM (MAP version 3), the message falls through to GTT.
7. If the OpCode is FSM (MAP version 1 or 2) or MO\_FSM (MAP version 3), the MAP portion of the message is decoded and searched for a MSISDN tag. If a MSISDN tag is not found, the message falls through to GTT. For version 3 MO\_FSMs, the SMRPOA parameter would contain the MSISDN tag. For version 1 or 2 FSMs, a MSISDN tag is found if the message is mobile originated. If it is mobile terminated, a MSISDN tag is not found and the message falls through to GTT.
8. If the MSISDN is found in [Item 7](#), the SCCP CgPA GTA is compared to the IN platform GTAs provisioned in the GSMOPTS table. If the decoded GTA matches one of the IN platform Gas, the message falls through to GTT.
9. If the SCCP CgPA GTA in [Item 8](#) does not match any of the IN platform GTAs, the MSISDN from the MAP portion is decoded and conditioned to an international number before performing the lookup. The number conditioning is based on NAI of MSISDN parameter. The number is converted to an international number, if necessary.
10. The database lookup is performed in two parts:
  - The exception or individual number database is searched for a match. If the match is found, the data associated with this entry is considered.
  - If the conditioned number is absent in the exception database, the number range database is searched. If the match is found, the data associated with this range entry is considered. If the search is unsuccessful, the result is no match.

In case of MSISDN numbers in the PPSMS database being odd and the last digit of the decoded MSISDN from the FSM being 'zero', PPSMS first performs database lookup once using the even number. If no match is found then PPSMS performs the database lookup again, using the odd number (without last digit).

11. If a number match is found as a result of the search, the Portability Type (pt) field associated with the entry is examined.
  - If the pt is prepaid1 or prepaid2, the IN platform translation information (PC and RI) associated with that type is retrieved from the GSM options. If the RI is SSN, the information is used to access the mated application (MAP) table for point code status and to see if the selected IN platform is in a load sharing relationship with another. If the RI is GT, and if the IGTTLoad Sharing feature is on, the mated relay node table is used for this purpose. If the point code is available, the message is routed to the IN platform. If the point code is in a load sharing relationship with other point codes, messages are equally divided between them.
  - If the pt is not prepaid1 nor prepaid2, the message falls through to GTT.
12. If a number match is not found as a result of the search in [Item 10](#), the message falls through to GTT.

## PPSMS Without G-Port

The G-Port feature must be enabled in order to enable the PPSMS feature. The PPSMS feature can be used without using G-Port. The PPSMS service and G-PORT service are mutually exclusive for a particular subsystem.

Service selector commands are used to provision the PPSMS service. The **serv=smsmr** parameter of the **ent-srvsel** command is used for PPSMS Service. This service can be assigned to ITU selectors only. The SNP parameter must be set to E.164 and all values of the SNAI parameter are supported. Refer to [EAGLE 5 ISS G-Port Service Selector Commands](#) for more information.

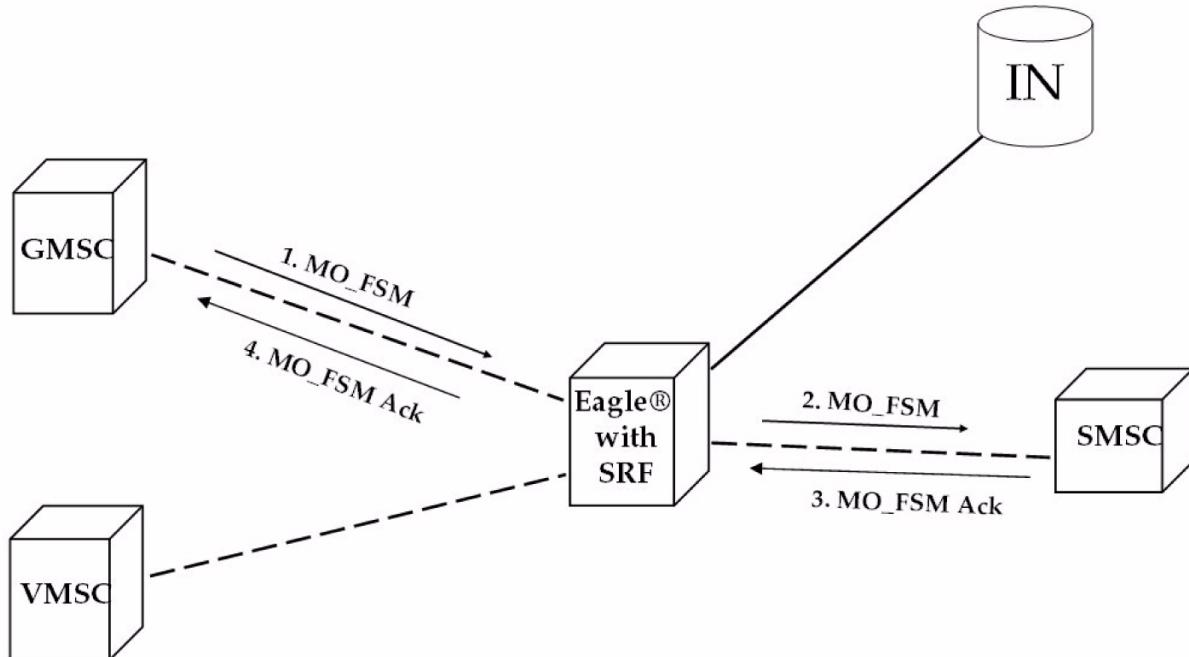
## PPSMS Call Flows

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

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

Refer to [Figure 2-15](#) for the steps in the flow for this call.

**Figure 2-15.** Successful Delivery of MO\_FSM from Contract Subscriber



1. The Gateway Mobile Switching Center (GMSC) sends the Mobile Originated Forward Short Message (MO\_FSM) to the EAGLE 5 ISS with PPSMS (TCBEGIN).

Based on MTPDPC = EAGLE 5 ISS's point code and SCCP CdPA TT, NP, NAI, SSN, and GTI, the message is pre-selected for PPSMS service. If service is not PPSMS, the message falls through to GTT.)

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

The EAGLE 5 ISS queries the DB using the sender's MSISDN from the OA field in the MAP portion of message.

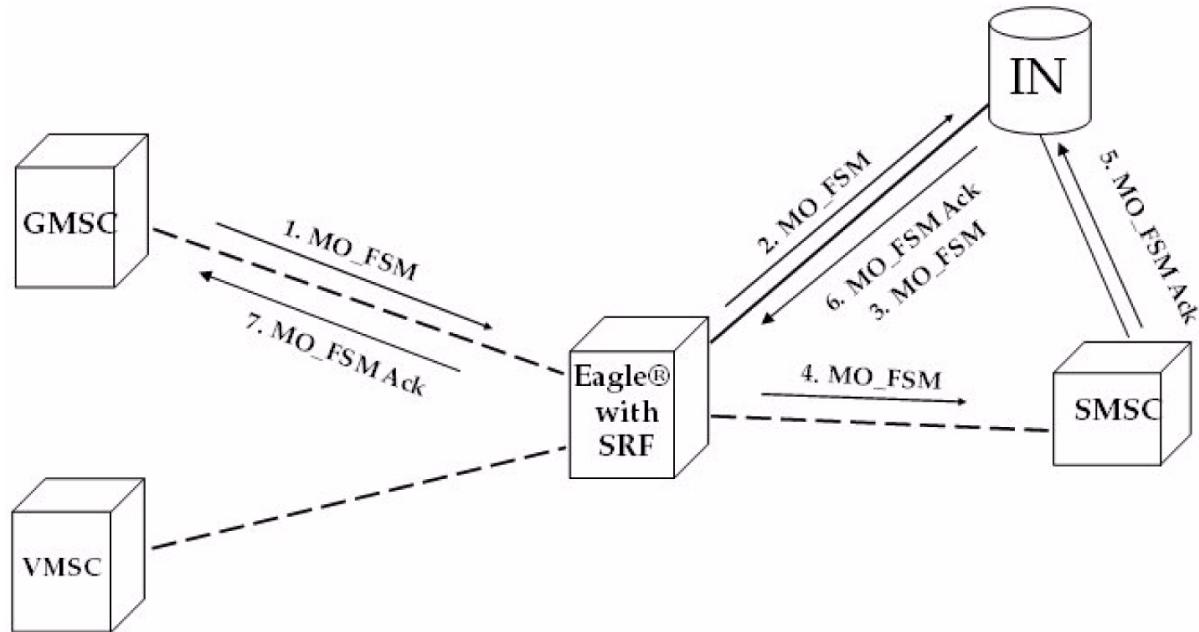
MSISDN is present in the database, but "Portability Type" is neither *prepaid1* nor *prepaid2*, meaning the sender is not a prepaid subscriber.

2. The EAGLE 5 ISS therefore GTT-routes the MO\_FSM to the SMSC (TCBEGIN).
3. The SMSC returns the MO\_FSM\_ack (TCEND).
4. One of two possibilities:
  - a. The SMSC sends the MO\_FSM\_ack route-on-SSN to the GMSC, then the SRF will simply MTP route the MO\_FSM\_ack to the GMSC. G-Port is not involved.
  - b. The SMSC sends the MO\_FSM\_ack route-on-GT, and the service selectors indicate G-Port/PPSMS. CdPA SSN = GMSC, which is same as SMSC, so PPSMS is selected. As PPSMS decodes message, it discovers it is a TCEND. Therefore, the message falls through to normal GTT and is routed to the GMSC.

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

Refer to [Figure 2-16](#) for the steps in the flow for this call.

**Figure 2-16.** Successful Delivery of Mobile Originated FSM from Prepaid Subscriber



1. The Gateway Mobile Switching Center (GMSC) sends the Mobile Originated Forward Short Message (MO\_FSM) to the EAGLE 5 ISS with PPSMS (TCBEGIN).

Based on MTPDPC = EAGLE 5 ISS's point code and SCCP CdPA TT, NP, NAI, SSN, and GTI, the message is pre-selected for PPSMS service. If service is not PPSMS, the message falls through to GTT).

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

The EAGLE 5 ISS queries the DB using sender's MSISDN from SM RP OA field in MAP portion of message. MSISDN is present in the database, and the "Portability Type" is *prepaid1*, meaning the sender is a prepaid subscriber.

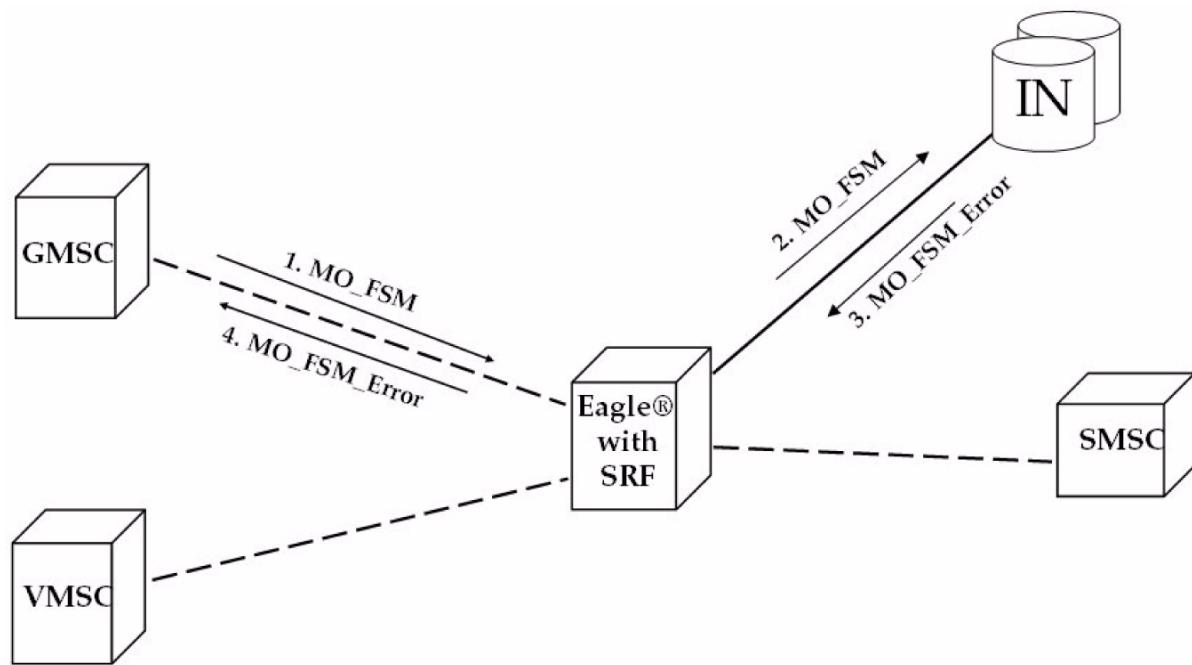
2. The EAGLE 5 ISS forwards the MO\_FSM to the IN Platform (TCBEGIN) associated with "prepaid1", after checking mated application or mated relay node table

**NOTE: The Portability Types *prepaid1* and *prepaid2* are used to select which of the two IN platforms the message should be sent. *prepaid1* indicates one and *prepaid2* the other.**

3. The IN Platform checks the account, finds there is enough credit to send the message, opens a new TCAP dialogue, and returns the MO\_FSM to the SRF (TCBEGIN-2).
4. The message arrives at EAGLE 5 ISS and is again selected for PPSMS service based on CdPATT, NP, NAI, GTI, and CdPA SSN = SMSC. The OpCode is MO\_FSM but the SCCP CgPA GTA is IN platform, therefore, PPSMS service is not indicated and the message falls through to GTT and is routed to the SMSC.
5. The SMSC returns the MO\_FSM\_ack to the IN platform (TCEND-2). There are two possibilities:
  - a. The SMSC sends the MO\_FSM\_ack route-on-SSN to the IN platform, then the SRF will simply MTP route the MO\_FSM\_ack to the IN platform. G-Port is not involved.
  - b. The SMSC sends the MO\_FSM\_ack route-on-GT, and the service selectors indicate G-Port/PPSMS. CdPA SSN = GMSC, which is same as SMSC, so PPSMS is selected. As PPSMS decodes the message, it discovers it is a TCEND. Therefore, the message falls through to normal GTT and is routed to the GMSC.
6. The IN Platform transfers the MO\_FSM\_ack to the first transaction and returns the MO\_FSM\_ack to the SRF (TCEND).
7. One of two possibilities:
  - a. The IN platform sends the MO\_FSM\_ack route-on-SSN to the GMSC, then the SRF will simply MTP route the MO\_FSM\_ack to the GMSC. G-Port is not involved.
  - b. The IN platform sends the MO\_FSM\_ack route-on-GT, and the service selectors indicate G-Port/PPSMS. CdPA SSN = GMSC, which is same as SMSC, so PPSMS is selected. PPSMS decodes message, discovers it is a TCEND, and the message falls through to normal GTT and is routed to the GMSC.

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

Refer to [Figure 2-17](#) for the steps in the flow for this call.

**Figure 2-17.** Unsuccessful Delivery of Mobile Originated FSM from Prepaid Subscriber at SCP

1. The Gateway Mobile Switching Center (GMSC) sends the Mobile Originated Forward Short Message (MO\_FSM) to the EAGLE 5 ISS with PPSMS (TCBEGIN).

Based on MTPDPC = EAGLE 5 ISS's point code and SCCP CdPA TT, NP, NAI, and GTI, the message is pre-selected for PPSMS service. If service is not PPSMS, the message falls through to GTT).

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

The EAGLE 5 ISS queries the DB using sender's MSISDN from the SM RP OA field in the MAP portion of message.

MSISDN is present in the database, and the "Portability Type" is *prepaid1*, meaning the sender is a prepaid subscriber.

2. The EAGLE 5 ISS forwards the MO\_FSM to the IN Platform (TCBEGIN) associated with *prepaid1*.

**NOTE: The Portability Types *prepaid1* and *prepaid2* are used to select which of the two IN platforms the message should be sent to. *prepaid1* indicates one and *prepaid2* the other.**

3. The IN Platform checks the account, finds there is not enough credit to send the message, and rejects the message by returning a MO\_FSM\_Neg\_Response to the SRF (TCEND).

4. One of two possibilities:

a. The IN platform sends the MO\_FSM\_Neg\_Response route-on-SSN, then the SRF will simply MTP route the MO\_FSM\_Neg\_Response to the GMSC. G-Port is not involved.

b. The IN platform sends the MO\_FSM\_Neg\_Response route-on-GT, and the service selectors indicate G-Port/PPSMS. CdPA SSN = GMSC, which is same as SMSC, so PPSMS service is selected.

PPSMS decodes message, discovers it is a TCEND, and the message falls through to normal GTT and is routed to the GMSC.

### ***Portability Check for Mobile Originated SMS***

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

The EAGLE 5 ISS will perform following with respect to MNPSMS Feature functionality.

1. The EAGLE 5 ISS receives an UDT message and checks if the service selector matches G-Port, if so continue on to [Step 2](#), If the service selector is not G-Port, the message falls through to GTT.
2. The EAGLE 5 ISS performs CdPA SSN discrimination. CdPA SSN = SMSC, PPSMS service is selected. (If CdPA SSN is HLR, G-Port MNP service is selected. If SSN is neither SMSC nor HLR, the message falls through to GTT.)
3. Next the MAP OpCode is examined. If the OpCode is MO\_FSM, PPSMS processing continues. (If the OpCode is not MO\_FSM, the message falls through to GTT.)
4. If The PPSMS feature is on and the message is from one of the IN Platforms (PPSMS Servers), the message exists from MNP SMS feature functionality and falls through to PPSMS processing. If not, MNPSMS processing continues with [Step 5](#).
5. If the MNP SMS feature is on, the MSISDN number is used to search the G-Port Mobile Number Portability subscriber database. If the MNP SMS feature is not on, the message falls through to GTT.
6. If the MSISDN Number is found in the PDB/DN table, then the portability type of the subscriber is checked for *Ported-out/ Not Known/ FNPTFN* and processing continues. If the MSISDN Number is not found in the PDB/DN table, the message falls through to GTT. If the portability type is *Prepaid-1/Prepaid-2* the message falls through to GTT.
7. The SCCP CdPA Address is used to search the list of "home network" SMSC addresses. If a match is found, the ported-out subscriber is fraudulently attempting to send SMS using the old network's SMSC. The message is discarded, UIM #1129 is issued, and an error message is generated and returned to the originating MSC. If the message is not on the list, the message falls through to GTT.
8. The message will be discarded, Print an UIM #1129 and an error message is generated and returned to the originating MSC. The message exists from MNP SMS feature functionality.
9. It is a fall-through case. Exit from MNP SMS feature functionality and continue with Normal GTT processing.
10. If the message is from one of the IN Platforms (PPSMS Servers), The message exists from MNP SMS feature functionality and falls through to PPSMS processing. If the message is not from one of the PPSMS Servers processing continues with step 13
11. The originating subscriber's Mobile Subscriber Integrated Services Digital Network (MSISDN) number (i.e. phone number) will be used to search the G-Port Mobile Number Portability subscriber database. If the MSISDN Number is found in the PDB / DN table, then continue on to [Step 12](#). Otherwise, exit from MNP SMS feature functionality and continue with Normal GTT processing.

12. Check the portability type of the subscriber, If it matches "Prepaid1/Prepaid2" go on to [Step 16](#) else continue with [Step 13](#).
13. If the subscriber portability type is "Ported out / FNPTFN/ Not Known" and MNP SMS feature is also ON, then go to [Step 7](#). Otherwise, exit from MNP SMS feature functionality and continue with Normal GTT processing.
14. Exit from MNP SMS feature functionality and continue with existing processing for other services or GTT.
15. Exit from MNP SMS feature functionality and continue with existing processing for G-Port.
16. Exit from MNP SMS feature functionality and continue with existing processing for PPSMS.
17. Exit from MNP SMS feature functionality.

## ISUP NP with EPAP Call Flows

In a service provider network, the calls from certain subscribers (prepaid subscribers) are routed to the Service Nodes that provide the rating engine or routing functionality. To apply charges, besides other factors (rate plan, date and time of call, etc), the rating engine needs to know if the calling and the called number are associated with the service provider's own network or if the numbers have been ported out.

The EAGLE 5 ISS provides the "ISUP NP With EPAP" treatments to the ISUP IAM messages that meet certain gateway screening criteria using the existing Gateway Screening feature. The Gateway Screening feature allows SS7 messages to be selected for the ISUP NP With EPAP treatments, minimally, based on

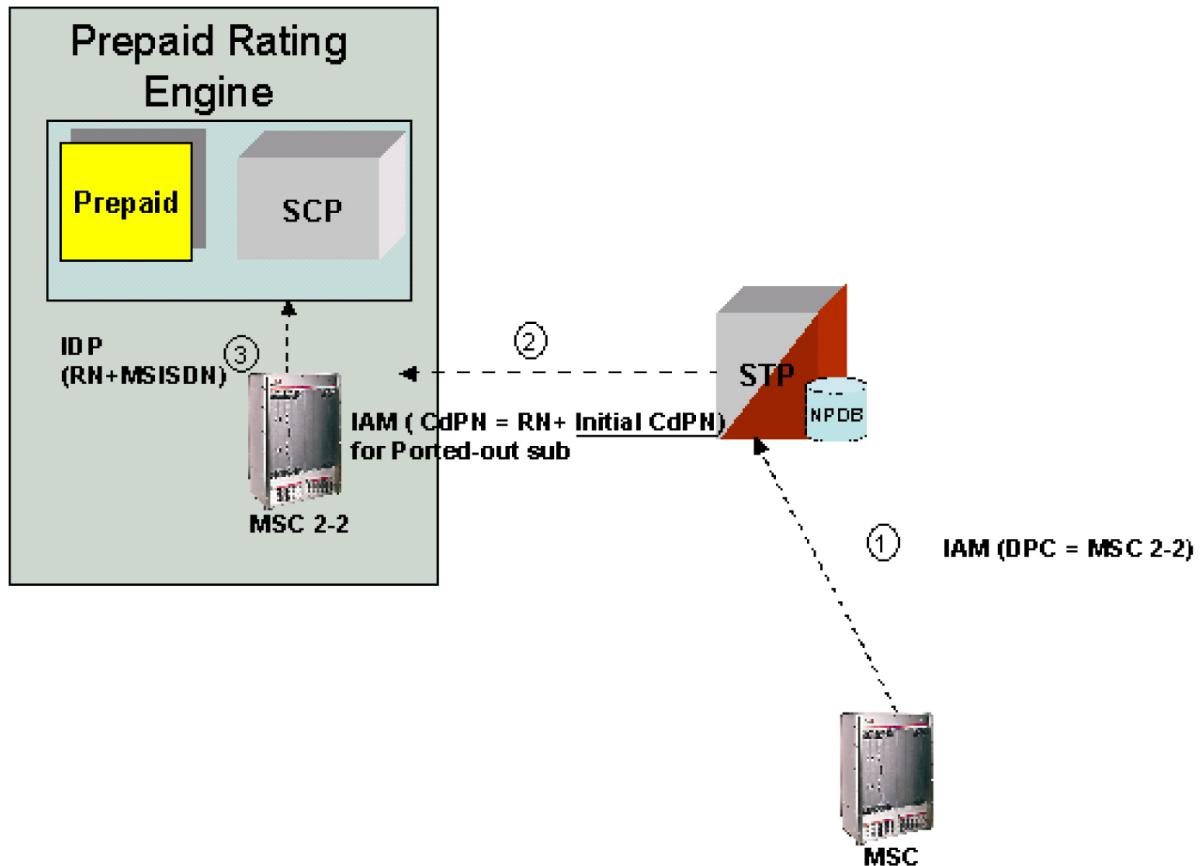
- OPC
- DPC
- SIO
- ISUP message type

For the selected ISUP messages, the EAGLE 5 ISS performs NPDB lookup based on ISUP IAM CdPN (the B-number). If CdPN is a ported-out number, the EAGLE 5 ISS relays the IAM message with CdPN=RN + Initial CdPN. If the CdPN is a ported-in or never been ported subscriber, the EAGLE 5 ISS prepends a SubNet prefix that identifies the SubNet to which the CdPN belongs within the operator network, to the CdPN of the IAM message before relaying the message to its destination. For any other types of CdPN, the EAGLE 5 ISS relays the IAM message without modifications. The descriptions of the detail call flows for these three different call scenarios are included in the following paragraphs.

### For Ported-Out Subscribers

Refer to [Figure 2-18](#) for a pictorial description of this call flow.

**Figure 2-18.** ISUP NP With EPAP Call Flow for Ported Out CdPN

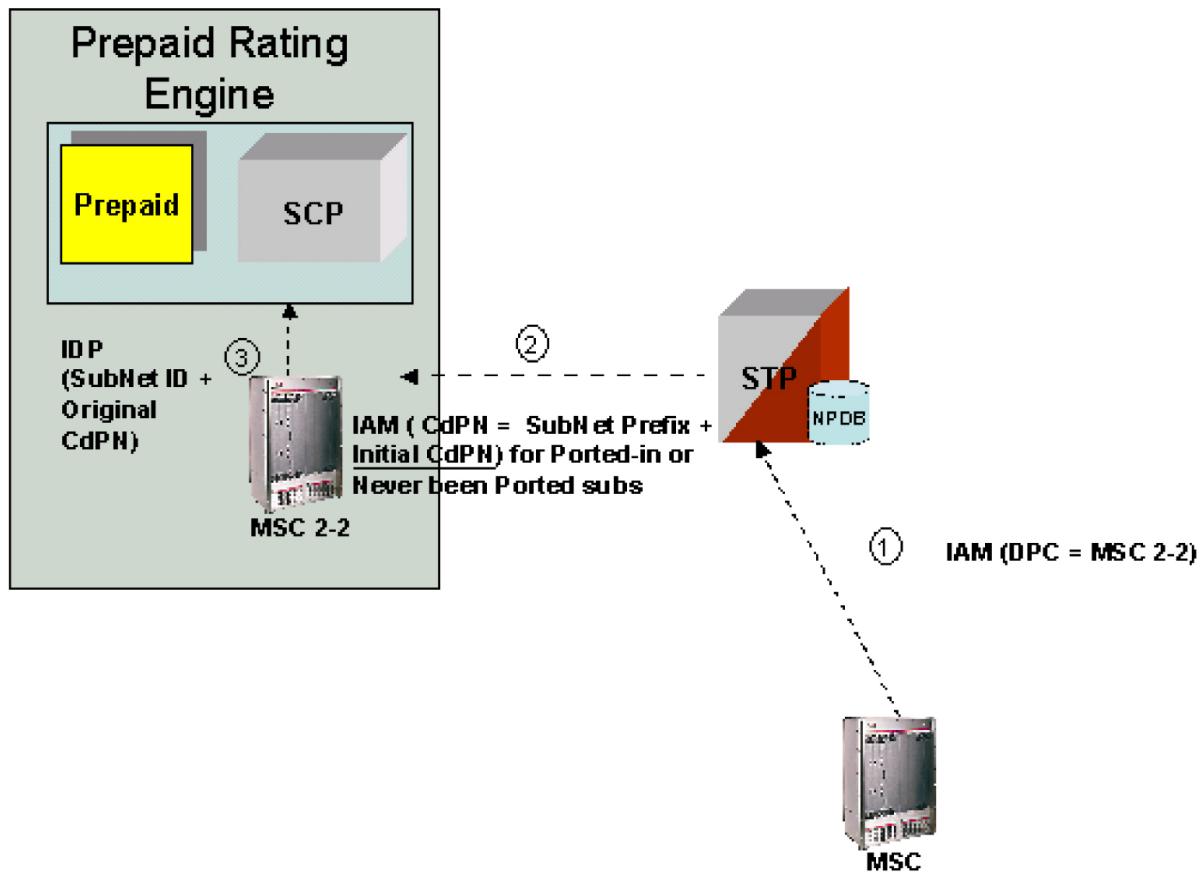


1. MSC sends the IAM message to its destination via the EAGLE 5 ISS.
2. The EAGLE 5 ISS intercepts the IAM message and determines if a NPDB look-up is required. The NPDB lookup is performed if the IAM message passes the Gateway Screening and the prefix specified for number deletion (as part of number conditioning) is found in the CdPN. If a lookup is required, the EAGLE 5 ISS then performs Number Conditioning by stripping the prefix defined for number deletion and appending the country code, if specified, to the CdPN. The NPDB lookup is based on the country code + CdPN (without the prefix specified for number deletion). If the DN is identified in the NPDB as a ported out number the EAGLE 5 ISS routes IAM ( $\text{CdPN} = \text{RN} + \text{Initial CdPN}$ ).
3. MSC2-2 forwards an IDP (RN + Initial CdPN) to its destination.

### For Ported-In and Never-Ported Subscribers

Refer to [Figure 2-19](#) for a pictorial description of this call flow.

**Figure 2-19.** ISUP NP With EPAP Call Flow for Ported-In/Never Ported CdPN

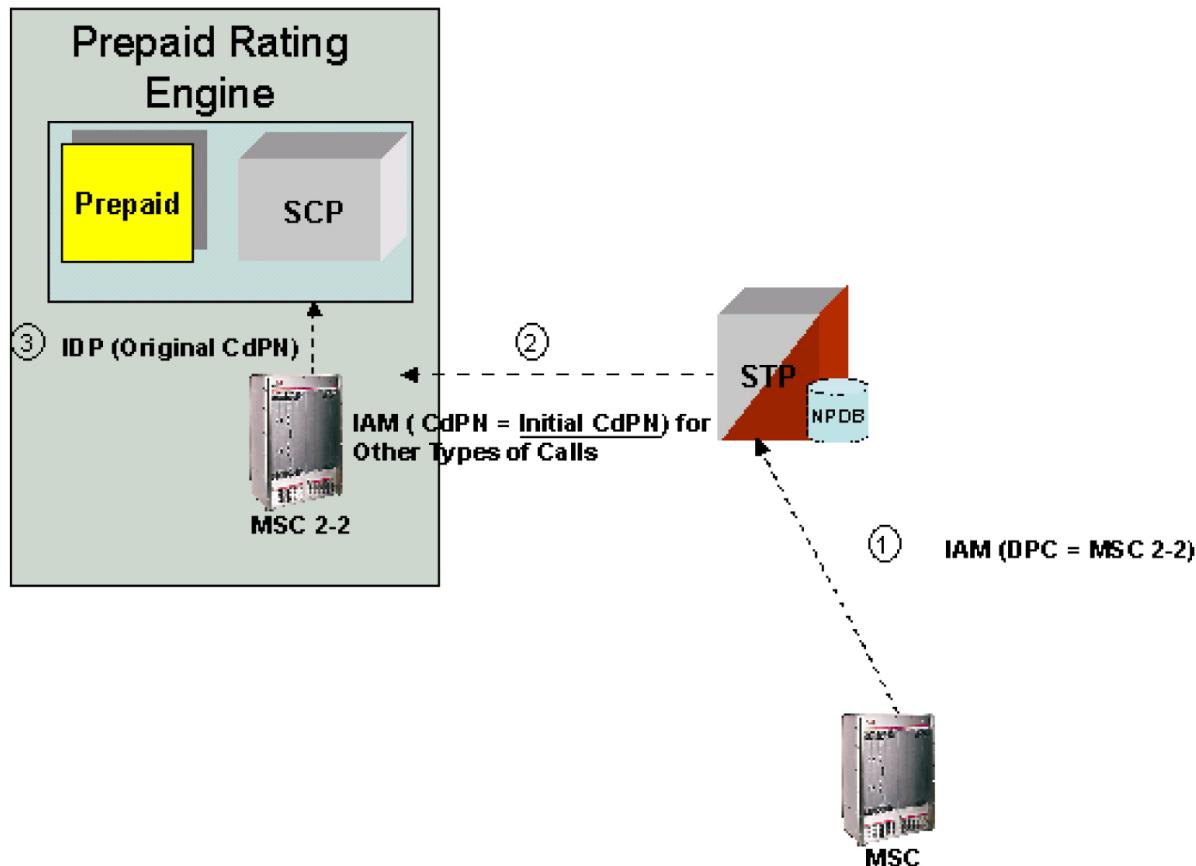


1. MSC sends the IAM message to its destination via the EAGLE 5 ISS.
2. The EAGLE 5 ISS intercepts the IAM message and determines if a NPDB look-up is required. The NPDB lookup is performed if the IAM message passes the Gateway Screening and the prefix specified for number deletion (as part of number conditioning) is found in the CdPN. If a look-up is required, the EAGLE 5 ISS then performs Number Conditioning by stripping the prefix defined for number deletion and appending the country code, if specified, to the CdPN. The NPDB lookup is based on the country code + CdPN (without the prefix specified for number deletion). The NPDB lookup identifies the CdPN as a ported-in number or never been ported DN (the DN is within the operator's DN ranges and the DN has never been ported). The EAGLE 5 ISS performs SubNet ID Look-up to locate the SubNet Number. The SubNet ID look-up is based on the entity address pointed to by the SP that is associated with the DN (where DN=CdPN) or associated with a range of DNs (this assumes that all range DNs for each HLR are provisioned with an SP in the NPDB). After the SubNet Number is identified, the EAGLE 5 ISS looks up the SubNet Prefix table to identify the prefix for the SubNet. The EAGLE 5 ISS prepends the SubNet prefix associated with the SubNet No to CdPN. The EAGLE 5 ISS routes IAM (CdPN = SubNet prefix + Initial CdPN).
3. MSC2-2 forwards an IDP (SubNet ID + Initial CdPN) to its destination.

**For all other Scenarios (including non-FET subscribers, international calls, and short code calls)**

Please refer to [Figure 2-20](#) for a pictorial description of this call flow.

**Figure 2-20.** ISUP NP With EPAP for All Other Cases



1. The MSC sends the IAM message to its destination via the EAGLE 5 ISS.
2. The EAGLE 5 ISS performs the NPDB lookup and the CdPN is not found in the NPDB. The EAGLE 5 ISS routes IAM (CdPN = Initial CdPN).
3. MSC2-2 forwards an IDP (Initial CdPN) to its destination.

## MO-Based GSM SMS NP

The MO-Based GSM SMS NP feature provides network information to the short message service center (SMSC) for subscribers using the GSM network. This information allows the SMSC to select a protocol to deliver SMS messages to the called party.

The MO-Based GSM SMS NP feature:

- Intercepts SMS messages after they have undergone Prepaid SMS (PPSMS) and Portability Check for Mobile Originated SMS (MNPSMS) processing and before they reach the SMSC.  
**NOTE: The MO-Based GSM SMS NP feature does not require the PPSMS or MNPSMS features to be enabled.**
- Decodes the TCAP/MAP message destination address and performs lookup in the number portability (NP) database
- Modifies the destination address in the TCAP message with directory number (DN) porting information, and
- Relays the message to the SMSC

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

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

## Options

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

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

## Feature Control Requirements

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

- A FAK for part number 893-0194-01
- The G-Port feature must be enabled and turned on before the feature can be enabled and turned on.
- The feature cannot be enabled if LNP is enabled.
- A temporary FAK cannot be used to enable the feature.
- The feature cannot be turned off after it has been turned on.

## System Options for MO-Based GSM SMS NP

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

The content of the GSMDOPTS table is used to help perform number conditioning, response generation, and other feature-specific options. [Table 2-8](#) shows the options stored in the GSMDOPTS table, their possible values, and the action taken for each value.

**Table 2-8. MO-Based GSM SMS NP Options**

GSMOPTS	Value	Action in the EAGLE 5 ISS
MOSMSDNFMT	RN	Same as G-Port general action.
	RNDN (default)	
	CCRNDN	
MOSMSTYPE	SP	When the lookup in the NPDB has entitytype=SP, then the lookup is considered successful.
	RN	When the lookup in the NPDB has entitytype=RN, then the lookup is considered successful.
	SPRN (default)	When the lookup in the NPDB has entitytype=SP or RN, then the lookup is considered successful.
	ALL	When the lookup in the NPDB has entitytype=SP or RN or no_entity, then the lookup is considered successful.
MOSMSNAI	NAT	The CdPN is treated as National number for lookup in the NPDB. When SNAI=NAT, the CC will be added to the DN before lookup in the NP database
	INTL (default)	When SNAI=INTL, no number conditioning is required before lookup in the database.
	UNKNOWN	When this value is set, the NAI will be treated as Unknown for the purposes of Number Conditioning
	NAI	<p>The NAI from the MO_SMS message is used for conditioning before lookup in database.</p> <ul style="list-style-type: none"> <li>• If the NAI is INTL, then NP lookup is performed immediately.</li> <li>• If the NAI is any other value, then the number is considered to be in national format. The CC is added before NP lookup is performed.</li> </ul>
MOSMSSA	YES	The subaddress is searched in the B party number. If the subaddress (identified by "#" being present in the B party number) is found, it is removed before NPDB lookup is performed.
	NO (default)	No subaddress is searched for in the B party number from the TCAP part.
MOSMSDNNAI	None (default)	The NAI is same as the NAI in the incoming message.
	0–15	The value to be encoded in the outgoing message.
MOSMSFWD	YES	<p>If the MO-SMS TCAP called party number is modified, then the MO-SMS message will be redirected, by modifying the SCCP CdPA, to the GTA identified in the MOSMSGTA field.</p> <p>This option cannot be set to YES unless the MOSMSGTA option has a valid value specified.</p>
	NO (default)	No MO-SMS forward will be performed.
MOSMSGTA	5–21 digits	<p>This field is used to replace the SCCP CdPA in the MO-SMS message. If the MO-SMS TCAP called party number is modified, then the MO-SMS message will be redirected by modifying the SCCP.</p> <p>This option cannot be specified unless a GTA with the same value has been provisioned in the GTT translation table. For more information about the GTT translation table, refer to the <i>Database Administration Manual - GTT</i>.</p>

## MO-Based GSM SMS NP Protocol Handling

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

- The MO-Based GSM SMS NP feature traps the MO\_SMS message and performs NPDB lookup based on the B number from the TCAP sm-RP-UI parameter. If the entity type is the same as the value of the MOSMSTYPE option in the GSMOPTS table, then this feature modifies the outgoing MO\_SMS based on the value of the MOSMSDNFMT option.
- When the outgoing MO-SMS is modified, the NAI is based on the value of the MOSMSNAI parameter in the GSMOPTS table.

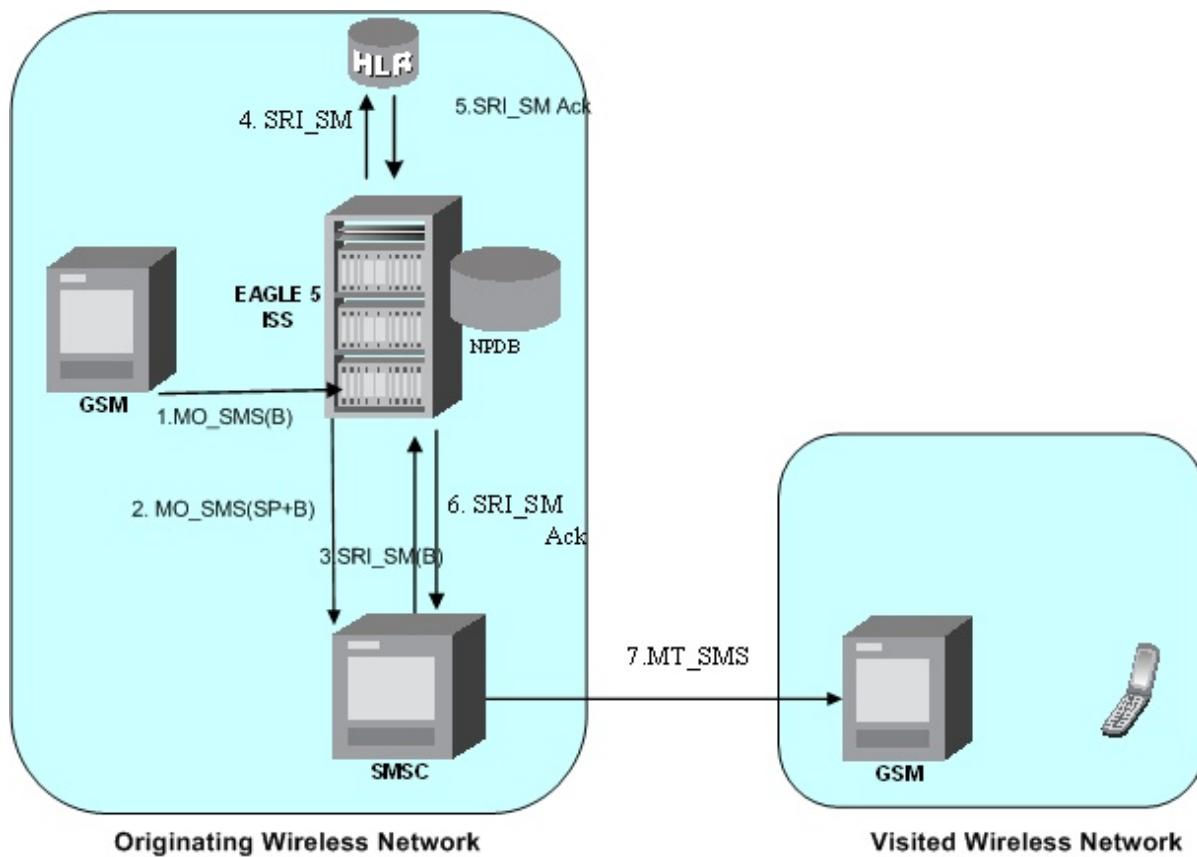
- The MO-Based GSM SMS NP feature performs SCCP CdPA GTA lookup against the SMSC list maintained by the STP. If the lookup is not successful, the MSU falls through to GTT handling.
- When both the MO-Based GMS SMS NP feature and the Portability Check for MO-SMS feature are enabled:
  - Both features must have the same service-selector service.
  - The MO-Based GSM SMS NP feature processes an MSU only when the MSU has passed the processing by the Portability Check for MO\_SMS feature and no NACK has been sent.
- The MO-Based GSM SMS NP feature is required only for MO\_SMS messages with SMS-Submit and SMS-Command.
- The number conditioning is based on the value of the MOSMSNAI option:
  - If MOSMSNAI=NATL, then the number is treated like a national number: DEFCC is prepended before performing lookup in the NPDB.
  - If MOSMSNAI=INTL, then the number is treated like an international number: this number is used for lookup in the NPDB.
  - If MOSMSNAI=NAI, then the conditioning is based on the NAI value from the TCAP part.
  - If MOSMSNAI=NAI and TCAP NAI is not INTL, then the number is considered to be international.
- For messages handled within this feature, the SCCP CdPA is always used to route the message.
- If the MOSMSTYPE=ALL, MOSMSDNFMT=RN, and the NPDB lookup has no entity assigned to the DN, then the MO\_SMS message is not modified.
- If the MOSMSSA=YES, then the subaddress is searched and removed from MAP called Party number for NPDB lookup. The subaddress is not removed from the final MO\_SMS message.
- If the number of called party digits in the modified MO\_SMS message is greater than 20, then the digits are not modified and the original message is routed to the SMSC based on SCCP CdPA.
- The MO-Based GSM SMS NP feature considers a successful NPDB lookup with entity\_type=RN and portability-type=0 to be entity\_type=SP, if the IS41-GSM Migration feature is enabled. When the IS41-GSM Migration feature is enabled, entity\_type=RN, and portability-type=0, the subscriber is considered to be migrated, and therefore is considered to be local (in-network, SP) for the MO-Based IS41 SMS NP feature.
- If the MOSMSFWD=Yes and the MO-SMS TCAP called-party number is modified after successful RTDB lookup, then the MO-SMS message is redirected to the GTA identified in the MOSMSGTA field by modifying the SCCP CdPA.

## MO-Based GSM SMS NP Call Flows

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

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

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

**Figure 2-21.** MO-Based GSM SMS NP Call Flow for In-Network Subscriber

Call considerations:

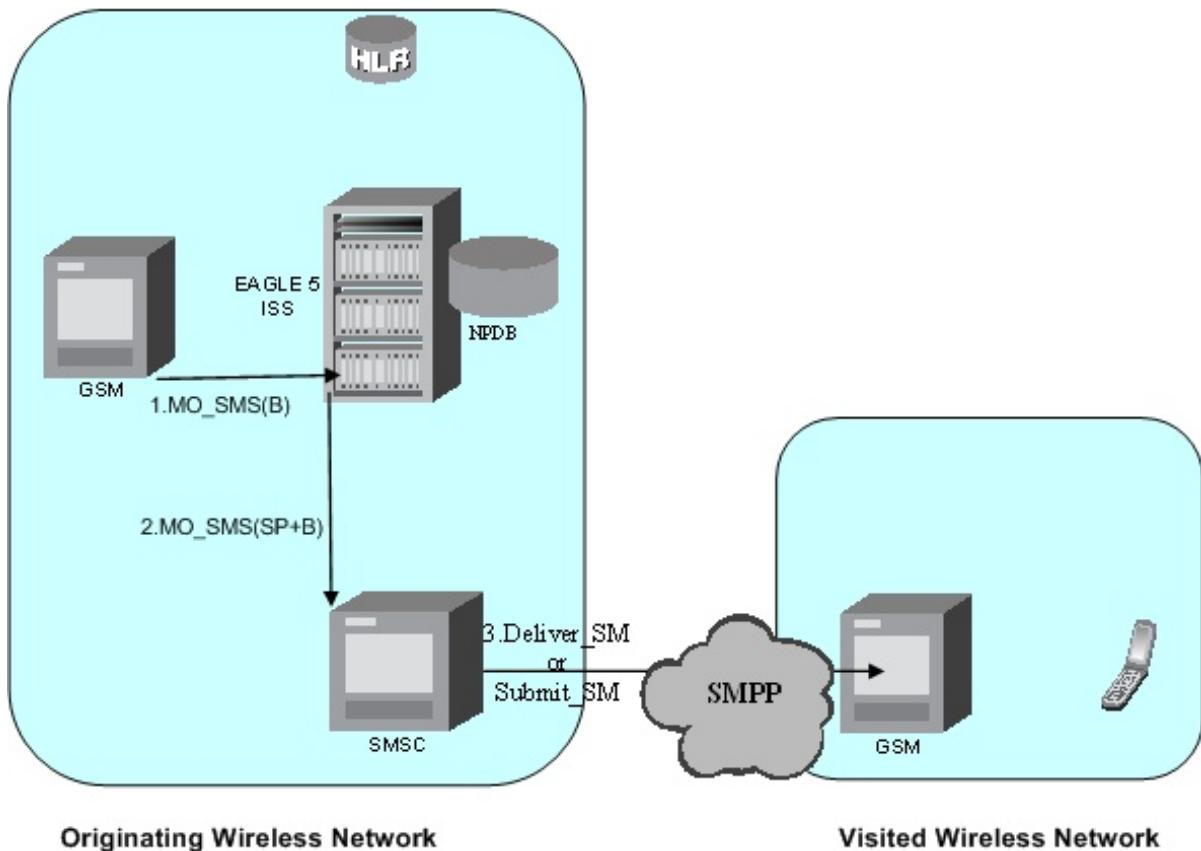
- The TCAP calling party is a wireless GSM subscriber.
- The TCAP called party is a non-ported or ported-in wireless subscriber that belongs to the same carrier as the TCAP calling party.
- The call type is SMS.
- The SMSC (Short Message Service Center) has to remove the prefix that indicates that the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

Message Flow:

1. MO\_SMS(B) - EAGLE 5 ISS intercepts SMS messages after they have undergone Prepaid SMS (PPSMS) and Portability Check for Mobile Originated SMS (MNPSMS) processing and decodes the TCAP/MAP message destination address.
2. MO\_SMS(SP+B) - If successful, modify B-party Number and relay to SMSC.
3. SRI\_SM(B) - Send message to HLR to find B-party.
4. SRI\_SM - Send message to HLR to locate B-party.

5. SRI\_SM Ack - HLR sends message to EAGLE 5 ISS.
6. SRI\_SM Ack - EAGLE 5 ISS routes message to SMSC.
7. MT\_SMS - Deliver message to in-network subscriber.

**Figure 2-22.** MO-Based GSM SMS NP Call Flow for Other-Network Subscriber



Call considerations:

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

Message Flow:

1. MO\_SMS(B) - EAGLE 5 ISS intercepts SMS messages after they have undergone Prepaid SMS (PPSMS) and Portability Check for Mobile Originated SMS (MNPSMS) processing and decodes the TCAP/MAP message destination address.

2. MO\_SMS(SP+B) - If successful, modify B-party Number and relay to SMSC.
3. Deliver\_SM - Forward message or submit message other network.

## MT-Based GSM SMS NP

The Mobile Terminated (MT)-Based GSM SMS NP feature allows wireless operators to route short message service (SMS) messages destined to mobile subscriber within a number portability (NP) environment. If the MT-Based GSM SMS NP feature is not enabled and turned on, then messages are processed by the G-Port feature.

The Mobile Terminated (MT)-Based GSM SMS NP feature allows number portability (NP) database lookup to be performed on short message service (SMS) messages that are routed from a short message service center (SMSC).

The MT-Based GSM SMS NP feature intercepts SRI\_SM messages and sends response messages with routing information for out-of-network destination subscribers using the following process:

1. An SRI\_SM message is intercepted by the Eagle 5 ISS before it reaches the home location register (HLR).
2. The message destination address (SCCP Called Party GTA), is extracted, the digits are conditioned, and lookup is performed in the NP database.
3. If the destination address/subscribers belongs to a foreign network, then a reply message is sent to the SMSC with routing information. If the destination address/subscribers belongs to a local network, then the SRI\_SM message is relayed to the HLR.

### Options

The MT-Based GSM SMS NP feature provides configurable options for controlling processing of SRI\_SM messages and the content of the response:

- Selecting the SMSC response message type and digit format
- Specifying when an NP database lookup is considered to be successful
- Specifying the format of digits encoded in the response message.

### Feature Control Requirements

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

- The **defcc** parameter in the **chg-stpopts** command must be set to a value other than **none** before the feature can be turned on.
- The **defmcc** parameter in the **chg-gsmopts** command must be set to a value other than **none** before the feature can be turned on.
- A FAK for part number 893-0200-01
- The G-Port feature must be enabled before the MT-Based GSM SMS NP feature can be enabled.
- The G-Port feature must be turned on before the MT-Based GSM SMS NP feature can be turned on.
- The MT-Based GSM SMS NP feature cannot be enabled if the LNP feature is enabled.
- A temporary FAK cannot be used to enable the feature.

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

## Hardware Requirements

The MT-Based GSM SMS NP feature cannot be enabled if TSM cards running the **sccp** application are present in the system. A TSM card that is running the **sccp** application cannot be provisioned when this feature is enabled.

## System Options for MT-Based GSM SMS NP

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

The content of the GSMDPTS table is used to help perform number conditioning, response generation, and other feature-specific options. [Table 2-9](#) shows the options stored in the GSMDPTS table, their possible values, and the action taken for each value.

**Table 2-9. MT-Based GSM SMS NP Options**

GSMDPTS Option	Value	Action in the EAGLE 5 ISS
MTSMSIMSI	RN	This setting specifies the required format of digits which will be encoded in the "IMSI" parameter of the SRI_SM return result response (ACK).
	RNDN	
	CCRNDN	<b>NOTE: The MT-Based GSM SMS NP feature will require GSMDPTS:DefCC to be set before the feature can be activated. Also, DefCC will not be allowed to change to "NONE" as long as this feature is turned ON.</b>
	DN	
	SRFIMSI	IMSI is encoded from the "SRFIMSI" parameter from the RTDB entity.
	MCCRNDN (default)	IMSI is encoded as MCCRNDN. The MCC will be encoded using the GSMDPTS:DefMCC setting. <b>NOTE: The MT-Based GSM SMS NP feature requires GSMDPTS:DefMCC to be set before the feature can be turned on. GSMDPTS:DefMCC will not be allowed to change to "NONE" as long as this feature is turned ON.</b>
MTSMSNNI	RN (default)	This setting specifies the required format of digits which will be encoded in the "Network Node Number" parameter ISDN digits field within the LocationInfoWithLMSI TCAP parameter in the of the SRI_SM response (ACK).
	RNDN	
	CCRNDN	In the response, the Nature of Number field will always be encoded as "International" (0x1) and the numbering plan will always be encoded as ISDN/Telephony Numbering (Rec ITU-T E.164) (0x1).
	DN	
	SRFIMSI	IMSI is encoded from the "SRFIMSI" parameter from the RTDB entity.
	MCCRNDN	IMSI is encoded as MCCRNDN. The MCC will be encoded using the GSMDPTS:DefMCC setting. <b>NOTE: The MT-Based GSM SMS NP feature requires GSMDPTS:DefMCC to be set before the feature can be turned ON. GSMDPTS:DefMCC will not be allowed to change to "NONE" as long as this feature is turned ON.</b>
	NONE	This parameter is not encoded in the response message. The LocationInfoWithLMSI TCAP parameter is included; the Network Node number sub-parameter is present; however the length of the parameter is 0.
MTSMSTYPE	SP	When the lookup in the RTDB has entitytype=SP, then the lookup is considered successful.
	RN (default)	When the lookup in the RTDB has entitytype=RN, then the lookup is considered successful.
	SPRN	When the lookup in the RTDB has entitytype=SP or RN, then the lookup is considered successful.
	ALL	When the lookup in the RTDB has entitytype=SP or RN or no_entity, then the lookup is considered successful.

GSMOPTS Option	Value	Action in the EAGLE 5 ISS
	NONSP	When the lookup in the RTDB does not have an entitytype SP, then the lookup is considered successful. This could mean that no entity was found or an entity with type RN was found.
<b>NOTE: This option is applied to messages in which the source is considered to be a Home SMSC.</b>		
MTSMSACKN	ACK (default)	This indicates that when the SRI_SM lookup is considered successful, a SRI_SM_ACK (Return Result Last) is sent back.
	NACK	This indicates that when SRI_SM look is considered successful, a SRI_SM_NACK (Return Error) is sent back.
<b>NOTE: This option is applied to messages in which the source is considered to be a Home SMSC.</b>		
MTSMSDLTR	NO (default)	This option specifies if delimiter digit(s) need to be inserted in the MTSMSSIMSI and MTSMSSNNI digits. A value of NO means that no delimiter is inserted.
	PRERN	This option specifies that a delimiter (MTSMSDLTRV) is to be inserted before the RN when the RN is used in the MTSMSSIMSI and MTSMSSNNI digits. (RN included in the digit format is MTSMSDLTRV + RN from RTDB)
	POSTRN	This option specifies that a delimiter (MTSMSDLTRV) is to be inserted after the RN when the RN is used in the MTSMSSIMSI and MTSMSSNNI digits. (RN included in the digit format is RN from RTDB + MTSMSDLTRV)
MTSMSDLTRV	1-5 hex digits	<p>This specifies if delimiter digit(s) need to be inserted in the MTSMSSIMSI and MTSMSSNNI if required (per MTSMSDLTR). This value can consist of 1-5 hexadecimal digits. A value must be defined here before MTSMSDLTR can be set to PRERN or POSTRN.</p> <p>Once set, the MTSMSDLTRV can never be configured to "NONE" again.</p>
MTSMSNAKERR	0-255 (default is 0x1 - Unknown Subscriber)	<p>This specifies the TCAP error choice code to be included in the SRI_SM_ACK generated by SMS_MT.</p> <p><b>NOTE: This option will affect only the Error code choice byte. Certain error code choices (e.g., systemFailure and callBarred) have additional mandatory data as per GSM specifications. However, the MT-Based GSM SMS NP feature will not encode any additional data in SRI_SM_NACK.</b></p> <p><b>NOTE: The MTSMSNAKERR is applicable to responses generated to both the SMSC and MMSC.</b></p>
MTSMSCHKSRC	YES	<p>This parameter value specifies that the SCCP CgPA GTA of the message will be used to determine whether the source of the message is a Home SMSC.</p> <p>If this option is set to YES and the SCCP CgPA GTA is present and there is not a match in the Home SMSC list, the source of the message is not considered to be a Home SMSC. In this case, the message is considered inapplicable for MT-SMS processing.</p> <p>If this option is YES and SCCP CgPA GTA is not present or has a 0 length, then it is assumed that the source is a Home SMSC.</p> <p>If this option is YES and SCCP CgPA GTA is present and there is a match in the Home SMSC list, then the message source is considered to be Home SMSC.</p> <p><b>NOTE: The order of checks performed follows:</b></p> <ol style="list-style-type: none"> <li>1. Home MMSC check is performed. If a Home MMSC check is to be performed (The MT-Based GSM MMS NP Feature is turned ON and GSMOPTS:MTMMMSGTA is not "NONE"), the SCCP CgPA GTA will be compared against GSMOPTS:MTMMMSGTA for a match. A match identifies the source to be a Home MMSC. This option (MTSMSCHKSRC) does not influence this first check for Home MMSC.</li> </ol>

GSMOPTS Option	Value	Action in the EAGLE 5 ISS
		2. If the Home MMSC check is not successful, AND MTMSCHKSRC is YES, then Home SMSC check is required if SCCP CgPA GTA is present.
	NO (default)	<p>This parameter value specifies that Eagle will not validate the SCCP CgPA GTA for Home SMSC check. If the initial check for Home MMSC is not successful and if this option is NO, then the source is assumed to be Home SMSC.</p> <p>This option may be used by the service provider to disable SCCP CgPA-checking for Home SMSC check, if the service provider ensures that only in-network nodes will send SRI_SM and receive the response generated by this feature.</p>

## MT-Based GSM SMS and MMS NP Call Flows

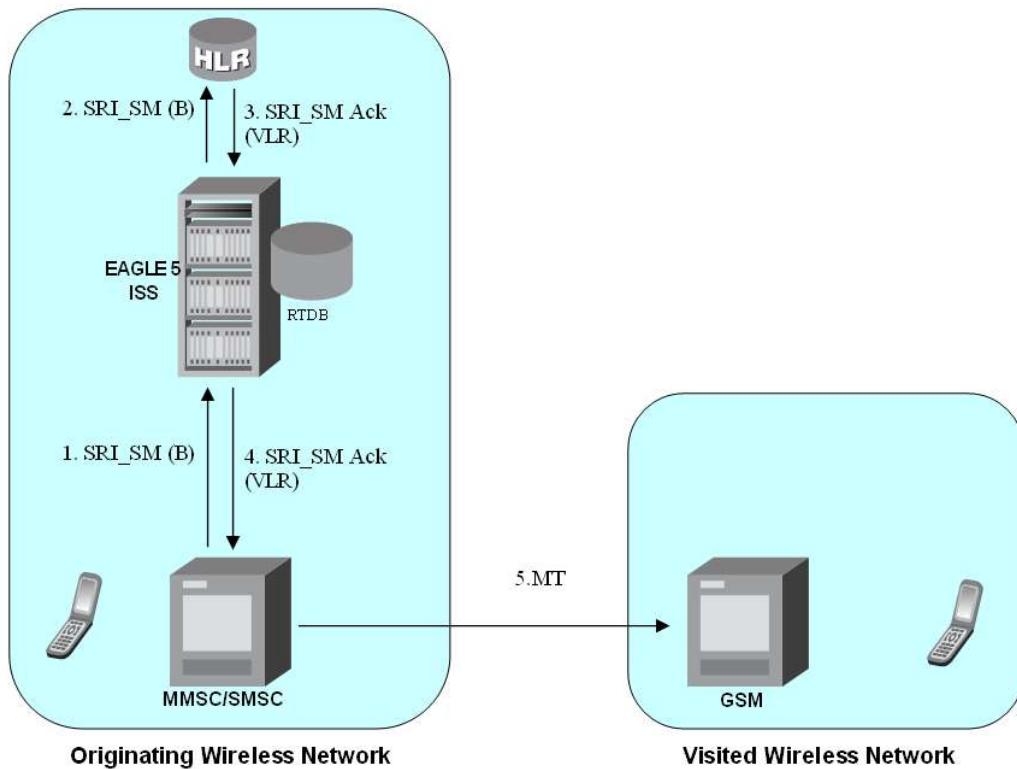
This section illustrates the sequence of messages that occur in the processing of SMS and MMS messages destined for mobile-terminated subscribers in a number portability environment. Two scenarios exist:

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

### ***MT-Based GSM SMS and MMS NP Call Flow for In-Network Subscriber***

[\*\*Figure 2-23\*\*](#) depicts the message and control flows for a called subscriber that is in the same network as the calling subscriber.

**Figure 2-23.** MT-Based GSM SMS and MMS NP Call Flow for In-Network Subscriber

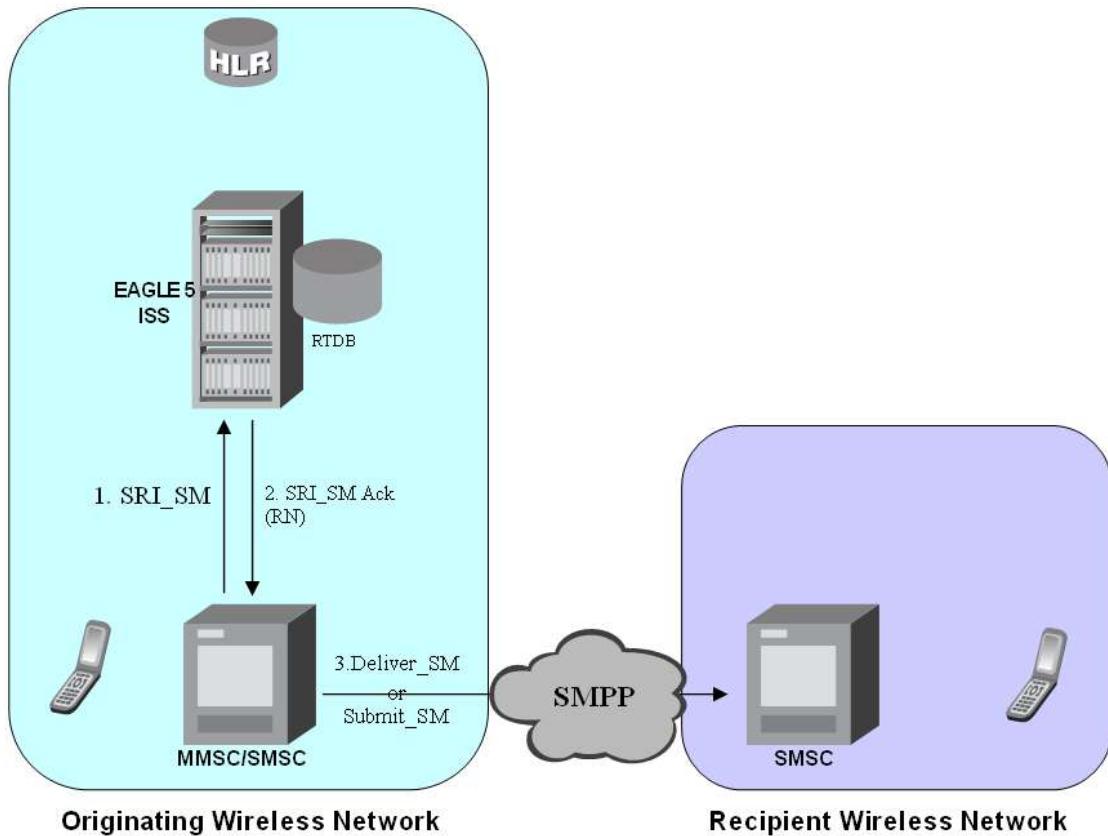


Call considerations:

- The TCAP calling party is a wireless GSM subscriber.
- The TCAP called party is a non-ported or ported-in wireless subscriber that belongs to the same carrier.
- The call type is SMS or MMS.
- SMSC has to be reconfigured to generate SRI\_SM to the HLR, regardless of called subscriber number being in or out of its own numbering range.
- In case called subscriber is ported-in, it has to be provisioned individually.
- In case called subscriber is TDMA, the Eagle Migration feature ensures that the message gets delivered in the TDMA network.

#### ***MT-Based GSM SMS and MMS NP Call Flow for Other-Network Subscriber***

[Figure 2-24](#) depicts the message and control flows for a called subscriber that is a different network from the calling subscriber.

**Figure 2-24.** MT-Based GSM SMS and MMS NP Call Flow for Other-Network Subscriber

Call considerations:

- The TCAP calling party is a wireless GSM subscriber.
- The TCAP called party is a non-ported or ported-out wireless subscriber that belongs to a different carrier from the TCAP calling party.
- The call type is SMS or MMS.
- The SMSC (Short Message Service Center) has to be configured to associate the RNs to their respective carriers.
- The called subscriber must be provisioned individually.

## MT-Based GSM MMS NP

The Mobile Terminated (MT)-Based GSM MMS NP feature allows wireless operators to route Multimedia Message Service (MMS) messages destined to mobile subscriber within a number portability (NP) environment. If the MT-Based GSM MMS NP feature is not enabled and turned on, then messages are processed by the G-Port feature.

The Mobile Terminated (MT)-Based GSM MMS NP feature allows number portability (NP) database lookup to be performed on MMS messages that are routed from a Multimedia Message Service Center (MMSC).

The MT-Based GSM MMS NP feature intercepts SRI\_SM messages and sends response messages with routing information for out-of-network destination subscribers using the following process:

1. An SRI\_SM message is intercepted by the Eagle 5 ISS before it reaches the home location register (HLR).
2. Extracts the message destination address (SCCP Called Party GTA), conditions the digits, and performs a lookup in the Real-Time Database (RTDB).
3. If the destination address/subscribers belongs to a foreign network, then a reply message is sent to the MMSC with routing information. If the destination address/subscribers belongs to a local network, then the SRI\_SM message is relayed to the HLR or according to the options set for normal G-Port routing.

## Options

The MT-Based GSM MMS NP feature provides the following configurable options for controlling processing of Multimedia Message Service (MMS) routing request messages and the content of the response:

- Selecting the Multimedia Message Service Center (MMSC) response message type and digit format
- Specifying when an Real-Time Database (RTDB) lookup is considered to be successful
- Specifying the format of digits encoded in the response message.

## Feature Control Requirements

The MT-Based GSM MMS NP feature has the following control requirements:

- The MT-Based GSM SMS NP feature must be enabled and turned on.
- A FAK for part number 893-0241-01
- The feature cannot be turned off after it has been turned on.
- A temporary FAK cannot be used to enable the feature.

## System Options for MT-Based GSM MMS NP

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

The content of the GSMDPTS table is used to help perform number conditioning, response generation, and other feature-specific options. [Table 2-10](#) shows the feature-specific options stored in the GSMDPTS table, their possible values, and the action taken for each value.

**NOTE: The options described in [Table 2-10](#) are accessible only when the MT-Based GSM MMS NP feature is enabled. Processing of MSUs from MMSCs will also require the use of the GSMDPTS options described for the MT-Based GSM SMS feature in [Table 2-9](#).**

**Table 2-10. MT-Based GSM MMS NP Options**

GSMDPTS Option	Value	Action in the EAGLE 5 ISS
MTMMMSGTA	5-21 hex digits (default is NONE)	This option pertains to Home MMSC check. When an SCCP CgPA GTA is present in the message, this option is used to compare the SCCP CgPA GTA of the incoming SRI_SM message to determine whether the originator is a Home MMSC. If a match is found, the MTMMSTYPE and MTMMSACKN options are used to

GSMOPTS Option	Value	Action in the EAGLE 5 ISS
		<p>determine whether SRI_SM ACK or NACK is to be sent, and the conditions when lookup is considered to be successful for MMS.</p> <p>The nature of match is a “Prefix match”. That is, the leading digits must match all the digits provisioned in MTMMSGTA.</p> <p><b>NOTE: The digits for compare can have more than the number of digits configured in MTMMSGTA</b></p> <p>This option can be set to NONE at any time.</p> <p>A value of NONE implies that the special processing of MMS is not required, and MT-Based SMS NP processing will follow. A setting of NONE will not match any SCCP CgPA GTA.</p>
MTSMSTYPE	SP	When the lookup in the RTDB has entitytype=SP, then the lookup is considered successful.
	RN (default)	When the lookup in the RTDB has entitytype=RN, then the lookup is considered successful.
	SPRN	When the lookup in the RTDB has entitytype=SP or RN, then the lookup is considered successful.
	ALL	When the lookup in the RTDB has entitytype=SP or RN or no_entity, then the lookup is considered successful.
	NONSP	When the lookup in the RTDB does not have an entitytype SP, then the lookup is considered successful. This could mean that no entity was found or an entity with type RN was found.
	<b>NOTE:</b>	<p><b>This option is applied to messages in which the source is considered to be a Home SMSC.</b></p> <p><b>Duplicate options are provided for this parameter for MTMMS and MTSMS in order to be able to control processing of messages from the Home MMSC independently from those coming from a Home SMSC.</b></p>
MTMMSACKN	ACK (default)	This indicates that when the SRI_SM lookup is considered successful, a SRI_SM_ACK (Return Result Last) is returned.
	NACK	This indicates that when SRI_SM lookup is considered successful, a SRI_SM_NACK (Return Error) is returned.
	<b>NOTE:</b>	<p><b>This option is applied to messages in which the source is considered to be a Home SMSC.</b></p> <p><b>Duplicate options are provided for this parameter for MTMMS and MTSMS in order to be able to control processing of messages from the Home MMSC independently from those coming from a Home SMSC.</b></p>

## MT-Based GMS MMS NP Call Flows

The MT-Based GMS MMS NP feature call flows are identical to those used by the MT-Based GMS SMS NP feature and are described in [MT-Based GSM SMS and MMS NP Call Flows](#).



# EAGLE 5 ISS G-Port Commands

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## Introduction

This section describes the user interface and provides command examples needed to administer the G-Port feature. The exact command syntax, specifications, and command classes are provided in the *Commands Manual*. The command examples are provided to convey the intention of the user interface requirements.

## EAGLE 5 ISS Commands for G-Port

This section includes the EAGLE 5 ISS commands that are either entirely new or modified for the G-Port feature. This chapter contains a brief description of the functions the commands provide and appropriate examples of usage.

The command examples in this chapter illustrate the requirements and provide suggestions for suitable names and output. Complete descriptions of these commands are detailed in the *Commands Manual*, including parameter names, valid values, and output examples for the commands.

### System Debug Services (SDS) Commands

The following section describes SDS command **ent-trace** used with G-Port.

### ***MSU Trap and Trace Command***

G-Port uses the existing **ent-trace** command to provide a trap-and-trace function for MSUs on the TSM card running the SCCP application. G-Port also introduces a new trigger so the user can trigger on DN and IMSI.

The user can create a MSU trigger on the TSM card running the SCCP application on one or more criteria (both old and new) defined in the following using the **ent-trace** command. When multiple trigger criteria are entered, the MSU is trapped when any one of the criteria is satisfied.



**CAUTION:** As with other debug commands, this command can cause OAM to reset if too many MSUs are trapped.

- **RN or SP address (Entity ID)** - Use this new criterion to trap messages immediately after performing the RTDB database lookup. If the RN or SP obtained from the database lookup matches the Entity ID provisioned in the command, the message is trapped. This parameter supports a variable number of hexadecimal digits from 1 to 15 digits, and the Entity ID specified must be the one stored in the G-PortRTDB.
- **E.164 MSISDN number (DN)** – Use this criterion to trap messages immediately before performing a G-Port search based on the MSISDN numbers defined in the G-PortRTDB. This parameter accepts a range of digits, from 5 to 15. The number specified must be an International E.164 number (MSISDN or Entity Number).
- **Global Title digits (GT)** – Use this criterion to trap messages based on CdPA Global Title Address (that is, either MSISDN (+ST) number or RN + MSISDN (+ST)) present in the SCCP part of the message.
- **Origination point code (SSPI/SSPN)** – Use this criterion to trap messages based on CgPASPC present in the SCCP part of the message. If no point code is present in the CgPASPC, the criteria is matched with the OPC present in the MTP part of the message.

A trace must be set on all TSM cards running the SCCP application; specify **card=sccp-all**. Use a repetition parameter (**rep**) to control the number of MSUs that are trapped.

MSUs that satisfy any trigger criteria are trapped on the TSM card running the SCCP application are forwarded to OAM, and are displayed. Refer to *Commands Manual* for a complete description of the **ent-trace** command.

### ***EAGLE 5 ISS Options Commands***

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

- **chg-stpopts: Change STP System Options Command** – The **chg-stpopts** command changes STP system options in the database. This command updates the STPOPTS table. The **defcc** and **defndc** parameters are used to convert non-international numbers received in the MSU to an international number. The parameters can only be changed if the G-Port (FAK), G-Flex, or INP feature bit is ON. A command example follows:

```
chg-stpopts: defcc=333: defndc=22345
```

Where:

**defcc={1-3 digits, none}** E164 Default Country Code

**defndc={1-5digits, none}** E164 Default National Destination Code

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

- **rtrv-stpopts: Retrieve STP System Options Command** – The `rtrv-stpopts` command is used to retrieve all STP options from the database. This command updates the STPOPTS table. The `defcc` and `defndc` parameters are the additional options displayed when the G-Port (FAK), G-Flex, or INP feature bit is ON.

## EAGLE 5 ISS G-Port System Options Commands

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

### *chg-gsmopts*

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

Command: `chg-gsmopts`      Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
defmapvr	Optional	1-3	Default MAP version
gsm2is41	Optional	1-15 digits, none	GSM to IS41 migration prefix
is412gsm	Optional	1-15 digits, none	IS-41 to GSM migration prefix.
msisdntrunc	Optional	1 digit (0-5)	Number of MSISDN digits to delete from the MISISDN before formulating the MSRN for SRI-ack response
msrndig	Optional	rn, rnidn, ccrndn	RN used as-is or with MSISDN
msrmnai	Optional	1-7	NAIV for the MSRN
msrnnp	Optional	0-15	Numbering plan for the MSRN
multcc	Optional	1 to 3 digits (0-9, a-f, or A-F)	Multiple Country Code
nmultcc	Optional	1 to 3 digits (0-9, a-f, A-F, or NONE)	New Multiple Country Code
nppmsgta	Optional	1-15 digits, none	New entity address of PPSMS Phase 1
ppmsgta	Optional	1-15 digits	Entity address of PPSMS Phase 1
ppspmsgta1	Optional	zone, area, id, none	ITUPC of IN platform 1 for PPSMS Phase 1

Parameter	Optional/ Mandatory	Range	Description
ppsmspci2	Optional	zone, area, id, none	ITUPC of IN platform 2 for PPSMS Phase 1
ppsmspcn1	Optional	nnnn, gc, m1, m2, m3, m4, none	ITUPC of IN platform 1 for PPSMS Phase 1
ppsmspcn2	Optional	nnnn, gc, m1, m2, m3, m4, none	ITUPC of IN platform 2 for PPSMS Phase 1
ppsmsri1	Optional	gt, ssn	RI of IN platform 1 for PPSMS Phase 1
ppsmsri2	Optional	gt, ssn	RI of IN platform 2 for PPSMS Phase 1
serverpx	Optional	1-4 digits, none	Server SRI prefix
srfaddr	Optional	1-15 digits, none	Entity address of MNP_SRF node
srfnai	Optional	0-127	NAIV of the MNP_SRF
srfnp	Optional	0-15	Numbering plan value of the MNP_SRF Network Code
sridn	Optional	tcap, sccp	SRIDN location

Command examples follow.

- **chg-gsmopts:srfnai=4:srfnp=2:srfaddr=331111111111**
- **chg-gsmopts:srfaddr=333221234567890:msrndig=rn:srfnai=1:srfnp=1:msrnnaai=4 :msrnnp=10**
- **chg-gsmopts:ppsmspcn2=234:ppsmsri2=ssn**
- **chg-gsmopts:sridn=tcap chg-gsmopts:is412gsm=0123456789abcde**

### **rtrv-gsmopts**

#### **Retrieve G-Port System Options Command**

The **rtrv-gsmopts** command displays all G-Port-specific system options from the database.

The following G-Port options are displayed.

```
GSM OPTIONS
-----
MSRNDIG      = 7
DEFMAPVR     = 2
SRIDN        = TCAP
IS412GSM     = 0123456789abcde
PPSMSRI1     = SSN
PPSMSRI2     = GT
PPSMSPCI1    = 1-1-1
PPSMSPCN2    = -----
PPMSGTA      = 1112223333,
                           2223334444,
```

```
ABCDEF123456ABC
MIGRPFX = SINGLE  GSM2IS41 = NONE
```

The following example shows the output if the MT-Based GSM SMS NP feature is enabled:

```
tekelecstp 08-01-08 19:38:30 EST EAGLE 38.0.0
GSM OPTIONS
```

```
-----
DEFMCC      = NONE
SRFADDR     = NONE
MSRNIDIG    = RN
DEFMAPVR    = 1
SRIDN       = TCAP
IS412GSM    = NONE
MSISDNTRUNC = 0
MIGRPFX    = SINGLE
GSM2IS41   = NONE
MTSMSIMSI  = MCCRNDN
MTSMSNNI   = RN
MTSMSTYPE  = RN
MTSMSACKN  = ACK
MTSMSDLTR  = NO
MTSMSDLTRV = NONE
MTSMSNAKERR= 1
MTSMSCHKSRC= NO
```

;

The following example shows the output if the MT-Based GSM MMS NP feature is enabled:

```
tekelecstp 08-01-08 19:38:30 EST EAGLE 38.0.0
GSM OPTIONS
```

```
-----
DEFMCC      = NONE
SRFADDR     = NONE
MSRNIDIG    = RN
DEFMAPVR    = 1
SRIDN       = TCAP
IS412GSM    = NONE
MSISDNTRUNC = 0
MIGRPFX    = SINGLE
GSM2IS41   = NONE
MTSMSIMSI  = MCCRNDN
MTSMSNNI   = RN
MTSMSTYPE  = RN
MTSMSACKN  = ACK
MTSMSDLTR  = NO
MTSMSDLTRV = NONE
MTSMSNAKERR= 1
MTSMSCHKSRC= NO
MTMSGTA    = NONE
MTMMSTYPE  = RN
MTMMSACKN  = ACK
```

;

## EAGLE 5 ISS G-Port Service Selector Commands

The G-Port service selector (**srvsel**) commands are used to provision new selectors for the G-Port service, providing greater flexibility when provisioning the type of messages that require G-Port processing. The following sections describe the four variants: **ent-srvsel**, **chg-srvsel**, **dlt-srvsel**, and **rtrv-srvsel**. For further details on the EAGLE 5 ISSG-Port service selector commands (such as command rules and output format), refer to the *Commands Manual*.

**ent-srvsel: Enter G-Port Service Selectors Command** – The **ent-srvsel** command specifies that the applicable G-Port service selectors indicating G-Port processing are required. The available parameters follow:

```
Command : ent-srvsel          Class = DATABASE
```

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gti, gtin, gtin24	Mandatory	2, 4	Global Title Indicator
serv	Mandatory	gport, gflex, inpq, inpmr, eir, smsmr, mnpsms, idpd, idpr, mnp	GSM service
snai	Mandatory	sub, natl, intl, rnidn, rnndn, rnsdn, ccrndn	Service Nature Of Address Indicator
snp	Mandatory	e164, e212, e214	Service Numbering Plan
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

**chg-srvsel: Change G-Port Service Selector Command** – The `chg-srvsel` command specifies the applicable G-Port selectors required to change an existing G-Port selector entry. The available parameters follow:

Command : chg-srvsel Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gti, 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	Optional	gport, gflex, inpq, inpmr, eir, smsmr, mnpsms, idpd, idpr, mnp	New GSM service
nsnai	Optional	sub, natl, intl, rnidn, rnndn, rnsdn, ccrndn	New Service Nature Of Address Indicator
nsnp	Optional	e164, e212, e214, none	New Service Numbering Plan

**dlt-srvsel:Delete G-Port Service Selector Command** – The **dlt-srvsel** command deletes a G-Port service selector. The available parameters follow:

Command: dlt-srvsel Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gti, 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 G-PortService Selector Command** – The **rtrv-srvsel** command displays a list of administered G-Port service selector combinations. All 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. The available parameters follow:

Command : rtrv-srvsel Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gti, 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	gport, gflex, inpq, inpmr, eir, smsmr, mnpsms, idpd, idpr, mnp	GSM service
snai	Optional	sub, natl, intl, rnldn, rrndn, rnsdn, ccrndn	Service Nature Of Address Indicator
snp	Optional	e164, e212, e214	Service Numbering Plan
ssn	Optional	0-255, *	Subsystem Number
tt	Optional	0-255	Translation Type

## EAGLE 5 ISS G-Port SCCP Service Commands

The **sccp-serv** commands allow for services to be taken online and offline, and for their processing load to be shifted to other designated nodes. These commands also support the assignment of PCs to PC groups used for G-

Port re-route assignment. The following sections describe three variations: **chg-sccp-serv**, **dlt-sccp-serv**, and **rtrv-sccp-serv**.

Entries using the **chg-sccp-serv** command are provisioned in the SCCP-SERV table, and are shown by the **rtrv-sccp-serv** command output. This reduces the maximum number of entries that the MRN table can contain by the number of entries shown in the **rtrv-sccp-serv** command output. For more information on provisioning MRN tables, refer to the *Database Administration Manual - Global Title Translations*.

For details on the EAGLE 5 ISSG-PortSCCP service commands (such as command rules and output format), refer to the *Commands Manual*.

**chg-sccp-serv: Change G-PortSCCP Service Command** – The **chg-sccp-serv** command is used to add point codes to an existing service group, or to change the Relative Cost (RC) of existing point codes in a group. SCCP Service groups are organized by service (G-Flex or G-Port) and point code network type (ANSI, ITU-I, Spare ITU-I, ITU-N, Spare ITU-N, or ITUN-24). Up to seven PCs may be in a network type grouping for service re-route load sharing. This command allows for additions/modifications of up to 4 PCs at once. The point code parameters support the Spare Point Code subtype prefix **s-** for ITU-I and ITU-N point codes. The available parameters follow:

Command : chg-sccp-serv Class = DATABASE

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 Manual	Post GTT-translated PC
rc1	Optional	00-99	Relative Cost
pc2, pca2, pci2, pcn2, pcn242	Optional	Refer to Commands Manual	Post GTT-translated PC
rc2	Optional	00-99	Relative Cost
pc3, pca3, pci3, pcn3, pcn243	Optional	Refer to Commands Manual	Post GTT-translated PC
rc3	Optional	00-99	Relative Cost
pc4, pca4, pci4, pcn4, pcn244	Optional	Refer to Commands Manual	Post GTT-translated PC
rc4	Optional	00-99	Relative Cost

**dlt-sccp-serv: Delete G-PortSCCP Service Command** – The **dlt-sccp-serv** command is used remove entries from the SCCP Service table. A single command may either remove a PC from a group, or remove the entire group. The available parameters follow:

Command : dlt-sccp-serv Class = DATABASE

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

**rtrv-sccp-serv: Retrieve G-PortSCCP Service Command** – The **rtrv-sccp-serv** command is used to display the SCCP Service application relationship information maintained by the EAGLE 5 ISS. Point codes are grouped by service. The sample output that follows indicates that the G-Port service is online and ANSI and ITU-I point codes are in the service set.

```
tekelecstp 05-12-20 08:51:53 EST 35.0.0-55.43.0
rtrv-sccp-serv
Command entered at terminal #4.

-----
Service      : GFLEX
State        : Offline
GTT Option   : Yes
-----

-----
Service      : GPORT
State        : Online
GTT Option   : Yes
-----

ANSI PC      RC
001-001-001  10
002-002-002  20
003-003-003  30
004-004-004  40
ITU-I PC     RC
2-002-2      10
3-003-3      10
;
```

## EAGLE 5 ISS Feature Key Control Commands

These commands are used to enable, update, view, and control the G-Port, MNPCRP, and PPSMS features on the EAGLE 5 ISS. A separate Feature Access Key is required to turn on each feature. Features must be purchased to have access to the Feature Access Key, which must be used when enabling these features.

Temporary keys are associated with the PPSMS and MNPCRP features. No temporary key is associated with the G-Port feature; after it is turned on, it cannot be turned off. Two steps are performed to turn on the G-Port feature. The first step is to enable the feature. The second step is to set the status to on.

Additional verifications are performed to ensure the correct hardware is present in the system. These checks include verifying that the GTT bit is on and that no SCCPGLP cards are provisioned. Refer to the Commands Manual for details of this command.

Part number 893017201 is used to enable the G-Port feature on the EAGLE 5 ISS.

Part number 893007001 is used to enable the MNPCRP feature on the EAGLE 5 ISS.

Part number 893006701 is used to enable the PPSMS feature on the EAGLE 5 ISS.

Part number 893019401 is used to enable the MO-Based GSM SMS NP feature on the EAGLE 5 ISS.

Part number 893020001 is used to enable the MT-Based GSM SMS NP feature on the EAGLE 5 ISS.

Part number 893024101 is used to enable the MT-Based GSM MMS NP feature on the EAGLE 5 ISS.

**enable-ctrl-feat: EnableControl Feature Command** –The **enable-ctrl-feat** command is used for temporary (PPSMS, MNPCRP) and permanent enabling of the features. An example of the command using the G-Port part number is:

```
enable-ctrl-feat:partnum=893017201:fak=<Feature Access Key>
```

**chg-ctrl-feat: Change Control Feature Command** –The **chg-ctrl-feat** command is used to activate or deactivate the G-Port, MNPCRP, PPSMS, MO-Based GSM SMS NP, MT-Based GSM SMS NP, and MT-Based GSM MMS NP features. The G-Port, MNPCRP, PPSMS, MO-Based GSM SMS NP, MT-Based GSM SMS NP, and MT-Based GSM MMS NP features require the G-Port feature to be enabled as a prerequisite. This command is also used to clear the temporary key expired critical alarm for the PPSMS and MNPCRP features. An example of the command using the MNPCRP part number is:

```
chg-ctrl-feat:partnum=893007001:status=on
```

**rtrv-ctrl-feat: Retrieve Control Feature Command** –The **rtrv-ctrl-feat** command is used display the status of the features (on/off) and to show the trial period remaining if temporarily enabled. An example output is:

The following features have been permanently enabled:

Feature Name	Partnum	Status	Quantity
IPGwx Signaling TPS	893012805	on	2000
ISUP Normalization	893000201	on	----
Command Class Management	893005801	on	----
Prepaid SMS Intercept Ph1	893006701	on	----
Intermed GTT Load Sharing	893006901	on	----
MNP Circ Route Prevent	893007001	on	----
XGTT Table Expansion	893006101	on	400000
XMAP Table Expansion	893007710	on	3000
Large System # Links	893005910	on	2000
Routesets	893006401	on	6000
EAGLE5 Product	893007101	off	----
EAGLE Product	893007201	off	----
IP7 Product	893007301	off	----
Network Security Enhance	893009101	off	----
HC-MIM SLK Capacity	893011801	on	64
MNP	893016601	on	----
EAGLE OA&M IP Security	893400001	off	----
SCCP Conversion	893012001	on	----

The following features have been temporarily enabled:

Feature Name	Partnum	Status	Quantity	Trial Period Left
G-Port Circ Route Prevent	893007001	On	----	20 days 8 hrs 57 mins

The following features have expired temporary keys:

Feature Name	Part Num
OnOffFeatV	893492401

;

## EAGLE 5 ISS Database Commands

The **chg-db** commands copies the EAGLE 5 ISSTDMD resident G-Port database tables during database backup, restore, and repair.

The **rept-stat-db** command displays both the STP and the G-Port database status and level information for each DSM network card, and for the active and standby EPAP databases.

## Maintenance and Measurements User Interface

This section provides a description of the user interface for maintenance and measurements for the G-Port features. These commands allow provisioning, operations, and maintenance activities for DSM cards.

### Maintenance Commands

The command examples shown illustrate the requirements and provide suggestions for suitable names and output. The commands are described in the *Commands Manual*, where the detailed parameter names, valid values, and output for the commands are provided.

Commands described here include:

- [rept-stat-sys](#)
- [rept-stat-sccp](#)
- [rept-stat-mps](#)
- [rept-ftp-meas](#)
- [chg-measopts](#)
- [rept-stat-meas](#)
- [rept-ftp-meas](#)
- [rtrv-measopts](#)
- [rept-stat-trbl](#)
- [rept-stat-alm](#)
- [rept-stat-db](#)
- [inh-card / alw-card](#)
- [chg-sid / dlt-sid](#)
- [ent-card / rtrv-card / dlt-card](#)
- [chg-gpl / act-gpl / rtrv-gpl / rept-stat-gpl / copy-gpl](#)
- [ent/dlt/rtrv-home-smsc](#)
- [inh-alm / unhb-alm](#)
- [pass:cmd="help"](#), including ping, netstat, nslookup, arp, and help commands

***rept-stat-sys***

The **rept-stat-sys** command is used to determine the location of troubles in the system. The display shows the number of these items that are in service (IS-NR) and how many are in another state (IS-ANR, OOS-MT, OOS-MT-DSBLD).

***rept-stat-sccp***

This command is used to display the status of the DSM cards, the TSM cards running the SCCP application, and the GTT (Global Title Translation), G-Flex (GSM Flexible Numbering), G-Port (GSM Mobile Number Portability), A-Port (ANSI-41 Mobile Number Portability), Migration, INP (INAP-based Number Portability), and EIR (Equipment Identity Register) services executing on those cards. This command also displays any cards that are denied SCCP service.

Two sample commands and their outputs are:

- **rept-stat-sccp** for a system that has the GTT, G-Flex, G-Port, and INP features enabled and activated

```
Command entered at terminal #3.
;
tekelecstp 00-06-23 13:34:22 EST EAGLE
36.0.0-30.10.0
SCCP SUBSYSTEM REPORT IS-NR Active -----
GSM SUBSYSTEM REPORT IS-NR Active -----
SCCP Cards Configured= 4 Cards IS-NR= 2 Capacity Threshold = 100%
CARD VERSION PST SST AST MSU USAGE CPU USAGE
-----
1212 101-001-000 IS-NR Active ALMINH 45% 30%
1301 101-001-000 IS-NR Active ----- 35% 20%
1305 ----- OOS-MT Isolated ----- 0% 0%
2112 ----- OOS-MT-DSBLD Manual ----- 0% 0%
-----
SCCP Service Average MSU Capacity = 40% Average CPU Capacity = 25%
AVERAGE CPU USAGE PER SERVICE:
    GTT = 15% GPORT = 5% GPORT = 10%
    INPMR = 2% INPQS = 3%
TOTAL SERVICE STATISTICS:
SERVICE SUCCESS ERRORS WARNINGS FORWARD TO GTT TOTAL
GTT: 1995 5 - - 2000
GFLEX: 500 1 4 10 515
GPORT: 800 0 2 3 800
INPMR: 50 5 1 15 70
INPQS: 499 1 - - 500
Command Completed.
;
```

- **rept-stat-sccp:loc=1107** for a system that has the GTT, G-Flex, G-Port, and INP features enabled and activated

```
Command entered at terminal #4.
;
tekelecstp 00-06-23 13:34:22 EST EAGLE 36.0.0-33.10.0
CARD VERSION TYPE PST SST AST
1106 103-010-000 DSM IS-NR Active -----
ALARM STATUS = No Alarms.
GTT: STATUS = ACT MSU USAGE = 10%
GFLEX: STATUS = ACT MSU USAGE = 10%
GPORT: STATUS = ACT MSU USAGE = 10%
INPMR: STATUS = ACT MSU USAGE = 13%
INPQS: STATUS = ACT MSU USAGE = 20%
CPU USAGE = 15%
```

```
CARD SERVICE STATISTICS:
  SERVICE    SUCCESS    ERRORS    WARNINGS    FORWARD TO GTT    TOTAL
  GTT:        1995       5          -          -          -        2000
  GFLEX:      500        1          4          10         515
  GPORT:      500        1          4          10         515
  INPMR:      50         2          3          15         70
  INPQS:      499        1          -          -          -        500
Command Completed.
;
```

***rept-stat-mps***

Two variations of this command are:

- **rept-stat-mps** - produces a summary report showing the overall status of the G-Port provisioning system and a moderate level of information for each DSM card.
- **rept-stat-mps:loc=xxxx** - produces a more detailed report showing the G-Port status of a specific DSM card. Note that this version of the command displays the percent utilization of a particular DSM memory.

Two sample commands and their outputs are:

- **rept-stat-mps**

```
Command entered at terminal #4.
;
Integrat40 00-06-24 10:37:22 EST EAGLE 37.2-30.10.0
  VERSION      PST      SST      AST
EPAP A        026-015-000  IS-NR      Active      -----
ALARM STATUS = No Alarms
EPAP B        026-015-000  IS-NR      Standby     -----
ALARM STATUS = No Alarms
CARD   PST      SST      GSM STAT  INP STAT
1106  P  IS-NR    Active    ACT      ACT
1201  IS-ANR   Active    SWDL     SWDL
1205  OOS-MT-DSBLLD Manual   -----   -----
1302  OOS-MT    Fault    -----   -----
1310  IS-ANR   Standby   SWDL     SWDL
CARD 1106 ALARM STATUS = No Alarms
CARD 1201 ALARM STATUS = No Alarms
CARD 1205 ALARM STATUS = No Alarms
CARD 1302 ALARM STATUS = ** 0013 Card is isolated from the system
CARD 1310 ALARM STATUS = No Alarms
Command Completed.
```

- **rept-stat-mps:loc=1106**

```
Command entered at terminal #4.
;
integrat40 99-09-24 10:37:22 EST EAGLE 37.2.0
CARD  VERSION      TYPE      PST      SST      AST
1106  101-9-000   DSM      IS-NR      Active      -----
DSM PORT A      IS-NR      Active      -----
DSM PORT B      IS-NR      Active      -----
GTT STATUS      = ACT
GSM STATUS      = ACT
ALARM STATUS     = No Alarms
DSM MEMORY USAGE = xxx%
Command Completed.
;
```

***rept-meas***

This command includes G-Port measurements in the output sent to the EAGLE 5 ISS Terminal. Refer to the *Commands Manual* for details of this command.

***chg-measopts***

This command is used to enable or disable the automatic generation and FTP transfer of scheduled measurement reports to the FTP server. Refer to the *Commands Manual* for details of this command.

***rept-stat-meas***

This command reports the status of the measurements subsystem including card location and state, Alarm level, and Subsystem State. Refer to the *Commands Manual* for details of this command.

***rept-ftp-meas***

This command manually initiates generation and FTP transfer of a measurements report from the MCPM to the FTP server. Refer to the *Commands Manual* for details of this command.

***rtrv-measopts***

This command generates a user interface display showing the enabled/disabled status of all FTP scheduled reports. Refer to the *Commands Manual* for details of this command.

***rept-stat-trbl***

This command includes the G-Port subsystem and DSM/EPAPIlink alarms. Refer to the *Commands Manual* for details of this command. An example of the command and its output is:

**rept-stat-trbl**

```
Command Accepted - Processing
eagle10605 99-06-24 14:34:08 EST EAGLE 37.2.0
rept-stat-trbl
Command entered at terminal #10.
;
eagle10605 99-06-24 14:34:08 EST EAGLE 37.2.0
Searching devices for alarms...
;
eagle10605 99-06-24 14:34:09 EST EAGLE 37.2.0
SEQN UAM AL DEVICE ELEMENT TROUBLE TEXT
0002.0143 * CARD 1113 OAM System release GPL(s) not approved
0011.0176 * SECULOG 1116 Stdby security log -- upload required
3540.0203 ** SLK 1201,A lsn1 REPT-LKF: lost data
3541.0203 ** SLK 1201,B lsn4 REPT-LKF: lost data
3542.0203 ** SLK 1202,A lsn2 REPT-LKF: lost data
3544.0202 ** SLK 1203,A lsn3 REPT-LKF: HWP - too many link interrupts
0021.0318 ** LSN lsn1 REPT-LKSTO: link set prohibited
0022.0318 ** LSN lsn2 REPT-LKSTO: link set prohibited
0023.0318 ** LSN lsn3 REPT-LKSTO: link set prohibited
0010.0318 ** LSN lsn4 REPT-LKSTO: link set prohibited
3537.0084 ** DSM A 1215 IP Connection Unavailable
3536.0084 ** EPAP B 7100 IP Connection Unavailable
```

```

0003.0313 *C DPC 010-010-003      DPC is prohibited
0004.0313 *C DPC 010-010-004      DPC is prohibited
0005.0313 *C DPC 010-010-005      DPC is prohibited
0028.0313 *C DPC 252-010-001      DPC is prohibited
0006.0313 *C DPC 252-010-003      DPC is prohibited
0008.0313 *C DPC 252-010-004      DPC is prohibited
0009.0313 *C DPC 252-011-*       DPC is prohibited
0029.0308 *C SYSTEM               Node isolated due to SLK failures

Command Completed.
;

```

### **rept-stat-alm**

This command includes the alarm totals of the G-Port subsystem and DSM/EPAPIP links. Refer to the *Commands Manual* for details of this command. An example of the command and its output is:

#### **rept-stat-alm**

```

Command Accepted - Processing
eagle10605 99-06-24 23:59:39 EST EAGLE 37.2.0
rept-stat-alm
Command entered at terminal #10.
;
eagle10605 99-06-24 23:59:39 EST EAGLE 37.2.0
ALARM TRANSFER= RMC
ALARM MODE CRIT= AUDIBLE MAJR= AUDIBLE MINR= AUDIBLE
ALARM FRAME 1 CRIT= 9 MAJR= 12 MINR= 2
ALARM FRAME 2 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME 3 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME 4 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME 5 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME 6 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME GPF CRIT= 1 MAJR= 2 MINR= 1
PERM. INH. ALARMS CRIT= 0 MAJR= 0 MINR= 0
TEMP. INH. ALARMS CRIT= 0 MAJR= 0 MINR= 0
ACTIVE ALARMS CRIT= 10 MAJR= 14 MINR= 3
TOTAL ALARMS CRIT= 10 MAJR= 14 MINR= 3

Command Completed.
;
```

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

This command displays both EAGLE 5 ISS and G-Port database status and level information for each DSM network card, and for the active and standby EPAP databases. It reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birthdates and levels. For details about this command, refer to the *Commands Manual*.

### **inh-card / alw-card**

The **inh-card** command is used to change the 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 DCM/LIM/ACM/DSM/GPSM-II/MIM 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 the loading is successful.

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

***chg-sid / dlt-sid***

These commands are used to change and report on the self-identification of the EAGLE 5 ISS. The self-identification identifies the EAGLE 5 ISS to other signaling points in the network. This command includes a CPC type for G-Port.

The CPC parameter is used to support incoming messages routed via Intermediate GTT (rt-gt) to the EAGLE 5 ISS (with DPC = CPC) for G-Port. Refer to the *Commands Manual* for details of this command.

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

**NOTE: A TSM card running the SCCP application cannot be provisioned if the MT-Based GSM SMS NP feature is enabled.**

The **ent-card** command is used to add a card to the database. The card type and application specifies the function assigned to the card.

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

The **dlt-card** command is used to remove a card entry from the system database.

Refer to the *Commands Manual* for details on using these commands.

***chg-gpl / act-gpl / rtrv-gpl / rept-stat-gpl / copy-gpl***

The **chg-gpl** command is used to copy a generic program load from the source disk to the destination disk (both active and standby disks). The new GPL becomes the trial version on each of the destination disks. This command also copies the system release table to the fixed disks.

The **act-gpl** command is used to change the status of the trial GPL from “trial” to “approved.” The status of the previously approved GPL is changed to “trial.”

The **rtrv-gpl** command is used to show the version numbers of the GPLs stored on each fixed disk (TDM) or removable cartridge (MDAL, if available) and the system release table stored on each fixed disk.

The **rept-stat-gpl** command is used to display the version of GPLs currently running for an application, plus the approved and trial versions of the GPL that will run if the card is restarted.

The **copy-gpl** command is used to copy all approved GPLs from one drive to another. The GPLs can be copied only from the fixed disk on the active TDM to the removable cartridge, or from the removable cartridge to the fixed disk on the standby TDM.

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

Samples of the reports produced by these commands are:

- **chg-gpl:appl=vsccp:ver=101-3-0**

```
        Command entered at terminal #3.
;
tekelecstp 99-10-24 06:54:39 EST EAGLE 37.2.0
VSCCP upload to 1114 completed
VSCCP upload to 1116 completed
;
```

- **act-gpl:appl=vsccp:ver=101-3-0**  
Command entered at terminal #3.  
;  
tekelecstp 99-10-24 06:54:39 EST EAGLE 37.2.0  
VS CCP activate on 1114 completed  
VS CCP activate on 1116 completed  
;
- **rtrv-gpl:appl=vsccp**  
Command entered at terminal #3.  
;  
tekelecstp 99-10-04 07:01:08 EST EAGLE 37.2.0  
GPL Auditing ON  
APPL CARD RELEASE APPROVED TRIAL REMOVE TRIAL  
VS CCP 1114 101-001-000 101-003-000 101-001-000 101-003-000  
VS CCP 1116 101-001-000 101-003-000 101-003-000 -----  
;
- **rept-stat-gpl:appl=vsccp**  
  
Command entered at terminal #3.  
;  
tekelecstp 99-10-04 12:55:50 EST EAGLE 37.2.0  
APPL CARD RUNNING APPROVED TRIAL  
VS CCP 1205 101-003-000 ALM 101-003-000 101-003-000  
VS CCP 1211 101-001-000 ALM+ 101-003-000 -----  
Command Completed.  
;

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

The ent-home-smsc command is used to enter home Short Message Service Center (SMSC) addresses in the database. Here is an example of the command and its output.

```
ent-home-smsc : smsc=256489
rlghncxa03w 04-02-28 08:50:12 EST EAGLE 31.3.0
ENT-HOME-SMSC: MASP A - COMPLTD
;
```

The dlt-home-smsc command is used to delete home Short Message Service Center (SMSC) addresses in from the database. Here is an example of the command and its output.

```
dlt-home-smsc:smsc=552611646
rlghncxa03w 04-02-28 08:50:12 EST EAGLE 31.3.0
DLT-HOME-SMSC: MASP A - COMPLTD
;
```

The rtrv-home-smsc command is used to retrieve HOME SMSC specific addresses currently used to identify SMSCs in the database. Here is an example of the command and its output.

```
rtrv-home-smsc
rlghncxa03w 03-03-28 08:50:12 EST EAGLE 31.3.0
SMSC ADDRESS
13214564894498
55231465465434
5465455655656456
HOME SMSC ADDRESS TABLE IS 1 % FULL (3 of 500)
;
```

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

### ***inh-alm / unhb-alm***

The **inh-alm** command is used inhibit the reporting of alarms for the given device. Inhibited alarms will not generate unsolicited output or cause alarm indicators to be turned on. All **rept-stat-xxx** commands continue to display the alarm with an indication that the device has its alarms inhibited.

The **unhb-alm** command is used to restore the reporting of alarms for the given device.

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

### ***chg-ip-card / rtrv-ip-card***

The **chg-ip-card** command is used to provision the Internet Protocol networking parameters for any given DSM card.

The **rtrv-ip-card** command is used to report on the Internet Protocol networking parameters for any given DSM card.

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

### ***chg-ip-lnk / rtrv-ip-lnk***

The **chg-ip-lnk** command is used to provision the Internet Protocol link table.

The **rtrv-ip-lnk** command is used to report on the Internet Protocol link table.

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

### ***ent-ip-host / dlt-ip-host / rtrv-ip-host***

These commands are used to provision, remove, and report on the entries in the Internet Protocol host table. The IP host table defines local and remote host names for IP addresses.

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

### ***pass***

The **pass** command allows remote execution of a selected command by the targeted card. (These commands recognize the DSM boards.) Selected commands are allowed as follows.

- **pass:cmd="ping"**
- **pass:cmd="netstat"**
- **pass:cmd="nslookup"**
- **pass:cmd="arp"**

- **pass:cmd="help"**

For this feature, the **loc** parameter must be a DSM card location. For other details of the **pass** command, refer to *Commands Manual*.

### **pass: cmd="Ping"**

The '**ping**' **pass** command supports troubleshooting of the private EPAP/DSMIP network. The following example demonstrates typical usage.

```
eagle10506 99-08-11 08:43:45 EST EAGLE 37.0.0
pass:loc=1215:cmd="ping      -h"
Command entered at terminal #2.
;
eagle10506 99-08-11 08:43:45 EST EAGLE 37.0.0
PASS: Command sent to card
;
eagle10506 99-08-11 08:43:45 EST EAGLE 37.0.0
Usage: ping <hostname | ipaddr> [-h] [-i size] [-n count]
Options:
-h      Displays this message
-i count Number of pings to send. Range=1..5. Default=3.
-n size Sets size of ICMP echo packet. Range=12..2048. Default=64.
hostname Name of machine to ping
ipaddr   IP Address of machine to ping (d.d.d.d)
;
```

### **pass:cmd="netstat"**

The '**netstat**' **pass** command supports troubleshooting of network interface and routing configuration problems within the private EPAP/DSMIP network.

The following examples demonstrate typical usage.

```
eagle10506 99-08-11 08:43:00 EST EAGLE 37.2.0
pass:loc=1215:cmd="netstat -h"
Command entered at terminal #2.
;
eagle10506 99-08-11 08:43:00 EST EAGLE 37.2.0
PASS: Command sent to card
;
eagle10506 99-08-11 08:43:00 EST EAGLE 37.2.0
Usage: netstat [-a] [-i] [-h] [-m data|sys|dd] [-p icmp|ip|tcp|udp] [-r]
Options:
-a      display socket information for all protocols
-h      Displays this message
-i      display interface information for all interfaces
-m      display buffer pool information for 1 of the system pools
-p      display socket information for 1 of the protocols
-r      display the route table information
;
```

### **pass:cmd="nslookup"**

The '**nslookup**' **pass** command supports debugging of domain name server (DNS) to IP addressing tables. DNS is not supported for EPAP cards for the initial release.

The following examples demonstrate typical usage.

```

eagle10506 99-08-11 08:45:57 EST EAGLE 37.2.0
pass:loc=1215:cmd="nslookup"
Command entered at terminal #2.
;
eagle10506 99-08-11 08:45:57 EST EAGLE 37.2.0
PASS: Command sent to card
;
eagle10506 99-08-11 08:45:57 EST EAGLE 37.2.0
Usage: nslookup [hostname|ipaddr]
Options:
    hostname  String name
    ipaddr    d.d.d.d
;

```

### ***pass:cmd="arp"***

The '**arp**' **pass** command supports the verification of and correction of IP stack ARP tables. In general, this command is not required for normal operation.

The following examples demonstrates typical usage.

```

eagle10506 99-08-11 08:43:23 EST EAGLE 37.2.0
pass:loc=1215:cmd="arp      -h"
Command entered at terminal #2.
;
eagle10506 99-08-11 08:43:23 EST EAGLE 37.2.0
PASS: Command sent to card
;
eagle10506 99-08-11 08:43:23 EST EAGLE 37.2.0
Usage: arp [-a] [-d ipaddr] [-f] [-h] [-s ipaddr enetaddr]
Options:
    -a      Display All entries in ARP table
    -d      Delete specified entry (ipaddr) from ARP table
    -f      Flush all entries from ARP table
    -h      Displays this message
    -s      Set ARP table entry to associate ipaddr with enetaddr
    enetaddr x:x:x:x:x:x
    ipaddr  d.d.d.d
;
eagle10506 99-08-11 08:43:25 EST EAGLE 37.2.0
ARP command complete
;
```

### ***pass:cmd="help"***

The '**help**' **pass** command provides a list of supported **pass** commands for the target location.

The following examples demonstrates typical usage.

```

eagle10506 99-08-11 08:42:18 EST EAGLE 37.2.0
pass:loc=1215:cmd="help"
Command entered at terminal #2.
;
eagle10506 99-08-11 08:42:18 EST EAGLE 37.2.0
PASS: Command sent to card
;
eagle10506 99-08-11 08:42:18 EST EAGLE 37.2.0
List of commands supported is:
nslookup
netstat
arp
ping
help
;
```

END of LIST

;



# G-Port Feature Activation

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## Introduction



**CAUTION:** After a permanently-on feature has been enabled and turned on with the `enable-ctrl-feat` and `chg-ctrl-feat` commands, the feature cannot be turned off. Because features may overwrite other features or create changes in the database, confirm that you have a license and full technical support from Tekelec before turning on this or any feature.

The G-Port feature requires DSM cards running the VSCCP application. Systems with TSM cards running the SCCP application need to be upgraded to DSM cards prior to turning on the G-Port feature.

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

**Procedures described in the remainder of this section can be performed only if the G-Port feature is turned on.**

This chapter identifies prerequisites for the G-Port feature activation procedure, an overview of the activation steps, and a matching number of detailed step descriptions to turn on the G-Port feature. The G-Port feature activation is performed at the EAGLE 5 ISS.

The G-Port feature optimizes the use of subscriber numbers and number ranges in a GSM Mobile Network by providing a logical link between any Mobile Station international ISDN (MSISDN) number and any International Mobile Station Identifier (IMSI). This feature allows subscribers to be moved easily from one Home Location Register (HLR) to another. The G-Port feature applies to ITU-I (international) and ITU-N (national) networks.

The G-Port feature and other related features are optional and can be purchased from Tekelec. If you are not sure whether you have purchased a specific feature, contact your Tekelec Sales or Account Representative.

The following features are related to the G-Port feature (see your Tekelec Sales or Account Representative for additional information):

- Global Title Translation (GTT)
- Enhanced Global Title Translation (EGTT)
- Variable-Length Global Title Translation (VGTT)
- Eagle Provisioning Application Processor (EPAP)
- Mobile Number Portability Circular Route Prevention (MNPCRP)
- Prepaid Short Message Service (PPSMS)

In addition, the following performance-related feature is related to G-Port:

- E5-SM4G Throughput Capacity

## Prerequisites

The G-Port feature activation assumes that the features Global Title Translation (GTT), Enhanced Global Title Translation (EGTT), and Variable-Length Global Title Translation (VGTT) are already provisioned. Refer to the *Database Administration Manual - Global Title Translation* for provisioning procedures.

The G-Port feature activation assumes that the EPAP software is already configured; refer to *EPAP Administration Manual*, EPAP Software Configuration.

The G-Port feature activation assumes that the DSM cards to be installed and the TSM cards to be removed are identified.

- Note installed DSM card locations, if any.
- Note available odd-even card slots for DSM card installation.
- Note installed TSM card locations.
- Note adjacent odd-even TSM card slot number positions for DSM card replacement.

**NOTE: TSM cards use one card slot; DSM cards require two card slots, odd-even. The G-Port feature cannot be turned on until the TSM cards running the SCCP application are removed from the system.**

- Determine DSM card IP addresses and have them available during the activation procedure.

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



**CAUTION:** In an in-service environment and when replacing TSM cards with DSM cards, initialize one DSM card at a time. Verify its return to IS-NR state before initializing another DSM card. This precaution keeps cards in service and prevents an interruption of SCCP services.

For in-service systems with TSM cards running SCCP traffic, one DSM card must be installed in an available double-slot odd-even location and provisioned for VSCCP prior to inhibiting the TSM card running the SCCP application. The DSM card running the VSCCP application will take over the SCCP traffic (`alw-card`) after the TSM card running the SCCP application becomes inhibited.



**CAUTION:** SCCP traffic redundancy will be lost if inhibiting two TSM cards running the SCCP application at a time with only one DSM card available in their place. Redundancy is re-established after the two TSM cards running the SCCP application are replaced with a second DSM card.

For in-service systems that already have the G-Flex and/or INP feature enabled, perform only steps [Step 70](#) through [Step 86](#) to turn on the G-Port feature. With the G-Flex and/or INP feature enabled, the DSM cards already contain the RTDB database.

For new systems, DSM cards may be rebooted all at one time using the `init-card:appl=vsccp` command.

For new systems, GTT, EGTT, and VGTT features may be turned on prior to or immediately following the reboot of all DSM cards.

## Feature Activation Overview

This section provides an overview of the G-Port feature activation procedure. The procedure is described in detail in the [G-Port Feature Activation Procedure](#) section.

The feature activation consists of these sections:

- Configure system for HLR destinations ([Step 1](#) through [Step 28](#)).
- Install DSM cards in available slots and configure for VSCCP ([Step 29](#) through [Step 44](#)).
- Replace TSM cards configured for SCCP with DSM cards configured for VSCCP and inhibit/remove any remaining TSM cards running the SCCP application ([Step 45](#) through [Step 69](#)).
- Turn on and configure the G-Port feature ([Step 70](#) through [Step 86](#)).

[Step 1](#) through [Step 28](#) configure the system to be able to communicate with the system of the HLR database. The route to this database may already be configured. Perform these steps to verify that you have entered all HLR destinations for G-Port and make configuration changes as needed.

1. Display and note current system settings for point codes (PCs) and capability point codes (CPCs), destination point codes (DPCs), routes, and linksets using [Step 1](#) through [Step 7](#).
2. Use `rtrv-sid` command to display current PCs and CPCs.
3. Use `rtrv-dstn` command to display current DPCs.
4. Use `rtrv-rte` command to display current route configurations.
5. Identify PCs and CPCs; determine new PC and CPC to be entered in step [Step 9](#).
6. Use `rtrv-stpopts` command to display PC or CPC format if ITU-N network.

7. Use **rtrv-map** command to display PCs of mated applications in database; remove system PC from table if necessary (refer to *Database Administration Manual - Global Title Translation*).



**CAUTION:** Changing the point code of a system requires a system reboot using the **init-sys** command to fully implement the changes. The **init-sys** command causes a complete system reload and should be used only in an environment that is not in-service. Using this command ensures the updated self identification information is loaded onto all cards, but does interrupt service.

8. Change PC, CPC, DPC, route, linkset, and LIM card configurations for the HLR database using [Step 9](#) through [Step 28](#).
9. Use **chg-sid** command to configure PC and CPC by network type.
10. Use **init-sys** command to initialize system if changes were made in step [Step 9](#) to any **pca/pci/pcn** parameter.



**CAUTION:** The **init-sys** command causes a complete system reload and should be used only in an environment that is not in service. Using this command ensures the updated self identification information is loaded onto all cards, but does interrupt service.

When the **init-sys** command executes, the system does not retain the manually initiated state (for example, OOS-MT-DSBLD) for the signaling link, card, or terminal. After the command executes, the system attempts to bring all provisioned links, cards, and terminals on line, including those that were previously out of service. You will need to manually put each device back into its previous state after the system is back on line. Print or electronically capture the output of the **rept-stat-slk**, **rept-stat-card**, and **rept-stat-trm** commands for reference prior to issuing the **init-sys** command. To restore a device to its previous state, issue the appropriate inhibit/deactivate command listed in the EAGLE 5 ISS Commands Manual in the Related Commands section for each of the above **rept-stat** commands.

11. Use **rtrv-sid** command to display new PC and CPC.
12. Use **ent-dstn** command to enter DPC for HLR destinations.
13. Use **rtrv-dstn** command to display new HLRDPC.
14. Use **ent-ls** command to enter linkset and assign DPC for HLR destinations.
15. Use **rtrv-ls** command to display new linkset and assigned DPC for HLR destinations.
16. Use **ent-card** command to enter LIM card(s) into database.
17. Use **rtrv-card** command to display new LIM card(s) in database.
18. Use **ent-slk** command to assign signaling link(s) to LIM card(s).
19. Use **rtrv-slk** command to display new signaling link(s) assigned to LIM card(s).
20. Use **ent-rte** command to assign route to new DPC.
21. Use **rtrv-rte** command to display route assigned to new DPC.
22. Use **ent-map** command to enter mated application into database.
23. Use **rtrv-map** command to display new mated application in database.
24. Use **alw-card** command to allow LIM card(s).
25. Use **rept-stat-card** command to display status of new LIM card(s) in database.
26. Use **act-slk** command to activate new signaling link(s) for LIM card(s).
27. Use **rept-stat-slk** command to display IS-NR status of signaling link(s).
28. Use **rtrv-card** command to confirm the new LIM card(s) and identify DSM cards running VS CCP application and TSM cards running SCCP application.



**CAUTION:** When adding DSM cards in an in-service environment, take precautions to not interrupt traffic. Before replacing TSM cards with DSM cards, first install a DSM

**card in an available odd-even double-slot before removing the TSM cards to make additional room for other DSM cards.**

29. Install and configure DSM cards in available odd-even slots as needed using [Step 30](#) through [Step 44](#).
30. Install DSM cards in available odd-even slots and verify that the IMT bus LEDs are illuminated green.
31. Use **ent-card** command to enter DSM card(s) as VSCCP card(s) into database.
32. Use **rtrv-card** command to display new DSM cards in database.
33. Use **rtrv-ip-lnk** command to display current link parameters associated with the DSM card.
34. Use **chg-ip-lnk** command to set the IP address port and speed associated with the DSM card.
35. Use **rtrv-ip-lnk** command to display changed link parameters. Use **rtrv-ip-host** command to display current IP host information in database.
36. Use **ent-ip-host** command to add host name and IP address for each VSCCP link.
37. Use **rtrv-ip-host** command to display changed IP host information.
38. Use **chg-ip-card** command to set local domain and IP router address if necessary.
39. Use **rtrv-ip-card** command to display changed DSM card information.
40. Use **alw-card** command to boot DSM card in TSM emulation mode.
41. Use **rept-stat-card** command to display IS-NR status of DSM card.
42. Use **pass** command to test presence of EPAP hosts on network.
43. Repeat [Step 30](#) through [Step 43](#) to add all DSM cards (N+1) to be installed in available slots.  
Go to the next step to start replacing TSM cards.
44. Replace TSM cards with DSM cards if applicable, and add DSM cards to database using [Step 46](#) through [Step 68](#).
45. Use **rtrv-card** command to display TSM cards running the SCCP application (SCCP cards) in database.
46. Use **rept-stat-card** command to display the TSM cards running the SCCP application in IS-NR status.
47. Use **inh-card** command to inhibit the TSM cards running the SCCP application.
48. Use **rept-stat-card** command to display OOS-MT-DSBLD status of the TSM cards running the SCCP application.
49. Use **dlt-card** command to delete the TSM cards running the SCCP application from database.
50. Use **rtrv-card** command to verify removal of the TSM cards running the SCCP application from database.
51. Remove first TSM card from shelf.
52. Remove second TSM card from shelf.
53. Install DSM card in shelf and verify that the IMT bus LEDs are illuminated green.
54. Use **ent-card** command to enter the DSM card into database.
55. Use **rtrv-card** command to display new DSM card in database.
56. Use **rtrv-ip-lnk** command to display current parameters associated with the DSM card.
57. Use **chg-ip-lnk** command to set the IP address port and speed associated with the DSM card.
58. Use **rtrv-ip-lnk** command to display changed link parameters associated with the DSM card.
59. Use **rtrv-ip-host** command to display IP host information in database.
60. Use **ent-ip-host** command to add host name and IP address for VSCCP link.
61. Use **rtrv-ip-host** command to display changed IP host information in database.
62. Use **chg-ip-card** command to set local domain and IP router address if necessary.
63. Use **rtrv-ip-card** command to display changed DSM card information.
64. Use **alw-card** command to boot the DSM card in TSM emulation mode.
65. Use **rept-stat-card** command to display IS-NR status of the DSM card.
66. Use **pass** command to test presence of EPAP hosts on network.
67. Repeat [Step 46](#) through [Step 67](#) to replace all adjacent TSM cards identified in the prerequisites and to be replaced with DSM cards.
68. Repeat [Step 48](#) through [Step 52](#) to inhibit any remaining TSM cards running the SCCP application and remove them from database and shelf.

**NOTE:** The G-Port feature cannot be turned on until TSM cards running the SCCP application are removed from the system.



**CAUTION:** Contact the Tekelec Customer Care Center at this point for assistance completing this G-Port activation procedure (see [Customer Care Center](#)). Do not proceed without consulting with the Tekelec Customer Care Center.

69. Turn on G-Port feature and configure it using [Step 70](#) through [Step 84](#).
70. Use `enable-ctrl-feat` command to enable the G-Port feature.
71. Use `chg-ctrl-feat` command to turn on the G-Port feature.

**NOTE:** [Step 74](#) through [Step 81](#) describe the commands that administer the G-Port protocol flow to support:

- G-PortSRIACK (Ported-out MSISDNs)
  - G-PortSRIACK (Foreign MSISDNs not known to be ported)
  - G-Port Message Relay (Ported-in, non-ported MSISDNs)
72. Use `chg-stpopts` command to enter default country code (CC) and default network destination code (NDC) if handling non-international numbers.
  73. Use `rtrv-stpopts` command to verify changes of CC and NDC.
  74. Use `chg-gsmopts` command to change GSM options.
  75. Use `rtrv-gsmopts` command to verify changes to GSM options.
  76. Use the `ent-homern` command to enter any Home RNs that are prefixed to DNs for incoming INPMR messages.
  77. Use `rtrv-homern` command to verify routing number prefixes.
  78. Use `ent-srvsel` command to enter G-Port service selectors.
  79. Use `rtrv-srvsel` command to verify changes to G-Port service selectors.



**CAUTION:** When the environment is in-service and TSM cards are being replaced with DSM cards, initialize one DSM card at a time. Verify its return to IS-NR state before initializing another card. This precaution keeps cards in service and precludes an interruption of SCCP services.

80. Use `init-card:loc=<DSM card>` command to load RTDB, OAM, GPL, and GTT data to VSCCP card.
81. Use `rept-stat-card` command to display IS-NR status of the DSM card.
82. Repeat [Step 82](#) and [Step 83](#) to reboot each DSM card.

**NOTE:** Once the G-Port feature is turned on, always boot the DSM cards with the `init-card:loc=<DSM card location>` command.

83. Use `chg-sccp-serv:serv=gport:state=online` to set the G-Port service to online.
84. Confirm success of activation procedure with `rept-stat-sccp`, `rept-stat-mps`, and `rept-stat-db:display=all` commands.

EPAP can now administer G-Port entity objects and G-Port subscribers. For the details about performing these actions, refer to the *EPAP Administration Manual*. The detailed G-Port activation procedure is described next.

## G-Port Feature Activation Procedure

Refer to the *Eagle 5 ISS Commands Manual* for detailed descriptions of the commands that are used in this procedure.

1. Before changing a true point code (PC) and adding a capability point code (CPC) for the G-Port feature, display the current values of the self-identification configuration (shown in step [Step 2](#)), the destination point codes (DPCs) (shown in step [Step 3](#)), and the routes and linksets assigned to the DPCs (shown in step [Step 4](#)).

The G-Port feature applies to ITU-I (international) and ITU-N (national) networks.

2. Display the current self identification of the system (PC and CPC) using the **rtrv-sid** command.

A sample output from this command is:

```
rlghncxa03w 01-10-07 00:57:31 GMT EAGLE 37.0.0
PCA          PCI          PCN          CLLI          PCTYPE
----- 1-100-1      11111      rlghncxa03w      OTHER

CPCA
-----
CPCI
1-101-1      1-101-2      1-101-3      1-101-4

CPCN
11121      11122      11123      11124
```

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).

3. Display the current destination point codes in the Destination table (**dpci/dpcn**) using the **rtrv-dstn** command.

A sample output from this command is:

```
rlghncxa03w 01-10-10 11:43:04 GMT EAGLE 37.0.0
DPCA        CLLI        BEI  ELEI  ALIASI        ALIASN  DOMAIN
-----  -----  ---  ---  -----  -----  ---
DPCI        CLLI        BEI  ELEI  ALIASA        ALIASN  DOMAIN
2-100-1    rlghncxa03w no   ---  222-210-000  12001   SS7

DPCN        CLLI        BEI  ELEI  ALIASA        ALIASI  DOMAIN
21111     rlghncxa03w no   ---  222-200-200  2-121-1  SS7

DESTINATION ENTRIES ALLOCATED:      2000
  FULL DPC(s):                  2
  NETWORK DPC(s):                0
  CLUSTER DPC(s):                0
  TOTAL DPC(s):                  2
  CAPACITY (% FULL):             1%
X-LIST ENTRIES ALLOCATED:           500
```

4. Display the current route configuration using the **rtrv-rte** command.

A sample output from this command is:

```
rlghncxa03w 01-01-07 11:43:04 GMT EAGLE 37.0.0
DPCA        ALIASI      ALIASN/N24  CLLI      LSN      RC      APC
-----  -----  -----  -----  -----  --  -----
DPCI        ALIASN/N24  ALIASA      CLLI      LSN      RC      APC
2-100-1    121111      -----  idp1    ls100001  10    1-234-5
                                         ls100002  10    1-234-6
```

				ls100003	20	1-234-7
				ls100004	30	1-234-1
				ls100005	40	1-234-2
				ls100006	50	1-234-3
DPCN	ALIASA	ALIASI	CLLI	LSN	RC	APC
21111	-----	0-001-1	ndp1	ls200001	10	11111
				ls200002	10	11112
				ls200003	20	11113
				ls200004	30	11114
				ls200005	40	11115
				ls200006	50	11116

5. If the system's point code (**pci/pcn**) or capability point code (**cpci/cpcn**) to be configured in this procedure is shown in steps [Step 2](#), [Step 3](#), or [Step 4](#), choose another point code to configure with this procedure (go to step [Step 9](#)).
6. Use the **rtrv-stpopts** command to display PC or CPC format, if configuring the system point code or capability point code (**pcn** or **cpcn**) of an ITU-N Network.
  - If configuring the system point code or capability point code (**pcn** or **cpcn**) of an ITU-N network, view the current value of the ITU-N point code format.
  - Otherwise continue with step [Step 7](#).

Enter the **rtrv-stpopts** command and specify the ITU-N point code format option **npcfmti**. The **npcfmti** option identifies how the ITU-N point code is entered into the database and how it is displayed in any outputs. The value is shown in the **NPCFMTI** field.

A sample output from this command is:

```
rlghncxa03w 01-10-17 16:02:05 GMT EAGLE 37.0.0
STP OPTIONS
-----
MTPT31CTL      1
MTPLTI        yes
MTPLTCTDPCQ    3
MTPLTST     10000
MTPXLQ       500
MTPXLET      0100
MTPXLOT       90%
MTPDPCQ     1750
TFATFRPR    1000
MTPRSI        yes
MTPRSIT     5000
MTPLPRST      yes
MTPPT10ALT   30000
SLSCNV       perl
UIMRD        yes
CRITALMINH    no
DISPACTALMS   no
NPCFMTI      4-4-4-2
DEFCC         49
DEFNDC       177
DSMAUD       on
```

**Optional:** To change the format of the ITU-N point code, go to section "ITU National Point Code Formats" in the *EAGLE 5 ISS Database Administration Manual - SS7*. Then continue with step [Step 7](#).

7. Display the mated applications in the database using the **rtrv-map** command.

Sample outputs for this command are:

```
rlghncxa03w 01-10-07 11:43:04 GMT EAGLE 37.0.0
PCN          SSN  RC  MPCN           MSSN MATERC SRM MRC GRP NAME
11111        5    10  12347          5     20
```

```

rlghncxa03w 01-10-07 11:43:04 GMT EAGLE 37.0.0
PCI          SSN   RC   MPCI           MSSN MATERC SRM MRC GRP NAME
2-100-1      5     20   3-200-1       250    99 ---- abcdefgh

```

- a. If the point code of the system is shown in the **rtrv-map** command output (in the **PCA**, **PCI**, **PCN**, **MPCA**, **MPCI**, or **MPCN** fields), remove the system's point code from the mated application table. Refer to procedure "Removing a Mated Application" in the EAGLE 5 ISS Database Administration Manual - Features.
- b. If the point code of the system or capability point code is a destination point code of a route, select a point code that is not the destination point code of a route (see output of the **rtrv-rte** command in step [Step 4](#)) and not in the destination point code table (see output of the **rtrv-dstn** command in step [Step 3](#)).
8. Change PC, CPC, DPC, route, linkset, and LIM card configurations for the HLR database using steps [Step 9](#) through [Step 28](#).



**CAUTION: Changing a point code of the system requires a system reboot using the **init-sys** command to fully implement the changes. The **init-sys** command causes a complete system reload and should be used only in an environment that is not in service. Using this command ensures the updated self identification information is loaded onto all cards but does interrupt service.**

9. Configure the point code of the system (**pci**/**pcn**) and capability point code (**cpci**/**cpcn**) by network type using the **chg-sid** command.

For example, enter one of these commands:

```
chg-sid:pci=1-100-2:cpci=1-102-1
```

```
chg-sid:pcn=11112:cpcn=11125
```

where:

**pci/pcn:**

The point code used to uniquely identify the system.

**cpci/cpcn:**

The point code used by the SS7 protocol to identify a group of functionally related EAGLE 5 ISSs in the signaling network to which the EAGLE 5 ISS belongs.

After successful completion of this command, the system returns the following output:

```

rlghncxa03w 01-10-07 00:57:31 GMT EAGLE 37.0.0
CHG-SID: MASP A - COMPLTD

```

When any of the **pci**/**pcn** parameters have changed, the system needs to be reinitialized. The following caution message is displayed:

```
CAUTION: SYSTEM SITE ID HAS BEEN CHANGED, MANUAL RE-INITIALIZATION IS NEEDED
```

10. Reinitialize the system by entering the **init-sys** command if changes were made to any **pca**/**pci**/**pcn** parameter in step [Step 9](#).



**CAUTION: The **init-sys** command causes a complete system reload and should be used only in an environment that is not in service. Using this command ensures the**

updated self identification information is loaded onto all cards, but does interrupt service.

When the **init-sys** command executes, the system does not retain the manually initiated state (for example, OOS-MT-DSBLD) for the signaling link, card, or terminal. After the command executes, the system attempts to bring all provisioned links, cards, and terminals on line, including those that were previously out of service. You will need to manually put each device back into its previous state after the system is back on line. Print or electronically capture the output of the **rept-stat-slk**, **rept-stat-card**, and **rept-stat-trm** commands for reference prior to issuing the **init-sys** command. To restore a device to its previous state, issue the appropriate inhibit/deactivate command listed in the EAGLE 5 ISS Commands Manual in the Related Commands section for each of the above **rept-stat** commands.

**NOTE:** The **init-sys** command must be entered twice within 30 seconds for the system to re-initialize. If the **init-sys** command is not executed twice within 30 seconds, the attempt to re-initialize the system is aborted.

When the **init-sys** command is first entered, this message should appear.

```
rlghncxa03w 01-10-07 00:57:31 GMT EAGLE 37.0.0
CAUTION: This command causes a complete system reload, and
will result in traffic loss.
Re-enter command within 30 seconds to confirm.
```

When the **init-sys** command is re-entered within the 30 second time limit, this message should appear.

```
rlghncxa03w 01-10-07 00:57:31 GMT EAGLE 37.0.0
Init System command issued at terminal #3
```

From the time that the **init-sys** command is accepted, approximately two minutes must elapse before performing step [Step 11](#) (logging into the system). If the terminal is in the VT-100/VT-320 mode, the terminal display will be refreshed with non-zero alarm counts. During this two-minute interval, an intermediate screen refresh occurs, which is caused by the MASP's role change from active to standby and from standby to active. This screen refresh is typically a partial refresh and the alarm indicators are set to zero. If you are logged into the system in the KSR mode, the only response you will receive of being able to log into the system is the message 'UAM 0009, MASP became active'. UAM 0009 could be issued twice due to a possible transient MASP role change (switching from active to standby). Following the execution of the **init-sys** command, the MASP that was active before the **init-sys** command was entered will be the active MASP again when the system has finished reinitializing.

- Verify the SID changes using the **rtrv-sid** command.

A sample output from this command is:

```
durhncxa03w 01-10-07 00:57:31 GMT EAGLE 37.0.0
PCA          PCI          PCN          CLLI          PCTYPE
-----  1-100-1      11111    rlghncxa03w     OTHER

CPCA
-----
CPCI
1-101-1      1-101-2      1-101-3      1-101-4
1-102-1

CPCN
```

11121	11122	11123	11124
11125			

- 12.** Enter a destination point code for the HLR location in the Destination table by network type using the **ent-dstn** command.

For example, enter one of these commands:

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

**ent-dstn:dpcn=21112**

where:

**:dpci/dpcn**

The destination point code being added to the database

The system returns this message:

```
rlghncxa03w 01-10-17 15:35:05 GMT EAGLE 37.0.0
Destination table is (40 of 4000) 1% full
ENT-DSTN: MASP A - COMPLTD
```

- 13.** Verify the changes using the **rtrv-dstn** command and specifying the DPC that was entered in step [Step 12](#).

For example, enter one of these commands:

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

**rtrv-dstn:dpcn=21112**

This is an example of the possible output **for DPCIs**.

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

RLGHNCXA03W 01-10-30 21:16:37 GMT EAGLE 37.0.0
DPCI      CLLI      BEI   ELEI   ALIASA      ALIASN      DOMAIN
2-100-2    -----    no    ---    -----    21112        SS7

SPC      NCAI
-----  no

Destination table is (20 of 2000) 1% full
```

This is an example of the possible output **for DPCNs**.

```
rtrv-dstn:dpcn=21112

RLGHNCXA03W 01-10-30 21:16:37 GMT EAGLE 37.0.0
DPCN      CLLI      BEI   ELEI   ALIASA      ALIASI     DOMAIN
21112    -----    no    ---    -----    2-100-2  SS7

SPC      NCAI
-----  no

Destination table is (20 of 2000) 1% full
```

- 14.** Enter a linkset with the **ent-ls** command, and assign it to the destination point code by network type.

For example, enter one of these commands:

**ent-ls:lsn=ls400001:apci=2-200-2:lst=c**

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

where:

**:lsn**

The name of the linkset

The name of the linkset

**:apci/apcn**

Adjacent point code – the point code identifying the node that is next to the system

**:lst**

The linkset type of the specified linkset

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-17 16:23:21 GMT EAGLE 37.0.0
Link set table is ( 114 of 1024) 12% full
ENT-LS: MASP A - COMPLTD
```

15. Verify the changes using the **rtrv-ls** command and specifying the linkset name.

For example, enter one of these commands:

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

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

For lsn400001, the system returns output similar to the following:

```
      L3T   SLT          GWS GWS GWS
LSN      APCN    (SS7)  SCRN  SET  SET BEI LST LNKS ACT MES DIS SLSI NIS
ls400001  2-200-2      scr1  1    2  no  a   0  on  off off no   on
CLLI     TFATCABMLQ  MTPRSE ASL8
RLGHNCXA03W 1           no
                           no
      L2T       L1          PCR PCR
LOC   LINK SLC TYPE   SET BPS   MODE TSET ECM   N1  N2
```

Link set table is (114 of 1024) 12% full

For lsn500001, the system returns output similar to the following:

```
      L3T   SLT          GWS GWS GWS
LSN      APCN    (SS7)  SCRN  SET  SET BEI LST LNKS ACT MES DIS SLSI NIS
ls500001  21122      scr3  1    2  no  a   0  on  off off no   on
CLLI     TFATCABMLQ  MTPRSE ASL8
RLGHNCXA03W 1           no
                           no
      L2T       L1          PCR PCR
LOC   PORT SLC TYPE   SET BPS   MODE TSET ECM   N1  N2
```

Link set table is (114 of 1024) 12% full

16. Add the LIM cards to the database using the **ent-card** command.

For this example, enter these commands:

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

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

where:

**:loc**

Specifies the slot number for the card.

**:type**

Specifies that the card is a LIMOCU card.

**:appl**

Specifies that the application is CCS7ITU.

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-12 09:12:36 GMT EAGLE 37.0.0
ENT-CARD: MASP A - COMPLTD
```

17. Verify the changes using the **rtrv-card** command with the card location specified.

For this example, enter these commands:

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

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

Examples of the output from these commands are:

```
RLGHNCXA03W 01-10-30 09:12:36 GMT EAGLE 37.0.0
CARD TYPE APPL LSET NAME LINK SLC LSET NAME LINK SLC
1105 LIMOCU CCS7ITU ----- A -- ----- B --
RLGHNCXA03W 01-10-30 09:12:36 GMT EAGLE 37.0.0
CARD TYPE APPL LSET NAME LINK SLC LSET NAME LINK SLC
1106 LIMOCU CCS7ITU ----- A -- ----- B --
```

18. Assign signaling links to the LIM cards using the **ent-slk** command.

For example, enter these commands:

```
ent-slk:loc=1105:link=a:lsn=ls400001:slc=0:12tset=1
```

```
ent-slk:loc=1106:link=a:lsn=ls500001:slc=0:12tset=1
```

where:

**:loc**

The card location of the LIM that the SS7 signaling link will be assigned to.

**:link**

The signaling link ID assigned on the card specified in the **loc** parameter.

**:lsn**

The name of the linkset that will contain the signaling link.

**:slc**

The signaling link code. The **slc** must be unique within the linkset. It must be the same at both the system location and the distant node.

**:l2tset**

The level 2 timer set table. A signaling link may be assigned to any of the twenty tables.

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-07 08:29:03 GMT EAGLE 37.0.0
ENT-SLK: MASP A - COMPLTD
```

Signaling links are the only elements in the database directly supported by a hardware device. When a link is added to a linkset, the link remains in the state OOS-MT-DSBLD (out of service maintenance disabled) until it is activated; see step [Step 26](#).

19. Verify the changes using the **rtrv-slk** command, specifying the card location and ID of the signaling link entered in step [Step 18](#).

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

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

This is an example of the possible output.

```
RLGHNCXA03W 01-10-19 21:16:37 GMT EAGLE 37.0.0
          L2T      L1      PCR  PCR
LOC  LINK LSN     SLC TYPE    SET  BPS   MODE TSET  ECM  N1  N2 1105 A  ls400001  0
LIMOCU 1  56000  ---  ---  BASIC ---  -----
RLGHNCXA03W 01-10-19 21:16:37 GMT EAGLE 37.0.0
          L2T      L1      PCR  PCR
LOC  LINK LSN     SLC TYPE    SET  BPS   MODE TSET  ECM  N1  N2 1106 A  ls500001  0
LIMOCU 1  56000  ---  ---  BASIC ---  -----
```

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

For example, enter one of these commands:

```
ent-rte:dpci=2-100-2:lsn=ls400001:rc=10
```

```
ent-rte:dpcn=21112:lsn=ls500001:rc=10
```

where:

**:dpci/dpcn**

Destination point code of the node that the traffic is bound for.

**:lsn**

The name of the linkset that will carry the traffic bound for the node specified by the destination point code.

**:rc**

The relative cost (priority) for this route.

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-07 08:28:30 GMT EAGLE 37.0.0
ENT-RTE: MASP A - COMPLTD
```

21. Verify the changes using the **rtrv-rte** command and specifying the destination point code of the route.

A sample output from this command is:

```
rlghncxa03w 01-10-07 11:43:04 GMT EAGLE 37.0.0
DPCA      ALIASI      ALIASN/N24  CLLI      LSN      RC APCA
-----  -----  -----  -----  -----  -----  -----
DPCI      ALIASN/N24  ALIASA      CLLI      LSN      RC APCI
2-100-1    121111    240-111-111  idp1    ls100001 10 1-234-5
                                         ls100002 10 1-234-6
                                         ls100003 20 1-234-7
                                         ls100004 30 1-234-1
                                         ls100005 40 1-234-2
                                         ls100006 50 1-234-3
                                         ls400001 10 1-200-2
```

DPCN	ALIASA	ALIASI	CLLI	LSN	RC	APCN
21111	011-222-111	0-001-1	ndp1	ls200001	10	11111
				ls200002	10	11112
				ls200003	20	11113
				ls200004	30	11114
				ls200005	40	11115
				ls200006	50	11116
21112	011-222-111	0-001-1	ndp1	ls500001	10	11122

22. Add a mated application to the database by network type using the **ent-map** command.

For this example, enter this command:

```
ent-
map:pci=2-100-1:ssn=12:rc=20:mpci=3-200-1:mssn=50 :materc=99:grp=grp03
ent-map:pcn=11112:ssn=12:rc=10:mpcn=11114:mssn=250:materc=99 :grp=grp07
```

where:

**:pci/pcn**

The point code of the primary signaling point that is to receive the message.

**:ssn**

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

**:rc**

The relative cost.

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

The point code of the backup signaling point that is to receive the message.

**:mssn**

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

**:materc**

Mate relative cost.

**:grp**

The name of the concerned signaling point code group that contains the point codes that should be notified of the subsystem status. This parameter applies to both RPCs/SSNs.

When each of these commands have successfully completed, this message should appear.

```
RLGHNCXA03W 01-10-07 00:28:31 GMT EAGLE 37.0.0
ENT-MAP: MASP A - COMPLTD
```

23. Verify the changes using the **rtrv-map** command.

Examples of possible output from this command are:

```
rlghncxa03w 01-10-07 11:43:04 GMT EAGLE 37.0.0
PCN SSN RC MPCN MSSN MATERC SRM MRC GRP NAME
11111 5 20 12347 250 99 --- --- GRP07
11112 12 0 12347 250 99 --- --- GRP07

rlghncxa03w 01-10-07 11:43:04 GMT EAGLE 37.0.0
PCI SSN RC MPCI MSSN MATERC SRM MRC GRP NAME
1-100-1 5 0 3-200-1 250 99 --- --- GRP03
2-100-1 12 20 3-200-1 50 99 --- --- GRP03
```

24. Allow the LIM cards that were entered in step [Step 16](#) by using the **alw-card** command.

For example, enter these commands:

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

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

This message appears:

```
RLGHNCXA03W 01-10-30 21:20:37 GMT EAGLE 37.0.0
Card has been allowed.
```

25. Verify the in-service normal (IS-NR) status of the cards using the **rept-stat-card** command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-27 16:43:42 GMT EAGLE 37.0.0
CARD VERSION TYPE APPL PST SST AST
1101 100-000-00003-000 TSM SCCP IS-NR Active ---
1102 100-000-00003-000 TSM SCCP IS-NR Active ---
1103 100-000-00003-000 ACMENET STPLAN IS-NR Active ---
1104 100-000-00003-000 ACMENET GLS IS-NR Active ---
1105 100-000-00003-000 LIMOCU CCS7ITU IS-NR Active ---
1106 100-000-00003-000 LIMOCU CCS7ITU IS-NR Active ---
1113 100-000-00002-000 MCAP OAM IS-NR Active ---
1114 100-000-00002-000 TDM IS-NR Active ---
1115 100-000-00002-000 MCAP OAM IS-NR Active ---
1116 100-000-00002-000 TDM IS-NR Active ---
1117 100-000-00002-000 MDAL IS-NR Active ---
1201 100-000-00003-000 LIMDS0 SS7ANSI IS-NR Active ---
1202 100-000-00002-000 LIMV35 SS7GX25 IS-NR Active ---
1203 100-000-00003-000 LIMV35 SS7ANSI IS-NR Active ---
1204 100-000-00003-000 LIMATM ATMANSI IS-NR Active ---
1205 100-000-00001-000 DCM IPLIM IS-NR Active ---
1207 100-000-00001-000 DCM SS7IPGW IS-NR Active ---
1303 100-000-00001-000 DCM IPLIM IS-NR Active ---
1305 100-000-00001-000 DCM SS7IPGW IS-NR Active ---
```

26. Activate the signaling links entered in step [Step 18](#) using the **act-slk** command.

For example, enter these commands:

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

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

The link changes its state from *OOS-MT-DSBLD* (out-of-service maintenance-disabled) to *IS-NR* (in-service normal). The output confirms the activation.

```
RLGHNCXA03W 01-10-07 11:11:28 GMT EAGLE 37.0.0
Activate Link message sent to card
```

27. Verify the in-service normal (IS-NR) status of the signaling link using the **rept-stat-slk** command.

For example, enter these commands:

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

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

This message should appear.

```
RLGHNCXA03W 01-10-30 21:16:37 GMT EAGLE 37.0.0
SLK LSN CLLI PST SST AST
1105,A ls400001 ----- IS-NR Avail ----
Command Completed.
```

```
RLGHNCXA03W 01-10-30 21:16:37 GMT EAGLE 37.0.0
SLK      LSN      CLLI      PST      SST      AST
1106,A  ls500001  ----- IS-NR     Avail   -----
Command Completed.
```

- 28.** Display the new LIM cards in the database using the **rtrv-card** command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-15 16:34:56 GMT EAGLE 37.0.0
CARD  TYPE    APPL    LSET NAME    LINK SLC LSET NAME    LINK SLC
1101 TSM     SCCP    ----- A   --  ----- B   --
1102 TSM     SCCP    ----- A   --  ----- B   --
1103 ACMENET STPLAN ----- A   --  ----- B   --
1104 ACMENET GLS     ----- A   --  ----- B   --
1105 LIMOCU CCS7ITU ls400001 A   00  ----- B   --
1106 LIMOCU CCS7ITU ls500001 A   00  ----- B   --
1113 MCAP    OAM     ----- 
1114 TDM     OAM     ----- 
1115 MCAP    OAM     ----- 
1116 TDM     OAM     ----- 
1117 MDAL    OAM     ----- 
1201 LIMDS0 SS7ANSI lsn1      A   00  lsn2      B   01
1202 LIMV35 SS7GX25 lsngwy   A   00  ----- B   --
1203 LIMV35 SS7ANSI lsn2      A   00  lsn1      B   01
1204 LIMATM ATMANSI atmngwy A   00  ----- B   --
1205 DCM     IPLIM    ipgwy1   A   00  ipgwy3   B   01
1207 DCM     SS7IPGW ipgwy2   A   00  ----- B   --
1303 DCM     IPLIM    ipgwy1   A   00  ipgwy3   B   01
1305 DCM     SS7IPGW ipgwy4   A   00  ----- B   --
```

Determine a location where the double-slot DSM card can be inserted. The output shows slots 1107 and 1108 are not occupied. Also determine adjacent (in odd-even slots) TSM cards running the SCCP application for later card replacements.

- 29.** Install and configure DSM card(s) as needed in available odd-even slots using steps [Step 30](#) through [Step 45](#).

For our example, install a DSM card in slots 1107 and 1108.

- 30.** Install the DSM card in slots 1107 and 1108.

The DSM card requires two slots and must be installed in an odd slot with an adjacent empty even slot on its right side.

- a. Open the ejector levers on the DSM card.

Carefully align the card edges with the top and bottom card guides. Then push the card along the length of the card guides until the rear connectors on the card engage the mating connectors on the target shelf backplane.

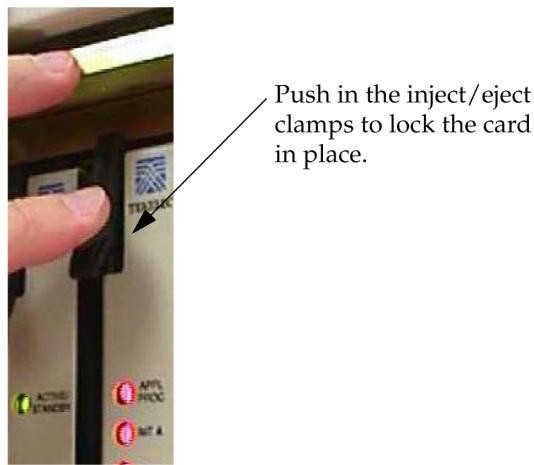
- b. Press the left edge of the card faceplate using constant pressure until you feel the card's progress cease.



**WARNING: Do not impact the faceplate in order to mate the connectors. Any impact to the card's faceplate can damage the faceplate, the pins, or the connectors.**

- c. Push in the top and bottom inject/eject clamps.

This locks the card in place and ensures a strong connection with the pins on the target shelf backplane.

**Figure 4-1.** Push in Inject/Eject Clamps

- d. Verify that both IMT bus LEDs are green.
  - e. Install the cabling required to connect the DSM card to the MPS.  
Refer to the *Installation Manual* for details.
- 31.** Add the DSM card to the database and configure it as DSM card running the VSCCP application using the **ent-card** command.

For this example, enter this command:

```
ent-card:loc=1107:type=dsm:appl=vsccp
```

where:

**:loc**

Specifies the slot number for the card. The slot number must be an odd number.

**:type**

Specifies that the card is a DSM card.

**:appl**

Specifies that the application is VSCCP.

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-12 09:12:36 GMT EAGLE 37.0.0
ENT-CARD: MASP A - COMPLTD
```

- 32.** Verify the DSM card using the **rtrv-card** command with the card location specified.

For this example, enter this command:

```
rtrv-card:loc=1107
```

A sample output from this command is:

```
RLGHNCXA03W 01-10-30 09:12:36 GMT EAGLE 37.0.0
```

CARD	TYPE	APPL	LSET NAME	LINK SLC	LSET NAME	LINK SLC		
1107	DSM	VSCCP	-----	A	--	-----	B	--

- 33.** Display the current link parameters associated with the DSM card in the database by entering the rtrv-ip-lnk command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-30 21:14:37 GMT EAGLE 37.0.0
LOC PORT IPADDR SUBMASK DUPLEX SPEED MACTYPE AUTO MCAST
1107 A ----- HALF 10 DIX NO NO
1107 B ----- HALF 10 DIX NO NO
```

- 34.** Enter the IP address port and speed associated with the DSM card in the database using the **chg-ip-lnk** command.

For this example, enter these commands:

```
chg-ip-
lnk:loc=1107:port=a:duplex=half:ipaddr=192.168.122.1:mactype=dix:speed=100:mcast=yes:submask=255.255.255.0
```

```
chg-ip-
lnk:loc=1107:port=b:duplex=half:ipaddr=192.168.123.1:mactype=dix:speed=10:mcast=yes:submask=255.255.255.0
```

where:

**:loc**

The card location of the DSM card within the EAGLE 5 ISS.

**:port**

The port ID. The port parameter of the chg-ip-lnk command specifies the physical interface of the DSM card.

**:ipaddr**

IP address assigned to the port. This is a TCP/IP address expressed in standard "dot notation." IP addresses consist of the network number of the system and the unique host number of the machine.

**:duplex**

This is the mode of operation of the interface.

**:speed**

This is interface bandwidth in megabits per second. The speed is either 100 Mbps for main DSM network or 10 Mbps for backup DSM network.

**:mactype**

This is the Media Access Control Type of the interface. Specify dix for the Digital/Inter/Xerox de facto standard for the Ethernet.

**:mcast**

This is the Multicast Control of the interface.

**:submask**

The subnet mask of the IP interface, in the form of an IP address with a restricted range of values.

When this command has successfully completed, the following message appears:

```
RLGHNCXA03W 01-10-30 21:18:37 GMT EAGLE 37.0.0
CHG-IP-LNK: MASP A - COMPLTD
```

- 35.** Verify the IP address port and speed associated with the DSM card in the database by entering the rtrv-ip-lnk command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-30 21:14:37 GMT EAGLE 37.0.0
LOC PORT IPADDR      SUBMASK      DUPLEX SPEED MACTYPE AUTO MCAST
1107 A   192.168.122.1 255.255.255.0 HALF    100   DIX     NO    YES
1107 B   192.168.123.1 255.255.255.0 HALF    10    DIX     NO    YES
```

- 36.** Display the current IP host information in the database by entering the **rtrv-ip-host** command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-30 21:17:37 GMT EAGLE 37.0.0
```

IPADDR	HOST
192.1.1.32	KC_HLR2
192.1.1.50	DN_MSC1
192.1.1.52	DN_MSC2

- 37.** Add the host name and IP address for each VSCCP link using the **ent-ip-host** command.

For example, enter these commands:

```
ent-ip-host:host=vsccp_1107_a:ipaddr=192.168.122.1
```

```
ent-ip-host:host=vsccp_1107_b:ipaddr=192.168.123.1
```

where:

**:host**

Specifies the host name. Each VSCCP link must be specified separately.

**:ipaddr**

Specifies the IP network address for each EPAP. The first three octets of the IP address must be the same as MPS A and B ports, respectively. The fourth octet identifies the DSM card and must have a unique octet identifier for the card's IP address; we recommend numbering the DSM cards sequentially, using values 1 to 25. (This example shows the assignment of the first DSM card.)

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-30 21:18:37 GMT EAGLE 37.0.0
ENT-IP-HOST: MASP A - COMPLTD
```

- 38.** Verify the new IP host information in the database by entering the **rtrv-ip-host** command.

The following is an example of the possible output.

```
RLGHNCXA03W 01-10-30 21:19:37 GMT EAGLE 37.0.0
```

IPADDR	HOST
192.1.1.32	KC_HLR2
192.1.1.50	DN_MSC1
192.1.1.52	DN_MSC2
192.168.122.1	VSCCP_1107_A
192.168.123.1	VSCCP_1107_B

**NOTE: Most G-Port customer private networks do not require setting up a default router for the DSM card. However, if your network configuration does require a default router to connect the DSM card communication to the EPAP, then only one default router is assignable to each DSM card. Assign the default router address to each DSM card as shown in this step.**

- 39.** Enter local domain and IP router address for the DSM card using the **chg-ip-card** command.

For this example, enter this command:

```
chg-ip-card:loc=1107:domain=nc.tekelec.com :defrouter=192.168.122.250
```

where:

**:loc**

The location of the DSM card within the EAGLE 5 ISS.

**:domain**

The domain name of domain server.

**:defrouter**

Default router address. The IP address for default router. This is a TCP/IP address expressed in standard “dot notation”. IP addresses consist of the system’s network number and the machine’s unique host number.

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-30 21:20:37 GMT EAGLE 37.0.0
CHG-IP-CARD: MASP A - COMPLTD
```

40. Verify the new TCP/IP parameters associated with the DSM card in the database by entering the **rtrv-ip-card** command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-30 21:21:37 GMT EAGLE 37.0.0
    LOC
1107
    SRCHORDR LOCAL
    DNSA -----
    DNSB -----
    DEFROUTER
192.168.122.250
    DOMAIN
    NC.TEKELEC.COM
```

41. Boot the DSM card that was added in step [Step 31](#) in TSM emulation mode by using the **alw-card** command.

For example, enter this command:

```
alw-card:loc=1107
```

This message appears:

```
RLGHNCXA03W 01-10-30 21:20:37 GMT EAGLE 37.0.0
Card has been allowed.
```

42. Verify the in-service normal (IS-NR) status of the DSM card using the **rept-stat-card** command.

This is an example of the possible output.

CARD	VERSION	TYPE	APPL	PST	SST	AST
1101	100-000-00003-000	TSM	SCCP	IS-NR	Active	---
1102	100-000-00003-000	TSM	SCCP	IS-NR	Active	---
1103	100-000-00002-000	ACMENET	STPLAN	IS-NR	Active	---
1104	100-000-00003-000	TSM	GLS	IS-NR	Active	---
1105	100-000-00003-000	LIMOCU	CCS7ITU	IS-NR	Active	---
1106	100-000-00003-000	LIMOCU	CCS7ITU	IS-NR	Active	---
1107	100-000-00003-000	DSM	VSCCP	IS-NR	Active	---

1113	100-000-00002-000	MCAP	OAM	IS-NR	Active	---
1114	100-000-00002-000	TDM		IS-NR	Active	---
1115	100-000-00002-000	MCAP	OAM	IS-NR	Active	---
1116	100-000-00002-000	TDM		IS-NR	Active	---
1117	100-000-00002-000	MDAL		IS-NR	Active	---
1201	100-000-00003-000	LIMDS0	SS7ANSI	IS-NR	Active	---
1202	100-000-00002-000	LIMV35	SS7GX25	IS-NR	Active	---
1203	100-000-00003-000	LIMV35	SS7ANSI	IS-NR	Active	---
1204	100-000-00003-000	LIMATM	ATMANSI	IS-NR	Active	---
1205	100-000-00001-000	DCM	IPLIM	IS-NR	Active	---
1207	100-000-00001-000	DCM	SS7IPGW	IS-NR	Active	---
1303	100-000-00001-000	DCM	IPLIM	IS-NR	Active	---
1305	100-000-00001-000	DCM	SS7IPGW	IS-NR	Active	---

43. Test the presence of the EPAP hosts on the network using the **pass** command with the **ping** parameter.

This command is invoked with a destination (either a hostname or IP address). For example, enter the following command:

```
pass:loc=1107:cmd="ping 192.168.122.100".
pass:loc=1107:cmd="ping 192.168.122.200".
pass:loc=1107:cmd="ping 192.168.123.100".
pass:loc=1107:cmd="ping 192.168.123.200".
```

After successful completion of each command, the system returns output similar to the following:

```
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 37.0.0
pass: loc=1107: cmd="ping 192.168.122.100"
Command entered at terminal #1.
;
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 37.0.0
PASS: Command sent to card
;
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 37.0.0
PING command in progress
;
rlghncxa03w 00-06-27 08:30:46 GMT EAGLE 37.0.0
PING 192.168.122.100: 56 data bytes
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=0.time=5. ms
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=1.time=0. ms
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=2.time=0. ms
----192.168.100.3 PING Statistics----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms) min/avg/max = 0/1/5
PING command complete
```

If the **pass** commands with the **ping** parameter is not successful, verify the the correct connection of the hardware cabling and try again. If the command fails again, contact the [Customer Care Center](#).

44. Repeat steps [Step 30](#) through [Step 43](#) to add all DSM cards (N+1) to be installed in available slots.  
Go to Step [Step 45](#) to start replacing TSM cards with DSM cards.
45. Replace TSM card(s) with DSM cards if applicable and add DSM card(s) to the database using steps [Step 45](#) through [Step 70](#).

In this procedure, we are removing two existing adjacent TSM cards and replace them with a dual-slot DSM card in slots 1101 and 1102.

**NOTE: When adding DSM cards in an in-service environment, you must take care not to interrupt traffic. Before replacing TSM cards with DSM cards, first install a DSM card in an available dual-slot.**

46. Display the TSM cards running the SCCP application in the database using the **rtrv-card** command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-15 16:34:56 GMT EAGLE 37.0.0
CARD  TYPE    APPL    LSET NAME   LINK SLC LSET NAME   LINK SLC
1101 TSM     SCCP    ----- A  -- ----- B  -- 
1102 TSM     SCCP    ----- A  -- ----- B  -- 
1103 ACMENET STPLAN ----- A  -- ----- B  -- 
1104 ACMENET GLS     ----- A  -- ----- B  -- 
1105 LIMOCU CCS7ITU ls300001 A  00 ----- B  -- 
1106 LIMOCU CCS7ITU ls400001 A  00 ----- B  -- 
1107 DSM     VSCCP   ls300001 A  00 ----- B  -- 
1113 MCAP    OAM     ----- 
1114 TDM     ----- 
1115 MCAP    OAM     ----- 
1116 TDM     ----- 
1117 MDAL    ----- 
1201 LIMDS0 SS7ANSI lsn1      A  00 lsn2      B  01 
1202 LIMV35 SS7GX25 lsngwy   A  00 ----- B  -- 
1203 LIMV35 SS7ANSI lsn2      A  00 lsn1      B  01 
1204 LIMATM ATMANSI atmngwy A  00 ----- B  -- 
1205 DCM     IPLIM    ipgwy1   A  00 ipgwy3   B  01 
1207 DCM     SS7IPGW ipgwy2   A  00 ----- B  -- 
1303 DCM     IPLIM    ipgwy1   A  00 ipgwy3   B  01 
1305 DCM     SS7IPGW ipgwy4   A  00 ----- B  -- 
```

Determine the cards to be removed from the database. In this procedure, we will remove the TSM cards running the SCCP application in card locations **1101** and **1102**.

47. Display the TSM cards that are in service with the **rept-stat-card:stat=nr** command.

For this example, enter the following command:

```
rept-stat-card:stat=nr
```

A sample output from this command is:

```
RLGHNCXA03W 01-10-27 16:43:42 GMT EAGLE 37.0.0
CARD  VERSION    TYPE    APPL    PST      SST      AST
1101 100-000-0003-000 TSM     SCCP    IS-NR   Active   --- 
1102 100-000-0003-000 TSM     SCCP    IS-NR   Active   --- 
1103 100-000-0003-000 ACMENET STPLAN IS-NR   Active   --- 
1104 100-000-0003-000 ACMENET GLS     IS-NR   Active   --- 
1105 100-000-0003-000 LIMOCU CCS7ITU IS-NR   Active   --- 
1106 100-000-0003-000 LIMOCU CCS7ITU IS-NR   Active   --- 
1107 100-000-0003-000 DSM     VSCCP   IS-NR   Active   --- 
1113 100-000-0002-000 MCAP    OAM     IS-NR   Active   --- 
1114 100-000-0002-000 TDM     ----- IS-NR   Active   --- 
1115 100-000-0002-000 MCAP    OAM     IS-NR   Active   --- 
1116 100-000-0002-000 TDM     ----- IS-NR   Active   --- 
1117 100-000-0002-000 MDAL    ----- IS-NR   Active   --- 
1201 100-000-0003-000 LIMDS0 SS7ANSI IS-NR   Active   --- 
1202 100-000-0002-000 LIMV35 SS7GX25 IS-NR   Active   --- 
1203 100-000-0003-000 LIMV35 SS7ANSI IS-NR   Active   --- 
1204 100-000-0003-000 LIMATM ATMANSI IS-NR   Active   --- 
1205 100-000-0001-000 DCM     IPLIM    IS-NR   Active   --- 
1207 100-000-0001-000 DCM     SS7IPGW IS-NR   Active   --- 
1303 100-000-0001-000 DCM     IPLIM    IS-NR   Active   --- 
1305 100-000-0001-000 DCM     SS7IPGW IS-NR   Active   --- 
```

48. Inhibit the TSM cards using the **inh-card** command and specifying the card locations.

```
inh-card:loc=1101
```

```
inh-card:loc=1102
```

When each command has successfully completed, this message appears:

```
RLGHNCXA03W 01-10-12 09:12:36 GMT EAGLE 37.0.0
Card has been inhibited.
```

- 49.** Verify that the TSM cards are in the Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD) state with the **rept-stat-card** command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-27 16:43:42 GMT EAGLE 37.0.0
CARD VERSION TYPE APPL PST SST AST
1101 100-000-0003-000 TSM SCCP OOS-MT-DSBLD Isolated ---
1102 100-000-0003-000 TSM SCCP OOS-MT-DSBLD Isolated ---
1103 100-000-0002-000 ACMENET STPLAN IS-NR Active ---
1104 100-000-0002-000 ACMENET STPLAN IS-NR Active ---
1105 100-000-0003-000 LIMOCU CCS7ITU IS-NR Active ---
1106 100-000-0003-000 LIMOCU CCS7ITU IS-NR Active ---
1107 100-000-0003-000 DSM VSCCP IS-NR Active ---
1113 100-000-0002-000 MCAP OAM IS-NR Active ---
1114 100-000-0002-000 TDM IS-NR Active ---
1115 100-000-0002-000 MCAP OAM IS-NR Active ---
1116 100-000-0002-000 TDM IS-NR Active ---
1117 100-000-0002-000 MDAL IS-NR Active ---
1201 100-000-0003-000 LIMDS0 SS7ANSI IS-NR Active ---
1202 100-000-0002-000 LIMV35 SS7GX25 IS-NR Active ---
1203 100-000-0003-000 LIMV35 SS7ANSI IS-NR Active ---
1204 100-000-0003-000 LIMATM ATMANSI IS-NR Active ---
1205 100-000-0001-000 DCM IPLIM IS-NR Active ---
1207 100-000-0001-000 DCM SS7IPGW IS-NR Active ---
1303 100-000-0001-000 DCM IPLIM IS-NR Active ---
1305 100-000-0001-000 DCM SS7IPGW IS-NR Active ---
```

- 50.** Remove the TSM cards from the database using the **dlt-card** command.

The **dlt-card** command has only one parameter, **loc**, which is the location of the card.

For this example, enter these commands:

```
dlt-card:loc=1101
dlt-card:loc=1102
```

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-12 09:12:36 GMT EAGLE 37.0.0
DLT-CARD: MASP A - COMPLTD
```

- 51.** Verify that the TSM cards are removed from the database using the **rtrv-card** command and specifying the cards that were removed in step [Step 50](#).

For this example, enter these commands:

```
rtrv-card:loc=1101
rtrv-card:loc=1102
```

After successful completion of this command, the system returns the following message:

```
E2144 Cmd Rej: Location invalid for hardware configuration
```

- 52.** Locate the TSM card to be removed from the shelf.

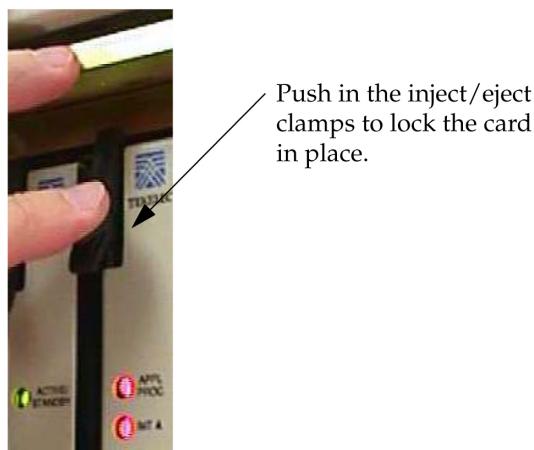
Because the TSM card takes just one slot and the DSM card requires two slots, the DSM card must be installed in an odd slot that is adjacent to an even slot on its right side. In this procedure, we will remove two TSM cards from slots 1101 and 1102 to make space for one DSM card.

- a. Push the inject/eject clamps outward from the card faceplate (top clamp in the “UP” position, bottom clamp in the “DOWN” position).

**Figure 4-2.** Push Inject/Eject Clamps Outward



- b. Pull the levers away from the shelf until they are parallel to the floor.
  - c. Gently pull the card towards you until the card clears the shelf
  - d. Place the card you have removed in an electrostatic discharge (ESD) protective container, or place the card in the spare card storage shelf.
53. Repeat step [Step 52](#) to remove the second TSM card.
54. Install the DSM card in slots 1101 and 1102.
- a. Open the ejector levers on the DSM card.  
Carefully align the card edges with the top and bottom card guides. Then push the card along the length of the card guides until the rear connectors on the card engage the mating connectors on the target shelf backplane.
  - b. Press the left edge of the card faceplate using constant pressure until you feel the card’s progress cease.
-  **WARNING:** Do not impact the faceplate in order to mate the connectors. Any impact to the card’s faceplate can damage the faceplate, the pins, or the connectors.
- c. Push in the top and bottom inject/eject clamps.  
This locks the card in place and ensures a strong connection with the pins on the target shelf backplane.

**Figure 4-3.** Push in Inject/Eject Clamps

- d. Verify that both IMT bus LEDs are illuminated green.
  - e. Install the cabling required to connect the DSM card to the MPS.  
Refer to the *Installation Manual* for details.
- 55.** Add the DSM card to the database and assign the VSCCP application using the **ent-card** command.

For this example, enter this command:

```
ent-card:loc=1101:type=dsm:appl=vsccp
```

where:

**:loc**

Specifies the slot number for the card. The slot number must be an odd number.

**:type**

Specifies that the card is a DSM card.

**:appl**

Specifies that the application is VSCCP.

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-12 09:12:36 GMT EAGLE 37.0.0
ENT-CARD: MASP A - COMPLTD
```

- 56.** Display the new DSM card using the **rtrv-card** command with the card location specified.

For this example, enter this command:

```
rtrv-card:loc=1101
```

A sample output from this command is:

```
RLGHNCXA03W 01-10-30 09:12:36 GMT EAGLE 37.0.0
CARD      TYPE        APPL      LSET NAME      LINK SLC LSET NAME      LINK SLC
1101      DSM         VSCCP     ----- A      -- ----- B      --
```

- 57.** Display the current link parameters associated with the DSM card in the database by entering the **rtrv-ip-lnk** command.

A sample output from this command is:

```
RLGHNCXA03W 01-10-30 21:14:37 GMT EAGLE 37.0.0
LOC PORT IPADDR      SUBMASK      DUPLEX SPEED MACTYPE AUTO MCAST
1101 A   -----      -----      HALF   10    DIX    NO    NO
1101 B   -----      -----      HALF   10    DIX    NO    NO
1107 A   -----      -----      HALF   10    DIX    NO    NO
1107 B   -----      -----      HALF   10    DIX    NO    NO
```

- 58.** Change the link parameters associated with the DSM card in the database using the chg-ip-lnk command.

For this example, enter these commands:

**chg-ip-**

**lnk:loc=1101:port=a:duplex=half:ipaddr=192.168.122.2 :mactype=dix:speed=100:mcast=yes:submask=255.255.255.0**

**chg-ip-**

**lnk:loc=1101:port=b:duplex=half:ipaddr=192.168.123.2 :mactype=dix:speed=10:mcast=yes:submask=255.255.255.0**

where:

**:loc**

The card location of the card within the EAGLE 5 ISS.

**:port**

The port ID. The port parameter of the chg-ip-lnk command specifies the physical interface of the DSM card.

**:ipaddr**

IP address assigned to the port. This is a TCP/IP address expressed in standard "dot notation." IP addresses consist of the network number of the system and the unique host number of the machine.

**:duplex**

This is the mode of operation of the interface.

**:speed**

This is interface bandwidth in megabits per second. The speed is either 100 Mbps for main DSM network or 10 Mbps for backup DSM network.

**:mactype**

This is the Media Access Control Type of the interface. Specify dix for the Digital/Inter/Xerox de facto standard for the Ethernet.

**:mcast**

This is the Multicast Control of the interface.

**:submask**

The subnet mask of the IP interface, in the form of an IP address with a restricted range of values.

When this command has successfully completed, the following message should appear.

```
RLGHNCXA03W 01-10-30 21:18:37 GMT EAGLE 37.0.0
CHG-IP-LNK: MASP A - COMPLTD
```

- 59.** Verify the new link parameters associated with the DSM card in the database by entering the **rtrv-ip-lnk** command.

The following is an example of the possible output.

```
RLGHNCXA03W 01-10-30 21:14:37 GMT EAGLE 37.0.0
LOC PORT IPADDR          SUBMASK        DUPLEX SPEED MACTYPE AUTO MCAST
1101 A    192.168.122.2 255.255.255.0 HALF   100   DIX    NO    YES
1101 B    192.168.123.2 255.255.255.0 HALF   10    DIX    NO    YES
1107 A    192.168.122.1 255.255.255.0 HALF   100   DIX    NO    YES
1107 B    192.168.123.1 255.255.255.0 HALF   10    DIX    NO    YES
```

- 60.** Display the current IP host information in the database by entering the **rtrv-ip-host** command.

The following is an example of the possible output.

```
RLGHNCXA03W 01-10-30 21:17:37 GMT EAGLE 37.0.0
```

IPADDR	HOST
192.1.1.32	KC_HLR2
192.1.1.50	DN_MSC1
192.1.1.52	DN_MSC2
192.168.122.1	VSCCP_1107_A
192.168.123.1	VSCCP_1107_B

- 61.** Add the host name and IP address for each VSCCP link using the **ent-ip-host** command.

For example, enter these commands:

```
ent-ip-host:host=vsccp_1101_a:ipaddr=192.168.122.2
```

```
ent-ip-host:host=vsccp_1101_b:ipaddr=192.168.123.2
```

where:

**:host**

Specifies the host name. Each VSCCP link must be specified separately.

**:ipaddr**

Specifies the IP network address for each EPAP. The first three octets of the IP address must be the same as MPS A and B ports, respectively. The fourth octet identifies the DSM card and must have a unique octet identifier for the card's IP address; we recommend numbering the DSM cards sequentially, using values 1 to 25. (This example shows the assignment of the second DSM card.)

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-30 21:18:37 GMT EAGLE 37.0.0
ENT-IP-HOST: MASP A - COMPLTD
```

- 62.** Verify the new IP host information in the database by entering the **rtrv-ip-host** command.

A sample output from this command follows:

```
RLGHNCXA03W 01-10-30 21:19:37 GMT EAGLE 37.0.0
```

IPADDR	HOST
192.1.1.32	KC_HLR2
192.1.1.50	DN_MSC1
192.1.1.52	DN_MSC2
192.168.122.1	VSCCP_1107_A
192.168.123.1	VSCCP_1107_B
192.168.122.2	VSCCP_1101_A
192.168.123.2	VSCCP_1101_B

**NOTE: Most G-Port customer private networks do not require setting up a default router for the DSM card. However, if your network configuration does require a default router to connect the DSM card communication to the EPAP, then only one default router is**

**assignable to each DSM card. Assign the default router address to each DSM card as shown in step [Step 63](#).**

63. Enter local domain and IP router address for the DSM card using the **chg-ip-card** command.

For this example, enter this command:

```
chg-ip-card:loc=1107:domain=nc.tekelec.com :defrouter=192.168.122.250
```

where:

**:loc**

The card location of the card within the EAGLE 5 ISS.

**:domain**

The domain name of domain server.

**:defrouter**

Default router address. The IP address for default router. This is a TCP/IP address expressed in standard “dot notation”. IP addresses consist of the system’s network number and the machine’s unique host number.

After successful completion of this command, the system returns the following message:

```
RLGHNCXA03W 01-10-30 21:20:37 GMT EAGLE 37.0.0
CHG-IP-CARD: MASP A - COMPLTD
```

64. Boot the DSM card that was inhibited in step [Step 48](#) in TSM emulation mode by using the **alw-card** command.

For example, enter this command:

```
alw-card:loc=1101
```

This message appears:

```
RLGHNCXA03W 01-10-30 21:20:37 GMT EAGLE 37.0.0
Card has been allowed.
```

65. Verify the local domain and IP router address associated with the DSM card in the database by enter the **rtrv-ip-card** command.

A sample output from this command follows:

```
RLGHNCXA03W 01-10-30 21:21:37 GMT EAGLE 37.0.0
CHG-IP-CARD: MASP A - COMPLTD
```

66. Verify the in-service normal (IS-NR) status of the DSM card using the **rept-stat-card** command.

A sample output from this command follows:

```
RLGHNCXA03W 01-10-27 16:43:42 GMT EAGLE 37.0.0
CARD VERSION TYPE GPL PST SST AST
1101 100-000-0003-000 DSM VSCCP IS-NR Active ---
1103 100-000-0002-000 ACMENET STPLAN IS-NR Active ---
1104 100-000-0003-000 TSM GLS IS-NR Active ---
1105 100-000-0003-000 LIMOCU CCS7ITU IS-NR Active ---
1106 100-000-0003-000 LIMOCU CCS7ITU IS-NR Active ---
1107 100-000-0003-000 DSM VSCCP IS-NR Active ---
1113 100-000-0002-000 MCAP OAM IS-NR Active ---
1114 100-000-0002-000 TDM IS-NR Active ---
1115 100-000-0002-000 MCAP OAM IS-NR Active ---
1116 100-000-0002-000 TDM IS-NR Active ---
1117 100-000-0002-000 MDAL IS-NR Active ---
```

1201	100-000-00003-000	LIMDS0	SS7ANSI	IS-NR	Active	---
1202	100-000-00002-000	LIMV35	SS7GX25	IS-NR	Active	---
1203	100-000-00003-000	LIMV35	SS7ANSI	IS-NR	Active	---
1204	100-000-00003-000	LIMATM	ATMANSI	IS-NR	Active	---
1205	100-000-00001-000	DCM	IPLIM	IS-NR	Active	---
1207	100-000-00001-000	DCM	SS7IPGW	IS-NR	Active	---
1303	100-000-00001-000	DCM	IPLIM	IS-NR	Active	---
1305	100-000-00001-000	DCM	SS7IPGW	IS-NR	Active	---

67. Test the presence of the EPAP hosts on the network using the **pass** command with the **ping** parameter. This command is invoked with a destination (either a hostname or IP address).

For example, enter the following command:

```
pass:loc=1101:cmd="ping 192.168.122.100".
pass:loc=1101:cmd="ping 192.168.122.200".
pass:loc=1101:cmd="ping 192.168.123.100".
pass:loc=1101:cmd="ping 192.168.123.200".
```

After successful completion of each command, the system returns output similar to the following:

```
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 37.0.0
pass: loc=1101: cmd="ping 192.168.122.100"
Command entered at terminal #1.
;
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 37.0.0
PASS: Command sent to card
;
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 37.0.0
PING command in progress
;
rlghncxa03w 00-06-27 08:30:46 GMT EAGLE 37.0.0
PING 192.168.122.100: 56 data bytes
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=0.time=5. ms
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=1.time=0. ms
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=2.time=0. ms
---192.168.100.3 PING Statistics---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms) min/avg/max = 0/1/5
PING command complete
```

If the **pass** command with the **ping** parameter is not successful, verify the the correct connection of the hardware cabling and try again. If the command fails again, contact the [Customer Care Center](#).

68. Repeat steps [Step 45](#) through [Step 67](#) to replace all adjacent TSM cards identified in the prerequisites and to be replaced with DSM cards.
69. Repeat steps [Step 47](#) through [Step 51](#) to inhibit any remaining TSM cards running the SCCP application and remove them from database and shelf.

**NOTE : The G-Port feature cannot be turned on until TSM cards running the SCCP application are removed from the system.**



**CAUTION: At this point in the procedure, contact the [Customer Care Center](#) for assistance in completing this G-Port activation procedure. Do not proceed without consulting with Technical Services.**

70. Turn on and configure the G-Port feature using steps [Step 71](#) through [Step 84](#).
71. Enter the **enable-ctrl-feat** command to enable the G-Port feature:
- ```
enable-ctrl-feat:partnum=893017001:fak=<Feature Access Key>
```
72. Enter the **enable-ctrl-feat** command to enable the G-Port feature:

```
chg-ctrl-feat:partnum=893017001:status=on
```

73. 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**) with the **chg-stpopts** command.

For example, enter this command:

```
chg-stpopts:defcc=1:defndc=38:dsmaud=on:npcfmti=2-9-2-1
```

where:

**:defcc**

The default country code.

**:defndc**

The default network destination code.

**:dsmaud**

The DSM audit running state (*on* or *off*).

**:npcfmt1**

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

After successful completion of this command, the system returns the following output:

```
rlghncxa03w 01-10-07 00:57:31 GMT EAGLE 37.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

74. Verify the new country code and network destination code using the **rtrv-stpopts** command.

A sample output from this command follows:

```
rlghncxa03w 01-10-07 00:57:31 GMT EAGLE 37.0.0
STP OPTIONS
-----
NPCFMTI      2-9-2-1
DEFCC        1
DEFNDC       38
DSMAUD      on
```

75. Change the GSM system options in the database.

For example, enter this command:

```
chg-gsmopts:srfnai=7:srfaddr=23448:srfnp=15:msrsndig=ccrndn:defmapvr=2
```

where:

**:srfnai**

Defines the nature of address indicator value of the MNP\_SRF.

**:srfaddr**

Defines the entity address of the MNP\_SRF node.

**:srfnp**

Defines the numbering plan value of the MNP\_SRF.

**:msrsndig**

Defines the routing number to be used or to be concatenated with the MSISDN.

**:defmapvr**

Defines the default MAP version.

The system returns the following message:

```
rlghncxa03w 00-08-20 09:04:14 GMT EAGLE 37.0.0
CHG-GSMOPTS: MASP A - COMPLTD
```

76. Verify the changes using the **rtrv-gsmopts** command.

This command displays all GSM system options from the database.

A sample output from this command follows:

```
rlghncxa03w 00-08-20 09:04:14 GMT EAGLE 37.0.0
GSMOPT OPTIONS
-----
SRFADDR=23448      SRFNAI=7      SRFNP=15
MSRNDIG=CCRNDN
MSRNNAI=7          MSRNNP=15    DEFMAPVR=2
```

77. Add routing number prefixes for the operating network using the **ent-homern** command.

Use this command to enter any Home RNs that are prefixed to DNs for incoming INPMR messages. You may use this command to enter up to 100 routing number prefixes for the operating network into the HOMERN table.

For example, enter this command:

**ent-homern:rn=34**

where:

**:rn**

The home routing number prefix. The range is 1 to 15 hex digits (0-F).

When this command has successfully completed, this message appears.

```
RLGHNCXA03W 01-10-07 00:28:31 GMT EAGLE 37.0.0
HOMERN table is (1 of 100) 1% full
ENT-HOMERN: MASP A - COMPLTD
```

78. Verify the changes using the **rtrv-homern** command.

This command retrieves a list of routing number prefixes that belong to the operating network.

Here is an example of the possible output.

```
rlghncxa03w 01-10-28 00:29:31 GMT EAGLE 37.0.0.0
RN
-----
216780909087654
76345098
c10234567
c222
cabade
abc
abc123

HOMERN table is (6 of 100) 6% full
```

79. Display the administered service selectors using the **rtrv-srvsel** command.

This command displays a list of administered service selector combinations. The list can be filtered using various parameter combinations.

A sample output from this command is:

```
rlghncxa03w 00-06-20 09:09:14 GMT EAGLE 37.0.0
GTII  TT    NP      NAI     NPV    NAIIV   SSN    SNP    SNAI    SERV
4      1    e214    intl   ---   ---    3    ---   ---    gport
```

- 80.** Use the **ent-srvsel** command to enter the G-Port service selectors by network type, if necessary. This command assigns applicable service selectors required to specify the service entry for DSM services.

For example, enter the following command:

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

where:

**:gtii**

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

**:tt**

Specifies the translation type.

**:snp**

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

**:snaI**

Specifies the international Service Nature of Address Indicator.

**:serv**

Specifies the service feature.

**:nai**

Specifies the nature of address indicator.

**:np**

Specifies the numbering plan.

**:ssn**

Defines the subsystem number.

The system returns the following message:

```
rlghncxa03w 01-10-07 00:28:31 GMT EAGLE 37.0.0
Service Selector table is (114 of 1024) 11% full
ENT-SRVSEL: MASP A - COMPLTD
```

- 81.** Verify the changes using the **rtrv-srvsel** command.

This command retrieves a list of administered service selector combinations. Avoid lengthy output by filtering the list using various parameter combinations. (The selector table can have over 1,000 entries.)

For example, enter this command:

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

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

After successful completion of this command, the system returns output similar to the following:

```
rlghncxa03w 01-10-28 00:29:31 GMT EAGLE 37.0.0
GTII  TT    NP      NAI     NPV    NAIIV   SNP    SNAI    SERV
```

```

2      0     e164      intl   --- ---    e164 intl  gport
2      1     e164      intl   --- ---    e164 intl  gport

rlghncxa03w 01-10-28 00:29:31 GMT EAGLE 37.0.0
GTII  TT    NP      NAI    NPV   NAI  SNP   SNAI  SERV
4      0     e164      intl   --- ---    e164 intl  gport
4      1     e164      intl   --- ---    e164 intl  gport

```



**CAUTION: When the environment is in-service and DSM cards are being replaced with TSM cards, initialize one card at a time. Verify its return to IS-NR state before initializing another DSM card. This precaution keeps cards in service and precludes an interruption of SCCP services.**

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

82. Reload a DSM card using the **init-card** command.

For example, enter this command:

```
init-card:loc=1101
```

The system returns the following message:

```

rlghncxa03w 01-10-07 00:28:31 GMT EAGLE 37.0.0
Command entered at terminal #3.
Init Card command issued to card 1101

```

83. Verify its return to IS-NR state with the **rept-stat-card** command.

(Wait until in-service state is restored.)

A sample output from this command follows:

| CARD | VERSION           | TYPE    | APPL    | PST   | SST    | AST |
|------|-------------------|---------|---------|-------|--------|-----|
| 1101 | 100-000-00003-000 | DSM     | VSCCP   | IS-NR | Active | --- |
| 1103 | 100-000-00002-000 | ACMENET | STPLAN  | IS-NR | Active | --- |
| 1104 | 100-000-00003-000 | TSM     | GLS     | IS-NR | Active | --- |
| 1105 | 100-000-00003-000 | LIMOCU  | CCS7ITU | IS-NR | Active | --- |
| 1106 | 100-000-00003-000 | LIMOCU  | CCS7ITU | IS-NR | Active | --- |
| 1107 | 100-000-00003-000 | DSM     | VSCCP   | IS-NR | Active | --- |
| 1113 | 100-000-00002-000 | MCAP    | OAM     | IS-NR | Active | --- |
| 1114 | 100-000-00002-000 | TDM     |         | IS-NR | Active | --- |
| 1115 | 100-000-00002-000 | MCAP    | OAM     | IS-NR | Active | --- |
| 1116 | 100-000-00002-000 | TDM     |         | IS-NR | Active | --- |
| 1117 | 100-000-00002-000 | MDAL    |         | IS-NR | Active | --- |
| 1201 | 100-000-00003-000 | LIMDSO  | SS7ANSI | IS-NR | Active | --- |
| 1202 | 100-000-00002-000 | LIMV35  | SS7GX25 | IS-NR | Active | --- |
| 1203 | 100-000-00003-000 | LIMV35  | SS7ANSI | IS-NR | Active | --- |
| 1204 | 100-000-00003-000 | LIMATM  | ATMANSI | IS-NR | Active | --- |
| 1205 | 100-000-00001-000 | DCM     | IPLIM   | IS-NR | Active | --- |
| 1207 | 100-000-00001-000 | DCM     | SS7IPGW | IS-NR | Active | --- |
| 1303 | 100-000-00001-000 | DCM     | IPLIM   | IS-NR | Active | --- |
| 1305 | 100-000-00001-000 | DCM     | SS7IPGW | IS-NR | Active | --- |

84. After the **init-card** and the **rept-stat-card** commands show that service is successfully restored, repeat steps [Step 82](#) and [Step 83](#) for each DSM card in your system.
85. Enter the **chg-sccp-serv:serv=gport:state=online** command to set the G-Port service state online.
86. Confirm that essential activation procedures are successful.

- Use **rept-stat-sccp** to verify that all your DSM cards are loaded and are IS-NR (in-service normal) status.
- Use **rept-stat-mps** to verify that all your DSM cards and the EPAP are connected and operational.
- Use **rept-stat-db:display=all** to verify that database levels are identical for the EPAPPDB and RTDB and the RTDBs on the DSM cards.

The G-Port feature is now enabled, turned on, and operating in the system.

## MO-Based GSM SMS NP Feature Activation Procedure

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

Before this feature can be enabled, the G-Port feature must be enabled.

Before the MO-Based GSM SMS NP feature can be turned on, the G-Port Feature must be turned on.

The MO-Based GSM SMS NP feature can be enabled before the G-Port feature is turned on.

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

1. Verify that the G-Port Feature is enabled using the **rtrv-ctrl-feat** command.
2. If the G-Port Feature is not enabled, enable it using [G-Port Feature Activation Procedure](#) before proceeding to [Step 3](#).
3. Enter the **enable-ctrl-feat** command to enable the MO-Based GSM SMS NP feature.  
**enable-ctrl-feat:partnum=893019401:fak=<Feature Access Key>**
4. Enter the **chg-stpopts** command to set the default country code and, if desired, the default network destination code to convert the nature of address indicator (NAI) of MDNs to the international format (**nai=intl**).

The parameters in this command are used for number conditioning.

For example, enter this command:

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

where:

**defcc**

The default country code.

**defndc**

The default network destination code.

5. Verify the new country code and network destination code using the **rtrv-stpopts** command.

This is an example of the possible output:

```
rlghncxa03w 01-10-17 16:02:05 GMT EAGLE 37.0.0
STP OPTIONS
-----
MTPT31CTL      1
MTPLTI        yes
MTPLTCTDPCQ    3
MTPLTST       10000
MTPXLQ        500
MTPXLET       0100
```

|             |         |
|-------------|---------|
| MTPXLOT     | 90%     |
| MTPDPCQ     | 1750    |
| TFATFRPR    | 1000    |
| MTPRSI      | yes     |
| MTPRSIT     | 5000    |
| MTPLPRST    | yes     |
| MTPT10ALT   | 30000   |
| SLSCNV      | perls   |
| UIMRD       | yes     |
| CRITALMINH  | no      |
| DISPACTALMS | no      |
| NPCFMTI     | 4-4-4-2 |
| DEFCC       | 49      |
| DEFNDC      | 177     |
| DSMAUD      | on      |

6. Enter the **rtrv-gsmopts** command to view the values of the GSMOPTS table options.
7. If desired, change the GSM system options in the database for the MO-Based GSM SMS NP feature.

For example, enter this command:

```
chg-gsmopts:mosmsdnfmt=ccrndn:mosmstype=all:mosmsnai=nat:mosmsdnnaia=7
```

where:

**mosmsdnfmt**

Specifies the format of a dialed number.

**mosmstype**

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

**mosmsnai**

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

**mosmsdnnaia**

Indicates the value to be encoded in the outgoing message..

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

8. Verify the changes using the **rtrv-gsmopts** command.

This command displays all GSM options from the database.

This is an example of the possible output:

```
rtrv-gsmopts
tekelecstp 07-04-16 11:49:33 EST EAGLE 37.5.0
GSM OPTIONS
-----
SRFADDR = NONE
MSRNDIG = RN
DEFMAPVR = 1
SRIDN = TCAP
IS412GSM = NONE
MSISDNTRUNC = 0
MIGRPFX = SINGLE
GSM2IS41 = NONE
MOSMSDNFMT = CCRNDN
MOSMSTYPE = ALL
MOSMSNAI = NAT
MOSMSSA = YES
MOSMSDNNAIA = 7
MOSMSFWD = YES
MOSMSGTA = ABCDEF1234567890EF
```

9. Verify that the G-Port Feature is turned on using the **rtrv-ctrl-feat** command.
10. If the G-Port Feature is not turned on, see [Step 72](#) of the [G-Port Feature Activation Procedure](#) before proceeding to [Step 11](#).

11. Enter the **chg-ctrl-feat** command to turn on the MO-Based GSM SMS NP feature.

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

The MO-Based GSM SMS NP feature is now enabled, turned on, and operating in the system.

## MT-Based GSM SMS NP Feature Activation Procedure

This procedure is used to activate the MT-Based GSM SMS NP feature.

Before this feature can be enabled, the G-Port feature must be enabled.

Before the MT-Based GSM SMS NP feature can be turned on, the G-Port Feature must be turned on.

The MT-Based GSM SMS NP feature can be enabled before the G-Port feature is turned on.

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

1. Verify that the G-Port Feature is enabled using the **rtrv-ctrl-feat** command.
2. If the G-Port Feature is not enabled, enable it using [G-Port Feature Activation Procedure](#) before proceeding to [Step 3](#).
3. Enter the **enable-ctrl-feat** command to enable the MT-Based GSM SMS NP feature.

```
enable-ctrl-feat:partnum=893020001:fak=<Feature Access Key>
```

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

The parameters in this command are used for number conditioning.

For example, enter this command:

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

where:

**defcc**

The default country code.

**defndc**

The default network destination code.

5. Verify the new country code and network destination code using the **rtrv-stpopts** command.
6. Enter the **rtrv-gsmopts** command to view the values of the GSMOPTS table options.
7. Change the value DefMCC in the GSM OPTS table using the **chg-gsmopts** command. If desired, other GSM system options may also be changed with this command.

**NOTE: GSMOPTS:DefMCC must be set to a valid value before the MT-Based GSM SMS NP feature can be turned on.**

**NOTE: MTSMSDLTRV must be set to a value other than "NONE" before MTSMSDLTR can be set to either PRERN or POSTRN. Details about the parameters that can be changed using this command can be found in the *Commands Manual*. For details about all of the options that can be changed using the **chg-gsmopts** command, see the *Commands Manual*.**

For example, enter this command:

```
chg-gsmopts:defmcc=253:mtsmsimsi=mccrndn:mtsmstype=rn
```

where:

**defmcc**

Specifies the E212 default mobile country code.

**mtsimsimsi**

Specifies the format of the IMSI parameter of the SRI\_SM ACK response.

**mtsmstype**

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

8. Verify the changes using the **rtrv-gsmopts** command.

This command displays all GSM options from the database.

This is an example of the possible output:

```
rtrv-gsmopts
  tekelecstp 08-01-08 19:38:30 EST  EAGLE 38.0.0
  GSM OPTIONS
  -----
  DEFMCC      = 253
  SRFADDR     = NONE
  MSRNDIG     = RN
  DEFMAPVR    = 1
  SRIDN       = TCAP
  IS412GSM    = NONE
  MSISDNTRUNC = 0
  MIGRPFX     = SINGLE
  GSM21S41    = NONE
  MTSMSSIMSI  = MCCRNDN
  MTSMSSNNI   = RN
  MTSMSTYPE   = RN
  MTSMACKN   = ACK
  MTSMSDLTR   = NO
  MTSMSDLTRV  = NONE
  MTSMSSAKERR = 1
  MTSMSCHKSRC = NO
```

9. If the value of GSMOPTS:MTSMSCHKSRC=YES, then provision the home SMSC table entries using the **ent-home-smsc** command.

For example, enter this command:

```
ent-home-smsc:smsc=552611646
```

10. Verify the SMSC table contents using the **rtrv-home-smsc** command.

This command retrieves the HOME SMSC specific addresses currently used to identify Short Message Service Centers in the database.

This is an example of the possible output:

```
rtrv-home-smsc
```

```
rlghncxa03w 03-03-28 08:50:12 EST  EAGLE 31.3.0
  SMSC ADDRESS

  13214564894498
  55231465465434
  5465455655656456

  HOME SMSC ADDRESS TABLE IS  1 % FULL  (3 of 500)
```

11. Verify that the G-Port Feature is turned on using the **rtrv-ctrl-feat** command.
12. If the G-Port Feature is not turned on, see [Step 72](#) of the [G-Port Feature Activation Procedure](#) before proceeding to [Step 13](#).
13. Enter the **chg-ctrl-feat** command to turn on the MT-Based GSM SMS NP feature.

```
chg-ctrl-feat:partnum=893020001:status=ON
```

The MT-Based GSM SMS NP feature is now enabled, turned on, and operating in the system.

# MT-Based GSM MMS NP Feature Activation Procedure

This procedure is used to activate the MT-Based GSM MMS NP feature.

Before this feature can be enabled, the MT-Based GSM SMS NP feature must be enabled.

Before the MT-Based GSM MMS NP feature can be turned on, the MT-Based GSM SMS NP feature must be turned on.

The MT-Based GSM MMS NP feature can be enabled before the MT-Based GSM SMS NP feature is turned on.

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

1. Verify that the MT-Based GSM SMS NP feature is enabled using the **rtrv-ctrl-feat** command.
2. If the MT-Based GSM SMS NP feature is not enabled, enable it using [MT-Based GSM SMS NP Feature Activation Procedure](#) before proceeding to [Step 3](#).
3. Enter the **enable-ctrl-feat** command to enable the MT-Based GSM MMS NP feature.  
**enable-ctrl-feat:partnum=893024101:fak=<Feature Access Key>**
4. Enter the **rtrv-gsmopts** command to view the values of the GSMOPTS table options.
5. If desired, MT-Based GSM MMS NP feature system options may be changed with this command.

For example, enter this command:

```
chg-gsmopts:mtmmsgta=12345:mtmmsackn=ack:mtmmstype=rn
```

where:

**mtmmsgta**

Specifies the GTA that is compared to the SCCP CgPA GTA of an SRI\_SM message to determine whether the originator of the messages is a Home MMSC.

**mtmmsackn**

Specifies the message that is generated in response to a successful RTDB lookup for an SRI\_SM message from a Home MMSC.

**mtmmstype**

Specifies the value of the entity type that indicates that a successful lookup occurred in the RTDB for messages that are modified by the MT-Based GSM MMS NP feature.

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

6. Verify the changes using the **rtrv-gsmopts** command.

This command displays all GSM options from the database.

This is an example of the possible output:

```
tekelecstp 08-01-08 19:38:30 EST EAGLE 38.0.0
GSM OPTIONS
-----
DEFMCC      = 253
SRFADDR     = NONE
MSRNIDIG    = RN
DEFMAPVR    = 1
SRIDN       = TCAP
IS412GSM    = NONE
MSISDNTRUNC = 0
MIGRPFX    = SINGLE
GSM2IS41    = NONE
MTSMSIMSI   = MCCRNDN
MTSMSNNI    = RN
MTSMSTYPE   = RN
```

```

MTSMSACKN = ACK
MTSMSDLTR = NO
MTSMSDLTRV = NONE
MTSMSNAKERR = 1
MTSMSCHKSRC = NO
MTMMSGTA = 12345
MTMMSTYPE = RN
MTMMSACKN = ACK

```

7. Verify that the MT-Based GSM SMS NP feature is turned on using the **rtrv-ctrl-feat** command.
8. If the MT-Based GSM SMS NP feature is not turned on, see the [MT-Based GSM SMS NP Feature Activation Procedure](#) before proceeding to [Step 9](#).
9. Enter the **chg-ctrl-feat** command to turn on the MT-Based GSM MMS NP feature.

**chg-ctrl-feat:partnum=893024101:status=ON**

The MT-Based GSM MMS NP feature is now enabled, turned on, and operating in the system.

## PPSMS Provisioning and Activation

The following gives the general sequence of the provisioning required to support PPSMS on the EAGLE 5 ISS. This procedure assumes G-Port and GTT are provisioned and turned on.

1. Use the following command to enter the NT serial number.

**ent-serial-num:serial=<System NT serial number>:lock=yes**

Enter NT serial number into EAGLE 5 ISS database. If the NT serial number is already entered, then ignore this step.

2. Enter the enable-ctrl-feat command to enable the PPSMS feature.

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

3. Enter the **chg-ctrl-feat** command to turn on the PPSMS feature.

**chg-ctrl-feat:partnum=893006701:status=on**

4. Enter the ent-srvsel command to enter GSM G-Port Global Title Selectors These selectors trigger G-Port as well as PPSMS processing.

**ent-srvsel:gtii=4:tt=0:np=e164:nai=intl:serv=smsmr**

This example sets up the service selectors needed to select incoming messages with GTI=4, NP=E164, TT=0 and NAI=INTL selected for G-Port/PPSMS service.

5. Use the **chg-gsmopts** command to enter various GSM system options, including PPSMS options.

**chg-gsmopts:ppsmspci1=1-1-1:ppsmsr1=gt:ppsmspci2=2-2-2: ppsmsri2=gt**

This example enters PC and RI for two PPSMS nodes.

6. Use the chg-gsmopts command to enter various PPSMS options.

**chg-gsmopts:ppsmmsgta=123543235**

This command defines one PPSMS global title for filtering.

7. Use the **chg-gsmopts** command to enter various PPSMS options.

**chg-gsmopts: ppsmsgta=555648309**

This command defines a second PPSMS global title for filtering.

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

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

Enters PPSMS PC 1-1-1 and node PC 3-3-3 as load shared mates. This entry is only used if the PPSMS RI is equal to the SSN in the GSMOPTS table. This is not the case for PPSMS PC1 in this example.

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

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

Enters PPSMS PC 2-2-2 and node PC 3-3-3 as load shared mates. This entry is only used if the PPSMS RI is equal to the GT in the GSMOPTS table, which it is in this case for PPSMS PC2.

## ISUP NP with EPAP Provisioning and Activation

This section presents the general sequence of the provisioning required to support ISUPNP with EPAP on the EAGLE 5 ISS. This procedure assumes G-Port, GWS, and GTT are provisioned and activated. [Table 4-1](#) and [Table 4-2](#) are included with example provisioning data used in the provisioning and activation procedure.

**Table 4-1. SubNet Prefix Table Example**

| SubNet No. | SubNet Prefix |
|------------|---------------|
| 1          | 1001          |
| 2          | 1002          |
| 3          | 1003          |
| 4          | 1004          |
| 5          | 1005          |

**Table 4-2. SubNet ID List Example**

| SubNet ID | SubNet No. |
|-----------|------------|
| 886932    | 1          |
| 886935    | 2          |
| 886936    | 3          |
| 886938    | 4          |
| 886939    | 5          |
| 886940    | 5          |
| 886941    | 1          |

- SubNet No. - A subset of an the network. The network may consist of 1 or more Subnets in the network.
- SubNet ID - The SubNet Id refers to the network entity address of the HLR within the operator's network.
- SubNet Prefix - The SubNet Prefix is defined as a provisionable number that is prepended to the Called Party Number of an IAM message.

The general sequence of the provisioning required to support ISUPNP with EPAP on the EAGLE 5 ISS is presented below.

1. Use the following command to enter the NT serial number.

```
ent-serial-num:serial=<System NT serial number>:lock=yes
```

Enter NT serial number into EAGLE 5 ISS database. If the NT serial number is already entered, then ignore this step.

2. Enter the enable-ctrl-feat command to enable the ISUPNP with EPAP feature.

```
enable-ctrl-feat:partnum=893013801:fak=<Feature Access Key>
```

3. Enter the chg-prefix-feat command to relate the ISUPNP with EPAP feature to a prefix, and to specify an prefix ID number that is used to refer to the prefix value from another table.

Examples of the use of this command follow:

```
chg-prefix:feature="isup np with epap":prefixnum=1:prefix=1001
chg-prefix:feature="isup np with epap":prefixnum=2:prefix=1002
chg-prefix:feature="isup np with epap":prefixnum=3:prefix=1003
chg-prefix:feature="isup np with epap":prefixnum=4:prefix=1004
chg-prefix:feature="isup np with epap":prefixnum=5:prefix=1005
```

4. Enter the following command to determine the allowed length for the subnetid values.

```
ent-subnetid:subnetidlen=6
```

5. Enter the following command to associate the subnetid with a subnet number.

```
ent-subnetid:subnetid=886932:subnetnum=1
ent-subnetid:subnetid=886935:subnetnum=2
ent-subnetid:subnetid=886936:subnetnum=3
ent-subnetid:subnetid=886938:subnetnum=4
ent-subnetid:subnetid=886940:subnetnum=5
```

6. The EPAP database must be populated for the ported subscribers.

Refer to the *Provisioning Database Interface Manual* to add and update the Network Entity and Dialed Number data for ported subscribers and subscribers belonging to the subnet.

7. Enter the commands related to Gateway Screening to add the STOPACTIONTLNP for the required combination of the screening rules for the OPC, DPC, SIO , ISUP, and message type=IAM. For more details about gateway screening commands, refer to the Database Administration Manual-Gateway Screening.

The gateway screening commands include the following.

- a. Commands to configure the gateway screening stop action sets in the system database

```
chg-gws-actset:actid=4:actname=fet:act1=tlnp
```

- b. Commands to add an allowed ISUP screening reference to the Allowed ISUP entity set  
One or more message types can be associated with the allowed ISUP screening reference. The ISUP message types listed in this entity set are accepted from another network.

```
ent-scr-isup:scr=is1:isupmt=1:nsfi=STOP:actname=fet
```

- c. Commands to allow all other types of ISUP messages for normal processing

```
ent-scr-dpc:scr=dpc1:zone=2:area=102:id=1:nsfi=isup:nsr=is1
```

- d. Commands to allow all other DPCs of the route table for normal processing

As a rule, every DPC in the Route table must be explicitly provisioned.

```
ent-scr-sio:sr=sio1:nic=0:pri=0:si=5:NSFI=DPC:nsr=dpc1
```

- e. Commands to allow all other SIO for the normal processing

```
ent-scr-opc:sr=opc1:zone=2:area=101:id=1:nsfi=sio :nsr=sio1
```

- f. Commands to allow all other OPC for normal processing

```
ent-scrset:scrn=f1:NSFI=OPC:nsr=opc1
```

```
chg-ls:lsn=srcmgt:scrn=f1:gwsa=on
```

8. Enter the chg-ctrl-feat command to activate the ISUPNP with EPAP feature.

```
chg-ctrl-feat:partnum=893013801:status=ON
```

## The 1100 TPS/DSM for ITU NP Feature

This procedure is used to enable and turn on the 1100 TPS/DSM for ITU NP feature. This feature provides up to 26,400 transactions per second when the maximum number of DSM cards are installed in the EAGLE 5 ISS and one or more EPAP-related features (such as G-Port, G-Flex, A-Port, INP, EIR, Migration) are enabled and turned on.

This feature can be enabled only for DSM cards that are rated at 850 transactions per second (TPS).



**CAUTION: The increase of the DSM card capacity, 1100 TPS per DSM card, assumes incoming traffic consists of at least 30% of GTT routed traffic that does not require EPAP based lookup. If more than 70% of incoming traffic requires EPAP based lookup, Group Ticket Voucher (TVG) may shutdown and overall TVG capacity of 1100 for the card may not be met.**

The feature access key is based on the feature's part number and the serial number of the EAGLE 5 ISS, making the feature access key site-specific.

The **enable-ctrl-feat** command enables the 1100 TPS/DSM for ITU NP feature by inputting the feature's access key and the feature's part number with these parameters:

**:fak**

The feature access key provided by Tekelec. The feature access key contains 13 alphanumeric characters and is not case sensitive.

**:partnum**

The Tekelec-issued part number of the 1100 TPS/DSM for ITU NP feature, 893018001.

After the 1100 TPS/DSM for ITU NP feature has been enabled, the feature must be turned on with the **chg-ctrl-feat** command. The **chg-ctrl-feat** command uses these parameters:

**:partnum**

The Tekelec-issued part number of the 1100 TPS/DSM or ITU NP feature, 893019101.

**:status=on**

Used to turn the 1100 TPS/DSM for ITU NP feature on.

### Activating the 1100 TPS/DSM for ITU NP Feature

#### Before you start:

The 1100 TPS/DSM for ITU NP feature cannot be enabled with a temporary feature access key.

The 1100 TPS/DSM for ITU NP feature cannot be enabled if:

- The EAGLE 5 ISS does not contain any DSM cards.
- The LNP feature is enabled.

The status of the LNP feature is shown with the **rtrv-ctrl-feat** command output.

- The ANSI G-Flex STP Option is enabled.

The status of the ANSI G-Flex STP Option is shown in the **rtrv-stpopts** command output.

- The GTT feature is not turned on.

The status of the GTT feature is shown in the **rtrv-feat** command output.

The **enable-ctrl-feat** command requires that the database contain a valid serial number for the EAGLE 5 ISS, and that this serial number is locked. This can be verified with the **rtrv-serial-num** command. The EAGLE 5 ISS is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the EAGLE 5 ISS is on-site, with the **ent-serial-num** command. The **ent-serial-num** command uses these parameters.

#### **:serial**

The serial number assigned to the EAGLE 5 ISS. The serial number is not case sensitive.

#### **:lock**

Specifies whether or not the serial number is locked. This parameter has only one value, yes, which locks the serial number. Once the serial number is locked, it cannot be changed.

**NOTE: To enter and lock the EAGLE 5 ISS's serial number, the ent-serial-num command must be entered twice, once to add the correct serial number to the database with the serial parameter, then again with the serial and the lock=yes parameters to lock the serial number. Verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).**

The 1100 TPS/DSM for ITU NP feature increases the processing capacity of SCCP traffic for an EAGLE 5 ISS processing EPAP-based traffic to 26,400 transactions per second. To achieve this increase in SCCP processing capacity, a maximum of 25 DSM cards must be provisioned and installed in the EAGLE 5 ISS.

1. Display the status of the 1100 TPS/DSM feature by entering the **rtrv-ctrl-feat** command.

The following is an example of the possible output:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0

The following features have been permanently enabled:
  Feature Name      Partnum  Status  Quantity
    TPS            893000110  on      1000
  ISUP Normalization  893000201  on      ----
  Prepaid SMS Intercept Phl 893006701  on      ----
  MNP Circ Route Prevent  893007001  on      ----
  1100 TPS/DSM for ITU NP  893018001  on      ----

The following features have been temporarily enabled:
  Feature Name      Partnum  Status  Quantity  Trial Period Left
    TPS            893000140  on      4000     20 days 8 hrs 57 mins

The following features have expired temporary keys:
  Feature Name      Part Num
    OnOffFeatV          893492401
```

2. Based on the output from the previous step, do one of the following:

- If the **rtrv-ctrl-feat** output shows that the 1100 TPS/DSM for ITU NP feature is enabled, shown by the entry 1100 TPS/DSM for ITU NP, and its status is **on**, no further action is necessary.
  - If the feature is enabled, and its status is **off**, skip [Step 3](#) through [Step 12](#), and go to [Step 13](#).
  - If the rtrv-ctrl-feat output shows that the LNP feature is enabled, this procedure cannot be performed. The 1100 TPS/DSM for ITU NP feature cannot be enabled if the LNP feature is enabled.
  - If the 1100 TPS/DSM for ITU NP and LNP features are not enabled, go to [Step 3](#).
- 3.** Determine whether the G-Flex feature is turned on by entering the **rtrv-ctrl-feat**.
- (If the G-Flex feature is off, then the ANSIGFLEX option is not displayed in the **rtrv-stpopts** output in [Step 4](#).)
- The status of the G-Flex feature is shown by the entry **G-Flex** in the **rtrv-ctrl-feat** output.
- If the G-Flex feature is turned off, skip to [Step 5](#).
  - If the G-Flex feature is turned on, go to [Step 4](#).
- 4.** Verify that the ANSI G-Flex option is not enabled or turned on by entering the **rtrv-stpopts** command.
- The 1100 TPS/DSM ITU NP feature cannot be enabled if the ANSI G-Flex option is turned on.
- The ANSI G-Flex option is shown by the entry **ANSIGFLEX** in the **rtrv-stpopts** output. If the **ANSIGFLEX** entry is displayed in the **rtrv-stpopts** output, both the G-Flex and the GTT features are turned on.
- If the ANSIGFLEX value is **yes** in the **rtrv-stpopts** output, the ANSI G-Flex option is enabled and the remainder of this procedure cannot be performed.
  - If the ANSIGFLEX value is **no** in the **rtrv-stpopts** output, the ANSI G-Flex option is *not* enabled. Skip [Step 5](#) and go to [Step 6](#).
- 5.** Determine whether the GTT feature is turned on by examining the output of the **rtrv-feat** command.
- The 1100 TPS/DSM ITU NP feature cannot be enabled unless the GTT feature is turned on. The GTT feature is shown by the entry **GTT** in the **rtrv-feat** output executed in [Step 3](#).
- If the GTT feature is turned on, go to [Step 6](#).
  - If the GTT feature is turned off, perform "Adding an SCCP card" in the *Database Administration Manual - Global Title Translation* manual to turn the GTT feature on and to add the required number of DSM cards to the database. After "Adding an SCCP card" has been performed, go to [Step 11](#) (skip [Step 6](#) through [Step 10](#)).
- 6.** Verify the number of DSM cards that are provisioned in the database using the **rept-stat-gpl:gpl=ccphc** command.

This is an example of the possible output.

```
rlghncxa03w 07-05-01 11:40:26 GMT EAGLE5 37.5.0
GPL CARD RUNNING APPROVED TRIAL
VSCCCP 1201 126-002-000 126-002-000 126-003-000
VSCCCP 1203 126-002-000 126-002-000 126-003-000
VSCCCP 1207 126-002-000 126-002-000 126-003-000
VSCCCP 1213 126-002-000 126-002-000 126-003-000
VSCCCP 1215 126-002-000 126-002-000 126-003-000
VSCCCP 1305 126-002-000 126-002-000 126-003-000
VSCCCP 1313 126-002-000 126-002-000 126-003-000
```

```
VSCCCP 2103 126-002-000 126-002-000 126-003-000
Command Completed
```

7. Based on the output shown in [Step 6](#), do one of the following:
  - If the required number of DSM cards are provisioned in the database, go to [Step 8](#).
  - If the required number of DSM cards are not provisioned in the database, perform "Adding an SCCP card" in the *Database Administration Manual - Global Title Translation* to add the required number of DSM cards to the database. After "Adding an SCCP card" has been performed, go to [Step 8](#).
8. Display the serial number in the database with the **rtrv-serial-num** command.

This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0

System serial number = nt00001231

System serial number is not locked

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0 Command Completed
```

9. Compare the actual serial number (located on a label affixed to the control shelf, shelf 1100) to the output shown in [Step 8](#), and do one of the following:
  - If the serial number is correct and locked, go to [Step 13](#) (skip [Step 10](#) through [Step 12](#)).
  - If the serial number is correct but not locked, go to [Step 12](#) (skip [Step 10](#) and [Step 11](#)).
  - If the serial number is not correct, but is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the [Customer Care Center](#) to get an incorrect and locked serial number changed.
10. Enter the correct serial number into the database using the **ent-serial-num** command with the serial parameter.

For this example, enter this command.

```
ent-serial-num:serial=<EAGLE 5 ISS's correct serial number>
```

When this command has successfully completed, the following message appears.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

11. Verify that the serial number entered into step 7 was entered correctly:
  - a. Enter the **rtrv-serial-num** command.
12. Lock the serial number in the database by entering the **ent-serial-num** command with the serial number shown in [Step 8](#) (if the serial number shown in [Step 8](#) is correct) or with the serial number shown in [Step 10](#) (if the serial number was changed in [Step 10](#)), and with the **lock=yes** parameter.

For this example, enter this command.

```
ent-serial-num:serial=<EAGLE 5 ISS's serial number>:lock=yes
```

When this command has successfully completed, a message similar to the following should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

13. Enable the 1100 TPS/DSM for ITU NP feature with the permanent key by entering the **enable-ctrl-feat** command.

For this example, enter this command.

```
enable-ctrl-feat:partnum=893018001:fak=<1100 TPS/DSM for ITU NP feature access key>
```

**NOTE:** The values for the feature access key (the fak parameter) are provided by Tekelec. If you do not have the feature access key for the 1100 TPS/DSM for ITU NP feature, contact your Tekelec Sales Representative or Account Representative.

When the **enable-ctrl-feat** command has successfully completed, a message similar to the following should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

14. Do one of the following:

- If you do not wish to turn the 1100 TPS/DSM for ITU NP feature on, skip this step and go to [Step 16](#). If you do not turn this feature on, the transaction rate will remain at 850 TPS/DSM.
- If you do wish to turn on the 1100 TPS/DSM for ITU NP feature, enter the **chg-ctrl-feat** command, specifying the 1100 TPS/DSM for ITU NP feature part number used in [Step 13](#) and the **status=on** parameter and enter the command again as shown in [Step 15](#).

For this example, enter this command:

```
chg-ctrl-feat:partnum=893018001:status=on
```

The following output message appears:

CAUTION: Rated TPS for this feature supports an engineered GTT traffic mix of no more than 70 percent EPAP-based traffic. Re-enter the command within 30 seconds to confirm change.



**CAUTION: If the EPAP-based traffic is higher than 70% of all traffic on the EAGLE SISS, the DSM cards performance may not reach 1100 TPS per DSM.**

15. Re-enter the chg-ctrl-feat command to turn the feature ON.

For example **chg-ctrl-feat:partnum=893018001:status=on**

When this command has successfully completed, a message similar to the following should appear:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
CHG-CTRL-FEAT: MASP B - COMPLTD
```

16. Verify the changes by entering the **rtrv-ctrl-feat** command with the 1100 TPS/DSM for ITU NP feature part number specified in [Step 14](#) or [Step 15](#).

```
rtrv-ctrl-feat:partnum=893018001
```

The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
The following features have been permanently enabled:
```

| Feature Name              | Partnum   | Status | Quantity |
|---------------------------|-----------|--------|----------|
| TPS                       | 893000110 | on     | 1000     |
| ISUP Normalization        | 893000201 | on     | ----     |
| Prepaid SMS Intercept Ph1 | 893006701 | on     | ----     |
| MNP Circ Route Prevent    | 893007001 | on     | ----     |
| 1100 TPS/DSM for ITU NP   | 893018001 | on     | ----     |

The following features have been temporarily enabled:

| Feature Name | Partnum   | Status | Quantity | Trial Period | Left          |
|--------------|-----------|--------|----------|--------------|---------------|
| TPS          | 893000140 | on     | 4000     | 20 days      | 8 hrs 57 mins |

The following features have expired temporary keys:

| Feature Name | Part Num  |
|--------------|-----------|
| OnOffFeatV   | 893492401 |

17. Backup the new changes by entering:

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

These messages should 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.
```

18. If you wish to turn off TPS/DSM for ITU NP feature, enter the **chg-ctrl-feat** command, specifying the 1100 TPS/DSM feature part number used in step [Step 14](#) and the **status=off** parameter.

For this example, enter this command.

```
chg-ctrl-feat:partnum=893018001:status=off
```

The following output message appears:

```
CAUTION: This command decreases the total TPS of the SCCP system from 1100 to 850 TPS for each  
DSM card.
```

19. Confirm that you wish to turn off TPS/DSM for ITU NP feature by re-entering the command, as shown below, within 30 seconds:

```
chg-ctrl-feat:partnum=893018001:status=off
```

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0  
CHG-CTRL-FEAT: MASP B - COMPLTD
```

## Activating the E5-SM4G Throughput Capacity Feature

This procedure is used to enable and turn on the E5-SM4G Throughput Capacity feature. This feature provides up to 75,000 transactions per second when the maximum number of E5-SM4G cards is installed in the EAGLE 5 ISS and one or more EPAP-related features (such as G-Port, A-Port, G-Flex) are enabled and turned on.

The feature access key is based on the part number of the feature and the serial number of the EAGLE 5 ISS, making the feature access key site-specific.

The **enable-ctrl-feat** command enables the E5-SM4G Throughput Capacity feature by inputting the feature access key and the part number of the feature with these parameters:

**:fak**

The feature access key provided by Tekelec. The feature access key contains 13 alphanumeric characters and is not case-sensitive.

#### **:partnum**

The Tekelec-issued part number of the E5-SM4G Throughput Capacity feature, 893019101.

This feature cannot be enabled with a temporary feature access key.

The E5-SM4G Throughput Capacity feature cannot be enabled if:

- The LNP feature is enabled.
- The STPLAN feature is turned on.
- The GTT feature is not turned on.

The E5-SM4G Throughput Capacity feature cannot be enabled unless the EAGLE 5 ISS contains E5-SM4G cards, and E5-SM4G cards cannot be installed in the EAGLE 5 ISS unless HIPR cards are installed in all shelves containing E5-SM4G cards. Enter the **rept-stat-gpl:gpl=hipr** command to verify if HIPR cards are installed in all shelves containing E5-SM4G cards.

The status of the LNP feature is shown with the **rtrv-ctrl-feat** command output.

The status of the GTT is shown in the **rtrv-feat** command output.

The **enable-ctrl-feat** command requires that the database contain a valid serial number for the EAGLE 5 ISS, and that this serial number is locked. This can be verified with the **rtrv-serial-num** command. The EAGLE 5 ISS is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the EAGLE 5 ISS is on-site, with the **ent-serial-num** command. The **ent-serial-num** command uses these parameters.

#### **:serial**

The serial number assigned to the EAGLE 5 ISS. The serial number is not case sensitive.

#### **:lock**

Specifies whether or not the serial number is locked. This parameter has only one value, yes, which locks the serial number. Once the serial number is locked, it cannot be changed.

**NOTE: To enter and lock the serial number of the EAGLE 5 ISS, the ent-serial-num command must be entered twice, first to add the correct serial number to the database with the serial parameter, then again with the serial and the lock=yes parameters to lock the serial number. Before locking the serial number, insure that the serial number in the database is correct. The serial number can be found on a label affixed to the control shelf (shelf 1100).**

Once the E5-SM4G Throughput Capacity feature has been enabled, the feature must be turned on with the **chg-ctrl-feat** command. The **chg-ctrl-feat** command uses these parameters:

#### **:partnum**

The Tekelec-issued part number of the E5-SM4G Throughput Capacity feature, 893019101

#### **:status=on**

used to turn the E5-SM4G Throughput Capacity feature on.

This feature increases the processing capacity of SCCP traffic for an EAGLE 5 ISS processing EPAP-based traffic to 75,000 transactions per second. To achieve this increase in SCCP processing capacity, a maximum of 25 E5-SM4G cards must be provisioned and installed in the EAGLE 5 ISS.

1. Display the status of the E5-SM4G Throughput Capacity feature by entering the **rtrv-ctrl-feat** command.

#### **Possible output of this command follows:**

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
```

```
The following features have been permanently enabled:
```

| Feature Name              | Partnum   | Status | Quantity |
|---------------------------|-----------|--------|----------|
| IPGWx Signaling TPS       | 893012814 | on     | 20000    |
| ISUP Normalization        | 893000201 | on     | ----     |
| Command Class Management  | 893005801 | on     | ----     |
| Intermed GTT Load Sharing | 893006901 | off    | ----     |
| XGTT Table Expansion      | 893006101 | off    | ----     |
| XMAP Table Expansion      | 893007710 | on     | 3000     |
| Large System # Links      | 893005910 | on     | 2000     |
| Routesets                 | 893006401 | on     | 6000     |
| HC-MIM SLK Capacity       | 893012707 | on     | 64       |

The following features have been temporarily enabled:

| Feature Name        | Partnum | Status | Quantity | Trial Period Left |
|---------------------|---------|--------|----------|-------------------|
| Zero entries found. |         |        |          |                   |

The following features have expired temporary keys:

| Feature Name           | Partnum                    |
|------------------------|----------------------------|
| Zero entries found.    |                            |
| MNP Circ Route Prevent | 893007001 On               |
|                        | ---- 20 days 8 hrs 57 mins |

If the **rtrv-ctrl-feat** output shows that the E5-SM4G Throughput Capacity feature is enabled, shown by the entry E5-SM4G Throughput Cap, and its status is on, no further action is necessary.

If the feature is enabled, and its status is off, skip [Step 2](#) through [Step 7](#), and go to [Step 8](#).

If the **rtrv-ctrl-feat** output shows that the LNP feature is enabled, this procedure cannot be performed. The E5-SM4G Throughput Capacity feature cannot be enabled if the LNP feature is enabled.

If the E5-SM4G Throughput Capacity and LNP features are not enabled, go to [Step 2](#).

2. Enter the **rtrv-feat** command to verify the status of the STPLAN feature.

To enable the E5-SM4G Throughput Capacity feature, the STPLAN feature cannot be turned on.

The STPLAN feature is shown by the entry LAN in the **rtrv-feat** output.

If the STPLAN feature is turned on, this procedure cannot be performed.

If the STPLAN feature is turned off, go to [Step 3](#)

3. Verify that the GTT feature is turned on.

To enable the E5-SM4G Throughput Capacity feature, the GTT feature must be turned on. The GTT feature is shown by the entry GTT in the rtrv-feat output executed in [Step 2](#). If the GTT feature is turned on, go to [Step 4](#). If the GTT feature is turned off, perform the "Adding an SCCP card" in the *Database Administration Manual - Global Title Translation* to:

- Turn the GTT feature
- add the required number of E5-SM4G cards to the database

After the "Adding an SCCP card" has been performed, skip [Step 4](#), and go to [Step 5](#).

4. Verify the number of E5-SM4G cards that are provisioned in the database using the **rept-stat-gpl:gpl=sccphc** command.

This is an example of the possible output.

```
rlghncxa03w 07-05-01 11:40:26 GMT EAGLE5 37.0.0
GPL CARD RUNNING APPROVED TRIAL
SCCPHC 1201 126-002-000 126-002-000 126-003-000
SCCPHC 1203 126-002-000 126-002-000 126-003-000
SCCPHC 1207 126-002-000 126-002-000 126-003-000
SCCPHC 1213 126-002-000 126-002-000 126-003-000
SCCPHC 1215 126-002-000 126-002-000 126-003-000
SCCPHC 1305 126-002-000 126-002-000 126-003-000
```

```

SCCPHC 1313 126-002-000 126-002-000 126-003-000
SCCPHC 2103 126-002-000 126-002-000 126-003-000
Command Completed

```

If the required number of E5-SM4G cards is provisioned in the database, go to [Step 5](#).

If the required number of E5-SM4G cards is not provisioned in the database, perform the "Adding an SCCP card" in the Database Administration Manual - Global Title Translation to add the required number of E5-SM4G cards to the database. After the "Adding an SCCP card" has been performed, go to [Step 5](#).

5. Verify whether HIPR cards are installed on all the EAGLE 5 ISS shelves containing E5-SM4G cards using the **rept-stat-gpl:gpl=hipr** command.

```

the rept-stat-gpl:gpl=hipr command.
rlghncxa03w 07-05-01 11:40:26 GMT EAGLE5 37.0.0
GPL      CARD    RUNNING     APPROVED      TRIAL
HIPR    1109  126-002-000  126-002-000  126-003-000
HIPR    1110  126-002-000  126-002-000  126-003-000
HIPR    1209  126-002-000  126-002-000  126-003-000
HIPR    1210  126-002-000  126-002-000  126-003-000
HIPR    1309  126-002-000  126-002-000  126-003-000
HIPR    1310  126-002-000  126-002-000  126-003-000
HIPR    2109  126-002-000  126-002-000  126-003-000
HIPR    2110  126-002-000  126-002-000  126-003-000
Command Completed

```

If HIPR cards are installed in all shelves containing E5-SM4G cards , go to [Step 6](#)

If HIPR cards are not installed on all shelves containing E5-SM4G cards, refer to the Installation Manual - EAGLE 5 ISS and install the HIPR cards. Once the HIPR cards have been installed, go to [Step 6](#).

6. Display the serial number in the database with the **rtrv-serial-num** command.

An example of output from this command follows:

```

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231

```

System serial number is not locked.

```

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed

```

If the serial number is correct and locked, skip [Step 7](#), [Step 8](#), and [Step 9](#), and go to [Step 10](#). If the serial number is correct but not locked, skip [Step 7](#) and [Step 8](#), and go to [Step 9](#). If the serial number is not correct, but is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to [Customer Care Center](#) for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100)

7. Enter the correct serial number into the database using the **ent-serial-num** command with the serial parameter .

For this example, enter this command:

```
ent-serial-num:serial=<EAGLE 5 ISS correct serial number>
```

When this command has successfully completed, the following message appears.

```

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM: MASP A - COMPLTD

```

8. Verify that the serial number entered into [Step 7](#) was entered correctly using the **rtrv-serial-num** command.

An example of output from this command follows:

```

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231

```

```
System serial number is not locked.

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

If the serial number was not entered correctly, repeat [Step 7](#) and [Step 8](#) and re-enter the correct serial number.

9. Lock the serial number in the database by entering the **ent-serial-num** command with the serial number shown in [Step 6](#), if the serial number shown in [Step 6](#) is correct, or with the serial number shown in [Step 8](#), if the serial number was changed in [Step 7](#), and with the **lock=yes** parameter.

For this example, enter this command:

```
ent-serial-num:serial=<EAGLE 5 ISS serial number>:lock=yes
```

When this command has successfully completed, the following message appears:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

10. Enable the E5-SM4G Throughput Capacity feature with the permanent key by entering the **enable-ctrl-feat** command.

For this example, enter the following command:

```
enable-ctrl-feat:partnum=893019101:fak=<E5-SM4G Throughput Capacity
feature access key>
```

**NOTE: The values for the feature access key (the fak parameter) are provided by Tekelec. If the feature access key for the E5-SM4G Throughput Capacity feature is not known, contact your Tekelec Sales Representative or Account Representative.**

When the **enable-ctrl-feat** command has successfully completed, this message appears:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

Note: If you do not wish to turn the E5-SM4G Throughput Capacity feature on, skip [Step 11](#) and go to [Step 12](#).

11. Turn the E5-SM4G Throughput Capacity feature using the **chg-ctrl-feat** command, specifying the E5-SM4G Throughput Capacity feature part number used in [Step 10](#) and the **status=on** parameter.

For example, enter the following command:

```
chg-ctrl-feat:partnum=893019101:status=on
```

**NOTE: Once this feature is turned on, it cannot be turned off.**

When this command has successfully completed, the following message appears:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
CHG-CTRL-FEAT: MASP B - COMPLTD
```

12. Verify the changes by entering the **rtrv-ctrl-feat** command with the E5-SM4G Throughput Capacity feature part number specified in [Step 10](#) or [Step 11](#).

For example, enter the following command:

```
rtrv-ctrl-feat:partnum=893019101
```

An example of output from this command follows:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:
```

| Feature Name           | Partnum   | Status | Quantity |
|------------------------|-----------|--------|----------|
| E5-SM4G Throughput Cap | 893019101 | on     | ----     |

The following features have been temporarily enabled:

| Feature Name              | Partnum   | Status | Quantity | Trial Period Left     |
|---------------------------|-----------|--------|----------|-----------------------|
| Zero entries found.       |           |        |          |                       |
| G-Port Circ Route Prevent | 893007001 | On     | ----     | 20 days 8 hrs 57 mins |

The following features have expired temporary keys:

| Feature Name        | Partnum |
|---------------------|---------|
| Zero entries found. |         |

13. Backup the new changes using the **chg-db:action=backup:dest=fixed** command.

The following messages appear with the active Maintenance and Administration Subsystem Processor (MASP) appearing 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.
```



# 5

## Maintenance and Measurements

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## Hardware Requirements

The G-Port feature requires DSM-based boards to run the VSCCPGPL. The EAGLE 5 ISS may be equipped with from 1 to 25 DSM boards to support G-Port.



**CAUTION:** Having a mix of SCCP and VS CCP card types is not permitted with the G-Port feature enabled. That is, VS CCP cards and SCCP cards cannot coexist in a system operating the G-Port feature. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

## EPAP Status and Alarms

EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 ISS terminals, so maintenance, measurements, and status information are routed through a DSM. EPAP sends two types of messages to the DSM: [EPAP Maintenance Blocks](#) and [DSM Status Requests](#). Each is discussed in the following sections.

### EPAP Maintenance Blocks

The active EPAP generates and sends maintenance blocks to the primary DSM. One maintenance block is sent as soon as the IP link is established between the active EPAP and the primary DSM. 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 so this information can be forwarded to the EPAP A Device Control Block (DCB), where it is 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 so this information can be forwarded to the EPAP B DCB, where it is available for the output of the `rept-stat-mps` command.
- Identification of Active EPAP - a field to identify the active EPAP.
- Congestion Indicator - an indicator showing provisioning link congestion. The link between the EPAPs and the external source of provisioning data can become congested in high-provisioning traffic situations. When this occurs and subsequently as the congestion clears, the EPAP sends maintenance blocks to the DSM. The EPAP must ensure that no more than one maintenance block per second is sent to the primary DSM if the only reason is to report a change in congestion status.
- 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 DSM uses this information to calculate the percentage of memory utilized by the RTDB.

### DSM Status Requests

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

### **DSM Status Reporting to the EPAP**

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

#### **DSM Status Messages – When Sent**

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

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

#### **DSM Status Messages Fields**

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

- **DSM Memory Size.** When the DSM card is initialized, it determines the amount of memory present. The EPAP uses the value to determine if the DSM card has enough memory to hold the RTDB.  
Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM card database capacity requirements.
- **Load Mode Status.** This indicator indicates whether or not 80% of the IS-NR (In-Service Normal) LIMs have access to SCCP services.

### **Hourly Maintenance Report**

The Hourly Maintenance Report, generated automatically, includes the alarm totals of the G-Port subsystem and DSM/EPAPIP links. A sample follows.

```
eagle10506 99-10-10 16:00:01 EST EAGLE 37.5.0
5072.0000 REPT COND GSM SS
"GSM SS :0440,MTCEINT-0,SA,99-10-10,16:00:01,,,,*C"
;
eagle10506 99-10-10 16:00:01 EST EAGLE 37.5.0
5073.0000 REPT COND INP SS
"INP SS :0440,MTCEINT-0,SA,99-10-10,16:20:01,,,,*C"
;
eagle10506 99-10-10 16:00:01 EST EAGLE 37.5.0
5077.0000 REPT COND EPAPDSM
"EPAPDSM :0084,MTCEINT-0,SA,99-10-10,16:00:01,,,,**"
;
eagle10506 99-10-10 16:00:01 EST EAGLE 37.5.0
5007.0000 REPT COND CARD
"CARD 1102:0422,SCMMA,SA,99-10-10,16:00:01,,,,**"
;
```

```
eagle10506 99-09-13 16:00:01 EST EAGLE 37.5.0
3561.0000 REPT COND ALARM STATUS
"ALARMS:PERM. INHIBITED,0,0,0"
"ALARMS:TEMP. INHIBITED,0,0,0"
"ALARMS:ACTIVE,10,14,3"
"ALARMS:TOTAL,10,14,3"
;
```

## G-Port System Status Reports

Status reporting described here includes the following:

- System status
- G-Port status
- DSM card memory capacity status
- Loading mode support status

### System Status Reporting

The **rept-stat-sys** command supports the DSM cards running the VSCCP application.

The **rept-stat-sccp** command supports the DSM cards running the VSCCP application and reports G-Port statistics.

### G-Port Status Reporting

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

### DSM Memory Capacity Status Reporting

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

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

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

## Loading Mode Support Status Reporting

The OAM application determines whether or not the system is in an unstable loading mode since it knows the state of all LIM, SCCP, and DSM cards in the system. When the loading mode is unstable, the `rept-stat-sys` command reports the existence of the unstable loading mode and the specific conditions that caused it. Refer to [Loading Mode Support](#), for more details.

# Code and Application Data Loading

## DSM Code Loading

The EAGLE 5 ISSOAM code loads the DSM card.

## EPAP Application Data Loading

The G-Port feature requires that new TDM-resident data tables be loaded in addition to those currently supported by EAGLE 5 ISS. The GPL and data loading support this additional table loading while maintaining support for loading the existing EAGLE 5 ISS tables.

In order to support both RTDB and EAGLE 5 ISS data loading, the VSCCP GPL verifies its hardware configuration during initialization to determine if it has the capacity to support the RTDB.

The VSCCP GPL application data loader registers all tables for loading, independent of the G-Port feature provisioning and main board / applique hardware configuration. As a result, load requests are always identical. During loading, multiple DSM load requests are combined into a single download, reducing the overall download time. The DSM card stores or discards RTDB table data based on whether or not it has RTDB-capable hardware for features like G-Port, G-Flex, INP, and EIR.

The OAM, on the other hand, downloads or sets memory boundaries for the G-Port options, HOMERN, and service selector tables only if the G-Port feature is provisioned. When the G-Port feature is not provisioned, the OAM does not attempt to read these tables from disk. Instead, empty tables (i.e., tables without entries) are downloaded. All other tables requested for loading are read from disk and downloaded routinely.

## *Non G-Port Data Initialization*

If the DSM card's hardware configuration cannot support the RTDB, the G-Port tables are marked as absent during Service Management System initialization. Memory is not reserved for the G-Port table data. G-Port tables are registered with the application data loader (ADL), specifying a data discard function. G-Port table data is discarded during loading by the ADL discard function, rather than storing it in memory.

## *G-Port Data Initialization*

If the DSM card detects G-Port-capable hardware, the G-Port tables are registered with ADL, specifying a data load function. Any G-Port table data downloaded are stored in memory during loading.

### ***EPAP-DSM Loading Interface***

The DSM must convey to the EPAP that it needs to download the RTDB. This occurs when the DSM sends a Full Download Request message to the EPAP.

### ***Loading Mode Support***

No more than 16 LIMs can be serviced by each SCCP (or VS CCP) card.

### ***80% Threshold of Support***

Loading mode is based on the ability of the system to provide SCCP service to at least 80% of the LIMs.

### ***VS CCP Capacity***

An insufficient number of VS CCP cards that are in the is-nr (In Service - Normal) or oos-mt-dsbl (Out of Service - Maintenance Disabled) relative to 80% of the number of provisioned LIMs is called a “failure to provide adequate SCCP capacity.”

### ***Insufficient SCCP Service***

It is also possible for LIMs or VS CCP cards to be inhibited or to have problems that prevent them from operating normally. If enough VS CCP cards are out of service, it may not be possible for the remaining is-nr VS CCP cards to service at least 80% of the number of is-nr LIMs. This is called “insufficient SCCP service.” When this occurs, some of the LIMs are denied SCCP service. It is possible to inhibit LIMs to bring the ratio back to 16:1 (or better).

### ***Conditions That Create an Unstable Loading Mode***

The current system implementation interrupts and aborts card loading upon execution of an STP database **chg** command. Loading mode support denies the execution of EAGLE 5 ISS database **chg** commands when the system is in an unstable loading mode. An unstable loading mode exists when any of the following conditions are true:

- The system's maintenance baseline has not been established.
- Less than 80% of the number of LIMs provisioned are is-nr or oos-mt-dsbl.
- The number of is-nr and oos-mt-dsbl sccp cards is insufficient to service at least 80% of all provisioned LIMs.
- Insufficient SCCP service occurs when an insufficient number of is-nr VS CCP cards are available to service at least 80% of the number of is-nr LIMs.
- LIM cards are being denied SCCP service and any VS CCP cards are in an abnormal state (oos-mt or is-anr).

### ***Effects of System in an Unstable Loading Mode***

- No affect on RTDB downloads or updates.

Unstable loading mode has no impact on RTDB downloads or the stream of RTDB updates.

- **rept-stat-sys** reports unstable loading mode.

When the loading mode is unstable, the **rept-stat-sys** command response reports the existence of the unstable loading mode and the specific trigger that caused it.

- No STP database updates allowed.

When in an unstable loading mode, the EAGLE 5 ISS does not accept STP database updates. When updates are rejected, the reason is given as:

E3112 Cmd Rej: Loading Mode unstable due to SCCP service is deficient.

The **inh-card** and **alw-card** commands can be used to alter SCCP service levels to achieve the 80% threshold. This can be repeated for each card until the system is able to supply SCCP services to at least 80% of the is-nr LIMs. The remaining 20% LIM or supporting VSCCP cards may remain out of service until the stream of database updates ceases. This stream of updates can be temporarily interrupted to allow the remaining 20% of the system to come in service.

Once an STP database has been loaded, that database can be updated (as long as the system is not in an unstable loading mode). However, if an STP update arrives during STP database loading, the DSM aborts the current loading, issues a class 01D7 obit, and reboots. [Figure 5-1](#) shows an example.

**Figure 5-1.** Obit Message for Abort of Card Loading

```
tekelecstp 97-04-08 12:29:04 EAGLE 35.0.0
-----
Card 1317 Module RADB_MGR.C Line 337 Class 01d7
Card 1317 Module RADB_MGR.C Line 337 Class 01d7
Register Dump :
    EFL=00000246    CS =0058        EIP=0000808d    SS =0060
    EAX=000a6ff3    ECX=000a0005    EDX=00000000    EBX=000a6fa0
    ESP=00108828    EBP=0010882c    ESI=001f1e10    EDI=00000000
    DS =0060        ES =0060        FS =0060        GS =0060

Stack Dump :
[SP+1E]=001f      [SP+16]=0000      [SP+0E]=000a      [SP+06]=0010
[SP+1C]=1e10      [SP+14]=0004      [SP+0C]=6fa0      [SP+04]=8850
[SP+1A]=0010      [SP+12]=001f      [SP+0A]=0004      [SP+02]=0001
[SP+18]=886c      [SP+10]=4928      [SP+08]=7ec3      [SP+00]=504b

User Data Dump :

14 02 fa ed 01 01 1d 01 5a 01 00          ....Z..
Report Date:97-04-08  Time:12:29:04
```

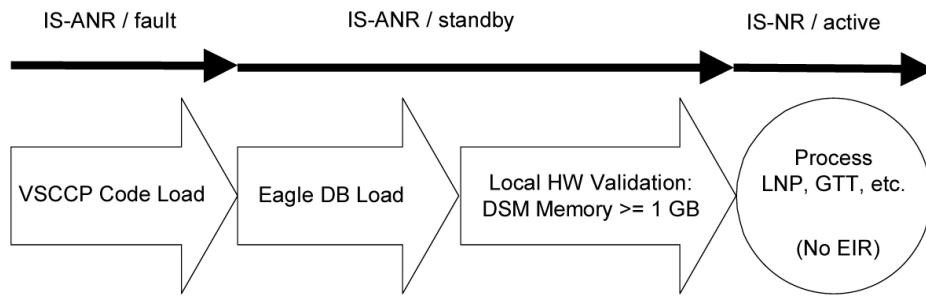
### ***Using the force Option***

Use the force option to force the execution of commands that would put the system in unstable loading mode. If executing the **ent-card** or **inh-card** commands would cause the system to enter an unstable loading mode, use the force option on the command.

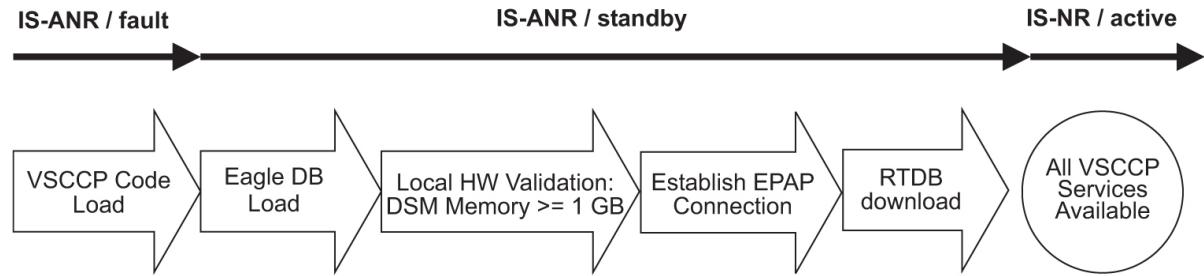
### **State Transitions During Start-Up**

[Figure 5-2](#) through [Figure 5-9](#) show the transitions that a DSM card goes through as it boots, loads code and data, and runs various VSCCP services. These figures do not illustrate every possible situation, but they do include the most common scenarios involving the EIR feature.

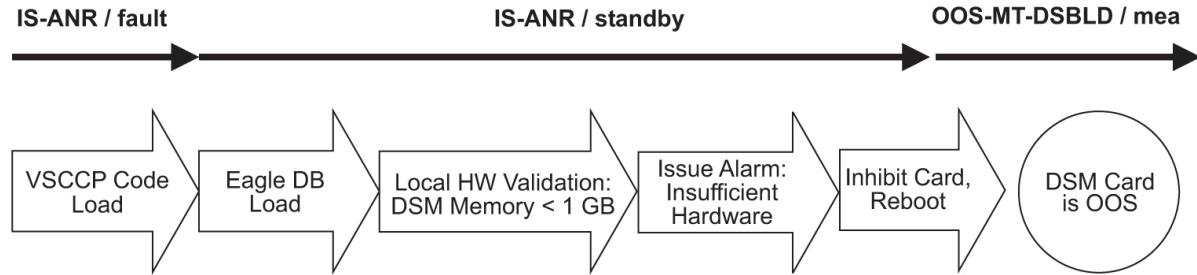
In [Figure 5-2](#), the G-Port feature is not enabled, and the DSM card can operate in TSM emulation mode, although it does not provide G-Port operation.

**Figure 5-2.** G-Port Not Enabled, DSM Running in TSM Emulation

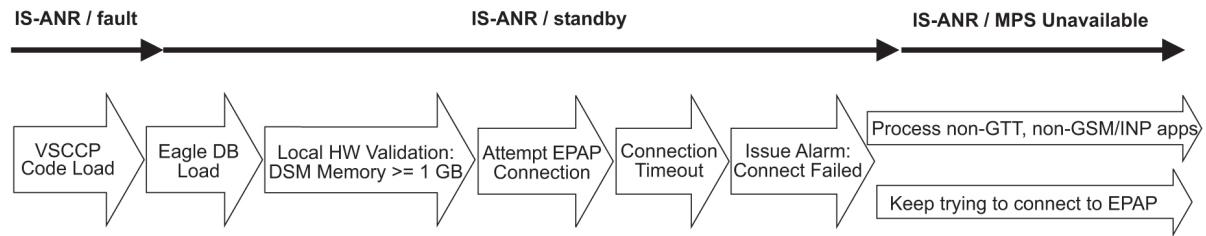
In [Figure 5-3](#), the G-Port feature is enabled, and the DSM card memory is at least 1 GB and is connected to the EPAP. A normal DSM card operating sequence occurs, providing G-Port service.

**Figure 5-3.** G-Port Enabled, Normal Operating Sequence

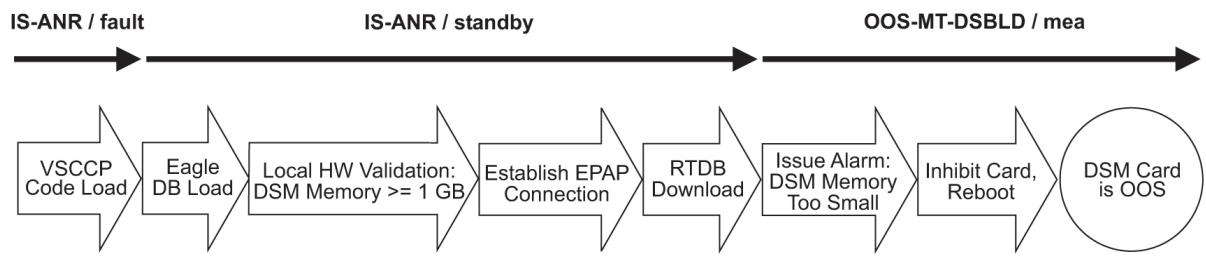
In [Figure 5-4](#), the G-Port feature is enabled, but the DSM card memory is less than 1 GB. The EIR feature cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

**Figure 5-4.** G-Port Enabled, but DSM Memory Less Than 1 GB

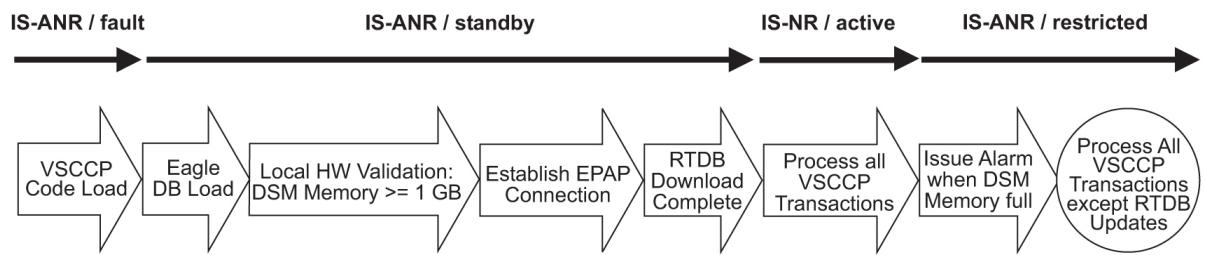
In [Figure 5-5](#), the G-Port feature is enabled, the DSM card memory has at least 1 GB, but the DSM card is unable to connect EPAP; the G-Port cannot begin operation.

**Figure 5-5.** G-Port Enabled, but DSM Not Connected to EPAP

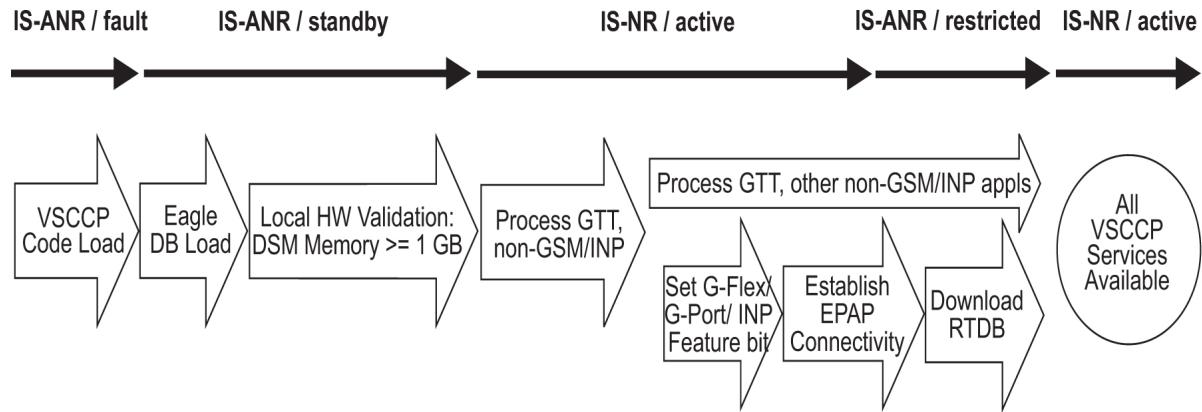
In [Figure 5-6](#), the G-Port feature is enabled, the DSM card has the required 1 GB memory and is connected to the EPAP, but the DSM card is too small for the required database; the G-Port cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

**Figure 5-6.** G-Port Enabled, but DSM Memory Insufficient for Database

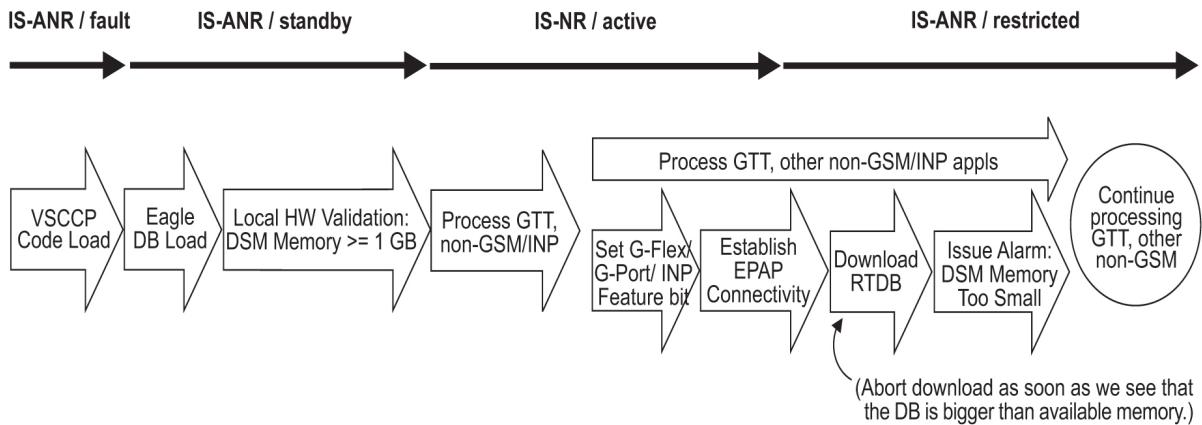
In [Figure 5-7](#), the G-Port feature is enabled, the DSM card is connected to the EPAP, but the RTDB grows eventually to exceed the capacity of the DSM card memory, despite its memory size of at least 1 GB (an alarm is issued when the DSM memory becomes full from the RTDB update). The G-Port cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

**Figure 5-7.** G-Port Enabled, but Database Exceeds DSM Memory

In [Figure 5-8](#), the G-Port feature is not initially enabled; the DSM card memory has at least 1 GB but no EPAP connection; the DSM card is running other applications when the G-Port feature is turned on; the DSM has sufficient memory to provide G-Port service.

**Figure 5-8.** G-Port Not Enabled at First, but then Activated on DSM

In [Figure 5-9](#), the G-Port feature is not initially enabled; the DSM card memory has at least 1 GB but no EPAP connection, and is running other applications when the G-Port feature is turned on. However, the DSM card memory is insufficient for the needed database, and the cannot provide G-Port operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

**Figure 5-9.** G-Port Activation Unsuccessful due to Insufficient Database

## G-Port Related Alarms

Refer to the *Maintenance Manual* for a complete description and the associated corrective procedure for all G-Port related UAMs.

### EPAP - DSM Connection Status

The EPAP and the DSM are connected over a 100-Mbit Ethernet link and use TCP/IP. If this connection is inoperative, the DSM generates an appropriate UAM. Loss of connectivity or inability of the EPAP to communicate (for example, hardware or software failure) is detected and reported within 10 seconds.

## EPAP UAMs

The maintenance blocks from the EPAP have a field used to identify error message requests. The DSM processes the incoming maintenance blocks and generates the requested UAM. The actual EPAP UAMs are defined in the *Maintenance Manual*; the DSM only acts as a delivery agent.

## DSM Failure

No new alarms have been created to report DSM failure. The existing card alarm UAM 013, *Card is isolated from the system*, indicates a DSM card failure. The DSM failure alarm is output to the Card Output Group.

## DSM-EPAP Link

Two alarms are used to indicate the DSM-to-EPAP link status:

- 0084, *IP Connection Unavailable* (Major)
- 0085, *IP Connection Available* (Normal/Clearing)

The DSM-EPAPLink alarms are output to the Link Maintenance Output Group. See the *Maintenance Manual* for details on these UAM formats.

Example:

```

1      2      3      4      5      6      7      8
1234567890123456789012345678901234567890123456789012345678901234567890
station1234 00-09-30 16:28:08 EST EAGLE 37.0.0-35.10.0
** 3582.0084 ** VSCCP PORT B    1217           IP Connection Unavailable

```

## DSM Hardware-Related Alarms

A major alarm appears when a DSM card does not have the hardware configuration required for the G-Port application. Loading the DSM card is automatically inhibited. Card alarms can be inhibited and uninhibited with the **inh-alm** and **unhb-alm** commands. The DSM Hardware-Related alarms are output to the Card Output Group.

A major alarm is displayed when a DSM card detects that its applique memory is at least 80% full. The actual memory usage can be displayed by entering the **rept-stat-mps:loc=xxxx** command.

Example:

```

1      2      3      4      5      6      7      8
1234567890123456789012345678901234567890123456789012345678901234567890
station1234 99-09-30 16:28:08 EST EAGLE 37.0.0-31.7.0
** 0012.0446 ** CARD 1108 VSCCP          RTDB database capacity is 80% full

```

A critical alarm is generated when a DSM card detects that its applique memory is 95% full. Loading of the DSM card is automatically inhibited when it reaches 100% of capacity. The actual memory usage can be displayed by entering the **rept-stat-mps:loc=xxxx** command.

Example:

```

1      2      3      4      5      6      7      8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

```

```

station1234 99-09-30 16:28:08 EST EAGLE 37.0.0-31.7.0
*C 0012.0442 *C CARD 1108 VSCCP           RTDB database capacity is 95% full

```

When the **alw-card** command is executed, loading of the DSM card is attempted. The following message appears, indicating that card loading is no longer inhibited.

*Example:*

```

1          2          3          4          5          6          7          8
1234567890123456789012345678901234567890123456789012345678901234567890
    station1234 00-09-30 16:28:08 EST EAGLE 37.0.0-35.10.0
0012.0423   CARD 1108 VSCCP           Card reload attempted

```

### DSM Database Audit Alarm

During an audit of the DSM cards, the status of the RTDB is examined and an alarm is raised when a corrupted database is found. When any RTDB database becomes corrupted, a major alarm is raised. The DSMDatabase Audit alarm is output to the Card Output Group.

*Example:*

```

1          2          3          4          5          6          7          8
1234567890123456789012345678901234567890123456789012345678901234567890
    station1234 00-09-30 16:28:08 EST EAGLE 37.0.0-35.10.0
** 0012.0443 ** CARD 1108 VSCCP           RTDB Database is corrupted

```

### DSM Database Alarms

During the operation of DSM cards, the status of databases is examined and alarms can be raised.

When the RTDB of a DSM card is inconsistent (that is, the DSM card birthdate and level do not match the active EPAP RTDB birthdate and level), a minor alarm is raised. The DSM Database alarms are output to the Card Output Group.

*Example:*

```

1          2          3          4          5          6          7          8
1234567890123456789012345678901234567890123456789012345678901234567890
    station1234 00-09-30 16:28:08 EST EAGLE 37.0.0-35.10.0
*   0012.0444 * CARD 1108 VSCCP           RTDB Database is inconsistent

```

When the RTDB database download is in-process or after an update faileds, the database is in an incoherent state. A alarm is raised.

*Example:*

```

1          2          3          4          5          6          7          8
1234567890123456789012345678901234567890123456789012345678901234567890
    station1234 00-09-30 16:28:08 EST EAGLE 37.0.0-35.10.0
*   0012.0448 * CARD 1108 VSCCP           RTDB Database is incoherent

```

When an inconsistent, incoherent, or corrupted DSM RTDB has been fixed when the DSM card is in an **is-nr** condition, an alarm is raised.

*Example:*

```

1          2          3          4          5          6          7          8
1234567890123456789012345678901234567890123456789012345678901234567890
    station1234 00-09-30 16:28:08 EST EAGLE 37.0.0-35.10.0
0012.0445 CARD 1108 VSCCP           RTDB Database has been corrected

```

## G-Port Subsystem Alarms

The same alarms that are output for an SCCP subsystem are output for the G-Port functions (including G-Port traffic). See [Table 5-1](#).

**Table 5-1. G-Port Subsystem Alarms**

| UAM # | Severity | Message Text                           | Output Group<br>(UI Output Direction) |
|-------|----------|----------------------------------------|---------------------------------------|
| 0328  | None     | SCCP is available                      | gtt                                   |
| 0329  | None     | SCCP capacity normal, card(s) abnormal | gtt                                   |
| 0330  | Major    | SCCPTPS Threshold exceeded             | gtt                                   |
| 0331  | Critical | SCCP is not available                  | gtt                                   |
| 0335  | None     | SCCP is removed                        | gtt                                   |
| 0336  | Major    | LIM(s) have been denied SCCP service   | gtt                                   |
| 0526* | None     | Service is available                   | sys_maint                             |
| 0527* | Minor    | Service abnormal                       | sys_maint                             |
| 0528* | Critical | Service is not available               | sys_maint                             |
| 0529* | Critical | Service is disabled                    | sys_maint                             |
| 0530* | None     | Service is removed                     | sys_maint                             |

\*GPORT will display in the text of the message if the G-Port feature is enabled without the additional features of A-Port or IGM being enabled. If the A-Port and/or IGM features are enabled, the text GPORT will be replaced with the text MNP.

## G-Port Related UIMs

G-Port UIM formats for the EGTT feature support GTT requirements.

The *EAGLE 5 ISS Maintenance Manual* contains a complete description of all UIM text and formats. If the G-Port is provisioned, then the following UIMs ([Table 5-2](#)) are used.

**Table 5-2. G-Port UIMs**

| UIM  | Text                                 | Description                                              | Action                                            | Output Group<br>(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 CGPATT 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 CGPAGTA address in the GTT database | gtt                                   |

| <b>UIM</b> | <b>Text</b>                              | <b>Description</b>                                                                                                                                                   | <b>Action</b>                                                                                | <b>Output Group<br/>(UI Output Direction)</b> |
|------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------|
| 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 CGPAGTI, TT, NP, and NAI in the EGTT selector table                            | gtt                                           |
| 1169       | SCCP rcvd inv TCAP portion               | This indicates that SCCP discarded a message because the TCAP provided in the called party address is invalid in the EAGLE 5 ISS.                                    | No action is necessary.                                                                      | application subsystem                         |
| 1227       | SCCP did not route - DPC not in MAP tbl  | This message indicates that SCCP did not route a message because the destination point code was not in the mated application (MAP) table. The message was discarded. | If the DPC indicated in the message should not be routed to, no further action is necessary. | gtt                                           |
| 1230       | SCCP did not route - SS not in MAP tbl   | This message indicates that SCCP did not route a message because the destination subsystem was not in the Mated Application (MAP) table. The message was discarded.  | No action is necessary.                                                                      | gtt                                           |
| 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<br><b>chg-stpopts :defcc=xxx</b>                                  | 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<br><b>chg-stpopts :defndc=xxxxx</b>                              | 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 MAPMSISDN parameter    | No digits found in MAP MSISDN parameter                                                                                                                              | Specify valid digits in the MSISDN                                                           | application subsystem                         |
| 1295       | Translation PC is Eagle's                | PC translation is invalid because it is one of EAGLE 5 ISS's PCs                                                                                                     | Change the point code                                                                        | application subsystem                         |
| 1296       | Translation PC type is ANSI              | PC translation is invalid because it is an ANSI point code                                                                                                           | Change the point code                                                                        | application subsystem                         |
| 1297       | Invalid length of prefix/suffix digits   | Attempted digit action of prefixing entity ID is invalid because combined length of entity ID and GT digits was greater than 21 digits                               | Change the attempted digit action or decrease the length of the entity ID and/or GT digits   | application subsystem                         |
| 1374       | SMS NP destination address decode failed | An error was detected during decode of SMS message destination address.                                                                                              | The message should be analyzed to determine the error, and the originating node should be    | application subsystem                         |

| UIM  | Text                                     | Description                                                                                                          | Action                                                                                                                                                                                                                    | Output Group<br>(UI Output Direction) |
|------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|      |                                          |                                                                                                                      | contacted to send corrected message.                                                                                                                                                                                      |                                       |
| 1375 | SMS NP failed to modify TCAP message     | The formatted outbound digit string length generated by SMS NP for encoding the TCAP message exceeded system limits. | The message and outbound digits formatting options should be analyzed to determine the error and the originating node or the requested outbound digit formatting option should be modified to correct the encoding error. | application subsystem                 |
| 1376 | SMS NP outbound digits leng exceed limit | During processing of SMS message, the formatted outbound digit string length exceeded limit for number of digits.    | The message and the digit format provisioning should be analyzed to determine the error and the originating node or the requested outbound digit formatting option should be modified to correct the encoding error..     | application subsystem                 |

## G-Port Measurements

Refer to the *Maintenance Manual* for detailed measurement usage information.

### OAM Based Measurements

G-Port measurements are available via the File Transfer Area ( FTA) feature and not directly via EAGLE 5 ISS terminals. The File Transfer Area feature supports the transfer of file data between an EAGLE 5 ISS and a remote computer. It provides the capability to download files from the EAGLE 5 ISS via a data communications link. The data communications link is accessed through a dial-up modem using one of the RS-232 I/O ports of the EAGLE 5 ISS, as described in [Network Connections](#).

See the *Commands Manual* for details about using FTA commands, which are:

- Activate File Transfer: **act-file-trns**
- Copy to or from Transfer Area: **copy-fta**
- Delete Entry from File Transfer Area: **dlt-fta**
- Display File Transfer Area: **disp-fta-dir**

### Measurements Platform

The Measurements Platform (MP) is required for an EAGLE 5 ISS with more than 700 links. It provides a dedicated processor for collecting and reporting EAGLE 5 ISS, LNP, INP, G-FLEX, EIR, IGM, A-Port, and G-PORT measurements data. The interface to the customer network supports the FTP transfer of Measurements reports to an FTP server. Following collection, scheduled reports are automatically generated and transferred to the customer's FTP server via the FTP interface.

**NOTE: Existing FTP file server reports are overwritten by subsequent requests that produce the identical file name.**

Reports can be scheduled or printed on-demand. Scheduled and on-demand reports are accessible by the following administrative commands:

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

The following Pegs per System measurement peg counts of G-Port MSUs (Message Signaling Units) are supported for the G-Port feature ([Table 5-3](#)).

**Table 5-3. Pegs for Per System G-Port Measurements**

| Event Name | Description                                                            | Type   | Unit      |
|------------|------------------------------------------------------------------------|--------|-----------|
| 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 G-Port service       | System | Peg count |
| GPSRERR    | Number of call-related messages that cause errors and SRI Negative ACK | System | Peg count |

The following Pegs per SSP measurement peg counts of G-Port MSUs are supported for the G-Port feature ([Table 5-4](#)).

**Table 5-4. Pegs for Per SSP G-Port Measurements**

| Event Name | Description                                 | Type       | Unit      |
|------------|---------------------------------------------|------------|-----------|
| GPSRACK    | Number of call-related SRI responses        | Point Code | Peg count |
| GPSRRLY    | Number of call-related SRI messages relayed | Point Code | Peg count |

The following Pegs for both Per System and Per SSP G-Port measurement peg counts of G-Port MSUs are supported for the G-Port feature ([Table 5-5](#)).

**Table 5-5. Pegs for Per System and Per SSP G-Port Measurements**

| Event Name | Description                                                                                     | Type               | Unit      |
|------------|-------------------------------------------------------------------------------------------------|--------------------|-----------|
| GPNOLC     | Number of non-call-related messages relayed by G-Port                                           | System, Point Code | Peg count |
| GPNOLCLGT  | Number of non-call-related messages that fell through to GTT                                    | System, Point Code | Peg count |
| SMSMOGRCV  | Number of MO_SMS messages received that resulted in modification to the outgoing MO_SMS message | System, Point Code | Peg count |
| SMSMOGERR  | Number of MO_SMS messages received that resulted in an error                                    | System, Point Code | Peg count |
| GPSRSMREP  | Number of SRI_SM messages that result in SRI_SM_ACK or SRI_SM_NACK responses                    | System, Point Code | Peg count |
| GPSRSMERR  | Number of SRI_SM messages that result in error                                                  | System, Point Code | Peg count |

| Event Name | Description                        | Type               | Unit      |
|------------|------------------------------------|--------------------|-----------|
| GPSRSMRCV  | Number of SRI_SM messages received | System, Point Code | Peg Count |

The following equations apply:

$$\sum \text{GPSRRCV} = \text{GPSRGTT} + \text{GPSRREP} + \text{GPSRERR}$$

$$\sum \text{GPSRREP} = \text{GPSRACK} + \text{GPSRLY}$$

The following measurement events are included on the STP Daily Maintenance (MTCD) and STP Day-to-Hour (MTCDFH) measurement reports and include peg counts for G-Port MSUs..

|                                                                                                                                                                                                                                      |                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| MSSCCPFL                                                                                                                                                                                                                             | MSUs discarded due to SCCP routing failure.           |
| GTTUN0NS                                                                                                                                                                                                                             | GTT unable to perform; no such type                   |
| GTTUN1NT                                                                                                                                                                                                                             | GTT unable to perform: no translation on this address |
| GTTPERFD                                                                                                                                                                                                                             | Total number of GTT performed                         |
| This implementation does not discriminate between the MSSCCPFL, GTTUN0NS, GTTUN1NT, or GTTPERFD pegs for G-Port or GTT applications. For example, a search failure could result from a problem in either the G-Port or GTT database. |                                                       |

## Measurement Reports

Measurements are available with these report commands. Refer to the *Commands Manual* for detailed usage information.

|             |                                                 |
|-------------|-------------------------------------------------|
| OAM daily:  | <code>rept-meas:type=mtcd:enttype=np</code>     |
| OAM hourly: | <code>rept-meas:type=mtch:enttype=np</code>     |
| MP daily:   | <code>rept-ftp-meas:type=mtcd:enttype=np</code> |
| MP hourly:  | <code>rept-ftp-meas:type=mtch:enttype=np</code> |

# Glossary

## A

|              |                                                                                                               |
|--------------|---------------------------------------------------------------------------------------------------------------|
| ACK          | Data Acknowledgement                                                                                          |
| ACM          | Address Complete Message                                                                                      |
|              | <i>Application Communications Module</i>                                                                      |
| ADL          | Application Data Loader                                                                                       |
| AINPQ        | ANSI-41 INP Query                                                                                             |
| Allowed ISUP | The gateway screening entity that identifies the ISUP or TUP message types that are allowed into the network. |
| ANSI         | American National Standards Institute                                                                         |
| A-Port       | ANSI-41 Mobile Number Portability                                                                             |
| ARP          | Address Resolution Protocol                                                                                   |
| AS           | Application Server                                                                                            |

## C

|                           |                                                                                                                                                                                                                                                                                   |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CC                        | Connection Confirmed                                                                                                                                                                                                                                                              |
|                           | Country Code                                                                                                                                                                                                                                                                      |
| CCBS                      | Completion of Call to Busy Subscriber                                                                                                                                                                                                                                             |
| CCS7ITU                   | The generic program load and application for the ITU SS7 signaling links that is used with card types <b>limds0</b> , <b>limch</b> , <b>limocu</b> , <b>limv35</b> , <b>lime1</b> , and <b>limt1</b> .                                                                            |
| CdPA                      | Called Party Address                                                                                                                                                                                                                                                              |
| CgPA                      | Calling Party Address                                                                                                                                                                                                                                                             |
| Circular Route Prevention | A G-Port MNP feature that detects instances of circular routing caused by incorrect information in one or more of the network number portability databases. If a circular route has been detected, a message will be generated by the EAGLE 5 ISS and returned to the originator. |
| CLLI                      | Common Language Location Identifier                                                                                                                                                                                                                                               |
| CPC                       | Capability Point Code                                                                                                                                                                                                                                                             |
| CSR                       | Customer Service Request                                                                                                                                                                                                                                                          |

## D

|          |                                                                                                                                                                                                                                                                                                    |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Database | All data that can be administered by the user, including cards, destination point codes, gateway screening tables, global title translation tables, links, LNP services, LNP service providers, location routing numbers, routes, shelves, subsystem applications, and 10 digit telephone numbers. |
| DB       | Database                                                                                                                                                                                                                                                                                           |
|          | Daughter Board                                                                                                                                                                                                                                                                                     |
|          | Documentation Bulletin                                                                                                                                                                                                                                                                             |
| DCB      | Device Control Block                                                                                                                                                                                                                                                                               |

|             |                                                                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DCM         | Database Communication Module<br>The DCM provides IP connectivity for applications. Connection to a host is achieved through an ethernet LAN using the TCP/IP protocol.  |
| DEFCC       | Default Country Code                                                                                                                                                     |
| Destination | The node to which the signaling link traffic is routed. This destination is identified by a point code, either a full point code or a cluster point code.                |
| DN          | Directory number<br>A DN can refer to any mobile or wireline subscriber number, and can include MSISDN, MDN, MIN, or the wireline Dialed Number.                         |
| DPC         | Destination Point Code<br>The point code of the signaling point to which the MSU is routed. This point code can be adjacent to the EAGLE 5 ISS, but does not have to be. |
| DPCI        | Destination Point Code International                                                                                                                                     |
| DSM         | Database Service Module.                                                                                                                                                 |

**E**

|                                   |                                                                                                                                                                                                                                                            |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EA                                | Expedited Data Acknowledgment                                                                                                                                                                                                                              |
| EGTT                              | Enhanced Global Title Translation                                                                                                                                                                                                                          |
| EIR                               | Equipment Identity Register                                                                                                                                                                                                                                |
| Enhanced Global Title Translation | A feature that is designed for the signaling connection control part (SCCP) of the SS7 protocol. The EAGLE 5 ISS uses this feature to determine to which service database to send the query message when a Message Signaling Unit (MSU) enters the system. |
| EPAP                              | EAGLE Provisioning Application Processor                                                                                                                                                                                                                   |
| ES                                | Encoding Scheme                                                                                                                                                                                                                                            |
| Extension Shelf                   |                                                                                                                                                                                                                                                            |
| ESD                               | Electro-Static Discharge                                                                                                                                                                                                                                   |
| ETSI                              | European Technical Standards Institute                                                                                                                                                                                                                     |

**F**

|     |                         |
|-----|-------------------------|
| FAK | Feature Access Key.     |
| FSM | Finite State Machine    |
| FTA | File Transfer Area.     |
| FTP | Feature Test Plan       |
|     | File Transfer Protocol. |

**G**

|        |                                                                                                                                                                                          |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB     | Gigabyte — 1,073,741,824 bytes                                                                                                                                                           |
| G-Flex | GSM Flexible numbering<br>A feature that allows the operator to flexibly assign individual subscribers to HLRs and route signaling messages, based on subscriber numbering, accordingly. |
| GMSC   | Gateway MSC                                                                                                                                                                              |
| GPDB   | G-Port Database                                                                                                                                                                          |
| GPL    | Generic Program Load                                                                                                                                                                     |
| G-Port | GSM Mobile Number Portability                                                                                                                                                            |

## Feature Manual - G-Port®

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

|         |                                         |
|---------|-----------------------------------------|
| GPSM-II | General Purpose Service Module          |
| GSM     | Global System for Mobile Communications |
| GT      | Global Title Routing Indicator          |
| GTA     | Global Title Address                    |
| GTAI    | Global Title Address Information        |
| GTI     | Global Title Indicator                  |
| GTT     | Global Title Translation.               |
| GWS     | Gateway Screening.                      |

## H

|        |                                    |
|--------|------------------------------------|
| HLR    | Home Location Register             |
| HOMERN | Home Network Routing Number Prefix |

## I

|                                     |                                                                                                                                                                                       |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IAM                                 | Initial Address Message                                                                                                                                                               |
| ID                                  | Identity, identifier                                                                                                                                                                  |
| IDP                                 | Initial Detection Point                                                                                                                                                               |
| IGM                                 | IS41 GSM Migration                                                                                                                                                                    |
| IGTT                                | Intermediate GTT<br><br>An EAGLE 5 ISS feature that routes a Global Title message based on the Global Title Translation.                                                              |
| IMSI                                | International Mobile Station Identity                                                                                                                                                 |
| IMT                                 | Inter-Module-Transport<br><br>The communication software that operates the inter-module-transport bus on all cards except the LIMATM, DCM, DSM, and HMUX.                             |
| IN                                  | Intelligent Network                                                                                                                                                                   |
| INAP                                | Intelligent Network Application Protocol                                                                                                                                              |
| INE                                 | Intelligent Network Entity                                                                                                                                                            |
| INR                                 | Interrogating Network Entity                                                                                                                                                          |
| INP                                 | INAP-based Number Portability<br><br>Intelligent Network (IN) Portability                                                                                                             |
| Integrated Services Digital Network | The network services that provide end-to-end digital connections to which users have access to a wide range of services through a limited set of standard user to network interfaces. |
| IP                                  | Intelligent Peripheral                                                                                                                                                                |
| IP <sup>7</sup>                     | Internet Protocol                                                                                                                                                                     |
| IS-41                               | Tekelec's Internet Protocol to SS7 Interface                                                                                                                                          |
| IS-ANR                              | Interim Standard 41, same as and interchangeable with ANSI-41.<br><br>In Service - Abnormal                                                                                           |
| ISDN                                | The entity is in service but only able to perform a limited subset of its normal service functions.<br><br>Integrated Services Digital Network                                        |

|          |                                                                                                                                                                                                     |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IS-NR    | In Service - Normal                                                                                                                                                                                 |
| ISDN     | Integrated Services Digital Network                                                                                                                                                                 |
| ISS      | Integrated Signaling System                                                                                                                                                                         |
| ISUP     | ISDN User Part                                                                                                                                                                                      |
| ITU      | International Telecommunications Union                                                                                                                                                              |
| ITUDUPPC | ITU National Duplicate Point Code                                                                                                                                                                   |
|          | This feature applies only to 14-bit ITU national point codes. This feature allows an EAGLE 5 ISS mated pair to route traffic for two or more countries that may have overlapping point code values. |

**K**

|     |                                                                                                                      |
|-----|----------------------------------------------------------------------------------------------------------------------|
| Key | For the ICNP feature, a unique DS value used to access a table entry, consisting of a number length and number type. |
| KSR | Keyboard Send/Receive Mode                                                                                           |

**L**

|              |                                                                                                                                                                                                                                                                         |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LIM          | Link Interface Module                                                                                                                                                                                                                                                   |
| Link         | Signaling Link                                                                                                                                                                                                                                                          |
| LNP          | Local Number Portability                                                                                                                                                                                                                                                |
| Load Sharing | A type of routing used by global title translation to route MSUs. This type of routing is used when a second point code and subsystem is defined for the primary point code and subsystem. Traffic is shared equally between the replicated point codes and subsystems. |

**M**

|                   |                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------|
| MAP               | Mated Application Part                                                                                                   |
|                   | Mobile Application Part                                                                                                  |
| MASP              | Maintenance and Administration Subsystem Processor                                                                       |
| Mated Application | The point codes and subsystem numbers of the service databases that messages are routed to for global title translation. |
| MCPM              | Measurement Collection and Polling Module                                                                                |
| MDAL              | Maintenance Disk and Alarm Card                                                                                          |
| MIM               | Multi-Channel Interface Module                                                                                           |
| MNP               | Mobile Number Portability                                                                                                |
| MO                | Magneto Optical                                                                                                          |
|                   | Managed Object                                                                                                           |
|                   | Mobile Originated                                                                                                        |
| MP                | Measurement Platform                                                                                                     |
| MPS               | Multi-Purpose Server                                                                                                     |
| MR                | Message Relay                                                                                                            |
| MRN               | Message Reference Number                                                                                                 |
|                   | Mated Relay Node                                                                                                         |
| MSC               | Mobile Switching Center                                                                                                  |
| MSISDN            | Mobile Station International Subscriber Directory Number                                                                 |

## **Feature Manual - G-Port®**

The MSISDN is the number dialed by someone trying to reach the subscriber.

|      |                               |
|------|-------------------------------|
| MSRN | Mobile Station Roaming Number |
| MSU  | Message Signaling Unit        |
| MT   | Mobile Terminated             |
| MTP  | Message Transfer Part         |
|      | Module Test Plan              |

## **N**

|      |                             |
|------|-----------------------------|
| NAI  | Nature of Address Indicator |
| NAIV | NAI Value                   |
| NC   | Network Cluster             |
|      | Network Code                |
| NDC  | Network destination code    |
|      | Network Data Collection     |
| NE   | Network Element             |
| NP   | Number Plan                 |
|      | Numbering Plan              |
|      | Number Portability          |
| NPDB | Number Portability Database |

Number Conditioning Conversion of incoming digits into subscriber format prior to RTDB lookup and conversion of outgoing RTDB digits into a format matching the original incoming digits.

## **O**

|        |                                             |
|--------|---------------------------------------------|
| OAM    | Operations, Administration, and Maintenance |
| OOS-MT | Out of Service - Maintenance                |
| OPC    | Originating Point Code                      |
| OPS    | Operator Provisioning System                |

## **P**

|       |                                         |
|-------|-----------------------------------------|
| PC    | Point Code.                             |
| PDB   | Provisioning Database                   |
| PDBA  | Provisioning Database Application       |
| PDBI  | Provisioning Database Interface         |
| PLMN  | Public Land Mobile Network              |
| PPP   | Point-to-Point Protocol                 |
| PPSMS | Prepaid Short Message Service           |
| PPSMS | Prepaid Short Message Service Intercept |
| PT    | Portability Type                        |

## **R**

|    |                      |
|----|----------------------|
| RC | Relative Cost        |
|    | Restriction Criteria |

|       |                                       |
|-------|---------------------------------------|
| RFC   | Request for Comment                   |
| RI    | Routing Indicator                     |
| RMTP  | Reliable Multicast Transport Protocol |
| RN    | Routing Number                        |
| RNIDN | Routing Number - International DN     |
| Route | A path to another signaling point.    |
| RS    | Requirement Specification             |
| RTDB  | DSM Real-time database                |

**S**

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SCCP                                | Signaling Connection Control Part                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| SCM                                 | System Configuration Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                     | System Configuration Matrix.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| SDS                                 | System Debug Services                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Service Nature of Address Indicator | An internal G-Port parameter that allows a user to specify how to interpret the signaling connection control part (SCCP) called party address (CdPA) GTA of a LOCREQ/SMSREQ message.                                                                                                                                                                                                                                                                                                                                                  |
| SIM                                 | Subscriber Identity Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SIO                                 | Service Information Octet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SIO                                 | Service Information Octet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SM                                  | Short Message                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| SMS                                 | Short Message Service                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| SMSC                                | Short Message Service Center                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| SMSMR                               | Prepaid Short Message Service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| SNAI                                | Service Nature of Address Indicator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| SOR                                 | Support of Optimal Routing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                     | System Out of Service Request                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| SP                                  | Service Provider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                     | Signaling Point                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Spare Point Code                    | The EAGLE ITU International/National Spare Point Code feature allows a network operator to use the same Point Codes across two networks (either ITU-I or ITU-N). The feature also enables National and National Spare traffic to be routed over the same linkset. The EAGLE uses the MSU Network Indicator (NI) to differentiate the same point code of one network from the other. In accordance with the SS7 standard, unique Network Indicator values are defined for Point Code types ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare. |
| SPC                                 | Secondary Point Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                     | Signaling Point Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                     | Spare Point Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                     | Stored Program Control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| SRF                                 | Signaling Relay Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SRI                                 | Send Routing Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                     | Send_Route_Information Message                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| SS                                  | Subsystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SS7                                 | Signaling System #7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SSN              | SS7 Subsystem Number<br>Subsystem Number                                                                                                                                                                                                                                                                                                                                                                                                            |
| SSP              | Subsystem Prohibited network management message.<br>Subsystem Prohibited SCCP (SCMG) management message. (CER)<br>Service Switching Point (SS7 Network)                                                                                                                                                                                                                                                                                             |
| STP              | Signal Transfer Point                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Subsystem Number | The subsystem number of a given point code. The subsystem number identifies the SCP application that should receive the message or the subsystem number of the destination point code to be assigned to an X.25 address or the LNP subsystem of the EAGLE 5 ISS.<br>A value of the routing indicator portion of the global title translation data commands indicating that no further global title translation is required for the specified entry. |

## T

|        |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TC     | Table Copy<br>Transaction Capabilities                                                                                                                                                                                                                                                                                                                                                                                             |
| TCAP   | Transaction Capabilities Application Part                                                                                                                                                                                                                                                                                                                                                                                          |
| TCP    | Transfer-Cluster-Prohibited<br>Transfer Control Protocol<br>Transmission Control Protocol                                                                                                                                                                                                                                                                                                                                          |
| TCP/IP | Transmission Control Protocol/Internet Protocol                                                                                                                                                                                                                                                                                                                                                                                    |
| TDM    | Terminal Disk Module.<br>Time Division Multiplexing.                                                                                                                                                                                                                                                                                                                                                                               |
| TFA    | TransFer Allowed (Msg)                                                                                                                                                                                                                                                                                                                                                                                                             |
| TFP    | TransFer Prohibited (Msg)                                                                                                                                                                                                                                                                                                                                                                                                          |
| TLNP   | Triggerless LNP                                                                                                                                                                                                                                                                                                                                                                                                                    |
| TPS    | Transactions Per Second<br>A method of measuring how quickly a network can transmit and receive data. Capacities listed with "TPS" units involve the maximum of the receive rate and the transmit rate, and the worst-case assumption is that the transmit and receive rates are the same. Under the TU model, transaction units per second are calculated with the total transaction unit value and the advertised card capacity. |
| TSM    | Translation Services Module                                                                                                                                                                                                                                                                                                                                                                                                        |
| TT     | Translation Type.                                                                                                                                                                                                                                                                                                                                                                                                                  |

## U

|      |                                 |
|------|---------------------------------|
| UAM  | Unsolicited Alarm Message.      |
| UDP  | User Datagram Protocol          |
| UDT  | Unit Data Transfer              |
| UDTS | Unit Data Transfer Service      |
| UI   | User Interface                  |
| UIM  | Unsolicited Information Message |
| UPU  | User Part Unavailable           |
| UPU  | User Part Unavailable           |

## V

VGTT

Variable Length GTT

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

VSCCP

VxWorks Signaling Connection Control Part

The application used by the DSM card to support the G-Flex, G-Port, INP, AINPQ, EIR, A-Port, IGM, V-Flex, and LNP features. If the G-Flex, G-Port, INP, AINPQ, EIR, A-Port, IGM, V-Flex, or LNP feature is not turned on, and a DSM card is present, the VSCCP GPL processes normal GTT traffic.

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