

Tekelec EAGLE[®] 5

Integrated Signaling System

Feature Manual - G-Port

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U.S. Patent Numbers:

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

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Chapter 1

Introduction

Topics:

- [*Overview Page 2*](#)
- [*Scope and Audience Page 2*](#)
- [*Manual Organization Page 2*](#)
- [*Documentation Admonishments Page 3*](#)
- [*Customer Care Center Page 3*](#)
- [*Emergency Response Page 5*](#)
- [*Related Publications Page 6*](#)
- [*Documentation Availability, Packaging, and Updates Page 6*](#)
- [*Locate Product Documentation on the Customer Support Site Page 7*](#)

This chapter provides a brief description of the G-Port feature of the EAGLE 5 Integrated Signaling System. The chapter also includes the scope, audience, and organization of the manual; how to find related publications; and how to contact Tekelec for assistance.

Overview

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

G-Port MNP 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 “NP HLR” for exported number by responding with a MAP SRI 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:

- [Introduction](#) on page 1 contains general information about the G-Port documentation, the organization of this manual, and how to request technical assistance.
- [Feature Description](#) on page 9 provides a description of the G-Port feature and related features, including network perspectives, assumptions and limitations, database overview, DSM provisioning and reloading, and G-Port protocol.
- [Commands](#) on page 73 describes the commands that support the G-Port and related features
- [Feature Activation](#) on page 93 describes how to activate the G-Port feature and related features.
- [Maintenance and Measurements](#) on page 149 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.

Documentation Admonishments

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

Table 1: Admonishments

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

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Tekelec Technical Assistance Centers are located around the globe in the following locations:

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In the event of a critical service situation, emergency response is offered by the Tekelec Customer Care Center 24 hours a day, 7 days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

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

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

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

Related Publications

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

Documentation Availability, Packaging, and Updates

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

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

The electronic file of each manual is also available from the Tekelec Customer Support site (support.tekelec.com). This site allows for 24-hour access to the most up-to-date documentation, including the latest versions of Feature Notices.

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

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

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

Documentation is updated when significant changes are made that affect system operation. Updates resulting from Severity 1 and 2 PRs are made to existing manuals. Other changes are included in the documentation for the next scheduled release. Updates are made by re-issuing an electronic file to the customer support site. Customers with printed documentation should contact their Sales Representative for an addendum. Occasionally, changes are communicated first with a Documentation Bulletin to provide customers with an advanced notice of the issue until officially released in the documentation. Documentation Bulletins are posted on the Customer Support site and can be viewed per product and release.

Locate Product Documentation on the Customer Support Site

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

1. Log into the Tekelec **new** Customer Support site at support.tekelec.com.
Note: If you have not registered for this new site, click the **Register Here** link. Have your customer number available. The response time for registration requests is 24 to 48 hours.
2. Click the **Product Support** tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.

Chapter 2

Feature Description

Topics:

- [*Introduction Page 10*](#)
- [*MPS/EPAP Platform Page 15*](#)
- [*G-Port Protocol Page 34*](#)
- [*G-Port SCCP Service Re-Route Capability Page 48*](#)
- [*ISUP NP with EPAP Call Flows Page 53*](#)
- [*MT-Based GSM SMS NP Page 57*](#)
- [*MT-Based GSM MMS NP Page 65*](#)
- [*GSM MAP SRI Redirect to Serving HLR Page 69*](#)

This chapter describes the G-Port feature and related features which include:

- ISUP NP with EPAP
- MT-Based GSM SMS NP
- MT-Based GSM MMS NP
- G-Port SRI Query for Prepaid
- GSM MAP SRI Redirect to Serving HLR

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.

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 DefCC and MULTCC table are 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, 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.

ISUP NP with EPAP

The ISUP NP 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 Access 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. For more information about the MO-Based GSM SMS NP feature, refer to *Feature Manual - MO SMS*.

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 SRI Query for Prepaid

The G-Port SRI Query for Prepaid feature enables the EAGLE 5 ISS to provide portability information to a Service Control Point (SCP) database. This information enables the database to determine the network used by a called subscriber. The G-Port SRI Query for Prepaid feature enables a user to provision the following Message Signal Unit (MSU) values in the EAGLE 5 ISS GSERV table:

- translation type (TT)—The TT of the called party (CdPA)
- originating point code (OPC)—The OPC from the message transfer part (MTP) layer
- global title address (GTA)—The GTA of the calling party (CgPA)

These values are used to determine whether an SRI should receive G-Port SRI Query for Prepaid service or normal G-Port SRI service.

If the G-Port SRI Query for Prepaid feature is enabled and turned on, incoming SRI TT, OPC, and GTA values are compared against the values in the GSERV table. If no match is found, or if no values are provisioned in the GSERV table, normal G-Port SRI processing is performed on the message. If a match is found for one or more of the values, the message is treated as a Prepaid Query. The G-Port SRI Query for Prepaid feature affects only SRI messages. All other messages, including SRI-SM and SRI-GPRS messages, are processed by normal G-Port service, even if the values in those messages match values in the GSERV table.

After an SRI message is identified as requiring G-Port SRI Query for Prepaid service, the EAGLE 5 ISS performs a Mobile Number Portability (MNP) database lookup on the Mobile Station Integrated Services Digital Number (MSISDN). The results of the lookup are returned to the SCP that originated the query.

A TCAP/MAP error specifically related to a decoding error in the SRI MSISDN parameter causes an “Unsupported/Unexpected Data Value” MAP error. All other TCAP/MAP errors cause the message to be relayed to a Home Location Register (HLR), which then returns the appropriate MAP error based on the status of the subscriber (e.g. Unknown, Barred, etc.)

The message relay is based on information in the G-Port MNP database. SCCP level errors cause the return on a UDTs message to the Prepaid SCP.

This feature requires a Feature Access Key and cannot be turned off after it is turned on.

GSM MAP SRI Redirect to Serving HLR

The GSM MAP SRI Redirect to Serving HLR feature provides the capability to resolve the incompatibility introduced by the proprietary implementation of the GSM MAP SRI message. This feature is an extension to the G-Port MNP protocol. The GSM MAP SRI Redirect to Serving HLR feature is compatible with other G-Port MNP enhancement features.

Additional Subscriber Data Support

The G-Port feature is enhanced to support new Mobile Station Routing Number (MSRN) formatting options that use Additional Subscriber Data (ASD). ASD information is inserted into the outgoing SRI ack messages. If the GSMMOPTS:MSRNDIG digit formatting option specifies the use of ASD information and a successful database lookup returns ASD, then the ASD is encoded into the outgoing message and the existing behavior for encoding messages for G-Port is followed.

G-Port Considerations

- G-Port can be turned on, but cannot be turned off.
- 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 Short Message Service 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

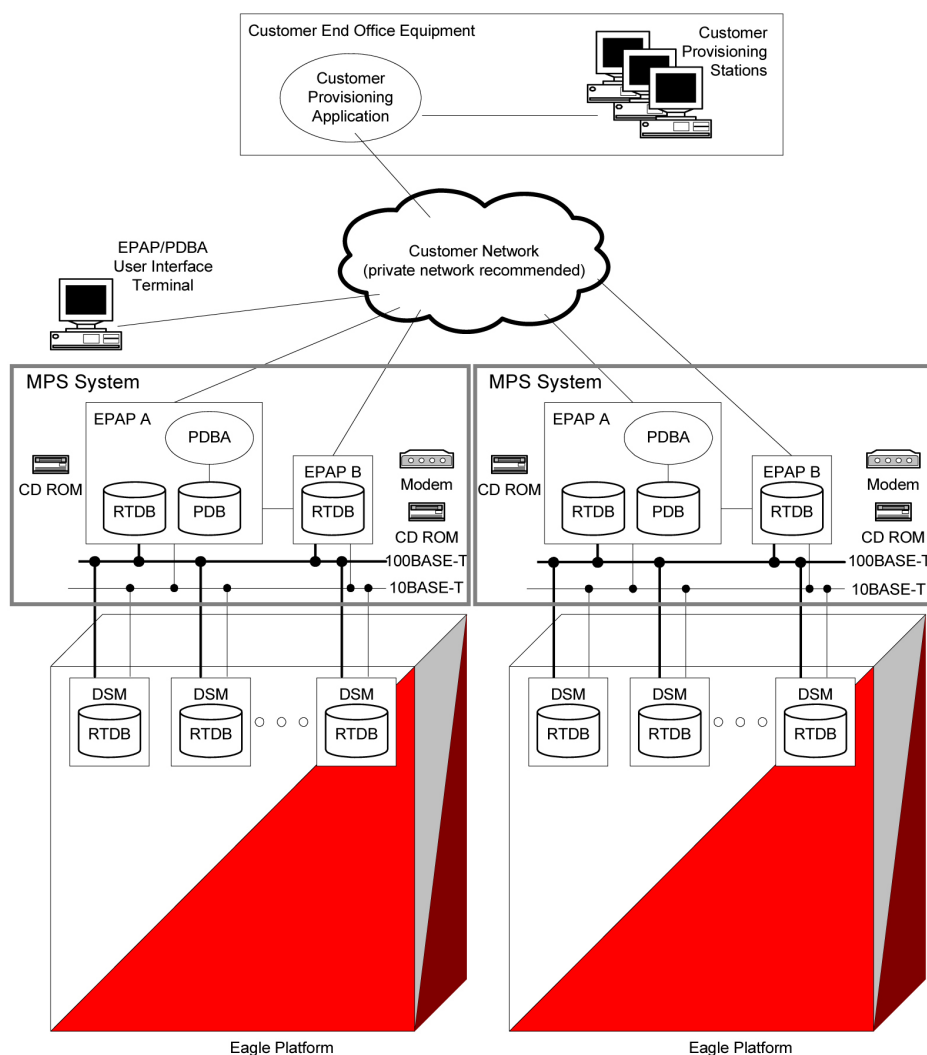
Tekelec provides the MPS (Multi-Purpose Server) platform as a subsystem of the EAGLE 5 ISS. The MPS provides support for the AINPQ, A-Port, EIR, G-Flex, G-Port, IGM, and INP features.

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 Service Module cards. [Figure 1: MPS/EPAP Platform Architecture](#) on page 15 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 Service Module card databases.

Note: In this Manual, Service Module Card refers to either a DSM card or an E5-SM4G card unless a specific card is required. For more information about the supported cards, refer to the *EAGLE 5 ISS Hardware Manual*.

Figure 1: MPS/EPAP Platform Architecture



Design Overview and System Layout

Figure 1: MPS/EPAP Platform Architecture on page 15 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 Service Module cards, which hold the RTDB database, is part of the STP. Two high-speed Ethernet links connect the Service Module 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 Service Module 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.

The major modules on the EPAP are:

- Service Module card provisioning module
- Maintenance module
- RTDB module
- PDB module

The Service Module card provisioning module is responsible for updating subscriber databases on the EAGLE 5 ISS Service Module 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 Service Module 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 Service Module 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 Service Module 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-Service Module card provisioning task sends database information out on the provisioning link. The Service Module 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 Service Module 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 Service Module 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 Service Module 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 Service Module cards. The EPAP server must comply with the hardware requirements in the *MPS Hardware Manual*. [Figure 1: MPS/EPAP Platform Architecture](#) on page 15 illustrates the EPAP architecture contained in the MPS subsystem.

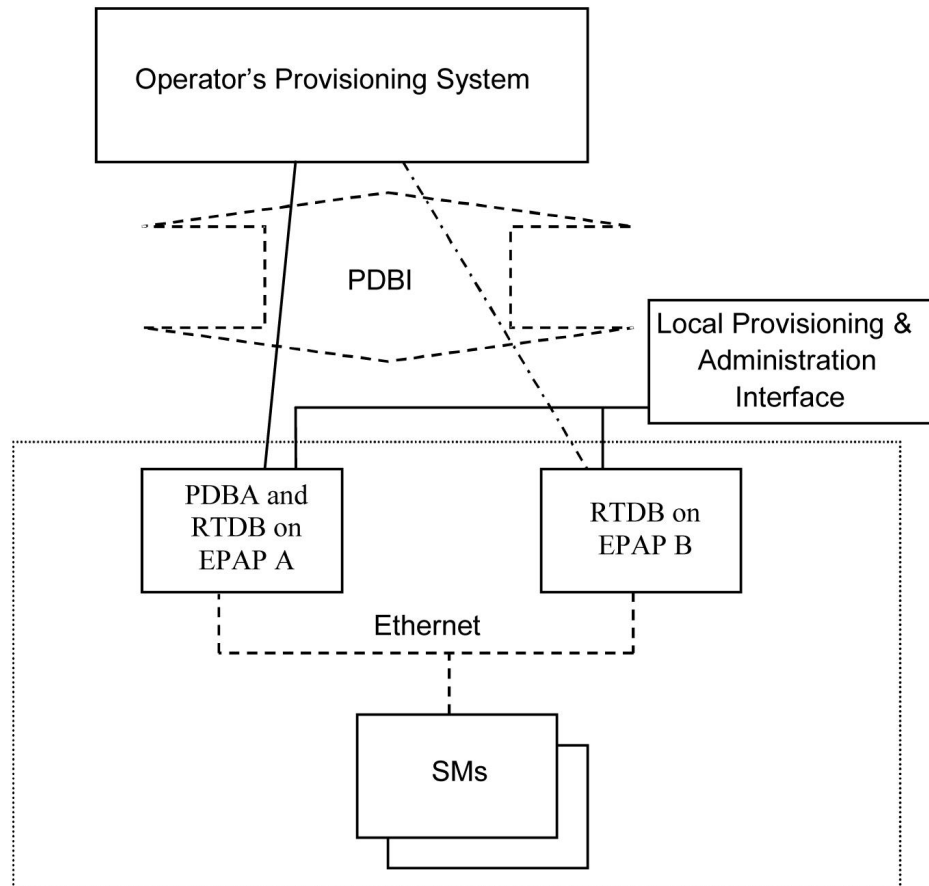
Each EPAP has a dedicated optical media drive. One EPAP per EAGLE 5 ISS platform has a modem capable of supporting remote diagnostics, configuration, and maintenance. These remote operations are performed through EPAP login sessions and are accessible across the customer network as well as through a 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: Subscriber Data Provisioning Architecture \(High Level\)](#) on page 19 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 Provisioning Database Interface (PDBI) between the EPAP and the operator's provisioning system (OPS). Provisioning clients connect to the EPAPs via the 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: Subscriber Data Provisioning Architecture (High Level)



A pair of active/standby EPAP servers provides the interface between the Real Time Database (RTDB) of the EAGLE 5 ISS Service Module cards and the OPS. EPAP A is equipped with both the PDB (Provisioning Database) and the RTDB, 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 Service Module cards from an EPAP MPS platform.

An EPAP consists of a combined Provisioning (MySQL) and Real Time Database (RTDB). The Provisioning Database (PDB) responds to requests for updates by the active and standby RTDBs on both mated EAGLE 5 ISSs. The active EPAP RTDB is responsible for initiating multi-cast updates of changed database records to the Service Module cards after the data has been committed to the EPAP disks. Furthermore, the PDB may accept and commit more database updates while the RTDBs 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 Service Module 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 EPAP RTDB 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 1: MPS/EPAP Platform Architecture](#) on page 15, a single MPS system contains two EPAP (EAGLE Provisioning Application Processor) servers. At any given time, only one actively communicates with the Service Module cards. 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 Service Module 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.

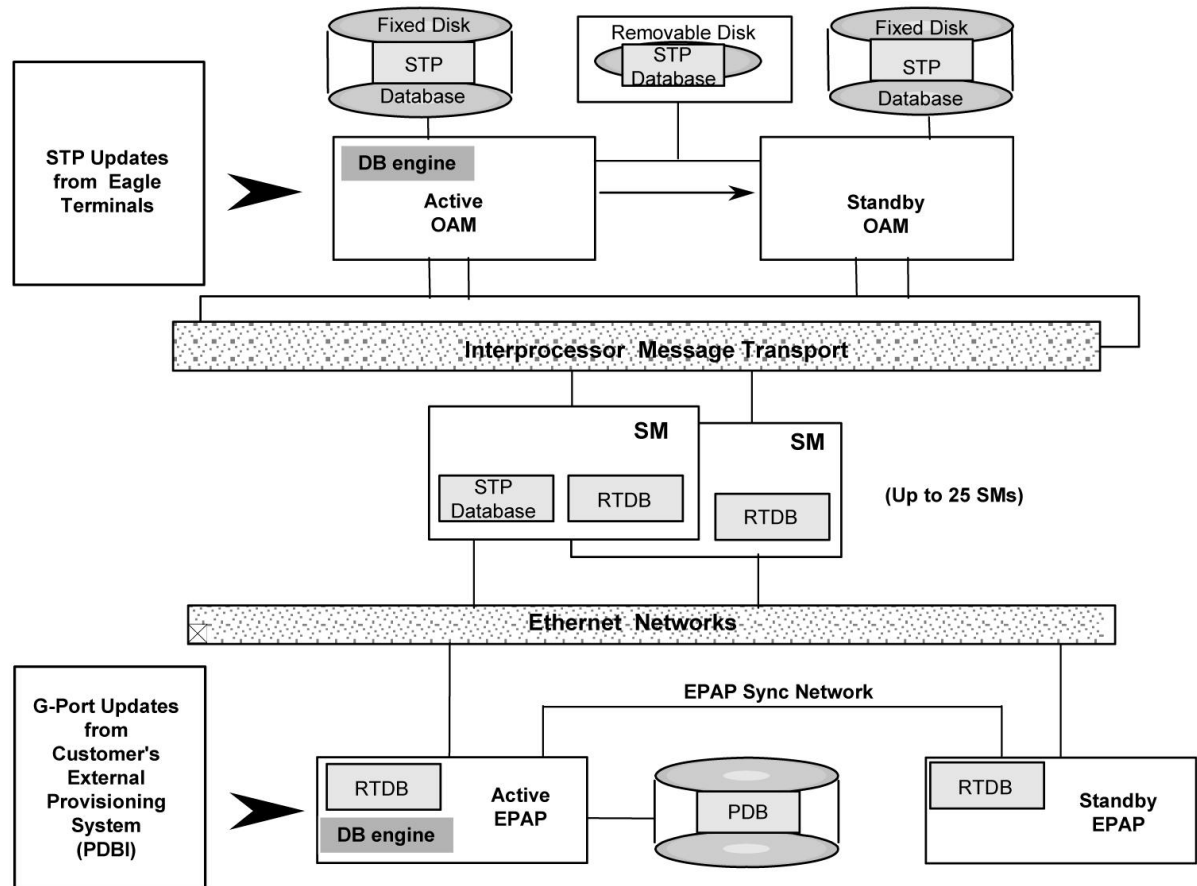
Both the active and standby EPAPs maintain copies of the RTDB. Periodically, the Service Module card polls the active EPAP RTDB for any new updates. The active EPAP downloads the updates to the Service Module for its own resident copy of the RTDB.

In a mated-pair configuration, there are two mated MPS Systems, as shown in [Figure 1: MPS/EPAP Platform Architecture](#) on page 15. 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 Service Module cards.

Provisioning of the EAGLE 5 ISS's Service Module 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 3: Database Administrative Architecture](#) on page 21.

Figure 3: Database Administrative Architecture



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 3: Database Administrative Architecture](#) on page 21 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 Service Module-VxWorks-SCCP application from the SCCP that runs on Translation Services Module (TSM) cards, the Service Module version is named 'VSCCP'.

Multiple Service Module cards provide a means of load balancing in high-traffic situations. The Service Module card 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 Service Module 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 card 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 Card Communications

Before discussing Service Module card 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 card 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 card.

- 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 (RMTP-II), 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 Card Provisioning and Reload

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

- EPAP A, Link A (on the main DSM network, 100BASE-T)
- EPAP A, Link B (on the backup DSM network, 10BASE-T)
- EPAP B, Link A (on the main DSM network, 100BASE-T)
- EPAP B, Link B (on the backup DSM 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 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 based on the Service Module card database level.

Service Module Card Reload Model

Service Module 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 Service Module cards with the current database. The database on the EPAP is large and may be updated constantly. The database sent to the Service Module 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 Service Module cards from different starting points. Reload begins when the first Service Module card requires it. Records are read sequentially from the Real Time Database (RTDB) from an arbitrary starting point, wrapping back to the beginning. If another Service Module card requires reloading at this time, it uses the existing record stream and notifies the Service Module card provisioning task of the first record it read. This continues until all Service Module cards are satisfied.

Service Module Card Database Levels and Reloading

The current database level when the reload started is of special importance during reload. When a Service Module 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 Service Module card continues to reload until it is completely caught up with the current level of the RTDB. As database records are sent to the Service Module 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 Service Module card.

The following terminology is used here for the stages of database reload for a given Service Module card.

- **Stage 1 loading:** The database is being copied record for record from the golden RTDB in the EPAP to the Service Module card 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 Service Module card provisioning task.
- **Coherent:** The database is at a whole database level, that is, not currently updating records belonging to a database level.

EPAP Status and Error Reporting via Maintenance Blocks

The EPAPs forward all status and error messages to the Service Module cards in maintenance blocks. Maintenance blocks are asynchronously sent whenever the EPAP has something to report. The 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](#) on page 24
- [EPAP Sync Network](#) on page 25
- [DSM Networks](#) on page 26
- [Dial-Up PPP Network](#) on page 27

The following discussion is an overview of these private networks. It expands on the networks in the architecture diagram shown in [Figure 4: Customer Provisioning Network](#) on page 24. (For details about configuring these networks, refer to the *EPAP Administration Manual*.)

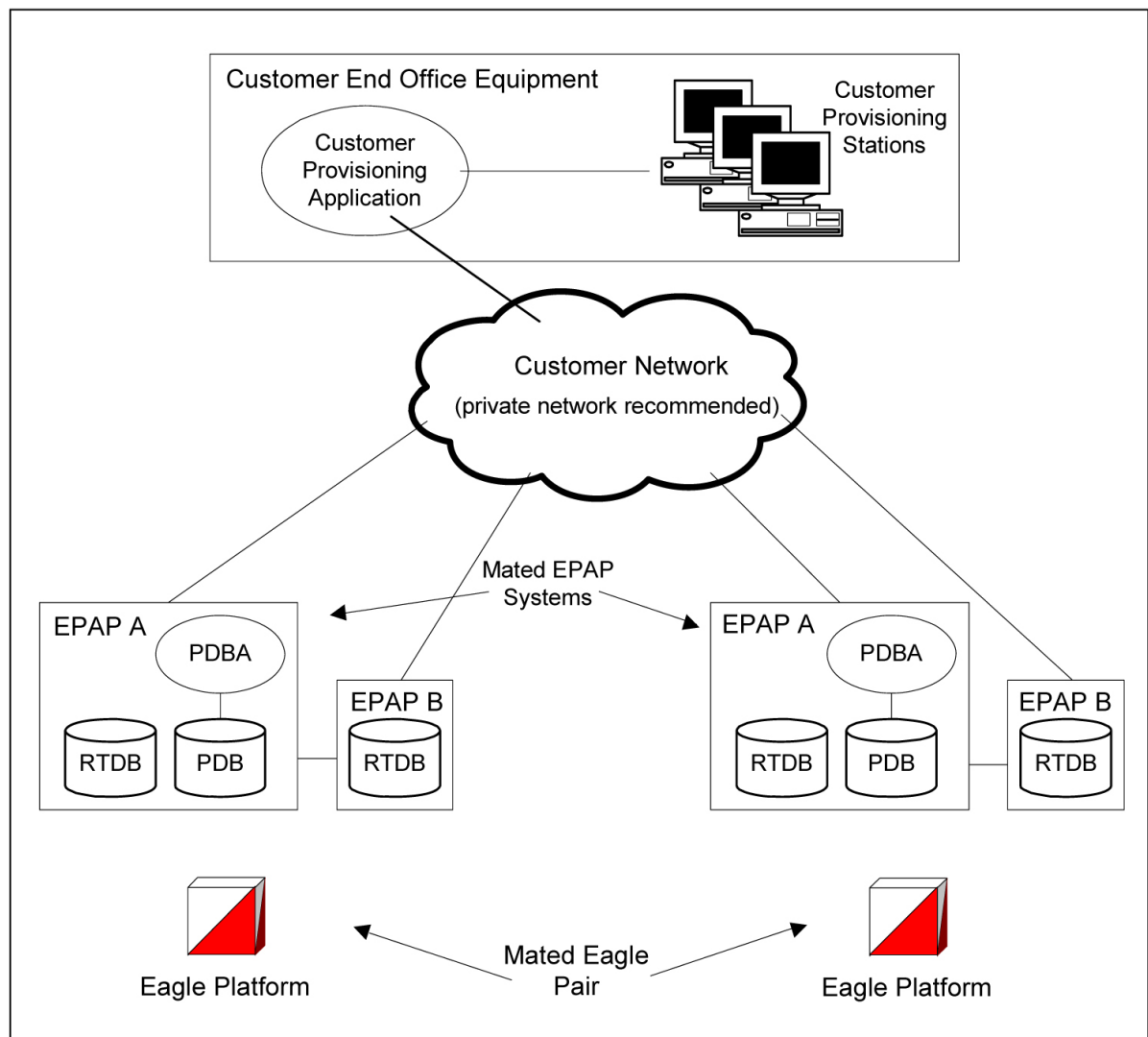
Customer Provisioning Network

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
- PDBA 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 4: Customer Provisioning Network](#) on page 24.

Figure 4: Customer Provisioning Network

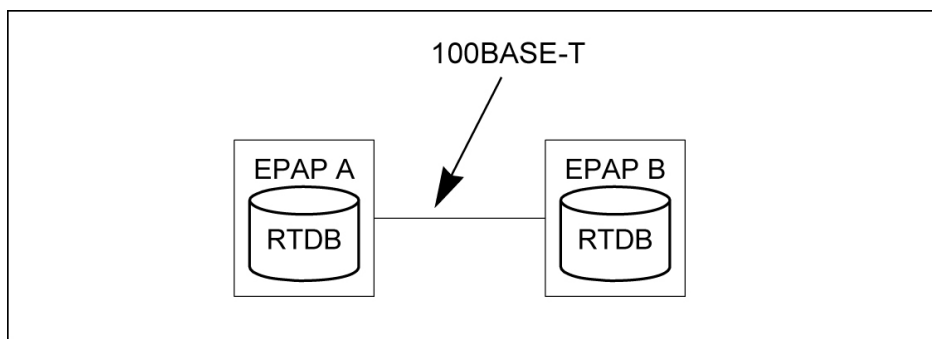


Although a dedicated network is recommended, it is possible that unrelated customer traffic can use the network as well. The determination, either to have a dedicated network or to allow other customer traffic, should be based on available external Ethernet bandwidth and network performance considerations.

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 5: EPAP Sync Network](#) on page 25.

Figure 5: EPAP Sync Network

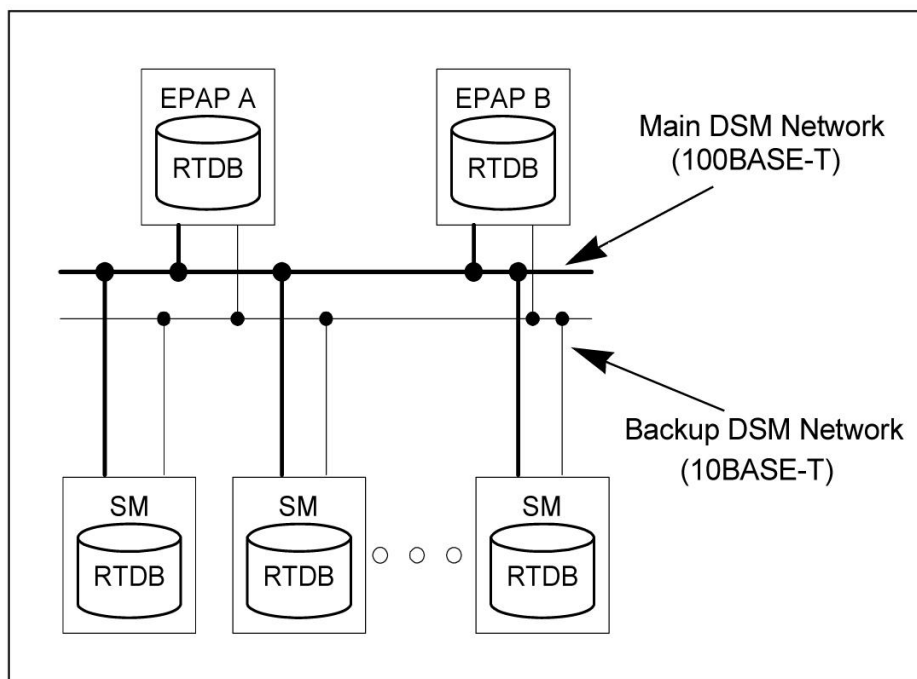


DSM Networks

The DSM networks are shown in [Figure 6: DSM Networks](#) on page 26. They carry provisioning data from the active EPAP RTDB to the Service Module cards. They also carry reload and maintenance traffic to the Service Module 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 Service Module card on a single EAGLE 5 ISS platform.

Figure 6: DSM Networks



Maintenance information is sent from the active EPAP to an arbitrarily selected Service Module card. The selected Service Module card is known as the primary Service Module card. 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 1918.)

The third octet is 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: EPAP IP Addresses in the DSM Network](#) on page 27 summarizes the contents of each octet.

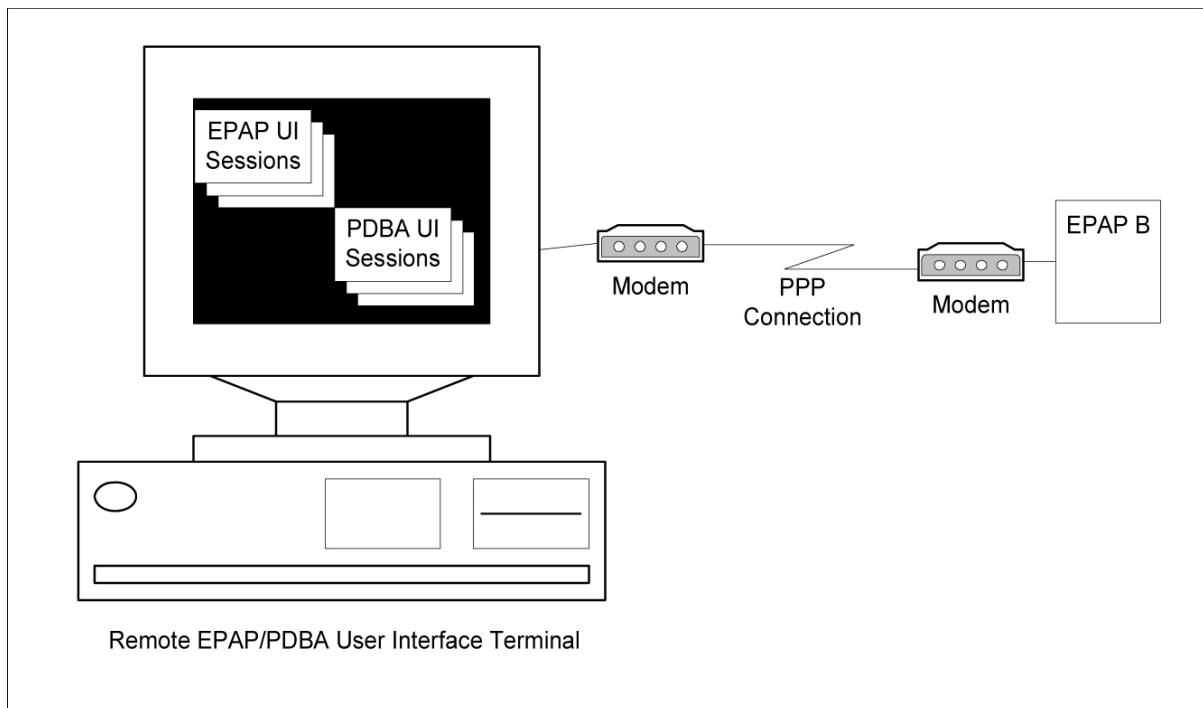
Table 2: EPAP IP Addresses in the DSM Network

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 7: Dial-Up PPP Network](#) on page 27.

Figure 7: Dial-Up PPP Network



Serviceability Hints

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

- [Mated Application Considerations](#) on page 28
- [Entity Point Codes and Routes](#) on page 28

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
- 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 8: G-Port Node in GSM Network on page 29 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, not known to be ported, or not identified 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-porting or porting-in.

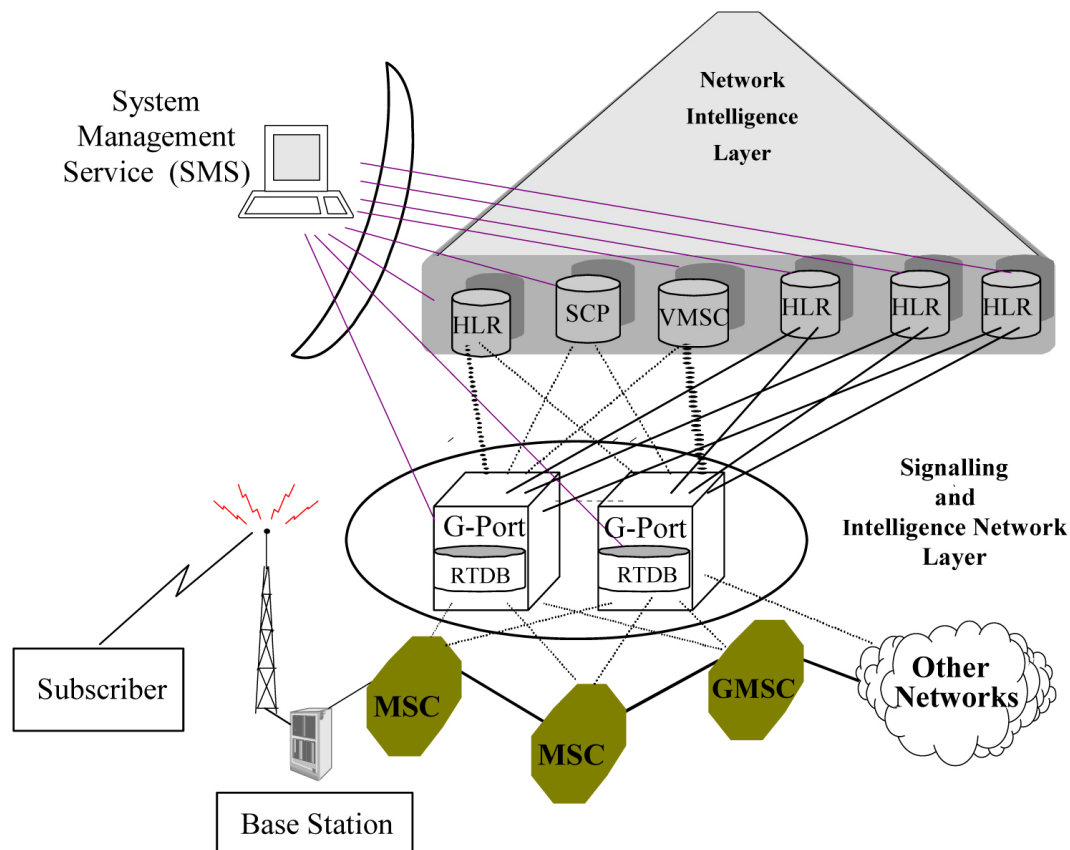
G-Port performs the following actions based on the message received and number status:

- If the message received is call-related SRI (not-SOR) and the number is porting-out, not known to be ported, or not identified to be ported, 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 porting-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-porting or porting-in, G-Port performs an HLR translation and forwards the translated message to the HLR.

An additional user option allows configuration of G-Port to modify the above processing as follows:

- If the number is not found in the RTDB (individual or range), then G-Port returns a negative acknowledgement in response to an SRI.

Figure 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

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

- **Service Module Card Main Board Verification**

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

- **Service Module Card Applique Memory Verification**

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



CAUTION

CAUTION: G-Port cannot be enabled if any of the Service Module 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 Service Module card 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 Service Module card is initializing, VSCCP checks if the Service Module card has at least 4GB of memory installed.
- **Real-Time Memory Validation (during card initialization)**. After communications between the Service Module card and EPAP have been established, and the Service Module card has joined the RMTP Tree, the EPAP starts downloading the RTDB to the Service Module card. After the Service Module 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 Service Module card. The Service Module card compares the size required to the amount of memory installed, and issues a minor alarm once the database exceeds 80% of the Service Module card memory. If the database completely fills the Service Module card memory, a major alarm is

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

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

When the hardware configuration for a Service Module card is determined to be invalid for the G-Port application, SCM automatically inhibits loading for that specific Service Module card. A major alarm is generated indicating that card loading for that Service Module card has failed and has been automatically inhibited (that is, prevented from reloading again). Refer to [G-Port Related Alarms](#) on page 159 for the specific alarm that is generated. When card loading has been inhibited, the primary state of the card is set to `oos-mt-dsbl'd`, and the secondary state of the card is set to `MEA` (Mismatch of Equipment and Attributes).

The following actions apply to a Service Module card determined to be invalid:

- The Service Module card will not download the EAGLE 5 ISS databases
- The Service Module card will not download the real-time RTDB from the EPAP.
- The Service Module 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 Service Module 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 Service Module cards results in some of the LIMs (Link Interface Module) being denied SCCP services. The threshold is monitored; if the number of valid Service Module cards is insufficient to provide service to at least 80% of the IS-NR LIMs, 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](#) on page 154.

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 [Maintenance and Measurements](#) on page 149.

G-Port Loading Mode Support

Loading mode support is not applicable for RTDB updates because Service Module cards use incremental loading from the EPAP. STP Administrative updates are allowed while a Service Module 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 Service Module 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 Service Module cards. The new audit mechanisms consist of the following.

- On each Service Module card and on the standby EPAP, a background audit calculates checksums for each G-Port RTDB 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 Service Module cards and the standby EPAP. If the database levels do not match, the standby EPAP or Service Module 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 MNPCRP 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, RNNDN, 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, then no prefix deletion is performed and G-Port processing continues.
- 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 RNNDN 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 3: G-Port Database Lookup](#) on page 37 shows call dispositions for the following configurations:

G-Port Only ([Table 3: G-Port Database Lookup](#) on page 37)

G-Port and IGM ([Table 4: IGM and G-Port Message Processing](#) on page 38)

The following notations apply to [Table 3: G-Port Database Lookup](#) on page 37 and [Table 4: IGM and G-Port Message Processing](#) on page 38:

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 – Prepaid1, Prepaid Short Message Service Intercept (PPSMS) subscriber on server #1
 - 4 – Prepaid2, PPSMS subscriber on server #2
 - 5 – IS41 GSM migrated subscriber with only GSM handset active
 - 6 – Prepaid3, PPSMS subscriber on server #3
- through
- 35– Prepaid32, PPSMS subscriber on server #32
 - 36 - Not identified to be ported
 - 255 - No portability type

RN = Routing Number

SOR = Support for Optimal Routing

SRI = Send Routing Information

SP = Signaling Point

NE = Network Entity

[Table 3: G-Port Database Lookup](#) on page 37 summarizes the actions taken based on the database result.

Table 3: G-Port Database Lookup

Message Type	MSISDN Found	Entity Result	MNPCRP on and HomeRN deleted from DN	Action
SRI	Yes	RN	No	SRI ack using RN prefix. If Portability Type = 0, 1, 2, 36, or <i>no status</i> is present with MSISDN, NPS will be encoded. For Portability Type = 36, NPS will have a value of 0.
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	Portability Type result is 0, 1, 2, or <i>no status</i>. SRI ack using MSISDN. Portability Type = 36 will map to NPS=0 in response. Portability Type = 0, 1, or 2 will have the values of 0, 1, or 2.
SRI	Yes	None	No	Portability Type result is 3 or 4. Fall through and perform GTT

Message Type	MSISDN Found	Entity Result	MNPCRCP on and HomeRN deleted from DN	Action
SRI	Yes	None	Yes	Issue UIM 1256 and fall through to GTT
SRI	No	N/A	N/A	Fall through and perform GTT
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 4: 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

NE/PT	SRI	SRI_SM	Other GSM
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 5: DigitAction Applications](#) on page 39 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 5: DigitAction Applications

DigitAction	Value in Incoming CdPA GTA	Value in Outgoing CdPA GTA	Meaning
none	886944000213	886944000213	No change to the Called Party GTA (default)
prefix	886944000213	1404886944000213	Prefix Called Party GTA with the entity id
replace	886944000213	1404	Replace Called Party GTA with the entity id

DigitAction	Value in Incoming CdPA GTA	Value in Outgoing CdPA GTA	Meaning
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 6: MAP Phase Determination](#) on page 41. (If the ACN does not match the one defined in ETSI GSM 03.18, the MAP version/phase is assumed to be from the `defmapvr` parameter of GSMOPTS specification.)

Table 6: MAP Phase Determination

Last Byte in ACN	MAP Phase
00	Specified by <code>defmapvr</code> parameter of a GSMOPTS command
01	Phase 1
02	Phase 2
03	Phase 2+
Greater than 3	Specified by <code>defmapvr</code> 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. If step #1 indicates that MNP SRF is required and the message is not a UDTs generated by the EAGLE 5 ISS, then the EAGLE 5 ISS performs SSN-based discrimination. If the message is a UDTs generated by the EAGLE 5 ISS, then regular GTT is performed on the message.
3. 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 CdPA GTAI are used for database lookup.
4. 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.

5. 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.
6. 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 on, 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.
7. 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.
8. 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 or not identified 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 through 35 (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 through 35, 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.
9. If the number is not found in the RTDB, then the GSMOPTS:SRIDNNOTFOUND option is queried.

10. If the GSMOPTS:SRIDNNOTFOUND option is set to SRINACK, then a negative acknowledgement is generated in response to the message.
11. If the GSMOPTS:SRIDNNOTFOUND option is set to GTT, then GTT is performed on the message.

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-portable 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.

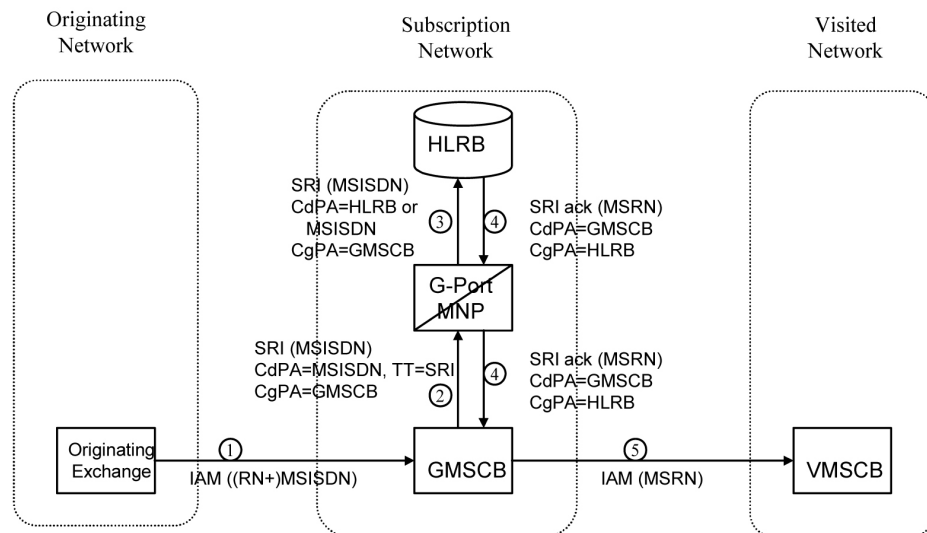
Several call flows refer to non-call related messages. Examples of non-call related messages are SRI for Short Message Service and SRI for Optimal Routing.

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-portable or imported number by indirect routing. Refer to [Figure 9: Mobile Terminated Call by Indirect Routing](#) on page 43 and see the steps in the flow for this call.

Figure 9: Mobile Terminated Call by Indirect Routing



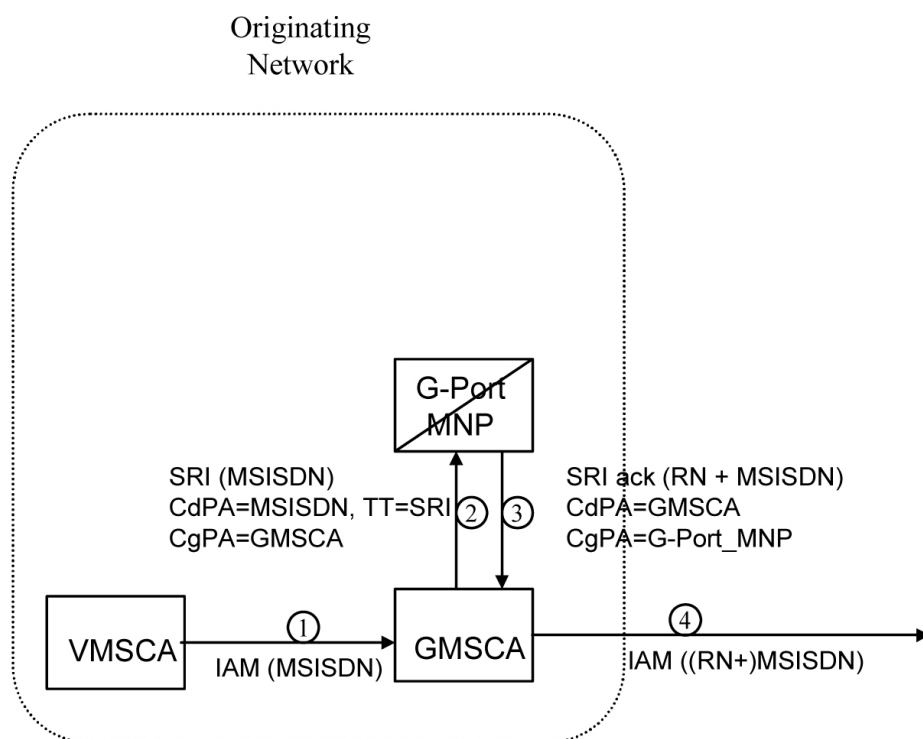
1. The originating exchange sends an IAM message to GMSCB in the subscription network. When the number is imported, the original number range owner network has already performed a NP database lookup and determined the new subscription network (Routing Number). As shown in the figure, this could be sent 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 10: Call to an Exported Number by Direct Routing](#) on page 44 and see the steps in the flow for this call.

Figure 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

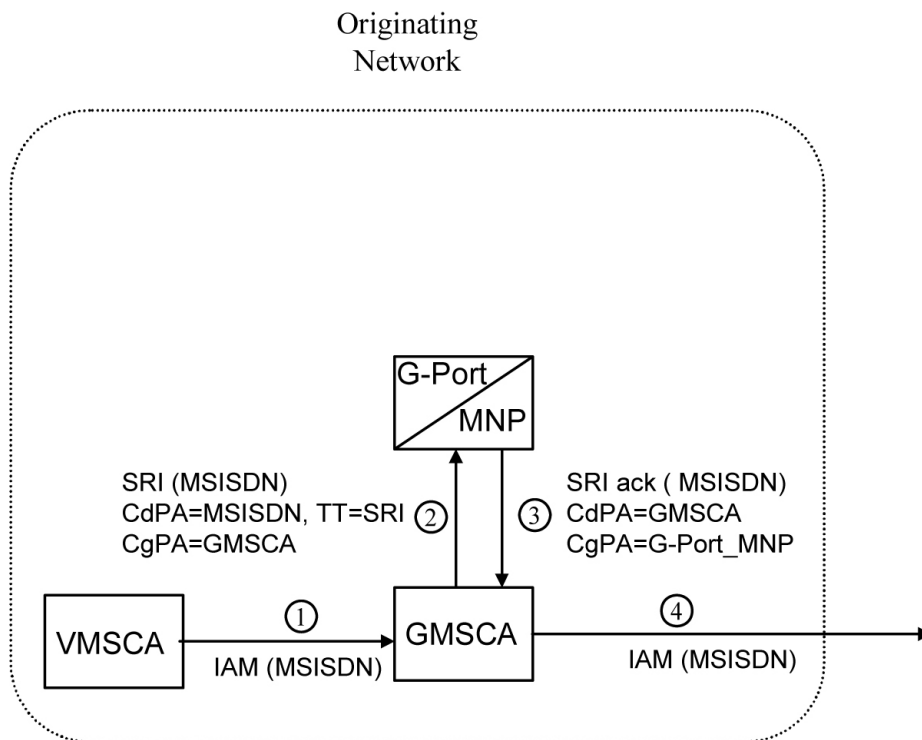
an SRI and uses the MSISDN from the MAP message to search the GPDB. A match is found with the Routing Number field populated.

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 11: MO/MT Call to Number Not Known to be Ported \(Direct Routing\)](#) on page 45 and see the steps in the flow for this call.

Figure 11: MO/MT Call to Number Not Known to be Ported (Direct Routing)



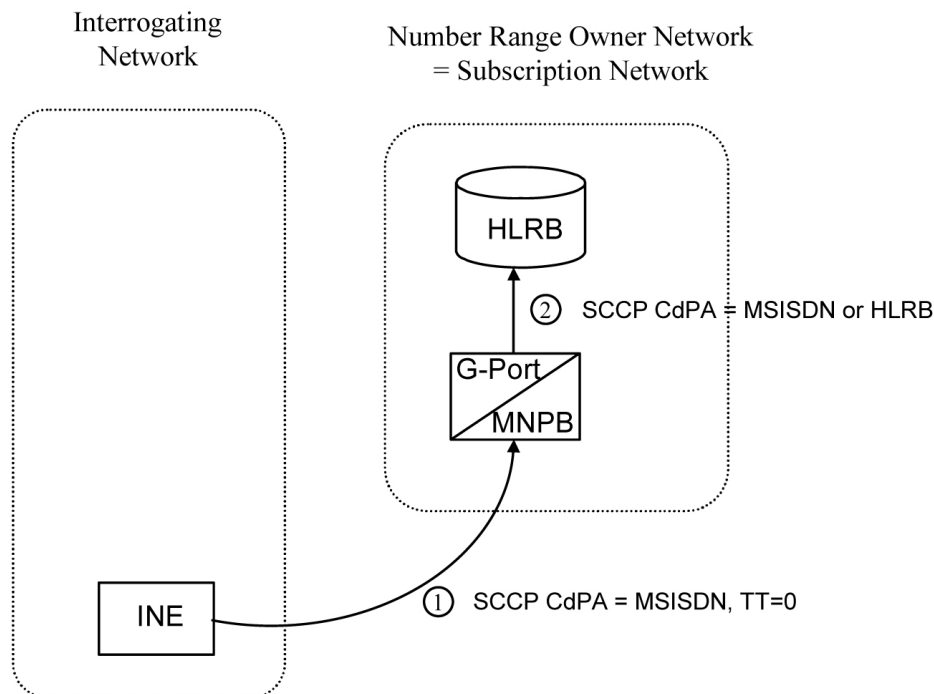
This call flow assumes the originating network is not the subscription network.

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 12: Non-Call Related Message for Non-Ported Number](#) on page 46 and see the steps in the flow for this call.

Figure 12: Non-Call Related Message for Non-Ported Number

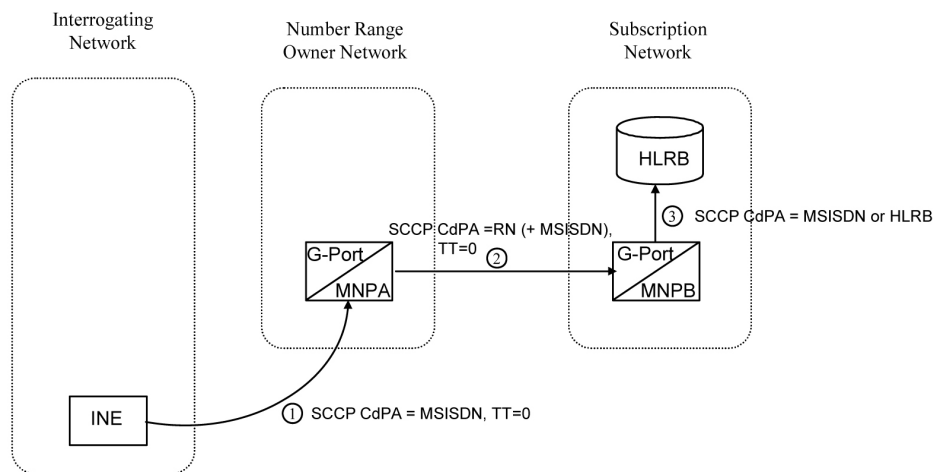


1. The Interrogating Network Entity (INE) sends the non-call related message to MNP-SRFB in the number range owner network. The SCCP CdPA contains the MSISDN number of the subscriber and the TT. The TT may be either 0 as shown in the figure, or another value depending upon the service, such as TT=17 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 13: Non-Call Related Message for Ported Number](#) on page 46 and see the steps in the flow for this call.

Figure 13: Non-Call Related Message for Ported Number

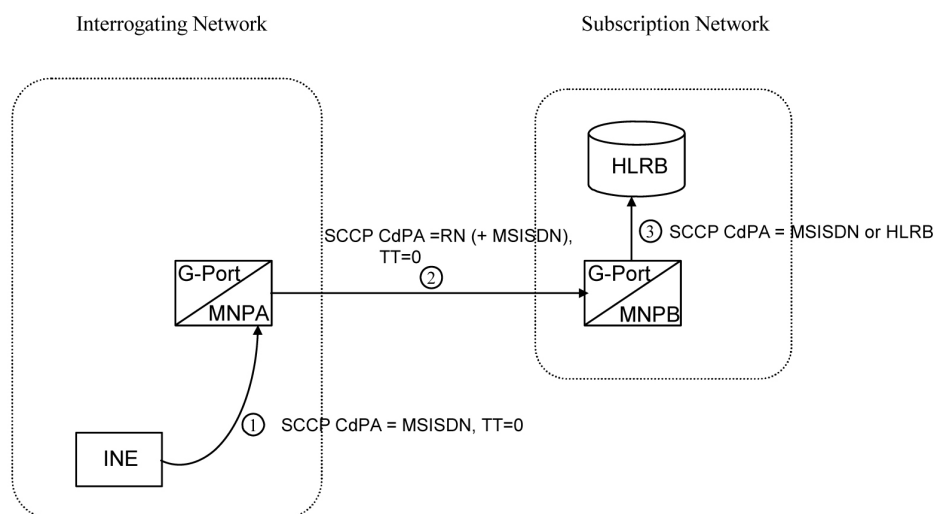


1. The Interrogating Network Entity (INE) sends a non-call related message to MNP-SRFA in the number range owner network. The SCCP CdPA contains the MSISDN number of the subscriber and the TT. The TT may be either 0 as shown in the figure, or another value depending upon the service, such as TT=17 for 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. 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 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. A match is found, and MNP-SRFB uses the HLR GT 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 14: Non-Call Related Message for Any Number](#) on page 47 and see the steps in the flow for this call.

Figure 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* on page 49

- [MNP Re-Routing](#) on page 49
- [MNP Capability Point Codes](#) on page 49

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 through 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:pci3=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:pci3=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 7: G-Port SCCP Service Re-Route Capability Summary](#) on page 51 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 7: 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 relation 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

Result of service selector	DPC	Alternate point code defined and available	GTT to be performed as fall through	Message Handling	Network Management
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 relation 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 8: G-Port LIM Re-Route Message Handling Summary](#) on page 52 shows the actions of LIM re-route functionality when TSM cards running the SCCP application are unavailable or down.

Table 8: 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

Routing Indicator in Incoming Message	DPC	Full or Partial Failure	G-Port Service Status	Message Handling	Network Management
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.					

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

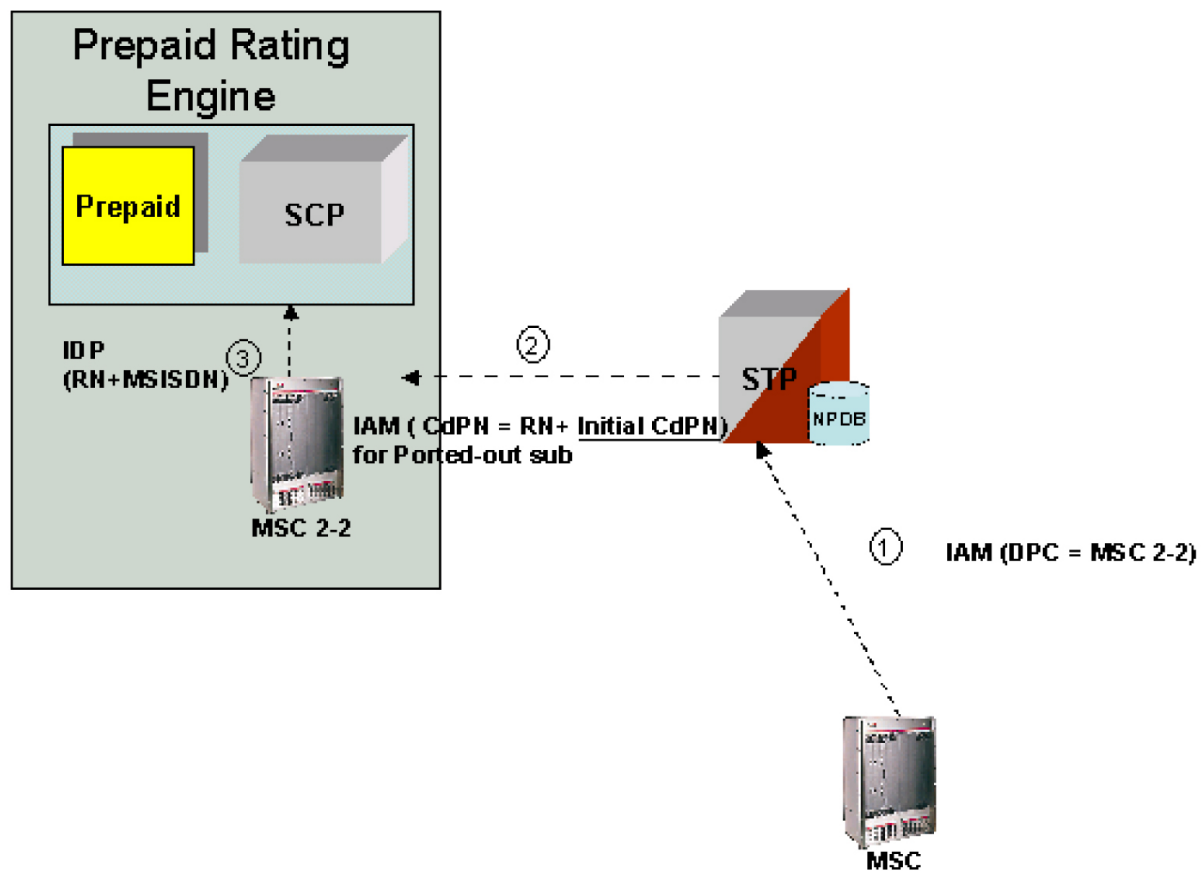
- OPC
- DPC
- SIO
- ISUP message type

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 15: ISUP NP with EPAP Call Flow for Ported Out CdPN](#) on page 54 for a depiction of this call flow.

Figure 15: 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

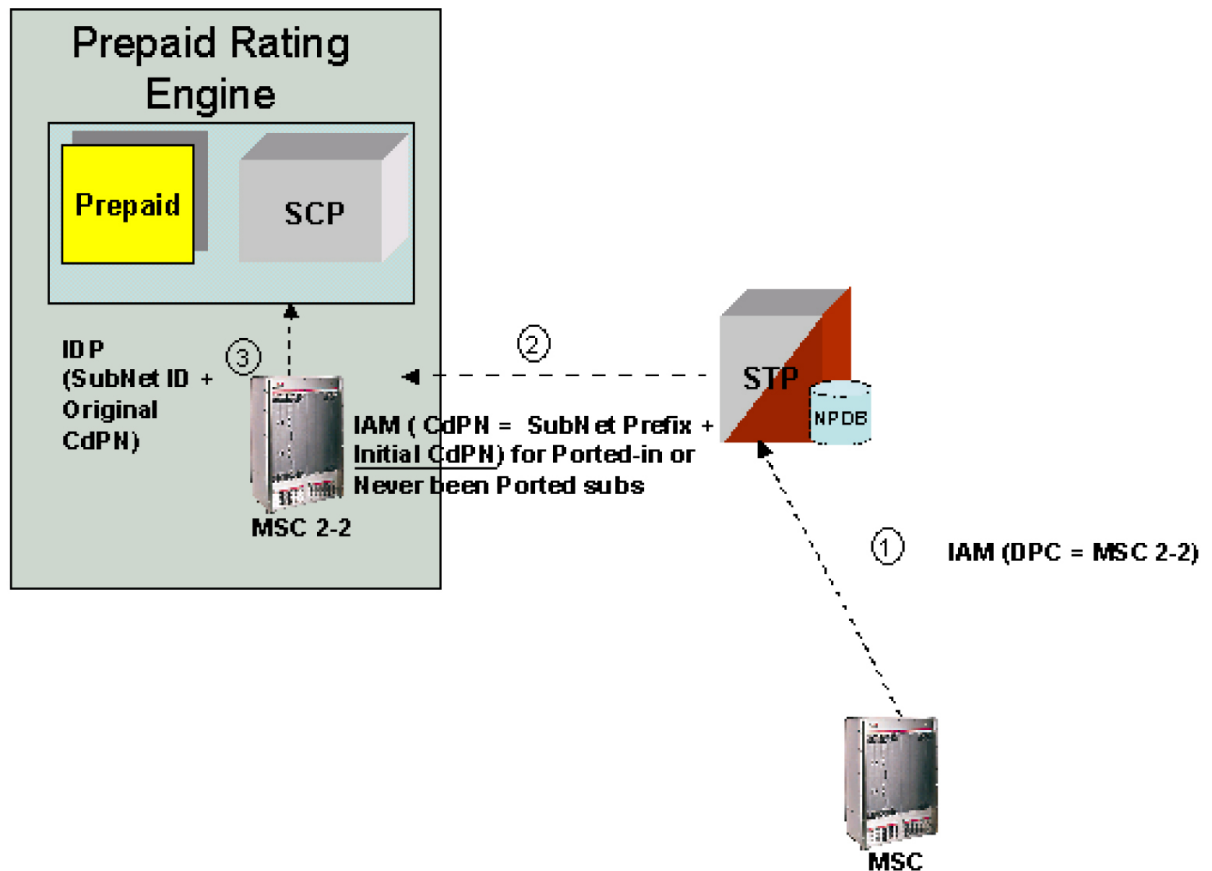
number deletion). If the DN is identified in the NPDB as a ported out number the EAGLE 5 ISS routes IAM (CdPN = RN + Initial CdPN).

3. MSC2-2 forwards an IDP (RN + Initial CdPN) to its destination.

For Ported-In and Never-Ported Subscribers

Refer to [Figure 16: ISUP NP with EPAP Call Flow for Ported-In/Never Ported CdPN](#) on page 55 for a depiction of this call flow.

Figure 16: 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 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). 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 Lookup to locate the SubNet Number. The SubNet ID lookup 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

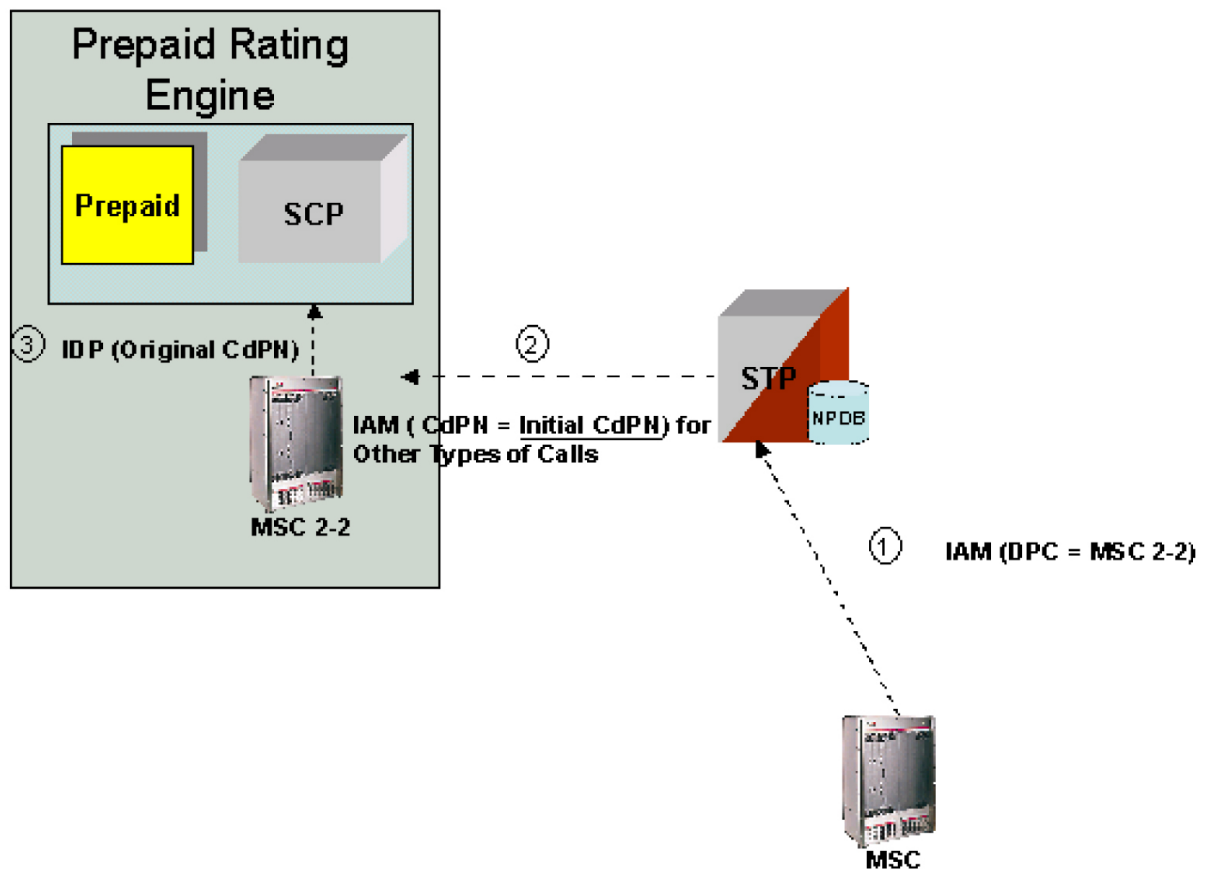
are provisioned with an SP in the NPDB). After the SubNet Number is identified, the EAGLE 5 ISS looks up the SubNet Prefix table to identify the prefix for the SubNet. The EAGLE 5 ISS prepends the SubNet prefix associated with the SubNet No to CdPN. The EAGLE 5 ISS routes IAM (CdPN = SubNet prefix + 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 17: ISUP NP with EPAP for All Other Cases](#) on page 56 for a depiction of this call flow.

Figure 17: 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.

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 GSMSMSOPTS database table. The MT-Based GSM SMS NP feature must be enabled before the following options in the GSMSMSOPTS table can be provisioned.

The content of the GSMSMSOPTS table is used to help perform number conditioning, response generation, and other feature-specific options. [Table 9: MT-Based GSM SMS NP Options](#) on page 58 shows the options stored in the GSMSMSOPTS table, their possible values, and the action taken for each value.

Table 9: MT-Based GSM SMS NP Options

GSMSMSOPTS 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	
	DN	
		Note: The MT-Based GSM SMS NP feature will require STPOPTS: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.
	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 GSMSOPTS:DefMCC setting. Note: The MT-Based GSM SMS NP feature requires GSMSOPTS:DefMCC to be set before the feature can be turned on. GSMSOPTS:DefMCC will not be allowed to change to

GSMMSOPTS Option	Value	Action in the EAGLE 5 ISS
		"NONE" as long as this feature is turned ON.
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). 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).
	RNDN	
	CCRNDN	
	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 GSMOPTS:DefMCC setting. Note: The MT-Based GSM SMS NP feature requires GSMOPTS:DefMCC to be set before the feature can be turned ON. GSMOPTS:DefMCC will not be allowed to change to "NONE" as long as this feature is turned ON.
	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

GSMSMSOPTS Option	Value	Action in the EAGLE 5 ISS
		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.
	Note: This option is applied to messages in which the source is considered to be a Home SMSC.	
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.
	Note: This option is applied to messages in which the source is considered to be a Home SMSC.	
MTSMSDLTR	NO (default)	This option specifies if delimiter digit(s) need to be inserted in the MTSMSIMSI and MTSMSNNI digits. A value of NO means that no delimiter is inserted.
	PRERN	This option specifies that a delimiter (MTSMSDLTRV) is

GSMSMSOPTS Option	Value	Action in the EAGLE 5 ISS
		to be inserted before the RN when the RN is used in the MTSMSIMSI and MTSMSNNI 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 MTSMSIMSI and MTSMSNNI 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 MTSMSIMSI and MTSMSNNI 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>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.</p> <p>Note: The MTSMSNAKERR is applicable to responses generated to both the SMSC and MMSC.</p>

GSMSMSOPTS Option	Value	Action in the EAGLE 5 ISS
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>Note: The order of checks performed follows:</p> <ol style="list-style-type: none"> 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 GSMSMSOPTS:MTMMMSGTA is not "NONE"), the SCCP CgPA GTA will be compared against GSMSMSOPTS: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. 2. If the Home MMSC check is not successful, AND

GSMMSOPTS Option	Value	Action in the EAGLE 5 ISS
		MTSMCHKSR 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 MMS 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

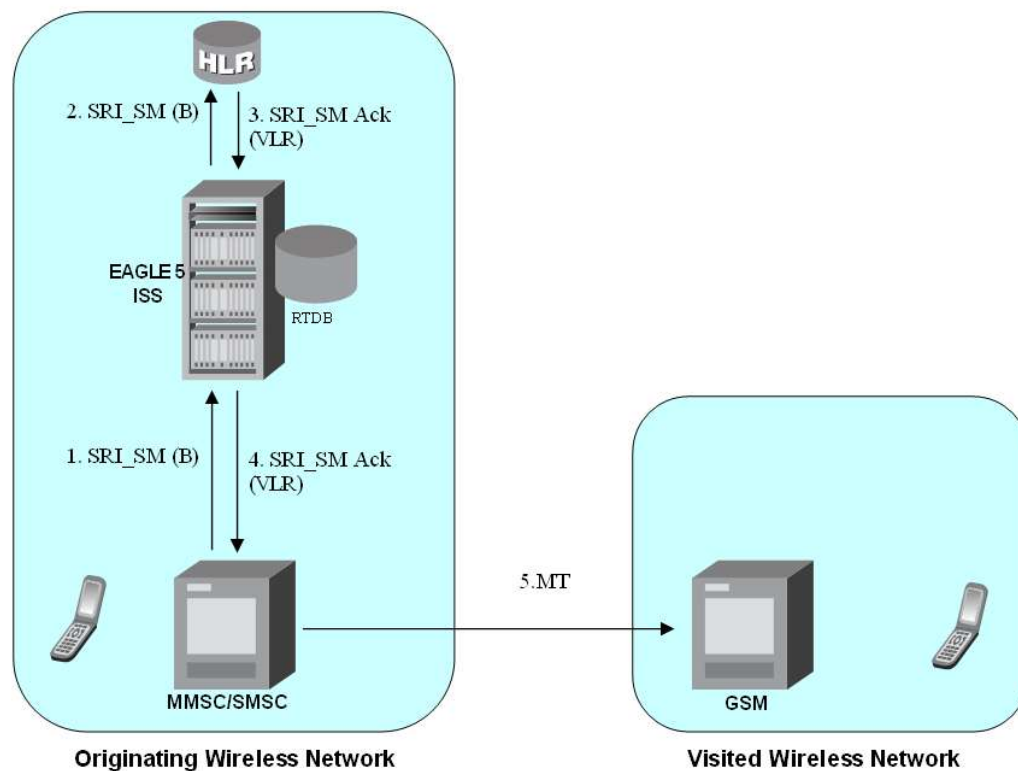
This section illustrates the sequence of messages that occur in the processing of SMS and MMS messages destined for mobile-terminated subscribers in a number portability environment. Two scenarios exist:

- 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 18: MT-Based GSM SMS and MMS NP Call Flow for In-Network Subscriber on page 63 depicts the message and control flows for a called subscriber that is in the same network as the calling subscriber.

Figure 18: MT-Based GSM SMS and MMS NP Call Flow for In-Network Subscriber



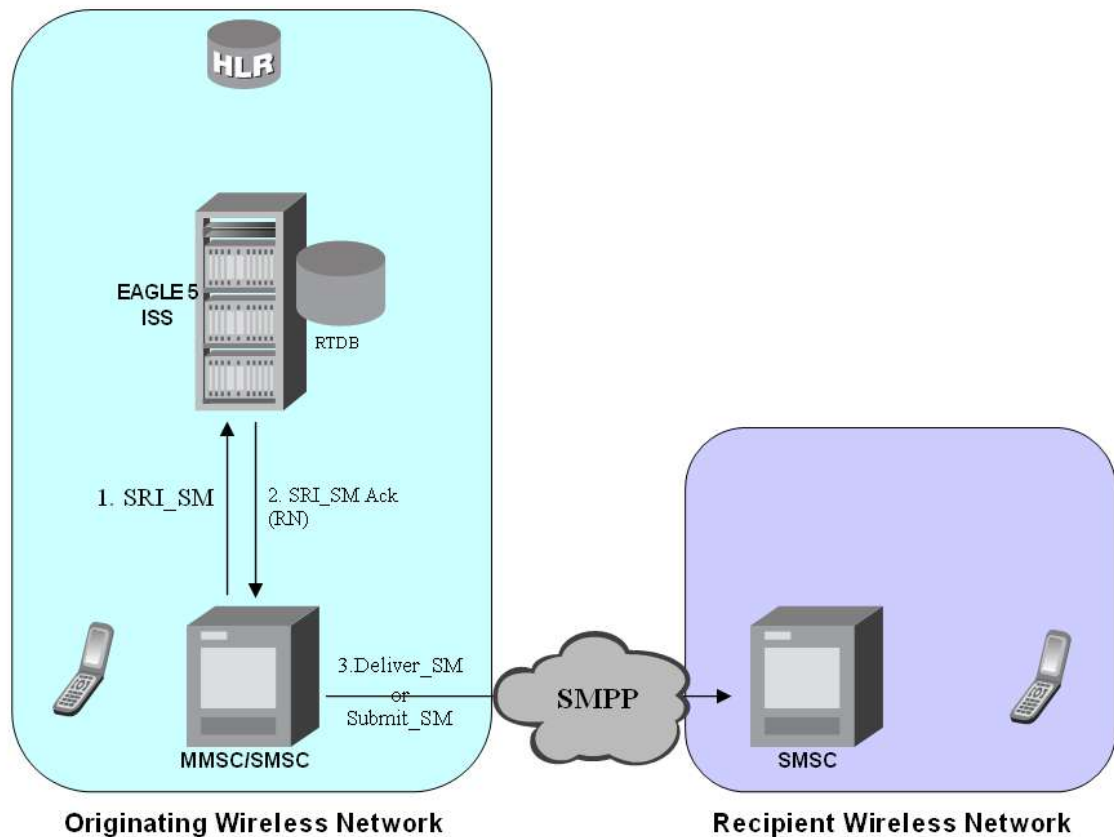
Call considerations:

- The TCAP calling party is a wireless GSM subscriber.
- The TCAP called party is a non-portable 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 19: MT-Based GSM SMS and MMS NP Call Flow for Other-Network Subscriber on page 64 depicts the message and control flows for a called subscriber that is a different network from the calling subscriber.

Figure 19: 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 GSMSMSOPTS database table. The MT-Based GSM MMS NP feature must be enabled before the GSMSMSOPTS table can be provisioned.

The content of the GSMSMSOPTS table is used to help perform number conditioning, response generation, and other feature-specific options. [Table 10: MT-Based GSM MMS NP Options](#) on page 67 shows the feature-specific options stored in the GSMSMSOPTS table, their possible values, and the action taken for each value.

Note: The options described in [Table 10: MT-Based GSM MMS NP Options](#) on page 67 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 GSMSMSOPTS options described for the MT-Based GSM SMS feature in [Table 9: MT-Based GSM SMS NP Options](#) on page 58.

Table 10: MT-Based GSM MMS NP Options

GSMSMSOPTS	Value	Action in the EAGLE 5 ISS
MTMMSGTA	5-21 hex digits (default is NONE)	<p>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 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>Note: The digits for compare can have more than the number of digits configured in MTMMSGTA</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

GSMSMSOPTS	Value	Action in the EAGLE 5 ISS
		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.
	Note: This option is applied to messages in which the source is considered to be a Home SMSC. 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.	
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.
	Note: This option is applied to messages in which the source is considered to be a Home SMSC. 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.	

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](#) on page 63.

GSM MAP SRI Redirect to Serving HLR

The GSM MAP SRI Redirect to Serving HLR feature provides the capability to resolve network problems introduced by maintaining equipment from multiple manufacturers with vendor-specific proprietary implementations. Normally, the G-Port feature relays an SRI message to an operator's own HLR for a ported-in number. This feature allows the operator to route those messages based on the type of equipment at the source MSC and destination HLR. Vendor Type, Vendor Number, and Vendor Prefix are used to provision this information.

If the originating Mobile Switching Center (MSC) of the Send Route Information (SRI) message and the destination Home Location Register (HLR) are the same vendor type, the message is relayed to the HLR associated in the RTDB to the service provider. If the originating MSC of the SRI message and the destination HLR are not the same vendor type, G-Port MNP checks whether the vendor type is deployed in more than one network; each network has its own vendor/network prefixes.

If the vendor types of the originating MSC and destination HLR are different and the destination HLR vendor type is deployed in more than one network, the vendor/network prefix that points to the network where the hosting HLR resides is appended. If the vendor types of the originating MSC and destination HLR are different and the vendor type of destination HLR is deployed in only one network, the vendor/network prefix that is assigned to the network is appended.

The GSM MAP SRI Redirect to Serving HLR feature supports provisioning of a Vendor Prefix List of up to three entries and a Vendor ID List of up to 200 entries. Each Vendor Prefix List entry contains the Vendor Number and associated Vendor Prefix (maximum of six digits). Each Vendor ID List entry contains the Vendor ID, Vendor Type, and Vendor (network) Number. All Vendor IDs must be the same length which is provisionable for 1 to 15 digits using the ent-vendid command. A Vendor ID cannot be entered into the database until the associated Vendor Prefix is defined.

Table 11: Vendor Prefix List example

Vendor Number	Vendor Prefix
1	1004
2	1003
3	1004

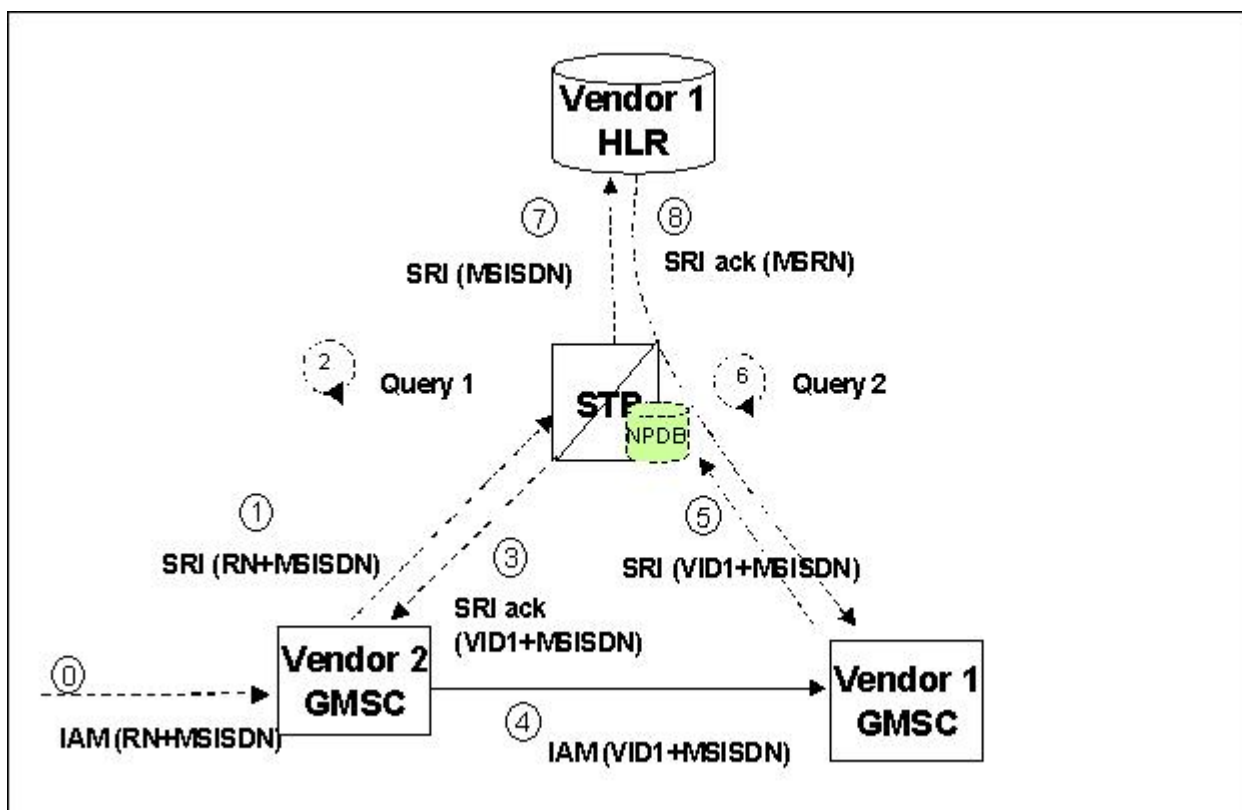
Table 12: Vendor ID List example

Vendor/Network Type	Vendor Number	Vendor ID
1	1	886932
1	1	886935
1	3	886938
2	2	886936

GSM MAP SRI Redirect to Serving HLR Call Flows

Refer to for a graphical representation description of the GSM MAP SRI Redirect to Serving HLR call flow.

Figure 20: GSM MAP SRI Redirect to Serving HLR Call Flows



For a ported-in number, Gateway Mobile Switching Center (GSMC) Vendor 2 receives an Initial Address Message (IAM) with CdPN.

1. The receiving GMSC interrogates the Home Location Register (HLR) for the current location of the subscriber by issuing a Send Route Information (SRI) message.
2. When an SRI message is received that meets the G-Port service selector criteria, HomeRN deletion and number conditioning are performed on the DN. The DN database is searched. If the DN is found in the database with a service provider (HLR entity address) associated with the called party MSISDN, the Vendor ID list is searched for the service provider. If the service provider is found in the Vendor ID list, the CgPA is checked for a valid length GTA. The Vendor ID list is searched for the CgPA GTA. If the CgPA GTA is found in the Vendor ID list, the two vendor numbers associated with the CgPA GTA and the service provider are compared. If the GMSC and the HLR are the same vendor type, go to step #7. If the GMSC and the HLR are different vendor types, go to step #3.
3. If the destination network belongs to a vendor type that is deployed in more than one network, an SRI_ACK is generated using the Vendor Prefix of the destination network as the RN. The MSRN is filled using various options provisioned in the GSMOPTS table for the G-Port SRI_ACK. The SRI_ACK is sent to the originating GMSC.

4. Based on the Vendor Prefix, the originating GMSC routes the call to the GMSC of the network associated with the vendor by the IAM.
5. The subscription network GMSC formulates and sends an SRI message to the Eagle 5 ISS to interrogate the current location of the subscriber.
6. G-Port MNP performs a database lookup based on the MSISDN in the SRI and determines that the number belongs to its network. The service provider (HLR entity address) associated with the MSISDN and the CgPA GTA (GMSC/MSC) are confirmed to be the same vendor type. .
7. The SRI is relayed to the HLR associated to the service provider.
8. The HLR returns an SRI_ACK to the GMSC through the Eagle 5 ISS.

Chapter 3

Commands

Topics:

- [*Introduction Page 74*](#)
- [*EAGLE 5 ISS Commands for G-Port Page 74*](#)
- [*Maintenance and Measurements User Interface Page 86*](#)

This chapter contains brief descriptions of the EAGLE 5 ISS commands that are used for the configuration, control, maintenance, and measurements of the G-Port, MT-Based GSM SMS NP, and MT-Based GSM MMS NP features.

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-Port RTDB.
- **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-Port RTDB. 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 CgPA SPC present in the SCCP part of the message. If no point code is present in the CgPA SPC, 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 `defcc` and `defndc` parameters can be specified only if the G-Port, Prepaid IDP Query Relay (IDPR), Prepaid SMS Intercept (PPSMS), V-Flex, or ATINP feature is enabled, or if the G-Flex, INP, or AINPQ feature is turned on. A command example follows:

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

Where:

`defcc`={1-3 digits, none} Default country code

`defndc`={1-5 digits, none} Default network destination code

Note: If the MT-Based GSM SMS NP or ATINP 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. The options that appear in the output vary, depending on the features that are enabled or turned 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 GSMOPTS table. The default parameters are always overwritten when specified.

Table 13: chg-gsmopts Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
defmapvr	Optional	1-3	Default MAP version
defmcc	Optional	1-3 digits, none	E212 default mobile country code
gsm2is41	Optional	1-15 digits, none	GSM to IS41 migration prefix
is412gsm	Optional	1-15 digits, none	IS-41 to GSM migration prefix.
migrpfx	Optional	multiple, single	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, rndn, ccrndn, rnccdn, rnasd, asdrn, rnasddn, asdrndn, ccrnasddn, ccasdrndn, rnasdcdn, asdrnccdn	RN used as-is or with MSISDN
msrnnai	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	digits (0-9, A-F, a-f) or none	New entity address of an IN platform for PPSMS
serverpfx	Optional	1-4 digits, none	Server SRI prefix

Parameter	Optional/ Mandatory	Range	Description
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
sridnnotfound	Optional	gtt, srinack	When G-Port encounters an RTDB query result that indicates that the given DN is not known, the SRIDNNOTFOUND parameter value determines further processing. The default value is gtt.

Command examples follow.

- `chg-gsmopts:srfnai=4:srfnp=2:srfaddr=331111111111`
- `chg-gsmopts:srfaddr=333221234567890:msrndig=rn:srfnai=1:srfnp=1:msrnnai=4:msrnp=10`
- `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 example shows the output if the G-Port feature is turned on.

```
tekelecstp 08-09-02 09:04:14 EST EAGLE 39.2.0
GSM OPTIONS
-----
DEFMCC          = NONE
SRFADDR         = 123456789abcdef
MSRNDIG         = RNASD
DEFMAPVR        = 1
SRIDN           = TCAP
IS412GSM        = 0123456789abcde
MSISDNTRUNC     = 0
MIGRPFIX        = SINGL
GSM2IS41        = NONE
```

```
SRIDNNOTFOUND = SRINACK
;
```

The following example shows the output if the G-Port feature is turned on and includes the Server Prefix digits. The SERVERPFX field does not appear if the G-Port feature is not on or if the Server Prefix string is not provisioned:

```
tekelecstp 08-03-02 09:04:14 EST EAGLE 39.2.0
GSM OPTIONS
-----
DEFMCC          = NONE
SRFADDR         = 123456789abcdef
MSRNDIG        = ASDRNDN
DEFMAPVR        = 1
SRIDN           = TCAP
IS412GSM        = 0123456789abcde
MSISDNTRUNC     = 3
MIGRPFX         = SINGLE
GSM2IS41        = NONE
SERVERPFX       = 0000
SRIDNNOTFOUND   = GTT
;
```

EAGLE 5 ISS GSM SMS Options Commands

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

The *mtmmsackn*, *mtmmsgta*, and *mtmmstype* parameters apply to only messages that are modified by the MT-Based GSM MMS NP feature. The MT-Based GSM MMS NP feature must be enabled to specify these parameters.

The *mtsmsackn*, *mtsmschksrc*, *mtsmsdltr*, *mtsmsdltrv*, *mtsmsimsi*, *mtsmsnakerr*, *mtsmsnni*, and *mtsmstype* parameters apply to only messages that are modified by the MT-Based GSM SMS NP feature. The MT-Based GSM SMS NP feature must be enabled to specify these parameters.

chg-gsmsmsopts

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

Table 14: chg-gsmsmsopts Parameters Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
mtmmsackn	Optional	ack, nack	MT-based MMS acknowledgement
mtmmsgta	Optional	5-21 digits, none	MT-based MMS GTA
mtmmstype	Optional	sp, rn, sprn, all, nonsp	MT-based MMS type

Parameter	Optional/ Mandatory	Range	Description
mtsmsackn	Optional	ack, nack	MT-based SMS acknowledgement
mtsmschksrc	Optional	yes, no	MT-based SMS check source
mtsmsdltr	Optional	no, prern, postrn	MT-based SMS delimiter
mtsmsdltrv	Optional	1-5 digits	MT-based SMS delimiter value
mtsmsimsi	Optional	rn, rndn, ccrndn, dn, srfimsi, mccrndn	MT-based SMS IMSI
mtsmsnakerr	Optional	0-255	MT-based SMS negative acknowledgement error
mtsmsnni	Optional	rn, rndn, ccrndn, dn, srfimsi, mccrndn, none	MT-based SMS network node indicator
mtsmstype	Optional	sp, rn, sprn, all, nonsp	MT-based SMS type

Command example:

- `chg-gsmsmsopts:mtsmsnakerr=55:mtsmsimsi=dn:mtsmsnni=rndn:mtsmstype=sprn`

rtrv-gsmsmsopts

Retrieve GSM SMS Options Command

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

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 ISS G-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:

Table 15: ent-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gtii, gtin, gtin24	Mandatory	2, 4	Global Title Indicator
serv	Mandatory	eir, gflex, gport, inpq, inpmr, smsmr, idps, idpr, mnp, vflex, atinp	GSM service
snai	Mandatory	1sub, natl, intl, rnidn, rnndn, rnsdn, ccrndn	Service Nature Of Address Indicator
snp	Mandatory	1e164, 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:

Table 16: chg-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gtii, gtin, gtin24	Mandatory	2, 4	Global Title Indicator
ssn	Mandatory	0-255, *	Subsystem Number

Parameter	Optional/ Mandatory	Range	Description
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	eir, gflex, gport, inpq, inpmr, smsmr, idpr, idps, mnp, vflex, atinp	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:

Table 17: dlt-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gtii, gtin, gtin24	Mandatory	2, 4	Global Title Indicator
ssn	Mandatory	0-255, *	Subsystem Number
tt	Mandatory	0-255	Translation Type
nai	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
naiv	Optional	0-127	NAI Value

Parameter	Optional/ Mandatory	Range	Description
np	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
npv	Optional	0-15	Numbering Plan Value

rtrv-srvsel: Retrieve G-Port Service 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:

Table 18: rtrv-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
gti, gtia, gtii, gtin, gtin24	Optional	2, 4	Global Title Indicator
nai	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
naiv	Optional	0-127	NAI Value
np	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
npv	Optional	0-15	Numbering Plan Value
serv	Optional	eir, gflex, gport, inpq, inpmr, smsmr, idps, idpr, mnp, vflex, atinp	GSM service
snai	Optional	sub, natl, intl, rnidn, rnndn, 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 ISS G-Port SCCP service commands (such as command rules and output format), refer to the *Commands Manual*.

chg-sccp-serv: Change G-Port SCCP 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:

Table 19: chg-sccp-serv Parameters - Class = DATABASE

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

Parameter	Optional/ Mandatory	Range	Description
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-Port SCCP Service Command – The `dlt-sccp-serv` command is used to 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:

Table 20: dlt-sccp-serv Parameters - 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 SCCP 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
ITUI 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, MT-Based GSM SMS NP, and MT-Based GSM MMS NP 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.

A temporary feature access key is associated with the MNPCRP feature. 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 SCCP GLP cards are provisioned. Refer to *Commands Manual* for details of this command.

enable-ctrl-feat: Enable Control Feature Command—The `enable-ctrl-feat` command is used for temporary 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, MT-Based GSM SMS NP, and MT-Based GSM MMS NP features. The MNPCRP, 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 MNPCRP feature. 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 to display the status of the features (on/off) and to show the trial period remaining if temporarily enabled.

EAGLE 5 ISS Database Commands

The `chg-db` commands copy the EAGLE 5 ISS TDM 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 Service Module cards.

Maintenance Commands

Refer to *Commands Manual* for detailed descriptions of all commands, parameters, parameter values, output examples, and restrictions. Commands described in this section include:

- [rept-stat-sys](#) on page 86
- [rept-stat-sccp](#) on page 87
- [rept-stat-mps](#) on page 87
- [rept-meas](#) on page 87
- [chg-measopts](#) on page 87
- [rept-stat-meas](#) on page 87
- [rept-ftp-meas](#) on page 87
- [rtrv-measopts](#) on page 87
- [rept-stat-trbl](#) on page 87
- [rept-stat-alm](#) on page 87
- [rept-stat-db](#) on page 88
- [inh-card / alw-card](#) on page 88
- [chg-sid / dlt-sid](#) on page 88
- [ent-card / rtrv-card / dlt-card](#) on page 88
- [chg-gpl / act-gpl / rtrv-gpl / rept-stat-gpl / copy-gpl](#) on page 88
- [ent-home-smisc / dlt-home-smisc / rtrv-home-smisc](#) on page 89
- [inh-alm / unhb-alm](#) on page 89
- [chg-ip-card / rtrv-ip-card](#) on page 89
- [chg-ip-lnk / rtrv-ip-lnk](#) on page 89
- [ent-ip-host / dlt-ip-host / rtrv-ip-host](#) on page 89
- [pass](#) on page 89, 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 Service Module 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.

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 Service Module card.
- `rept-stat-mps:loc=xxxx` - produces a detailed report showing the G-Port status of a specific Service Module card. This version of the command displays the percent utilization of a specific Service Module card memory.

rept-meas

This command includes G-Port measurements in the output sent to the EAGLE 5 ISS terminal.

chg-measopts

This command is used to enable or disable the automatic generation and FTP transfer of scheduled measurement reports to the FTP server.

rept-stat-meas

This command reports the status of the measurements subsystem including card location and state, Alarm level, and Subsystem State.

rept-ftp-meas

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

rtrv-measopts

This command generates a user interface display showing the enabled/disabled status of all FTP scheduled reports.

rept-stat-trbl

This command displays the G-Port subsystem and Service Module card/EPAP IP link alarms.

rept-stat-alm

This command displays the alarm totals of the G-Port subsystem and Service Module card/EPAP IP links.

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 xactive and standby EPAP databases. The command reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birthdates and levels.

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/Service Module card/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 to IS-NR if the loading is successful.

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.

ent-card / rtrv-card / dlt-card

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.

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 system removable cartridge or drive to the destination active and standby system disks as a "trial" version. The system release identification file is uploaded from the system removable cartridge or drive to the active and standby fixed drives along with each GPL. This command also provides a parameter to turn GPL auditing "on" and "off".

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 or removable cartridge or drive, 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, and 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 drive, or from the removable cartridge or drive to the fixed disk on the standby TDM.

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

The `ent-home-smsc` command is used to enter home Short Message Service Center (SMSC) addresses in the database.

The `dlt-home-smsc` command is used to delete home Short Message Service Center (SMSC) addresses in from the database.

The `rtrv-home-smsc` command is used to retrieve HOME SMSC specific addresses currently used to identify SMSCs in the database.

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.

chg-ip-card / rtrv-ip-card

The `chg-ip-card` command is used to provision the Internet Protocol networking parameters for any given Service Module card.

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

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.

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.

pass

The `pass` command allows remote execution of a selected command by the targeted card. These commands recognize the Service Module cards. 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 Service Module card location. Additional details for the `pass` command are available in *Commands Manual*.

pass:cmd="ping"

The 'ping' pass command supports troubleshooting of the private EPAP/DSM IP network. This 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/Service Module card IP network. This example demonstrates 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.

This example demonstrates 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. This command is not required for normal operation.

The following example 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 example 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
;

```


Chapter

4

Feature Activation

Topics:

- [*Introduction Page 94*](#)
- [*Prerequisites Page 95*](#)
- [*Feature Activation Overview Page 96*](#)
- [*G-Port Feature Activation Procedure Page 101*](#)
- [*ISUP NP with EPAP Provisioning and Activation Page 130*](#)
- [*MT-Based GSM SMS NP Feature Activation Procedure Page 132*](#)
- [*MT-Based GSM MMS NP Feature Activation Procedure Page 134*](#)
- [*G-Port SRI Query for Prepaid Feature Activation Procedure Page 135*](#)
- [*GSM MAP SRI Redirect to Serving HLR Feature Activation Procedure Page 136*](#)
- [*The 1100 TPS/Service Module Card for ITU NP Feature Page 137*](#)
- [*Activating the E5-SM4G Throughput Capacity Feature Page 143*](#)

This chapter describes the prerequisites, considerations, and steps to activate the G-Port feature. This chapter also includes the feature activation procedures for ISUP NP with EPAP, MT-Based GSM SMS NP, MT-Based GSM MMS NP, G-Port SRI Query for Prepaid, and GSM MAP SRI Redirect to Serving HLR features.

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. If you are not sure whether you have purchased a specific feature, contact your Tekelec Sales or Account Representative.

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

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

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. Contact 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)

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

- E5-SM4G Throughput Capacity

Summary of Feature Activation

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

Table 21: Feature Activation Summary

Feature Name	Part Number	Temporary FAK Available?	Permanently-On?
GSM Mobile Number Portability (G-Port)	893017201	No	Yes
MNP Circular Route Prevention (MNPCRP)	893007001	Yes	No
ISUP NP with EPAP	893013801	No	Yes
MT-Based GSM SMS NP	893020001	No	Yes
MT-Based GSM MMS NP	893024101	No	Yes
G-Port SRI Query for Prepaid	893017701	No	Yes
GSM MAP SRI Redirect to Serving HLR	893014001	No	Yes
1100 TPS/Service Module card for ITU NP	893018001	No	No
E5-SM4G Throughput Capacity	893019101	No	Yes

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 Service Module cards to be installed and the TSM cards to be removed are identified.

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

Note:

TSM cards use one card slot; Service Module 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 Service Module card IP addresses and have them available during the activation procedure.

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

**CAUTION:**

In an in-service environment and when replacing TSM cards with Service Module cards, initialize one Service Module card at a time. Verify its return to IS-NR state before initializing another Service Module 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 Service Module 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 Service Module 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 Service Module card available in their place. Redundancy is re-established after the two TSM cards running the SCCP application are replaced with a second Service Module card.

For in-service systems that already have the G-Flex and/or INP feature enabled, perform only steps [Step 70](#) on page 125 through [Step 86](#) on page 129 to turn on the G-Port feature. With the G-Flex and/or INP feature enabled, the Service Module cards already contain the RTDB database.

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

For new systems, GTT, EGTT, and VGTT features may be turned on prior to or immediately following the reboot of all Service Module 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](#) on page 101 section.

The feature activation consists of these sections:

- Configure system for HLR destinations ([Step 1](#) on page 101 through [Step 28](#) on page 110).
- Install Service Module cards in available slots and configure for VSCCP ([Step 29](#) on page 111 through [Step 44](#) on page 116).

- Replace TSM cards configured for SCCP with Service Module cards configured for VSCCP and inhibit/remove any remaining TSM cards running the SCCP application ([Step 45](#) on page 116 through [Step 69](#) on page 125.
- Turn on and configure the G-Port feature ([Step 70](#) on page 125 through [Step 86](#) on page 129.

[Step 1](#) on page 101 through [Step 28](#) on page 110 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](#) on page 101 through [Step 7](#) on page 102.
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](#) on page 102.
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

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](#) on page 102 through [Step 28](#) on page 110.
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](#) on page 102 to any `pca/pci/pcn` parameter.



CAUTION

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 HLR DPC.
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 Service Module cards running VSCCP application and TSM cards running SCCP application.

**CAUTION**

CAUTION: When adding Service Module cards in an in-service environment, take precautions to not interrupt traffic. Before replacing TSM cards with Service Module cards, first install a Service Module card in an available odd-even double-slot before removing the TSM cards to make additional room for other Service Module cards.

29. Install and configure Service Module cards in available odd-even slots as needed using [Step 30](#) on page 111 through [Step 44](#) on page 116.
30. Install Service Module cards in available odd-even slots and verify that the IMT bus LEDs are illuminated green.
31. Use `ent-card` command to enter Service Module card(s) configured for the VSCCP application into the database.
32. Use `rtrv-card` command to display new Service Module cards in database.
33. Use `rtrv-ip-lnk` command to display current link parameters associated with the Service Module card.
34. Use `chg-ip-lnk` command to set the IP address port and speed associated with the Service Module 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 Service Module card information.
40. Use `alw-card` command to boot Service Module card in TSM emulation mode.

41. Use `rept-stat-card` command to display IS-NR status of Service Module card.
42. Use `pass` command to test presence of EPAP hosts on network.
43. Repeat [Step 30](#) on page 111 through [Step 43](#) on page 115 to add all Service Module cards (N+1) to be installed in available slots.
Continue to the next step to begin replacing TSM cards.
44. Replace TSM cards with Service Module cards if applicable, and add Service Module cards to database using [Step 46](#) on page 116 through [Step 68](#) on page 125.
45. Use `rtrv-card` command to display TSM cards running the SCCP application 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 Service Module card in shelf and verify that the IMT bus LEDs are illuminated green.
54. Use `ent-card` command to enter the Service Module card into database.
55. Use `rtrv-card` command to display new Service Module card in database.
56. Use `rtrv-ip-lnk` command to display current parameters associated with the Service Module card.
57. Use `chg-ip-lnk` command to set the IP address port and speed associated with the Service Module card.
58. Use `rtrv-ip-lnk` command to display changed link parameters associated with the Service Module 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 Service Module card information.
64. Use `alw-card` command to boot the Service Module card in TSM emulation mode.
65. Use `rept-stat-card` command to display IS-NR status of the Service Module card.
66. Use `pass` command to test presence of EPAP hosts on network.
67. Repeat [Step 46](#) on page 116 through [Step 67](#) on page 124 to replace all adjacent TSM cards identified in the prerequisites and to be replaced with Service Module cards.
68. Repeat [Step 48](#) on page 117 through [Step 52](#) on page 118 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**

CAUTION: Contact the Tekelec Customer Care Center at this point for assistance completing this G-Port activation procedure (see [Customer Care Center](#) on page 3). Do not proceed without consulting with the Tekelec Customer Care Center.

69. Turn on G-Port feature and configure it using [Step 70](#) on page 125 through [Step 84](#) on page 129.
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](#) on page 126 through [Step 81](#) on page 128 describe the commands that administer the G-Port protocol flow to support:

- G-Port SRI ACK (Ported-out MSISDNs)
 - G-Port SRI ACK (Foreign MSISDNs not known to be ported)
 - G-Port Message Relay (Ported-in, non-porting 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 INP MR 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**

CAUTION: When the environment is in-service and TSM cards are being replaced with Service Module cards, initialize one Service Module 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=<Service Module card>` command to load RTDB, OAM, GPL, and GTT data to Service Module card.
81. Use `rept-stat-card` command to display IS-NR status of the Service Module card.
82. Repeat [Step 82](#) on page 129 and [Step 83](#) on page 129 to reboot each Service Module card.

Note: Once the G-Port feature is turned on, always boot the Service Module cards with the `init-card:loc=<Service Module 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 *Commands Manual* for detailed descriptions of the commands that are used in this procedure.

- 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 (step [Step 2](#) on page 101), the destination point codes (DPCs) (step [Step 3](#) on page 101, and the routes and linksets assigned to the DPCs (step [Step 4](#) on page 101).

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

- Display the current system self identification (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).

- Display the current destination point codes in the Destination table (`dpci/dpcn`) using the `rtrv-dstn` command.
- Display the current route configuration using the `rtrv-rte` command.
- If the system point code (`pci/pcn`) or capability point code (`cpcci/cpcn`) to be configured in this procedure is shown in steps [Step 2](#) on page 101, [Step 3](#) on page 101, or [Step 4](#) on page 101, choose another point code to configure with this procedure. Go to step [Step 9](#) on page 102).
- 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 to step [Step 7](#) on page 102.

Enter the `rtrv-stpopts` command and specify the ITU-N point code format option `npcfmt i`. The `npcfmt i` 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.

Optional: To change the format of the ITU-N point code, go to section “ITU National Point Code Formats” in *EAGLE 5 ISS Database Administration Manual - SS7*. Then continue with step [Step 7](#) on page 102.

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  MPCN          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, MPCN, 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](#) on page 101) and not in the destination point code table (see output of the `rtrv-dstn` command in step [Step 3](#) on page 101).
8. Change PC, CPC, DPC, route, linkset, and LIM card configurations for the HLR database using steps [Step 9](#) on page 102 through [Step 28](#) on page 110.



CAUTION

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 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](#) on page 102.

**CAUTION**

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 *Commands Manual* 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 logging in to the system in step [Step 11](#) on page 103. 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 change of the MASP role 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 logged in to the system in the KSR mode, the only response indicating the ability to log in to the system is the message 'UAM 0009, MASP became active'. UAM 0009 may 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.

11. 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](#) on page 104.

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 **DPCI** s.

```
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:

```

LSN          APCI  (SS7)  SCRNL3T  SLT          GWS GWS GWS
ls400001      2-200-2    scr1  1    2    no  a    0    on  off  off  no    on
CLLI         TFATCABMLQ  MTPRSE  ASL8
RLGHNCXA03W  1          no    no
LOC  LINK  SLC TYPE    SET BPS    MODE TSET ECM    PCR PCR
Link set table is (114 of 1024) 12% full

```

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

```

LSN          APCN  (SS7)  SCRNL3T  SLT          GWS GWS GWS
ls500001      21122    scr3  1    2    no  a    0    on  off  off  no    on
CLLI         TFATCABMLQ  MTPRSE  ASL8
RLGHNCXA03W  1          no    no
LOC  PORT  SLC TYPE    SET BPS    MODE TSET ECM    PCR PCR
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:l2tset=1
```

```
ent-slk:loc=1106:link=a:lsn=ls500001:slc=0:l2tset=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](#) on page 110.

19. Verify the changes using the `rtrv-slk` command, specifying the card location and ID of the signaling link entered in step [Step 18](#) on page 106.

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

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
           121111      240-111-111 idp1      ls100002 10 1-234-6
           121111      240-111-111 idp1      ls100003 20 1-234-7
           121111      240-111-111 idp1      ls100004 30 1-234-1
           121111      240-111-111 idp1      ls100005 40 1-234-2
           121111      240-111-111 idp1      ls100006 50 1-234-3
           121111      240-111-111 idp1      ls400001 10 1-200-2
2-100-2    121111      240-111-111 idp1
DPCN      ALIASA      ALIASI      CLLI      LSN      RC  APCN
21111      011-222-111 0-001-1      ndp1      ls200001 10 11111
           011-222-111 0-001-1      ndp1      ls200002 10 11112
           011-222-111 0-001-1      ndp1      ls200003 20 11113
           011-222-111 0-001-1      ndp1      ls200004 30 11114
           011-222-111 0-001-1      ndp1      ls200005 40 11115
           011-222-111 0-001-1      ndp1      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  MPCN          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](#) on page 106 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    OAM     IS-NR      Active  ---
1115  100-000-00002-000  MCAP   OAM     IS-NR      Active  ---
1116  100-000-00002-000  TDM    OAM     IS-NR      Active  ---
1117  100-000-00002-000  MDAL   OAM     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](#) on page 106 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
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    atmgyw        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 Service Module 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 Service Module cards as needed in available odd-even slots using steps [Step 30](#) on page 111 through [Step 45](#) on page 116.

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

30. Install the Service Module card in slots 1107 and 1108.

The Service Module 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 Service Module 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 21: Push in Inject/Eject Clamps



Push in the inject/eject clamps to lock the card in place.

- d) Verify that both IMT bus LEDs are green.
e) Install the cabling required to connect the Service Module card to the MPS.
Refer to the *Installation Manual* for details.

31. Add the Service Module card to the database and configure it as Service Module 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 Service Module 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 Service Module 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 Service Module 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 Service Module card in the database using the `chg-ip-lnk` command.

For this example, enter these commands:

```
chg-ip-lnk:loc=1107:port=a:dplex=half:ipaddr=192.168.122.1:mac-type=dix:speed=100:mcst=yes:submask=255.255.255.0
```

```
chg-ip-lnk:loc=1107:port=b:dplex=half:ipaddr=192.168.123.1:mac-type=dix:speed=10:mcst=yes:submask=255.255.255.0
```

where:

:loc

The card location of the Service Module 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 Service Module 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 Service Module card in the database by entering the `rtvr-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 `rtvr-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 Service Module card and must have a unique octet identifier for the card's IP address; we recommend numbering the Service Module cards sequentially, using values 1 to 25. (This example shows the assignment of the first Service Module 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 Service Module card. However, if your network configuration does require a default router to connect the Service Module card communication to the EPAP, then only one default router is assignable to each Service Module card. Assign the default router address to each Service Module card as shown in this step.

39. Enter local domain and IP router address for the Service Module 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 Service Module 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 Service Module 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 Service Module card that was added in step [Step 31](#) on page 111 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 Service Module card using the `rept-stat-card` command.

This is an example of the possible output.

```
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	100-000-00002-000	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](#) on page 3.

44. Repeat steps [Step 30](#) on page 111 through [Step 43](#) on page 115 to add all Service Module cards (N+1) to be installed in available slots.

Go to Step [Step 45](#) on page 116 to start replacing TSM cards with DSM cards.

45. Replace TSM card(s) with Service Module cards if applicable and add Service Module cards to the database using steps [Step 45](#) on page 116 through [Step 70](#) on page 125.

In this procedure, we are removing two existing adjacent TSM cards and replace them with a dual-slot Service Module card in slots 1101 and 1102.

Note: When adding Service Module cards in an in-service environment, you must take care not to interrupt traffic. Before replacing TSM cards with Service Module cards, first install a Service Module 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	atmgwy	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  100-000-00003-000  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      ---
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      ---
```

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  100-000-00003-000  TSM   SCCP   OOS-MT-DSBLD  Isolated  ---
1102  100-000-00003-000  TSM   SCCP   OOS-MT-DSBLD  Isolated  ---
1103  100-000-00002-000  ACMENET STPLAN  IS-NR        Active    ---
1104  100-000-00002-000  ACMENET STPLAN  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    VS CCP  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    ---
```

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](#) on page 118.

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 Service Module card requires two slots, the Service Module 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 Service Module 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 22: 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](#) on page 118 to remove the second TSM card.
54. Install the Service Module card in slots 1101 and 1102.
- a) Open the ejector levers on the Service Module 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 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 23: Push in Inject/Eject Clamps



Push in the inject/eject clamps to lock the card in place.

- d) Verify that both IMT bus LEDs are illuminated green.
- e) Install the cabling required to connect the Service Module card to the MPS.

Refer to the *Installation Manual* for details.

55. Add the Service Module 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 Service Module 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 Service Module 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 Service Module 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 Service Module 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 Service Module 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 Service Module 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 Service Module card and must have a unique octet identifier for the card IP address; we recommend numbering the Service Module cards sequentially, using values 1 to 25. (This example shows the assignment of the second Service Module 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 Service Module card. However, if your network configuration does require a default router to connect the Service Module card communication to the EPAP, then only one default router is assignable to each Service Module card. Assign the default router address to each Service Module card as shown in step [Step 63](#) on page 123.

63. Enter local domain and IP router address for the Service Module 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 Service Module card that was inhibited in step [Step 48](#) on page 117 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 Service Module 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 Service Module 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  100-000-00003-000  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      OAM      IS-NR    Active   ---
1115  100-000-00002-000  MCAP     OAM      IS-NR    Active   ---
1116  100-000-00002-000  TDM      OAM      IS-NR    Active   ---
1117  100-000-00002-000  MDAL     OAM      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](#) on page 3.

68. Repeat steps [Step 45](#) on page 116 through [Step 67](#) on page 124 to replace all adjacent TSM cards identified in the prerequisites and to be replaced with Service Module cards.
69. Repeat steps [Step 47](#) on page 117 through [Step 51](#) on page 118 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

CAUTION: At this point in the procedure, contact the [Customer Care Center](#) on page 3 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](#) on page 125 through [Step 84](#) on page 129.
71. Enter the enable-ctrl-feat command to enable the G-Port feature:
enable-ctrl-feat:partnum=893017201:fak=<Feature Access Key>
72. Enter the enable-ctrl-feat command to enable the G-Port feature:
chg-ctrl-feat:partnum=893017201: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:dsmad=on:npcfmt1=2-9-2-1
```

where:

:defcc

The default country code.

:defndc

The default network destination code.

:dsmad

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 INP MR 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 NAIV 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 Service Module card 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 NAIV 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 NAIV SNP SNAI SERV
4 0 e164 intl --- --- e164 intl gport
4 1 e164 intl --- --- e164 intl gport
```



CAUTION

CAUTION:

When the environment is in-service and Service Module cards are being replaced with TSM cards, initialize one card at a time. Verify its return to IS-NR state before initializing another Service Module 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 Service Module card running the VSCCP application causes both the OAM and RTDB databases on the Service Module card to reload.

82. Reload a Service Module 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:

```
RLGHNCXA03W 01-10-07 00:30:42 GMT EAGLE 37.0.0
```

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	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	---

84. After the `init-card` and the `rept-stat-card` commands show that service is successfully restored, repeat steps [Step 82](#) on page 129 and [Step 83](#) on page 129 for each Service Module 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 Service Module cards are loaded and are IS-NR (in-service normal) status.
 - Use `rept-stat-mps` to verify that all your Service Module cards and the EPAP are connected and operational.
 - Use `rept-stat-db:display=all` to verify that database levels are identical for the EPAP PDB and RTDB and the RTDBs on the Service Module cards.

The G-Port feature is now enabled, turned on, and operating in the system.

ISUP NP with EPAP Provisioning and Activation

This section presents the general sequence of the provisioning required to support ISUP NP with EPAP on the EAGLE 5 ISS. This procedure assumes G-Port, GWS, and GTT are provisioned and activated. [Table 22: SubNet Prefix Table Example](#) on page 130 and [Table 23: SubNet ID List Example](#) on page 130 are included with example provisioning data used in the provisioning and activation procedure.

Table 22: SubNet Prefix Table Example

SubNet No.	SubNet Prefix
1	1001
2	1002
3	1003
4	1004
5	1005

Table 23: 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 ISUP NP 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 ISUP NP with EPAP feature.
`enable-ctrl-feat:partnum=893013801:fak=<Feature Access Key>`
3. Enter the chg-prefix-feat command to relate the ISUP NP 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 *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 *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:sr=isl:isupmt=1:nsfi=STOP:actname=fet
```

- c) Commands to allow all other types of ISUP messages for normal processing

```
ent-scr-dpc:sr=dpc1:zone=2:area=102:id=1:nsfi=isup:nsr=isl
```

- 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
```

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, refer to *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](#) on page 101 before proceeding.

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 `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 GSMOPTS 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.

For example, enter this command:

```
chg-gsmopts:defmcc=253
```

where:

defmcc

Specifies the E212 default mobile country code.

8. Verify the changes using the `rtrv-gsmopts` command.
This command displays GSM system options from the database.
9. Enter the `rtrv-gsmsmsopts` command to view the values of the GSMSMSOPTS table options.
10. If desired, change the GSM SMS options in the database for the MT-Based GSM SMS NP feature using the `chg-gsmsmsopts` command.

Note: MTSMSDLTRV must be set to a value other than "NONE" before MTSMSDLTR can be set to either PRERN or POSTRN. For details about all options that can be changed using the `chg-gsmsmsopts` command, see the *Commands Manual*.

For example, enter this command:

```
chg-gsmsmsopts:mtsmsimsi=mccrndn:mtsmstype=rn
```

where:

mtsmsimsi

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.

11. Verify the changes using the `rtrv-gsmsmsopts` command.
This command displays all GSM SMS options from the database.
12. If the value of GSMSMSOPTS:MTSMSCHKSRC=YES, then provision the home SMSC table entries using the `ent-home-smsc` command.

For example, enter this command:

```
ent-home-smsc:smc=552611646
```

13. 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.
14. Verify that the G-Port Feature is turned on using the `rtrv-ctrl-feat` command.

15. If the G-Port Feature is not turned on, see [Step 72](#) on page 125 of the [G-Port Feature Activation Procedure](#) on page 101 before proceeding.
16. 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, refer *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](#) on page 132 before proceeding.
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-gsmsmsopts` command to view the values of the GSMSMSOPTS table option.
5. If desired, MT-Based GSM MMS NP feature options may be changed with this command.

For example, enter this command:

```
chg-gsmsmsopts: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-gsmsmsopts` command, see the *Commands Manual*.

6. Verify the changes using the `rtrv-gsmsmsopts` command.

This command displays the GSM SMS options from the database.

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, refer to the [MT-Based GSM SMS NP Feature Activation Procedure](#) on page 132 before proceeding.
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.

G-Port SRI Query for Prepaid Feature Activation Procedure

This procedure is used to activate the G-Port SRI Query for Prepaid feature.

Before this feature can be enabled, the G-Port feature must be enabled and turned on.

The G-Port SRI Query for Prepaid feature cannot be enabled with a Temporary Feature Access key (FAK).

The G-Port SRI Query for Prepaid feature cannot be turned off after the feature is turned on.

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

1. Verify that the G-Port Feature is enabled and turned on using the `rtrv-ctrl-feat` command.
2. If the G-Port Feature is not enabled and turned on, enable and turn on the G-Port feature using [G-Port Feature Activation Procedure](#) on page 101 before proceeding.
3. Enter the `enable-ctrl-feat` command to enable the G-Port SRI Query for Prepaid feature.
`enable-ctrl-feat:partnum=893017701:fak=<Feature Access Key>`

4. Enter the `ent-gserv-data` command to provision the translation type, originating point code, or global title address data in the GSERV table.

These values are used to determine whether a Send Routing Information (SRI) request receives G-Port SRI Query for Prepaid service or normal G-Port service..

Command example:

```
ent-gserv-data:tt=77
```

where:

tt

Translation Type.

5. Verify the new values of the GSERV table using the `rtrv-gserv-data` command.
6. Enter the `chg-ctrl-feat` command to turn on the G-Port SRI Query for Prepaid feature.
`chg-ctrl-feat:partnum=893017701:status=ON`

The G-Port SRI Query for Prepaid feature is now enabled, turned on, and operating in the system.

GSM MAP SRI Redirect to Serving HLR Feature Activation Procedure

This procedure is used to activate the GSM MAP SRI Redirect to Serving HLR feature.

Before this feature can be enabled, the G-Port feature must be enabled and turned on.

The GSM MAP SRI Redirect to Serving HLR feature cannot be enabled with a Temporary Feature Access Key.

The GSM MAP SRI Redirect to Serving HLR feature cannot be turned off after the 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 and turned on using the `rtrv-ctrl-feat` command.
2. If the G-Port Feature is not enabled and turned on, enable and turn on the G-Port feature using [G-Port Feature Activation Procedure](#) on page 101 before proceeding.
3. Enter the `enable-ctrl-feat` command to enable the GSM MAP SRI Redirect to Serving HLR feature.

```
enable-ctrl-feat:partnum=893014001:fak=<Feature Access Key>
```

4. Enter the `chg-prefix-feat` command to relate the GSM MAP SRI Redirect to Serving HLR feature to vendor prefix values, and to specify the prefix numbers that associate to entries in the Vendor ID List. A maximum of three prefix values can be entered in the Vendor Prefix Table for the GSM MAP SRI Redirect to Serving HLR feature.

Command examples:

```
chg-prefix:feature="gsm map sri redirect"prefixnum=1:prefix=1004
```

```
chg-prefix:feature="gsm map sri redirect"prefixnum=2:prefix=1003
```

```
chg-prefix:feature="gsm map sri redirect"prefixnum=3:prefix=1004
```

where:

feature

Feature Name.

prefixnum

Prefix Number. GSM MAP SRI Redirect to Serving HLR feature uses 1 - 3.

prefix

Prefix Value.

5. Verify the Vendor Prefix Table entries using the `rtrv-prefix` command.
6. Enter Vendor ID Length for the Vendor ID List using the `ent-vendid` command.

Command example:

```
ent-vendid:vendidlen=6
```

where:

vendidlen

Vendor ID Length. All Vendor IDs defined for the GSM MAP SRI Redirect to Serving HLR feature must contain this number of digits.

7. Enter the Vendor IDs and Vendor Numbers using the `ent-vendid` command.

Command example:

```
ent-vendid:vendid=886932:vendnum=1:vendtype=1
ent-vendid:vendid=886936:vendnum=1:vendtype=1
ent-vendid:vendid=886935:vendnum=2:vendtype=2
ent-vendid:vendid=886938:vendnum=3:vendtype=1
```

where:

vendid

Vendor ID.

vendnum

Vendor Number, used as a reference to the Vendor prefix.

vendtype

Vendor Type.

8. Verify that all G-Port provisioning information is specified: service selector, HomeRN deletions, default GTT, and GSMOPTS values.
9. Enter the `chg-ctrl-feat` command to turn on the GSM MAP SRI Redirect to Serving HLR feature.

```
chg-ctrl-feat:partnum=893014001:status=ON
```

The GSM MAP SRI Redirect to Serving HLR feature is now enabled, turned on, and operating in the system.

The 1100 TPS/Service Module Card for ITU NP Feature

This procedure is used to enable and turn on the 1100 TPS/Service Module card for ITU NP feature. This feature provides up to 26,400 transactions per second when the maximum number of Service Module 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 Service Module cards that are rated at 850 transactions per second (TPS).



CAUTION

CAUTION: The increase of the Service Module card capacity, 1100 TPS per Service Module 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/Service Module card 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/Service Module card for ITU NP feature, 893018001.

After the 1100 TPS/Service Module card 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/Service Module card for ITU NP feature, 893018001.

:status=on

Used to turn the 1100 TPS/Service Module card for ITU NP feature on.

Activating the 1100 TPS/Service Module Card for ITU NP Feature

The 1100 TPS/Service Module card for ITU NP feature cannot be enabled with a temporary feature access key.

The 1100 TPS/Service Module card for ITU NP feature cannot be enabled if:

- The EAGLE 5 ISS does not contain any Service Module 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 serial number of the EAGLE 5 ISS, 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/Service Module card 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 Service Module cards must be provisioned and installed in the EAGLE 5 ISS.

1. Display the status of the 1100 TPS/Service Module card 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 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

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/Service Module card for ITU NP feature is enabled, shown by the entry 1100 TPS/Service Module card for ITU NP, and its status is *on*, no further action is necessary.
 - If the feature is enabled and its status is *off*, go to [Step 13](#) on page 141.
 - If the `rtrv-ctrl-feat` output shows that the LNP feature is enabled, this procedure cannot be performed. The 1100 TPS/Service Module card for ITU NP feature cannot be enabled if the LNP feature is enabled.
 - If the 1100 TPS/Service Module card for ITU NP and LNP features are not enabled, go to the next step.

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 the next step.)

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](#) on page 140.
- If the G-Flex feature is turned on, go to the next step.

4. Verify that the ANSI G-Flex option is not enabled or turned on by entering the `rtrv-stpopts` command.

The 1100 TPS/Service Module card 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. Go to [Step 6](#) on page 140.
5. Determine whether the GTT feature is turned on by examining the output of the *rtrv-feat* command.

The 1100 TPS/Service Module card 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](#) on page 139.

- If the GTT feature is turned on, go to the next step.
 - If the GTT feature is turned off, perform "Adding a Service Module" in the *Database Administration Manual - Global Title Translation* manual to turn the GTT feature on and to add the required number of Service Module cards to the database. After "Adding a Service Module" has been performed, go to [Step 11](#) on page 141.
6. Verify the number of Service Module 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 37.5.0
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 the previous step, do one of the following:
- If the required number of Service Module cards are provisioned in the database, go to the next step.
 - If the required number of Service Module cards are not provisioned in the database, perform "Adding a Service Module" in the *Database Administration Manual - Global Title Translation* to add the required number of Service Module cards to the database. After "Adding a Service Module" has been performed, go to the next step.
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 the previous step, and do one of the following:
 - If the serial number is correct and locked, go to [Step 13](#) on page 141.
 - If the serial number is correct but not locked, go to [Step 12](#) on page 141.
 - 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](#) on page 3 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](#) on page 140 was entered correctly:
 - a) Enter 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
```

- b) If the serial number was not entered correctly, repeat [Step 10](#) on page 141 and [Step 11](#) on page 141 and re-enter the correct serial number.
12. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in [Step 8](#) on page 140 (if the serial number shown in [Step 8](#) on page 140 is correct) or with the serial number shown in [Step 10](#) on page 141 (if the serial number was changed in [Step 10](#) on page 141), 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/Service Module card 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/Service Module card
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/Service Module card 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/Service Module card for ITU NP feature on, skip this step and go to [Step 16](#) on page 142. If you do not turn this feature on, the transaction rate will remain at 850 TPS/Service Module card.
- If you do wish to turn on the 1100 TPS/Service Module card for ITU NP feature, enter the chg-ctrl-feat command, specifying the 1100 TPS/Service Module card for ITU NP feature part number used in [Step 13](#) on page 141 and the status=on parameter and enter the command again as shown in the next step.

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

CAUTION: If the EPAP-based traffic is higher than 70% of all traffic on the EAGLE 5 ISS, the Service Module card's performance may not reach 1100 TPS per Service Module card.

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/Service Module card for ITU NP feature part number specified in [Step 14](#) on page 142 or [Step 15](#) on page 142.

```
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/Service Module card for ITU NP feature, enter the `chg-ctrl-feat` command, specifying the 1100 TPS/Service Module card feature part number used in [Step 14](#) on page 142 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/Service Module card 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 Service Module cards, and Service Module cards cannot be installed in the EAGLE 5 ISS unless HIPR cards are installed in all shelves containing Service Module cards. Enter the `rept-stat-gpl:gpl=hipr` command to verify if HIPR cards are installed in all shelves containing Service Module 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	Status	Quantity	Trial Period Left
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](#) on page 145 through [Step 7](#) on page 147, and go to [Step 8](#) on page 147.

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](#) on page 145.

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](#) on page 145

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](#) on page 145.

If the GTT feature is turned on, go to [Step 4](#) on page 146. 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 Service Module cards to the database

After the "Adding a TSM card running the SCCP application" has been performed, skip [Step 4](#) on page 146, and go to [Step 5](#) on page 146.

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 Service Module cards is provisioned in the database, go to [Step 5](#) on page 146.

If the required number of Service Module cards is not provisioned in the database, perform the "Adding a TSM card running the SCCP application" in the *Database Administration Manual - Global Title Translation* to add the required number of Service Module cards to the database. After the "Adding a TSM card running the SCCP application" has been performed, go to [Step 5](#) on page 146.

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 Service Module cards, go to [Step 6](#) on page 146.

If HIPR cards are not installed on all shelves containing Service Module 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](#) on page 146.

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](#) on page 147, [Step 8](#) on page 147, and [Step 9](#) on page 147, and go to [Step 10](#) on page 147. If the serial number is correct but not locked, skip [Step 7](#) on page 147 and [Step 8](#) on page 147, and go to [Step 9](#) on page 147. 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](#) on page 3 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](#) on page 147 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](#) on page 147 and [Step 8](#) on page 147 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](#) on page 146 , if the serial number shown in [Step 6](#) on page 146 is correct, or with the serial number shown in [Step 8](#) on page 147 , if the serial number was changed in [Step 7](#) on page 147 , 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](#) on page 148 and go to [Step 12](#) on page 148.

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](#) on page 147 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](#) on page 147 or [Step 11](#) on page 148 .

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.
```


Chapter 5

Maintenance and Measurements

Topics:

- [*Hardware Requirements Page 150*](#)
- [*EPAP Status and Alarms Page 150*](#)
- [*G-Port System Status Reports Page 152*](#)
- [*Code and Application Data Loading Page 153*](#)
- [*G-Port Related Alarms Page 159*](#)
- [*G-Port Related UIMs Page 163*](#)
- [*G-Port Measurements Page 167*](#)

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

Hardware Requirements

The G-Port feature requires Service Module cards-based boards to run the VSCCP GPL. The EAGLE 5 ISS may be equipped with from 1 to 25 Service Module cards to support G-Port.

**CAUTION**

CAUTION: Having a mix of TSM cards running the SCCP application and Service Module card types is not permitted with the G-Port feature enabled. That is, Service Module cards and TSM cards running the SCCP application 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 Service Module card database capacity requirements.

EPAP Status and Alarms

Because EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 ISS terminals, maintenance, measurements, and status information are routed through a Service Module card. EPAP sends two types of messages to the Service Module card: [EPAP Maintenance Blocks](#) on page 150 and [DSM Status Requests](#) on page 151. Each message type is discussed in the following sections.

EPAP Maintenance Blocks

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

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

- Status of EPAP 'A' - actual states are active, standby, and down (inoperative). Maintenance blocks include a field for this information so that it can be 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 for this information so that it 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 Service Module card. The EPAP must ensure that no more than one maintenance block per second is sent to the primary Service Module card 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 Service Module card 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 Service Module card, it sends a DSM status request to that Service Module card. Because status messages are sent over UDP, the EPAP broadcasts the DSM status request (to all Service Module cards) and each Service Module card returns its status to the EPAP.

DSM Status Reporting to the EPAP

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

DSM Status Messages – When Sent

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

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

DSM Status Messages Fields

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

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

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

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

Hourly Maintenance Report

The Hourly Maintenance Report, generated automatically, includes the alarm totals of the G-Port subsystem and Service Module card /EPAP IP 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
- Service Module card memory capacity status
- Loading mode support status

System Status Reporting

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

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

Service Module card Memory Capacity Status Reporting

As described in the [DSM Status Messages Fields](#) on page 151, the Service Module card sends a message to the EPAP containing the amount of memory on the Service Module card. The EPAP determines whether the Service Module card has enough memory to store the RTDB and sends an ack or nak back to the Service Module card indicating whether or not the Service Module card has an adequate amount of memory. Refer to the *Dimensioning Guide for EPAP Advanced DB Features*

Technical Reference for important information on the dimensioning rules and the Service Module card database capacity requirements.

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

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

Loading Mode Support Status Reporting

The OAM application determines whether or not the system is in an unstable loading mode since it knows the state of all LIM, SCCP, and Service Module cards in the system. When the loading mode is unstable, the `rept-stat-sys` command reports the existence of the unstable loading mode and the specific conditions that caused it. Refer to [Loading Mode Support](#) on page 154, for more details.

Code and Application Data Loading

Service Module Code Loading

The EAGLE 5 ISS OAM code loads the Service Module 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 Service Module card GPL verifies its hardware configuration during initialization to determine if it has the capacity to support the RTDB.

The Service Module card 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 Service Module card load requests are combined into a single download, reducing the overall download time. The Service Module 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 Service Module 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 Service Module 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-Service Module Card Loading Interface

The Service Module card must convey to the EPAP that it needs to download the RTDB. This occurs when the Service Module card sends a Full Download Request message to the EPAP.

Loading Mode Support

No more than 16 LIMs can be serviced by each TSM card running the SCCP application (or Service Module card).

80% Threshold of Support

Loading mode is based on the ability of the system to provide TSM card running the SCCP application service to at least 80% of the LIMs.

Service Module card Capacity

An insufficient number of Service Module 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 TSM card running the SCCP application capacity."

Insufficient TSM Card Running the SCCP Application Service

It is also possible for LIMs or Service Module cards to be inhibited or to have problems that prevent them from operating normally. If enough Service Module cards are out of service, it may not be possible for the remaining is-nr Service Module cards to service at least 80% of the number of is-nr LIMs. This is called "insufficient TSM card running the SCCP application service." When this occurs, some of the LIMs are denied TSM card running the SCCP application 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'd TSM card running the SCCP application is insufficient to service at least 80% of all provisioned LIMs.
- Insufficient TSM card running the SCCP application service occurs when an insufficient number of is-nr Service Module cards are available to service at least 80% of the number of is-nr LIMs.
- LIM cards are being denied TSM card running the SCCP application service and any Service Module 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 TSM card running the SCCP application service is deficient.

The `inh-card` and `alw-card` commands can be used to alter TSM card running the SCCP application service levels to achieve the 80% threshold. This can be repeated for each card until the system is able to supply TSM card running the SCCP application services to at least 80% of the is-nr LIMs. The remaining 20% LIM or supporting Service Module 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 Service Module card aborts the current loading, issues a class 01D7 obit, and reboots. [Figure 24: Obit Message for Abort of Card Loading](#) on page 155 shows an example.

Figure 24: 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

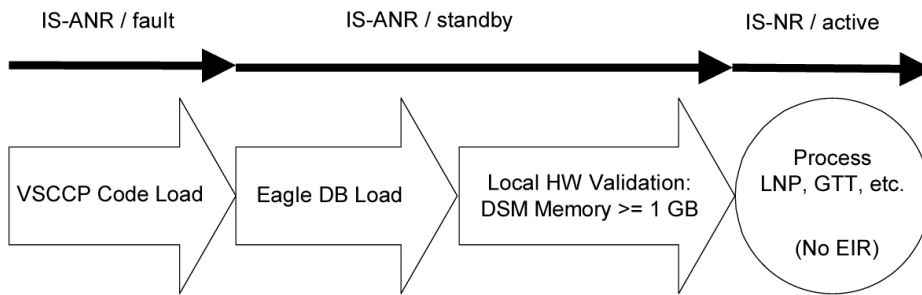
Use the force option to force the execution of commands that would put the system in unstable loading mode. If executing the `ent-card` or `inh-card` commands would cause the system to enter an unstable loading mode, use the force option on the command.

State Transitions During Start-Up

Figure 25: G-Port Not Enabled, Service Module card Running in TSM Emulation on page 156 through *Figure 32: G-Port Activation Unsuccessful due to Insufficient Database* on page 159 show the transitions that a Service Module 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 G-Port feature.

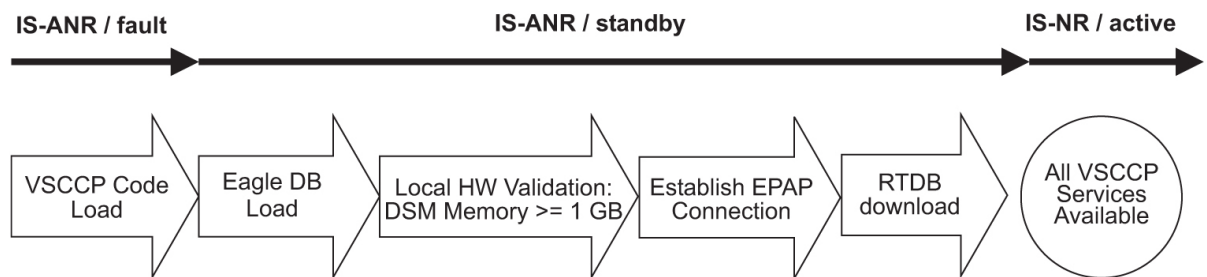
In *Figure 25: G-Port Not Enabled, Service Module card Running in TSM Emulation* on page 156, the G-Port feature is not enabled, and the Service Module card can operate in TSM emulation mode, although it does not provide G-Port operation.

Figure 25: G-Port Not Enabled, Service Module card Running in TSM Emulation



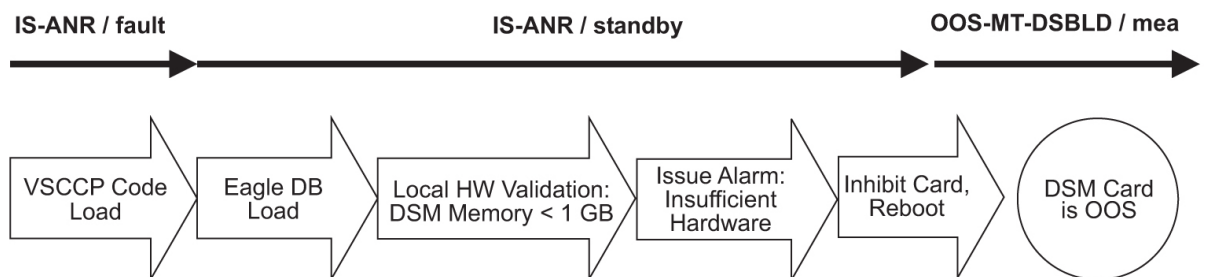
In [Figure 26: G-Port Enabled, Normal Operating Sequence](#) on page 157, the G-Port feature is enabled, and the Service Module card memory is at least 1 GB and is connected to the EPAP. A normal Service Module card operating sequence occurs, providing G-Port service.

Figure 26: G-Port Enabled, Normal Operating Sequence



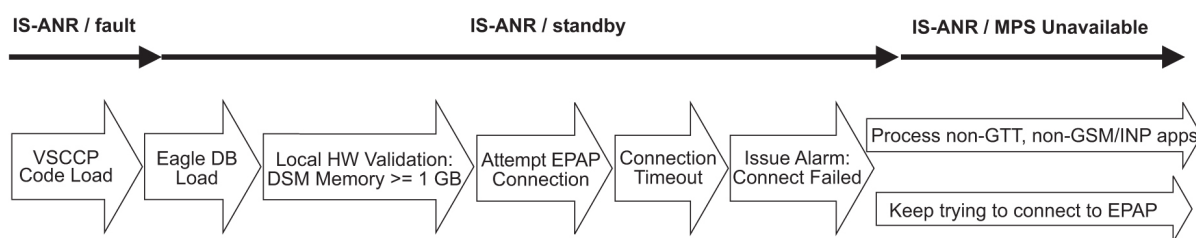
In [Figure 27: G-Port Enabled, but Service Module card Memory Less Than 1 GB](#) on page 157, the G-Port feature is enabled, but the Service Module card memory is less than 1 GB. The G-Port feature cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module card database capacity requirements.

Figure 27: G-Port Enabled, but Service Module card Memory Less Than 1 GB



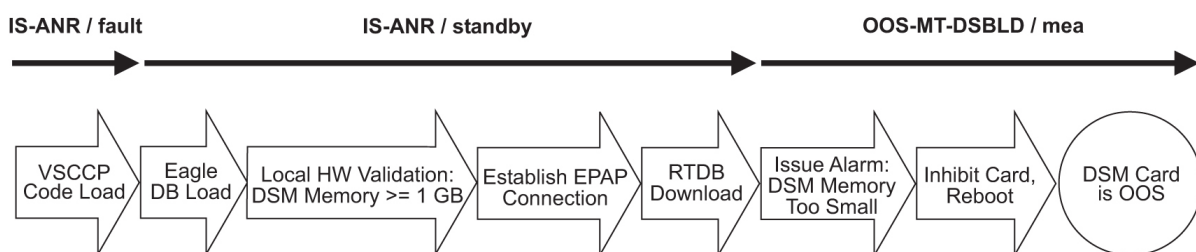
In [Figure 28: G-Port Enabled, but Service Module card Not Connected to EPAP](#) on page 157, the G-Port feature is enabled, the Service Module card memory has at least 1 GB, but the Service Module card is unable to connect EPAP; the G-Port cannot begin operation.

Figure 28: G-Port Enabled, but Service Module card Not Connected to EPAP



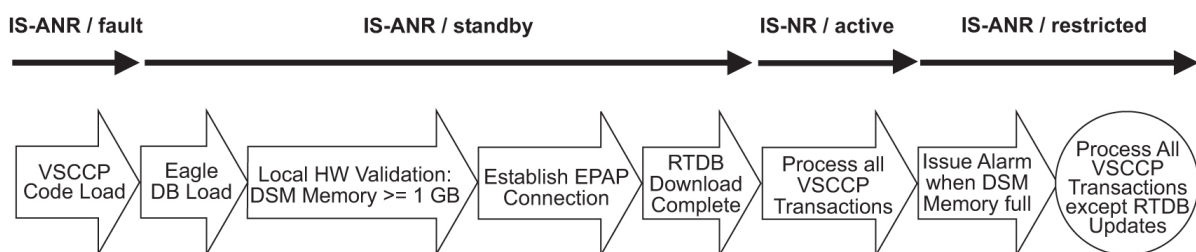
In [Figure 29: G-Port Enabled, but Service Module card Memory Insufficient for Database](#) on page 158, the G-Port feature is enabled, the Service Module card has the required 1 GB memory and is connected to the EPAP, but the Service Module card is too small for the required database; the G-Port cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module card database capacity requirements.

Figure 29: G-Port Enabled, but Service Module card Memory Insufficient for Database



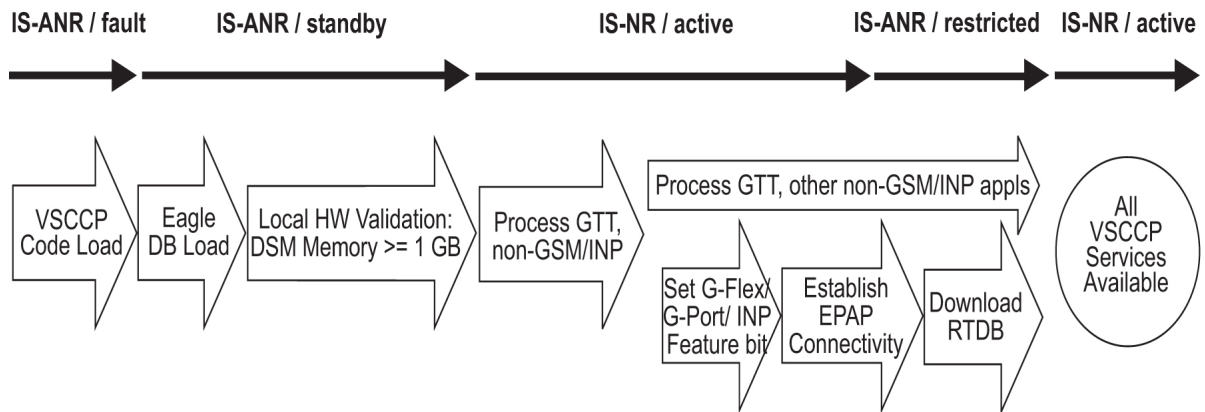
In [Figure 30: G-Port Enabled, but Database Exceeds Service Module card Memory](#) on page 158, the G-Port feature is enabled, the Service Module card is connected to the EPAP, but the RTDB grows eventually to exceed the capacity of the Service Module card memory, despite its memory size of at least 1 GB (an alarm is issued when the Service Module card 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 Service Module card database capacity requirements.

Figure 30: G-Port Enabled, but Database Exceeds Service Module card Memory



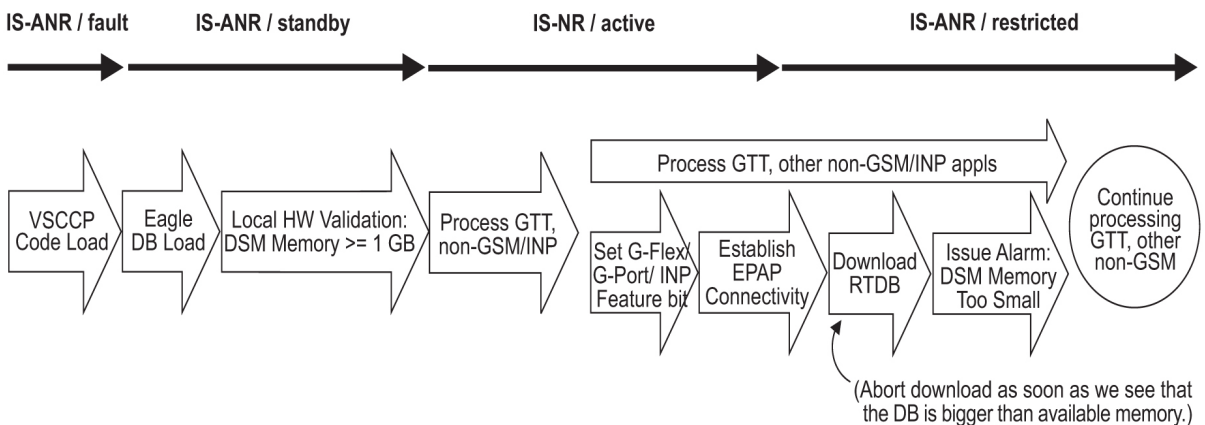
In [Figure 31: G-Port Not Enabled at First, but then Activated on Service Module card](#) on page 158, the G-Port feature is not initially enabled; the Service Module card memory has at least 1 GB but no EPAP connection; the Service Module card is running other applications when the G-Port feature is turned on; the Service Module card has sufficient memory to provide G-Port service.

Figure 31: G-Port Not Enabled at First, but then Activated on Service Module card



In [Figure 32: G-Port Activation Unsuccessful due to Insufficient Database](#) on page 159, the G-Port feature is not initially enabled; the Service Module 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 Service Module 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 Service Module card database capacity requirements.

Figure 32: G-Port Activation Unsuccessful due to Insufficient Database



G-Port Related Alarms

Refer to the *Unsolicited Alarm and Information Messages* manual for a complete description and the associated corrective procedure for all G-Port related UAMs.

EPAP - Service Module card Connection Status

The EPAP and the Service Module are connected over a 100-Mbit Ethernet link and use TCP/IP. If this connection is inoperative, the Service Module 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 Service Module processes the incoming maintenance blocks and generates the requested UAM. The actual EPAP UAMs are defined in the *Unsolicited Alarm and Information Messages* manual; the Service Module acts only as a delivery agent.

Service Module card Failure

No new alarms have been created to report Service Module failure. The existing card alarm UAM 013, *Card is isolated from the system*, indicates a Service Module card failure. The Service Module failure alarm is output to the Card Output Group.

Service Module card-EPAP Link

Two alarms are used to indicate the Service Module card-to-EPAP link status:

- 0084, *IP Connection Unavailable* (Major)
- 0085, *IP Connection Available* (Normal/Clearing)

The Service Module-EPAPLink alarms are output to the Link Maintenance Output Group. See the *Unsolicited Alarm and Information Messages* 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

```

Service Module card Hardware-Related Alarms

A major alarm appears when a Service Module card does not have the hardware configuration required for the G-Port application. Loading the Service Module 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 Service Module 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 Service Module card detects that its applique memory is 95% full. Loading of the Service Module 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
1234567890123456789012345678901234567890123456789012345678901234567890
      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 Service Module 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 Service Module 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 DSM Database 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 Service Module cards, the status of databases is examined and alarms can be raised.

When the RTDB of a Service Module card is inconsistent (that is, the Service Module 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 fails, 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 Service Module card RTDB has been fixed when the Service Module 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 24: G-Port Subsystem Alarms](#) on page 162.

Table 24: G-Port Subsystem Alarms

UAM #	Severity	Message Text	Output Group (UI Output Direction)
0328	None	SCCP is available	gtt
0329	None	SCCP capacity normal, card(s) abnormal	gtt
0330	Major	SCCP TPS 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

UAM #	Severity	Message Text	Output Group (UI Output Direction)
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 *Unsolicited Alarm and Information Messages* manual contains a complete description of all UIM text and formats. If the G-Port is provisioned, then the following UIMs ([Table 25: G-Port UIMs](#) on page 163) are used.

Table 25: G-Port UIMs

UIM	Text	Description	Action	Output Group (UI Output Direction)
1035	SCCP rsp did not route - invalid GTI	The SCCP response did not route due to an invalid GTI	Use a valid GTI in the CGPA part of the query	gtt
1036	SCCP rsp did not route - invalid TT	The SCCP response did not route due to an invalid TT	Provision the CGPA TT in the GTT TT table	gtt
1037	SCCP rsp did not route - bad Xlation	The SCCP response did not route due to a bad translation	Provision the CGPA GTA address in the GTT database	gtt
1038	SCCP rsp did not route - SSP not True PC	The SCCP response did not route due to SSP is not true point code	Use the true point code in the CGPA point code or OPC of the query	gtt

UIM	Text	Description	Action	Output Group (UI Output Direction)
1039	SCCP rsp did not route - bad Selectors	The SCCP response did not route due to invalid selectors	Provision the CGPA GTI, TT, NP, and NAI in the EGTT selector table	gtt
1169	SCCP rcvd inv TCAP portion	This indicates that SCCP discarded a message because the TCAP provided in the called party address is invalid in the EAGLE 5 ISS.	No action is necessary.	application subsystem
1227	SCCP did not route - DPC not in MAP tbl	This message indicates that SCCP did not route a message because the destination point code was not in the mated application (MAP) table. The message was discarded.	If the DPC indicated in the message should not be routed to, no further action is necessary.	gtt
1230	SCCP did not route - SS not in MAP tbl	This message indicates that SCCP did not route a message because the destination subsystem was not in the Mated Application (MAP) table. The message was discarded.	No action is necessary.	gtt

UIM	Text	Description	Action	Output Group (UI Output Direction)
1242	Conv to intl num - Dflt CC not found	Conversion to international number failed because default CC was not found	Define the default CC with chg-stpopts :defcc=xxx	application subsystem
1243	Conv to intl num - Dflt NC not found	Conversion to international number failed because default NC was not found	Define the default NDC with chg-stpopts :defndc=xxxxxx	application subsystem
1246	Invalid length of conditioned digits	Invalid length of conditioned digits (length of conditioned international number is less than 5 or greater than 15)	Use an international number with length in the acceptable range	application subsystem
1256	MNP Circular Route Detected	This message indicates the network has incorrect number portability data for a subscriber.	Verify and update number portability data.	application subsystem
1294	Invalid digits in MAP MSISDN parameter	No digits found in MAP MSISDN parameter	Specify valid digits in the MSISDN	application subsystem
1295	Translation PC is Eagle's	PC translation is invalid because it is one of EA GLE 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

UIM	Text	Description	Action	Output Group (UI Output Direction)
1297	Invalid length of prefix/suffix digits	Attempted digit action of prefixing entity ID is invalid because combined length of entity ID and GT digits was greater than 21 digits	Change the attempted digit action or decrease the length of the entity ID and/or GT digits	application subsystem
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 contacted to send corrected message.	application subsystem
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	The message and the digit format provisioning should be analyzed to determine the error and the	application subsystem

UIM	Text	Description	Action	Output Group (UI Output Direction)
		exceeded limit for number of digits.	originating node or the requested outbound digit formatting option should be modified to correct the encoding error..	

G-Port Measurements

Refer to the *Unsolicited Alarm and Information Messages* 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](#) on page 24.

See *Commands Manual* for details about using FTA commands, which are:

- Activate File Transfer: `act-file-trns`
- Copy to or from Transfer Area: `copy-fts`
- Delete Entry from File Transfer Area: `dlt-fts`
- Display File Transfer Area: `disp-fts-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 Message Signaling Units (MSUs) are supported for the G-Port feature ([Table 26: Pegs for Per System G-Port Measurements](#) on page 168).

Table 26: 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 27: Pegs for Per SSP G-Port Measurements](#) on page 168).

Table 27: 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 28: Pegs for Per System and Per SSP G-Port Measurements](#) on page 169).

Table 28: Pegs for Per System and Per SSP G-Port Measurements

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

The following equations apply:

$$\sum \text{GPSRRCV} = \text{GPSRGTT} + \text{GPSRREP} + \text{GPSRERR}$$

$$\sum \text{GPSRREP} = \text{GPSRACK} + \text{GPSRRLY}$$

The following measurement events are included on the STP Daily Maintenance (MTCD) and STP Day-to-Hour (MTCDTH) 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: `rept-meas:type=mtcd:enttype=np`

OAM hourly: `rept-meas:type=mtch:enttype=np`

MP daily:

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

MP hourly:

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

Glossary

A

ACK	Data Acknowledgement
ACM	<p>Application Communications Module</p> <p>A card in the EAGLE 5 ISS that provides a communications interface to a remote host across an Ethernet LAN.</p>
ADL	Application Data Loader
AINPQ	ANSI-41 INP Query
ANSI	<p>American National Standards Institute</p> <p>An organization that administers and coordinates the U.S. voluntary standardization and conformity assessment system. ANSI develops and publishes standards. ANSI is a non-commercial, non-government organization which is funded by more than 1000 corporations, professional bodies, and enterprises.</p>
A-Port	ANSI-41 Mobile Number Portability
AS	<p>Application Server</p> <p>A logical entity serving a specific Routing Key. An example of an Application Server is a virtual switch element handling all call processing for a unique range of PSTN trunks, identified by an SS7</p>

A

DPC/OPC/CIC_range. Another example is a virtual database element, handling all HLR transactions for a particular SS7 DPC/OPC/SCCP_SSN combination. The AS contains a set of one or more unique Application Server Processes, of which one or more normally is actively processing traffic.

C

CC	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 <code>limds0</code> , <code>limch</code> , <code>limocu</code> , <code>limv35</code> , <code>lime1</code> , and <code>limt1</code> .
CdPA	<p>Called Party Address</p> <p>The portion of the MSU that contains the additional addressing information of the destination of the MSU. Gateway screening uses this additional information to determine if MSUs that contain the DPC in the routing label and the subsystem number in the called party address portion of the MSU are allowed in the network where the EAGLE 5 ISS is located.</p>
CgPA	<p>Calling Party Address</p> <p>The point code and subsystem number that originated the MSU. This point code and subsystem number are contained in the calling party address portion of the</p>

C

signaling information field of the MSU. Gateway screening uses this information to determine if MSUs that contain this point code and subsystem number area allowed in the network where the EAGLE 5 ISS is located.

Circular Route Prevention

See CRP.

CPC

Capability Point Code

A capability point code used by the SS7 protocol to identify a group of functionally related STPs in the signaling network.

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

The DCM provides IP connectivity for applications. Connection to a host is achieved through an ethernet LAN using the TCP/IP protocol.

D

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	<p>Directory number</p> <p>A DN can refer to any mobile or wireline subscriber number, and can include MSISDN, MDN, MIN, or the wireline Dialed Number.</p>
DNS	Domain Name Services
DPC	<p>Destination Point Code</p> <p>DPC refers to the scheme in SS7 signaling to identify the receiving signaling point. In the SS7 network, the point codes are numeric addresses which uniquely identify each signaling point. This point code can be adjacent to the EAGLE 5 ISS, but does not have to be.</p>
DPCI	Destination Point Code International
DSM	<p>Database Service Module.</p> <p>The DSM provides large capacity SCCP/database functionality. The DSM is an application card that supports network specific functions such as EAGLE Provisioning Application Processor (EPAP), Global System for Mobile Communications (GSM), EAGLE Local Number Portability (ELAP), and interface to Local Service Management System (LSMS).</p>

E

EA	Expedited Data Acknowledgment
EGTT	<p>Enhanced Global Title Translation</p> <p>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.</p>
EIR	<p>Equipment Identity Register</p> <p>A network entity used in GSM networks, as defined in the 3GPP Specifications for mobile networks. The entity stores lists of International Mobile Equipment Identity (IMEI) numbers, which correspond to physical handsets (not subscribers). Use of the EIR can prevent the use of stolen handsets because the network operator can enter the IMEI of these handsets into a 'blacklist' and prevent them from being registered on the network, thus making them useless.</p>
Enhanced Global Title Translation	See EGTT.
EPAP	EAGLE Provisioning Application Processor
ES	<p>The shelves in the EAGLE 5 ISS that contain the LIM, ASM, and ACM cards. This shelf cannot contain the CAM, TDM, or the MDAL card. This shelf can be added to and removed from the database. These shelves are numbered from 1200 to 6100.</p>

E

ESD Electro-Static Discharge

ETSI European Technical Standards Institute

F

FAK Feature Access Key

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

FTA File Transfer Area

A special area that exists on each OAM hard disk, used as a staging area to copy files to and from the EAGLE 5 ISS using the Kermit file-transfer protocol.

FTP File Transfer Protocol

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

G

GB Gigabyte — 1,073,741,824 bytes

G-Flex GSM Flexible numbering

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

GPDB G-Port Database

G

GPL	<p>Generic Program Load</p> <p>Software that allows the various features in the system to work. GPLs and applications are not the same software.</p>
G-Port	<p>GSM Mobile Number Portability</p> <p>A feature that provides mobile subscribers the ability to change the GSM subscription network within a portability cluster, while retaining their original MSISDN(s).</p>
GSM	<p>Global System for Mobile Communications</p>
GT	<p>Global Title Routing Indicator</p>
GTA	<p>Global Title Address</p>
GTAI	<p>Global Title Address Information</p>
GTI	<p>Global Title Indicator</p>
GTT	<p>Global Title Translation</p> <p>A feature of the signaling connection control part (SCCP) of the SS7 protocol that the EAGLE 5 ISS uses to determine which service database to send the query message when an MSU enters the EAGLE 5 ISS and more information is needed to route the MSU. These service databases also verify calling card numbers and credit card numbers. The service databases are identified in the SS7 network by a point code and a subsystem number.</p>

H

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

IMSI International Mobile Subscriber Identity

IMT Inter-Module-Transport
The communication software that operates the inter-module-transport bus on all cards except the LIMATM, DCM, DSM, and HMUX.

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

INAP Intelligent Network Application Protocol

INE Intelligent Network Entity
Interrogating Network Entity

INP INAP-based Number Portability

I

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

Intelligent Network (IN)
Portability

IP

Internet Protocol

IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.

IS-41

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

ISDN

Integrated Services Digital
Network

IS-NR

In Service - Normal

I

ISDN

Integrated Services Digital Network

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

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

KSR

Keyboard Send/Receive Mode

L

LIM

Link Interface Module

Provides access to remote SS7, X.25, IP and other network elements, such as a Signaling Control Point (SCP) through a variety of signaling interfaces (V.35, OCU, DS0, MPL, E1/T1 MIM, LIM-ATM, E1-ATM, IPLIMx, IPGWx). The LIMs consist of a

L

main assembly and possibly, an interface appliqué board. These appliqués provide level one and some level two functionality on SS7 signaling links.

Link Signaling Link

LNP Local Number Portability

M

MAP Mobile Application Part

MASP Maintenance and Administration Subsystem Processor

The Maintenance and Administration Subsystem Processor (MASP) function is a logical pairing of the GPSM-II card and the TDM card. The GPSM-II card is connected to the TDM card by means of an Extended Bus Interface (EBI) local bus.

The MDAL card contains the removable cartridge drive and alarm logic. There is only one MDAL card in the Maintenance and Administration Subsystem (MAS) and it is shared between the two MASPs.

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

The Measurement Collection and Polling Module (MCPM) provides comma delimited core STP measurement data to a remote

M

server for processing. The MCPM is an EDSM with 2 GB of memory running the MCP application.

MIM Multi-Channel Interface Module

MNP Mobile Number Portability

MNP Circular Route Prevention A G-Port MNP feature that detects instances of circular routing caused by incorrect information in one or more of the network number portability databases. If a circular route has been detected, a message will be generated by the EAGLE 5 ISS and returned to the originator.

MO Magneto Optical
Managed Object
Mobile Originated
Refers to a connection established by a mobile communication subscriber. Everything initiated by the mobile station is known as mobile originated.

MP Measurement Platform
Message Processor
The role of the Message Processor is to provide the application messaging protocol interfaces and processing. However, these servers also have OAM&P components. All Message Processors replicate from their System OAM's database and generate faults to a Fault Management System.

MPS Multi-Purpose Server

M

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

MR

Message Relay

MRN

Message Reference Number

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

Mated Relay Node

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

MSC

Mobile Switching Center

MSISDN

Mobile Station International
Subscriber Directory Number

The MSISDN is the network specific subscriber number of a mobile communications subscriber. This is normally the phone number that is used to reach the subscriber.

MSRN

Mobile Station Roaming Number

MSU

Message Signaling Unit

The SS7 message that is sent between signaling points in the SS7 network with the necessary

M

information to get the message to its destination and allow the signaling points in the network to set up either a voice or data connection between themselves. The message contains the following information:

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

MT**Mobile Terminated**

All transmissions that reach the mobile station and are accepted by it, such as calls or short messages.

MTP

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

N

NAI	Nature of Address Indicator Standard method of identifying users who request access to a network.
NAIV	NAI Value
NC	Network Cluster Network Code
NDC	Network destination code
NE	Network Element An independent and identifiable piece of equipment closely associated with at least one processor, and within a single location.
NP	Number Plan
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 The generic load program (application) that operates the Maintenance and Administration Subsystem which controls the operation of the EAGLE 5 ISS.
-----	---

O

OOS-MT

Out of Service - Maintenance

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

OPC

Originating Point Code

OPS

Operator Provisioning System

P

PC

Point Code

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

- ANSI point codes in the format network indicator-network cluster-network cluster member (**ni-nc-ncm**).
- Non-ANSI domestic point codes in the format network indicator-network cluster-network cluster member (**ni-nc-ncm**).
- Cluster point codes in the format network indicator-network cluster-* or network indicator-*-*.
- ITU international point codes in the format **zone-area-id**.
- ITU national point codes in the format of a 5-digit number (**nnnnn**), or 2, 3, or 4 numbers (members) separated by dashes (**m1-m2-m3-m4**) as defined by the Flexible Point Code system option. A group code is required (**m1-m2-m3-m4-gc**) when the ITUDUPPC feature is turned on.

P

- 24-bit ITU national point codes in the format main signaling area-subsignaling area-service point (**msa-ssa-sp**).

The EAGLE 5 ISS LNP uses only the ANSI point codes and Non-ANSI domestic point codes.

PDB	Provisioning Database
PDBA	Provisioning Database Application There are two Provisioning Database Applications (PDBAs), one in EPAP A on each EAGLE 5 ISS. They follow an Active/Standby model. These processes are responsible for updating and maintaining the Provisioning Database (PDB).
PDBI	Provisioning Database Interface The interface consists of the definition of provisioning messages only. The customer must write a client application that uses the PDBI request/response messages to communicate with the PDBA.
PLMN	Public Land Mobile Network
PPP	Point-to-Point Protocol
PPSMS	Prepaid Short Message Service Prepaid Short Message Service Intercept
PT	Portability Type

R

R

RC	Relative Cost
RFC	<p>Request for Comment</p> <p>RFCs are standards-track documents, which are official specifications of the Internet protocol suite defined by the Internet Engineering Task Force (IETF) and its steering group the IESG.</p>
RMTP	Reliable Multicast Transport Protocol
RN	Routing Number
RNIDN	Routing Number - International DN
Route	A path to another signaling point.
RTDB	Real Time Database

S

SCCP	Signaling Connection Control Part
SCM	<p>System Configuration Manager</p> <p>System Configuration Matrix.</p>
SDS	System Debug Services
Service Nature of Address Indicator	See SNAI.
SIM	<p>Subscriber Identity Module</p> <p>An ID card the size of a credit card for GSM network</p>

S

subscribers, and is typically referred to as a chip card or smartcard.

SIO

Service Information Octet.

The network indicator code (NIC), priority (PRI), and service indicator (SI) in the SIO field in the message signaling unit (MSU). This information identifies the type of MSU (ISUP, TCAP, and so forth) that is allowed in the network where the EAGLE 5 ISS is located.

SMS

Short Message Service

SMSC

Short Message Service Center

SNAI

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.

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

S

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

The SPC enables the EAGLE 5 ISS to assume more than one point code for SS7 routing. The EAGLE 5 ISS uses the SPC for routing and provisioning as if the SPC were an actual point code of the EAGLE 5 ISS. The EAGLE 5 ISS supports one ANSI true point code and up to seven secondary point codes.

Spare Point Code

SRF

Signaling Relay Function

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

SRI

Send_Route_Information Message

SS

Subsystem

SS7

Signaling System #7

SSP

Subsystem Prohibited network management message.

S

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

STP

Signal Transfer Point

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

Subsystem Number

See SSN.

T

TCAP

Transaction Capabilities
Application Part

TCP

Transfer Control Protocol

TCP/IP

Transmission Control
Protocol/Internet Protocol

TDM

Terminal Disk Module
Time Division Multiplexing

TFA

TransFer Allowed (Msg)

TFP

TransFer Prohibited (Msg)
A procedure included in the signaling route management (functionality) used to inform a signaling point of the

T

unavailability of a signaling route.

TPS Transactions Per Second

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

TT Translation Type.
Resides in the Called Party Address (CdPA) field of the MSU and determines which service database is to receive query messages. The translation type indicates which Global Title Translation table determines the routing to a particular service database.

U

UAM Unsolicited Alarm Message.

UDP User Datagram Protocol

UDTS Unitdata Service message

UI User Interface

UIM Unsolicited Information Message

UPU User Part Unavailable

V

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 Service Module 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 Service Module card is present, the VSCCP GPL processes normal GTT traffic.

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