

# *Tekelec EAGLE<sup>®</sup> 5*

## *Integrated Signaling System*

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### **Feature Manual - A-Port<sup>™</sup>**

910-5023-001 Revision B

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# Introduction

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## Overview

This manual provides a description, along with commands, maintenance, measurements, and configuration details associated with the ANSI-41 Mobile Number Portability (A-Port) feature of the EAGLE 5 ISS (Integrated Signaling System). A-Port provides IS41 number portability functionality using a triggerless solution. In response to governmental mandates for telecommunication networks, this feature focuses on service provider number portability on IS41 networks.

A-Port minimizes the challenges for IS41 network operators while enabling them to meet their regulatory obligations. A-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, A-Port acts as an “NP HLR” for exported number by responding with a MAP SRI message; A-Port performs a message relay function for calls to imported numbers and non-call related messages.

A-Port is an optional feature on the EAGLE 5 ISS, and can be enabled and turned on, but not off, via a feature access key. Note that A-Port requires the Global Title Translation (GTT) feature and that A-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 A-Port feature in the EAGLE 5 ISS. Users of this manual and the others in the EAGLE 5 ISS family of documents must have a working knowledge of telecommunications and network installations.

## **Manual Organization**

This document is organized into the following chapters:

- Chapter 1, “Introduction”, contains general information about the A-Port documentation, the organization of this manual, and how to get technical assistance.
- Chapter 2, “Feature Description”, provides a functional description of the A-Port feature, including network perspectives, assumptions and limitations, a database overview, DSM provisioning and reloading, A-Port user interface, and an audit overview.
- Chapter 3, “EAGLE 5 ISS A-Port Commands”, describes the new or updated commands that support the A-Port feature. It provides some sample reports and explanations of appropriate command usage.
- Chapter 4, “A-Port Feature Activation”, describes how to activate the A-Port feature.
- Chapter 5, “Maintenance and Measurements”, describes maintenance and measurements in detail, including EPAP status and alarms, hardware verification messages, TSM emulation mode, A-Port system status reports and commands, code and application data loading, and alarms.

## Related Publications

The *A-Port Feature Manual* is part of the EAGLE 5 ISS documentation set and may refer to one or more of the following manuals:

- The *Commands Manual* contains procedures for logging into or out of the EAGLE 5 ISS, a general description of the terminals, printers, the disk drive used on the system, and a description of all the commands used in the system.
- The *Commands Pocket Guide* is an abridged version of the *Commands Manual*. It contains all commands and parameters, and it shows the command-parameter syntax.
- The *Commands Quick Reference Guide* contains an alphabetical listing of the commands and parameters. The guide is sized to fit a shirt-pocket.
- The *Commands Error Recovery Manual* contains the procedures to resolve error message conditions generated by the commands in the *Commands Manual*. These error messages are presented in numerical order.
- The *Database Administration Manual – Features* contains procedural information required to configure the EAGLE 5 ISS to implement these features:
  - X.25 Gateway
  - STP LAN
  - Database Transport Access
  - GSM MAP Screening
  - EAGLE 5 Integrated Monitoring Support.
- The *Database Administration Manual - Gateway Screening* contains a description of the Gateway Screening (GWS) feature and the procedures necessary to configure the EAGLE 5 ISS to implement this feature.
- The *Database Administration Manual – Global Title Translation* contains procedural information required to configure an EAGLE 5 ISS to implement these features:
  - Global Title Translation
  - Enhanced Global Title Translation
  - Variable Length Global Title Translation
  - Global Title Translation Modification
  - Intermediate GTT Load Sharing
  - ANSI-ITU-China SCCP Conversion

- Flexible GTT Load Sharing
  - Origin-Based SCCP Routing
  - Hex Digit Support for GTT
  - Weighted GTT Load Sharing
  - Transaction-Based GTT Load Sharing.
- The *Database Administration Manual - IP<sup>7</sup> Secure Gateway* contains procedural information required to configure the EAGLE 5 ISS to implement the SS7-IP Gateway.
  - The *Database Administration Manual - SEAS* contains the EAGLE 5 ISS configuration procedures that can be performed from the Signaling Engineering and Administration Center (SEAC) or a Signaling Network Control Center (SNCC). Each procedure includes a brief description of the procedure, a flowchart showing the steps required, a list of any EAGLE 5 ISS commands that may be required for the procedure but that are not supported by SEAS, and a reference to optional procedure-related information, which can be found in one of these manuals:
    - *Database Administration Manual - Gateway Screening*
    - *Database Administration Manual - Global Title Translation*
    - *Database Administration Manual - SS7.*
  - The *Database Administration Manual - SS7* contains procedural information required to configure an EAGLE 5 ISS to implement the SS7 protocol.
  - The *Database Administration Manual - System Management* contains procedural information required to manage the EAGLE 5 ISS database and GPLs, and to configure basic system requirements such as user names and passwords, system-wide security requirements, and terminal configurations.
  - The *Dimensioning Guide for EPAP Advanced DB Features* is used to provide EPAP planning and dimensioning information. This manual is used by Tekelec personnel and EAGLE 5 ISS customers to aid in the sale, planning, implementation, deployment, and upgrade of EAGLE 5 ISS systems equipped with one of the EAGLE 5 ISS EPAP Advanced Database (EADB) Features.
  - The *ELAP Administration Manual* defines the user interface to the EAGLE 5 ISS LNP Application Processor on the MPS/ELAP platform. The manual defines the methods for accessing the user interface, menus, screens available to the user and describes their impact. It provides the syntax and semantics of user input and defines the output the user receives, including information and error messages, alarms, and status.

- The *EPAP Administration Manual* describes how to administer the EAGLE 5 ISS Provisioning Application Processor on the MPS/EPAP platform. The manual defines the methods for accessing the user interface, menus, and screens available to the user and describes their impact. It provides the syntax and semantics of user input and defines the output the user receives, including messages, alarms, and status.
- The *Feature Manual - A-Port* provides an overview of a feature providing the capability for IS41 mobile subscribers to change service provider while retaining their original Mobile Directory Number (MDN). This manual gives the instructions and information on how to install, use, and maintain the A-Port feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.
- The *Feature Manual - ECAP* provides instructions and information on how to install, use, and maintain the Integrated Accounting Feature Application feature on the Eagle Collector Application Processor (ECAP). This feature collects raw MSU data from the EAGLE 5 ISS, categorizes the data into groups, and feeds those groups to another system for accounting activities. Additional features will be added to this manual at a later date.
- The *Feature Manual - EIR* provides instructions and information on how to install, use, and maintain the EIR feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS. The feature provides network operators with the capability to prevent stolen or disallowed GSM mobile handsets from accessing the network.
- The *Feature Manual - G-Flex C7 Relay* provides an overview of a feature supporting the efficient management of Home Location Registers in various networks. This manual gives the instructions and information on how to install, use, and maintain the G-Flex feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.
- The *Feature Manual - G-Port* provides an overview of a feature providing the capability for mobile subscribers to change the GSM subscription network within a portability cluster while retaining their original MSISDNs. This manual gives the instructions and information on how to install, use, and maintain the G-Port feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.
- The *Feature Manual - INP/AINPQ* provides the user with information and instructions on how to implement, utilize, and maintain either the INAP-based Number Portability (INP) feature or the ANSI-41 INP Query (AINPQ) feature or both features on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.

- The *Feature Manual - Migration* provides an overview of a feature providing the capability for IS41 subscribers to migrate to a GSM network and GSM mobile subscribers to migrate to an IS41 network. This manual gives the instructions and information on how to install, use, and maintain the Migration feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.
- The *FTP-Based Table Retrieve Application (FTRA) User Guide* describes how to set up and use a PC to serve as the offline application for the EAGLE 5 ISS FTP Retrieve and Replace feature.
- The *Hardware Manual - EAGLE 5 ISS* provides an overview of each system and its subsystems, details of standard and optional hardware components in each system, and basic site engineering. These include the EAGLE 5 ISS, OEM-based products such as the ASi 4000 Service Control Point (SCP), and the Netra-based Multi-Purpose Server (MPS).
- The *Hardware Manual - Tekelec 1000 Application Server* provides general specifications and a description of the Tekelec 1000 Application Server (T1000 AS). This manual also includes site preparation, environmental and other requirements, procedures to physically install the T1000 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).
- The *Hardware Manual - Tekelec 1100 Application Server* provides general specifications and a description of the Tekelec 1100 Application Server (T1100 AS). This manual also includes site preparation, environmental and other requirements, procedures to physically install the T1100 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).
- The *Installation Manual - EAGLE 5 ISS* contains cabling requirements, schematics, and procedures for installing the EAGLE 5 ISS along with LEDs, connectors, cables, and power cords to peripherals. Refer to this manual to install components or the complete systems.
- The *LNP Database Synchronization Manual - LSMS with EAGLE 5 ISS* describes how to keep the LNP databases at the LSMS and at the network element (the EAGLE 5 ISS is a network element) synchronized through the use of resynchronization, audits and reconciles, and bulk loads. This manual is contained in both the LSMS documentation set and in the EAGLE 5 ISS documentation set.
- The *LNP Feature Activation Guide* contains procedural information required to configure the EAGLE 5 ISS for the LNP feature and to implement these parts of the LNP feature on the EAGLE 5 ISS:
  - LNP services
  - LNP options
  - LNP subsystem application
  - Automatic call gapping

- Triggerless LNP feature
- Increasing the LRN and NPANXX Quantities on the EAGLE 5 ISS
- Activating and Deactivating the LNP Short Message Service (SMS) feature.
- The *Maintenance Manual* contains procedural information required for maintaining the EAGLE 5 ISS and the card removal and replacement procedures. The *Maintenance Manual* provides preventive and corrective maintenance procedures used in maintaining the different systems.
- The *Maintenance Pocket Guide* is an abridged version of the Maintenance Manual and contains all the corrective maintenance procedures used in maintaining the EAGLE 5 ISS.
- The *Maintenance Emergency Recovery Pocket Guide* is an abridged version of the Maintenance Manual and contains the corrective maintenance procedures for critical and major alarms generated on the EAGLE 5 ISS.
- The *MPS Platform Software and Maintenance Manual - EAGLE 5 ISS with Tekelec 1000 Application Server* describes the platform software for the Multi-Purpose Server (MPS) based on the Tekelec 1000 Application Server (T1000 AS) and describes how to perform preventive and corrective maintenance for the T1000 AS-based MPS. This manual should be used with the EPAP-based applications (EIR, G-Port, G-Flex, A-Port, Migration, AINPQ, and INP).
- The *MPS Platform Software and Maintenance Manual - EAGLE 5 ISS with Tekelec 1100 Application Server* describes the platform software for the Multi-Purpose Server (MPS) based on the Tekelec 1100 Application Server (T1100 AS) and describes how to perform preventive and corrective maintenance for the T1100 AS-based MPS. This manual should be used with the ELAP-based application (LNP).
- The *Provisioning Database Interface Manual* defines the programming interface that populates the Provisioning Database (PDB) for the EAGLE 5 ISS features supported on the MPS/EPAP platform. The manual defines the provisioning messages, usage rules, and informational and error messages of the interface. The customer uses the PDBI interface information to write his own client application to communicate with the MPS/EPAP platform.
- The *Previously Released Features Manual* summarizes the features of previous EAGLE, EAGLE 5 ISS, and IP<sup>7</sup> Secure Gateway releases, and it identifies the release number of their introduction.

- The *Release Documentation* contains the following documents for a specific release of the system:
  - *Feature Notice* - Describes the features contained in the specified release. The Feature Notice also provides the hardware baseline for the specified release, describes the customer documentation set, provides information about customer training, and explains how to access the Customer Support website.
  - *Release Notice* - Describes the changes made to the system during the lifecycle of a release. The Release Notice includes Generic Program Loads (GPLs), a list of PRs resolved in a build, and all known PRs.

**NOTE: The *Release Notice* is maintained solely on Tekelec's Customer Support site to provide you with instant access to the most up-to-date release information.**

  - *Systems Overview* - Provides high-level information on SS7, the IP<sup>7</sup> Secure Gateway, system architecture, LNP, and EOAP.
  - *Master Glossary* - Contains an alphabetical listing of terms, acronyms, and abbreviations relevant to the system.
  - *Master Index* - Lists all index entries used throughout the documentation set.
- The *SEAS Commands Error Messages Manual* lists the error messages generated by the EAGLE 5 ISS that are specific to the Signaling Engineering and Administration System (SEAS). It includes the SEAS commands that trigger the error messages, the equivalent system error messages and commands, and the explanatory text.
- The *SS7-over-IP Networks Using SIGTRAN* manual examines the reasons for transitioning to an SS7-over-IP network, the considerations that go into planning and dimensioning, and helpful information for implementing the network using EAGLE 5 ISS.
- The *System Manual – EOAP* describes the Embedded Operations Support System Application Processor (EOAP) and provides the user with procedures on how to implement the EOAP, replace EOAP-related hardware, device testing, and basic troubleshooting information.

## Documentation Packaging, Delivery, and Updates

Customer documentation is provided with each system in accordance with the contract agreements. It is updated whenever significant changes that affect system operation or configuration are made. Updates may be issued as an addendum, or a reissue of the affected documentation.



The document part number appears on the title page along with the current revision of the document, the date of publication, and the software release that the document covers. The bottom of each page contains the document part number and date of publication.

Two types of releases are major software releases and maintenance releases. Maintenance releases are issued as addenda with a title page and change bars. On changed pages, the date and document part number are changed; on unchanged pages that accompany the changed pages, the date and document part number are unchanged.

When the software release has a minimum affect on documentation, an addendum is provided. The addendum contains an instruction page, a new title page, a change history page, and replacement chapters with the date of publication, the document part number, and change bars.

If a new release has a major impact on documentation, such as a new feature, the entire documentation set is reissued with a new part number and a new release number.

## Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage. This manual has three admonishments, listed in descending order of priority.



**DANGER:** This icon and text indicate the possibility of *personal injury*.



**WARNING:** This icon and text indicate the possibility of *equipment damage*.



**CAUTION:** This icon and text indicate the possibility of *service interruption*.

## **Customer Assistance**

The Tekelec Customer Care Center offers a point of contact through which customers can receive support for problems. The Tekelec Customer Care Center is staffed with highly-trained engineers to provide solutions to technical questions and issues seven days a week, twenty-four hours a day. A variety of service programs are available through the Tekelec Customer Care Center to maximize the performance of Tekelec products that meet and exceed customer needs.

### **Customer Care Center**

To receive technical assistance, call the Tekelec Customer Care Center at one of these locations:

To receive technical assistance, call Technical Services at one of the following locations by one of the following methods:

- Tekelec, UK

Phone: +44 1784 467804

Fax: +44 1784 477120

Email: [ecsc@tekelec.com](mailto:ecsc@tekelec.com)

- Tekelec, USA

Phone (within continental US): 1-888-FOR-TKLC

1-888-367-8552

(outside continental US): +1 919-460-2150

Fax 1-919-460-0877

Email: [support@tekelec.com](mailto:support@tekelec.com)

When the call is received, a Customer Service Report (CSR) is issued to record the request for service. Each CSR includes an individual tracking number.

Once a CSR is issued, the Customer Care Center determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, information regarding the serial number of the system, COMMON Language Location Identifier (CLLI), initial problem symptoms (includes outputs and messages) is recorded. A primary Technical Services engineer is also assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

### **Emergency Response**

In the event of a critical service situation, emergency response is offered by Tekelec Technical Services twenty-four hours a day, seven 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 Tekelec Technical Services.

## Acronyms

|        |   |
|--------|---|
| ADL    | Application Data Loader                                   |
| A-Port | IS41 Mobile Number Portability                            |
| AuC    | Authentication Center                                     |
| CC     | E.164 Country Code  |
| CCRNDN | Country Code + Routing Number + National Directory Number |
| CdPA   | Called Party Address                                      |
| CgPA   | Calling Party Address                                     |
| CPC    | Capability Point Code                                     |
| CRP    | Circular Route Prevention                                 |
| DCB    | Device Control Block                                      |
| DCM    | Data Communications Module                                |
| DSM    | Database Services Module                                  |
| EIR    | Equipment Identity Register                               |
| EPAP   | EAGLE Provisioning Application Processor                  |
| ES     | Encoding Scheme   |
| ETSI   | European Telecommunications Standards Institution         |

|        |  |
|--------|--|
| FTP    | File Transport Protocol                              |
| FTR    | File Transfer Region                                 |
| GDB    | G-Flex/G-Port/INP Database                           |
| GFDB   | G-Flex Database                                      |
| G-Flex | GSM Flexible Numbering                               |
| GMSC   | Gateway Mobile Switching Center                      |
| G-Port | GSM Mobile Number Portability                        |
| GPL    | Generic Program Load                                 |
| GSM    | Global System for Mobile communications              |
| GTA    | Global Title Address                                 |
| GTAI   | Global Title Address Information                     |
| GTI    | Global Title Indicator                               |
| GTT    | Global Title Translation                             |
| HLR    | Home Location Register                               |
| HomeRN | Home Network Routing Number Prefix                   |
| IAM    | Initial Address Message                              |
| IMEI   | International Mobile Equipment Identity              |
| IMSI   | International Mobile Station Identifier              |
| IN     | Intelligent Network                                  |
| INAP   | Intelligent Network Application Protocol             |
| INP    | INAP-Based Number Portability                        |
| IP     | Internet Protocol                                    |
| IS-41  | International Standard 41, same as ANSI-41           |
| ISDN   | Integrated Services Digital Network                  |
| ITU    | International Telecommunications Union               |
| LIM    | Link Interface Module                                |
| LNP    | Local Number Portability                             |
| LSS    | Local Subsystem                                      |
| MAP    | (1) Mobile Application Part<br>(2) Mated APplication |
| MAS    | Maintenance and Administration Subsystem             |
| MCAP   | MAS Communication Application Processor Card         |
| MEA    | Mismatch of Equipment and Attributes                 |

|        |   |
|--------|---|
| MDN    | Mobile Directory Number   |
| MGT    | Mobile Global Title   |
| MIN    | Mobile Identification Number                                    |
| MMI    | Man-Machine Interface   |
| MNP    | Mobile Number Portability                                       |
| MPS    | Multi-Purpose Server (Multi-Platform Server)                    |
| MS     | Mobile Station  |
| MSRN   | Mobile Station Roaming Number                                   |
| MSC    | Mobile Switching Center   |
| MSISDN | Mobile Station international ISDN number                        |
| MSU    | Message Signaling Unit  |
| MTP    | Message Transfer Part   |
| NC     | E.214 Network Code  |
| NDC    | E.164 National Destination Code                                 |
| NP     | (1) Number Portability<br>(2) Numbering Plan                    |
| NPA    | Numbering Plan Area   |
| NPDB   | Number Portability Database                                     |
| NPV    | Numbering Plan Value  |
| NSD    | Network Systems Division, Tekelec                               |
| OAI    | Object Access Interface   |
| OAM    | Operation Administration & Maintenance                          |
| OAP    | Operations Support System/ Application Processor                |
| OPS    | Operator Provisioning System                                    |
| PDB    | Provisioning Database   |
| PDBA   | Provisioning Database Application                               |
| PDBI   | Provisioning Database Interface                                 |
| PFS    | Product Functional Specification                                |
| PLMN   | Public Land Mobile Network                                      |
| PMTC   | Peripheral Maintenance Control                                  |
| RMTP   | Reliable Multicast Transport Protocol                           |
| RNIDN  | Routing Number prefix + International dialed / Directory Number |
| RNNDN  | Routing Number prefix + National dialed / Directory Number      |

|       |  |
|-------|--|
| RNSDN | Routing Number prefix + Subscriber dialed / Directory Number   |
| RTDB  | Real-Time Database   |
| SCCP  | Signaling Connection Control Part                              |
| SCMG  | SCCP Management  |
| SCP   | Service Control Point  |
| SDS   | System Debug Services  |
| SIM   | Subscriber Identity Module                                     |
| SMS   | (1) Service Management System, or<br>(2) Short Message Service |
| SNP   | Service Numbering Plan   |
| SP    | Signaling Point  |
| SPC   | Secondary Point Code   |
| SRF   | Signaling Relay Function                                       |
| SRI   | Send Routing Information                                       |
| SS7   | Signaling System 7   |
| SSH   | Secure Shell   |
| SSN   | Subsystem Number   |
| SSP   | Service Switching Point  |
| STP   | Signal Transfer Point  |
| TCAP  | Transaction Capabilities Application Part                      |
| TCP   | Transmission Control Protocol                                  |
| TFA   | Transfer Allowed   |
| TFP   | Transfer Prohibited  |
| TSM   | Translation Service Module                                     |
| TT    | Translation Type   |
| UAM   | Unsolicited Alarm Message                                      |
| UDP   | User Datagram Protocol   |
| UDT   | Unit Data Transfer   |
| UDTS  | Unit Data Transfer Service                                     |
| UIM   | Unsolicited Information Message                                |
| UPU   | User Part Unavailable  |
| VLR   | Visitor Location Register                                      |
| VMSC  | Voice Mail Service Center                                      |

## VSCCP VxWorks Signaling Connection Control Part





## Feature Description

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### Introduction

Throughout the world, an increasing number of governments are mandating that telecommunications network operators support service provider number portability. It is primarily intended to promote competition among service providers. It applies to both wireline and mobile phone networks. In particular, the A-Port (IS41 Mobile Number Portability) feature provides the ability for IS41 subscribers to change service providers while retaining their current Mobile Directory Number (MDN).

A-Port provides the ability for IS41 subscribers to change service providers while retaining their Mobile Directory Number (MDN).

A-Port utilizes the EPAP database to derive the portability status of a subscriber. This feature supports LOCREQ messages as well as SMSREQ messages (if the option is selected) for number portability handling. LOCREQ messages generate a LOCREQ response if the MDN is ported and also relays the LOCREQ if the MDN is not ported (non-porting or porting are handled the same way).

If the MTP Msgs for SCCP Apps feature is turned ON, all MTP routed UDT/non-segmented XUDT SCCP messages are routed to SCCP cards. SCCP card then perform SCCP decode/verification on MTP routed messages. If the MTP routed messages have CDPA GTI = 0, and the A-Port feature is turned ON, then the message is sent for A-Port processing. If the MTP routed messages have CDPA GTI  $\neq$  0, then SRVSEL lookup is performed using the SCCP CDPA information. If the result of the lookup is MNP service, the MTP routed messages are sent to MNP handling. MNP begins A-Port general TCAP/MAP verification if the message is ANSI TCAP and A-Port feature is turned ON.

The MNP Circular Route Prevention (MNP CRP) feature is an extension of the A-Port 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. This results in a circular route. The MNP CRP feature provides the logic to prevent this scenario. This feature is enabled and turned-on using Feature Access Key (FAK) commands.

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

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.

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

The MNP SCCP Service Re-Route feature is designed to handle and control re-routing of A-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 A-Port functionality. This feature also provides the option to mark A-Port *OFFLINE* to perform a controlled re-routing during this state.

Standards are defined so that carriers can choose to implement either Signaling Relay Function (SRF)-based (using MAP protocol) MNP or IN-based (using INAP protocol) MNP. A-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, A-Port acts as a “NP HLR,” in the case where the number has been exported, by responding to the switch with a Loc\_req ack message. For calls to imported numbers and non-call related messages, A-Port performs message relay.

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

A-Port MNP is based on the EAGLE 5 ISS platform. It is deployed in a node that is also performing the STP function.

Number lengths vary between countries and may even vary within a country. As a result, the A-Port 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.

### **A-Port Considerations**

1. GTT must be ON before the A-Port feature can be enabled.
2. The A-Port feature cannot be enabled if any TSMs are in the system.
3. The A-Port feature requires 4 GB DSMs.
4. A-Port is activated or turned on, but not off, via a feature access key (FAK).
5. The A-Port, IGM, G-Port MNP, G-Flex C7 Relay, AINPQ, and INP features can run concurrently on an EAGLE 5 ISS node.
6. When A-Port and G-Flex are run on the same node, interactions between the two features must be addressed.
7. A-Port and North American LNP are mutually exclusive on an EAGLE 5 ISS node.

## MPS/EPAP Platform

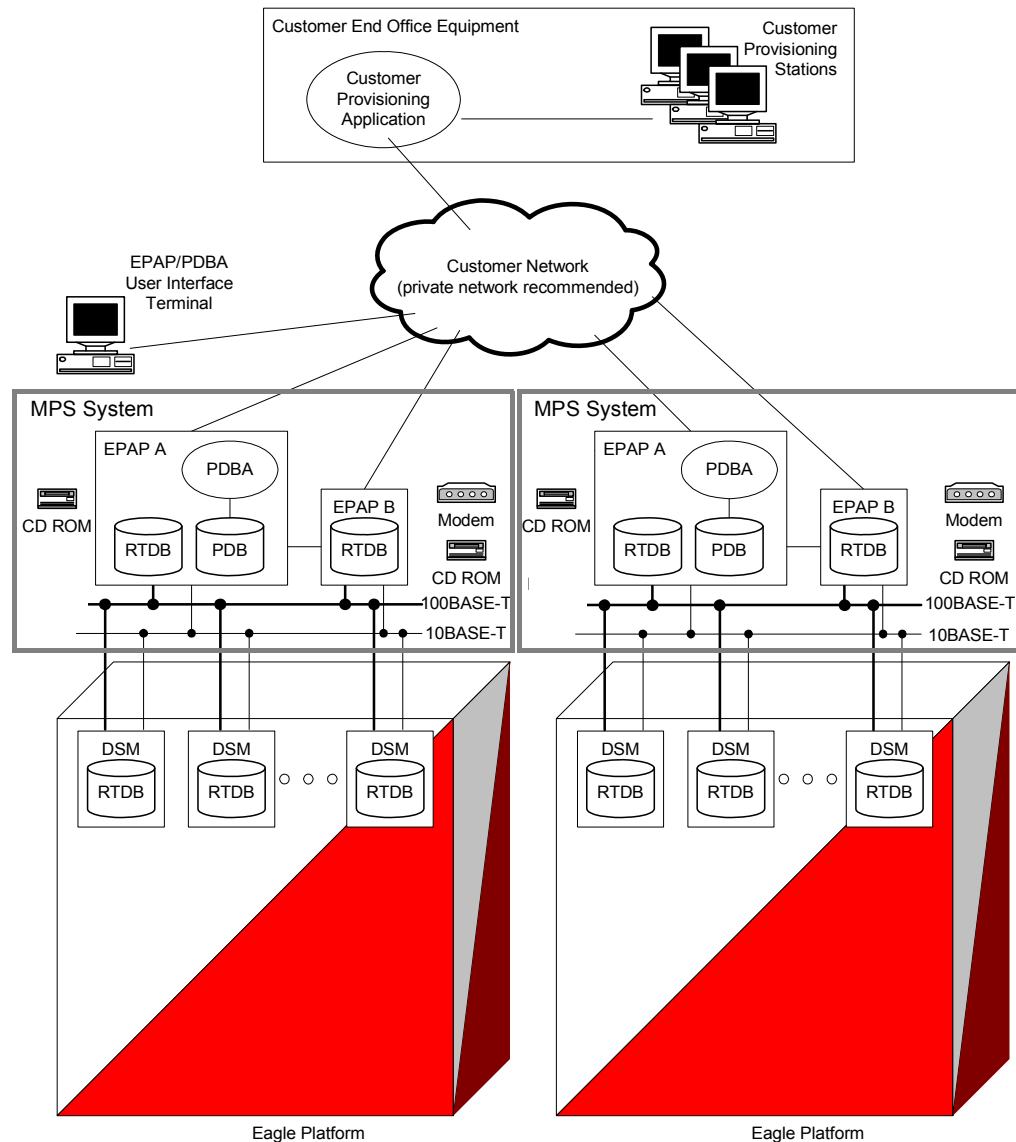
Tekelec provides the MPS (Multi-Purpose Server) platform as a subsystem of the EAGLE 5 ISS. The MPS provides support for multiple features, which currently are the AINPQ, INP, G-Flex, G-Port, A-Port, IGM, and EIR features.

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 (international format).

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

**NOTE:** The EAGLE 5 ISS supports more than one model of DSM card. The cards differ in the size of database and the transactions/second rate that they support. In this manual, the term DSM is used to mean any model of DSM, unless a specific model is mentioned. For more information about the supported DSM models, refer to the *Hardware Manual - EAGLE 5 ISS*.

**Figure 2-1. MPS/EPAP Platforms for Provisioning A-Port**



## Design Overview and System Layout

Figure 2-1 illustrates the overall system architecture of A-Port 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, a Real-time Database, a Provisioning Database, servers, CD ROMS, modems, and network hubs. Each MPS and its EPAPs may be thought of as an 'EPAP system'; the EPAP system at 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.

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

The A-Port subscriber 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 A-Port subscriber database. In the case where the active link fails, the active EPAP switches to the standby link to continue provisioning the DSMs. The two Ethernet links are part of the DSM network.

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

Major modules on the EPAP are the:

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

The DSM provisioning module is responsible for updating A-Port subscriber databases on the EAGLE 5 ISS DSM cards using the 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 A-Port 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 A-Port data from the customer network to the DSM cards on the EAGLE 5 ISS. A-Port 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 socket to provision the DSM cards on the EAGLE 5 ISS. The maintenance module is responsible for the overall stability and performance of the system.

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

## EPAP/PDBA Overview

The EAGLE Provisioning Application Processor (EPAP) platform and the Provisioning Database Application (PDBA) coupled with the Provisioning Database Interface (PDBI) facilitate the user database required for the A-Port feature. It performs the following two basic functions in support of the A-Port feature:

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

The PDBA operates on the master A-Port provisioning database (PDB). The EPAP and PDBA are both installed on the MPS hardware platform.

The EPAP platform maintains an exact copy of the real-time database (RTDB) required by the EAGLE 5 ISS DSM cards, provisions the EAGLE 5 ISS DSM cards, and maintains redundant copies of both databases on mated EPAP hardware. 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. A-Port 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 across a private network to the DSM cards located in the EAGLE 5 ISS frame by the EPAPs.

The primary interface to the PDBA consists of machine-to-machine messages. The interface is defined by Tekelec and is available in the Provisioning Database Interface Manual. Use that manual to update or create provisioning software compatible with the EPAP socket interface.

A direct user interface is provided on each EPAP to allow 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 high provisioning rates that A-Port requires. Implementing the persistent database and provisioning as an open systems platform, compared to the traditional OAM 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 in order to provision the EAGLE 5 ISS DSM cards. The EPAP server must comply with the hardware requirements in the *MPS Hardware Manual*. Figure 2-1 illustrates the EPAP architecture contained in the MPS subsystem.

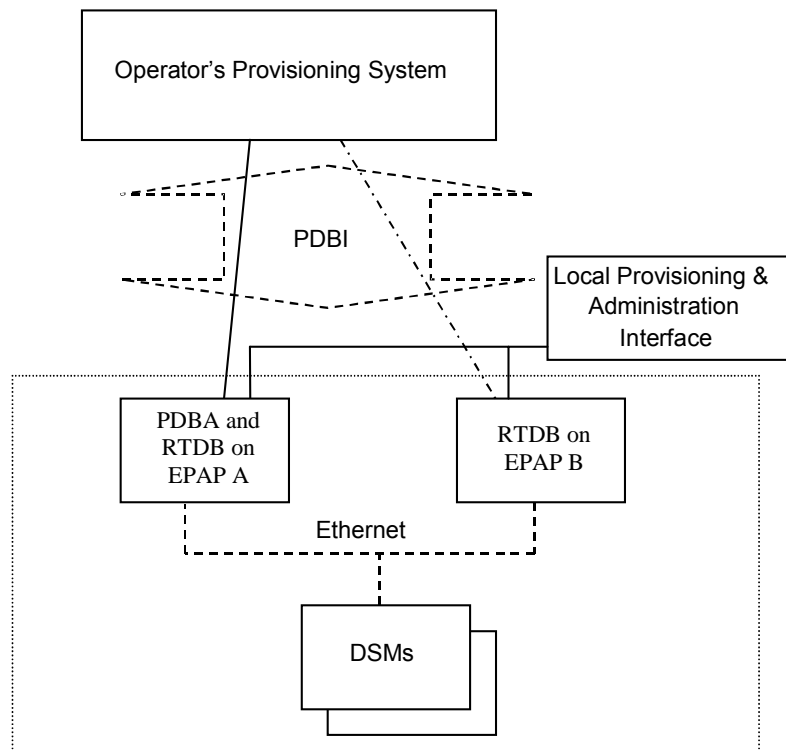
Each EPAP has a dedicated CD ROM drive. One EPAP per EAGLE 5 ISS platform has a modem capable of supporting remote diagnostics, remote configuration, and remote maintenance; these remote operations are performed through EPAP login sessions. These sessions are accessible across the customer network (that is, the ssh) as well as through direct terminal connection to the EPAP via an RS232 connection. Refer to the *Tekelec 1000 Application Server Hardware Manual* for details about the hardware devices and network connections.

## Subscriber Data Provisioning

“**Subscriber Data Provisioning Architecture (High Level)**” on page 2-8 shows the current high-level view of the subscriber data provisioning architecture that used for A-Port. Only those parts of the EAGLE 5 ISS platform that are relevant to subscriber data provisioning are shown. This section defines requirements for the PDBI (Provisioning Database Interface) between the A-Port and the operator's provisioning system (OPS).

Provisioning clients connect to the EPAPs via the Provisioning Database Interface (PDBI). This interface contains commands that allow all of the provisioning and retrieving of A-Port data. The PDBI is used only for real-time provisioning of subscriber and network entity data. Refer to the *Provisioning Database Interface Manual* for more details about the A-Port PDBI.

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





A pair of active/standby EPAP (EAGLE Provisioning Application Processors) servers provides the interface between the Real-time Database (RTDB) of the EAGLE 5 ISS DSM (Database Service Modules) cards and the OPS (Operator Provisioning System). EPAP A is equipped with both the PDB (Provisioning Database) and the RTDB database, and EPAP B has just the RTDB. An EPAP with just the RTDB must be updated by the EPAP that has the PDB. The EPAP uses the Multi-Purpose Server (MPS) hardware.

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*.

### ***Database Overview***

This section describes, at a high level, the distributed administrative architecture for the EAGLE 5 ISS, which includes the A-Port administrative solution.

In general, STP 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. STP database updates are generally considered to be EAGLE 5 ISS link, linkset, route, destination, mated application, gateway screening, and global title types of information.

Typically, large databases requiring much faster update and retrieval rates (compared to the rates provided by the OAM) are not administered via EAGLE 5 ISS terminals. These databases, such as A-Port, are populated using redundant Ethernet connections to DSM cards from an EPAP MPS platform.

An EPAP consists of a combined Provisioning database (MySQL) and RTDB database, as shown in Figure 2-1. The PDB responds to requests for updates by the active and standby RTDB databases on both mated EAGLE 5 ISSs. The active EPAP RTDB database is responsible for initiating multicast updates of changed database records to the DSM cards after the data has been committed to the EPAP disks. Furthermore, the PDB may accept and commit to more database updates while the RTDB databases are completing their previous updates

It is this overlapping of database updates, coupled with an RTDB transactional database engine and fast download time, that allows larger amounts of data at a time from the PDB. Committing larger amounts of data at a time to be committed in the RTDB (versus a single update at a time) results in achieving faster overall transaction rates. 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 already completed the update and sent it to the DSM card.

The EPAP architecture contains a local provisioning terminal and a modem for remote access, as well as other functions. A backup device can be used to backup or restore the Provisioning database. The local provisioning terminal is used to manually repair the standby EPAP RTDB database or to turn the A-Port subscriber database audit on or off. For additional information, refer to the *Tekelec 1000 Application Server Hardware Manual* and the *EPAP Administration Manual*.

### ***EPAP (EAGLE Provisioning Application Processor)***

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

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

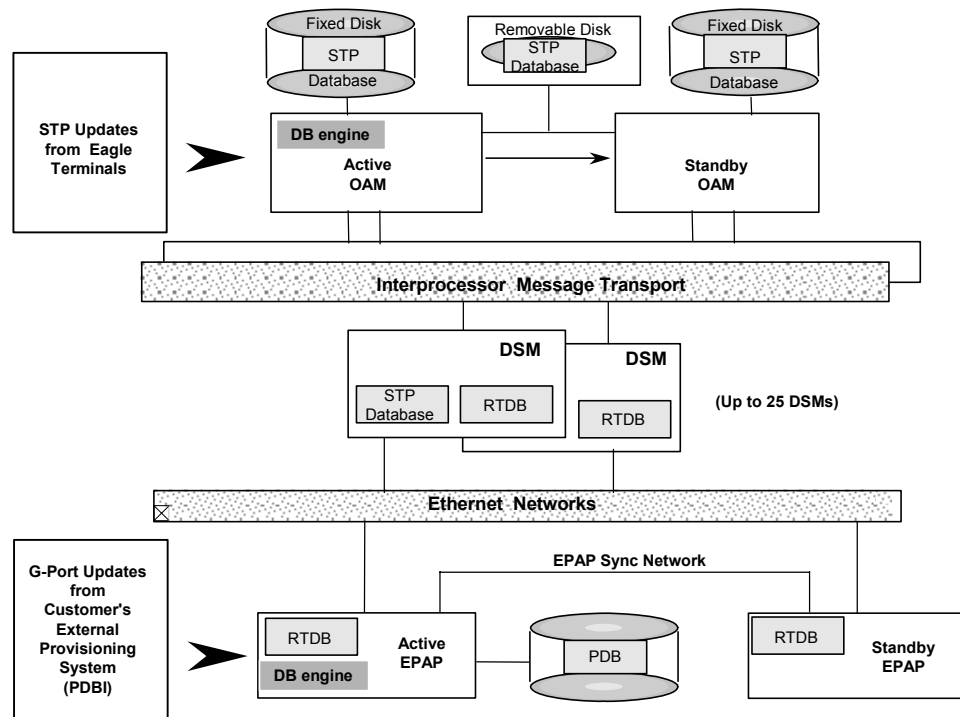
The PDB on the active EPAP receives A-Port data from the customer network through the PDBI, the external source of A-Port provisioning information. The PDBA continually updates the active EPAP's PDB. (The PDB uses MySQL database software.) Once an update is applied to the active PDB, it is sent to the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

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

In a mated pair configuration, there are mated EPAP servers that provide two A-Port platforms, as shown in Figure 2-1. The PDB on the active EPAP automatically updates the PDB on the mate platform. The PDB on the mate platform then updates its EPAP RTDBs, which in turn update the RTDBs on the DSM cards.

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

**Figure 2-3. Administrative Architecture**



### ***DSM (Database Service Module) Cards***

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

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

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

However, the various databases may not be identical at all times for several reasons. First of all, when a DSM card is initialized, it downloads the current copy of the database from the EPAP. While that card is being loaded, it cannot receive new updates that have arrived at the EPAP since reload began. Another condition

that can result in databases being out-of-sync occurs when the EPAP receives updates from its provisioning source, but it has not yet sent them down to the DSM cards. Updates are applied to the provisioning database as they are received.

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

The other case occurs when a DSM 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 DSM is responsible for recognizing and reporting its out-of-memory conditions by means of alarms.

**Overview of EPAP to DSM Communications.** Before discussing DSM status reporting or EPAP status reporting, it is helpful to understand the communications between the DSMs and the EPAP in broad terms.

- UDP - sending DSM status messages

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

- IP - reporting EPAP maintenance data

The DSMs create an TCP/IP 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 DSMs and issues a *Connect* to establish the TCP/IP connection with that DSM (referred to as the primary DSM). The purpose of this link is to provide a path for reporting EPAP alarms and to forward maintenance blocks to the DSM.

- IP Multicast - downloading GSM database

Because of the large size of the database and the need to download it quickly on up to 25 DSM cards, A-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 the DSMs.

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. DSMs that need to download the real time database or to receive database updates “join the tree”. DSMs can also “leave the tree”, typically when the database fills their available memory.

### ***DSM Provisioning and Reload***

One of the core functions of the EPAP is to provision the DSM cards with the A-Port subscriber database 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 DSM cards. Provisioning is done by database level in order to leave DSM tables coherent between updates.

The DSM cards do the following:

- Detect the need for incremental updates and send a status message to the EPAP.
- Discriminate between the various streams by the database level contained in each message and accept updates according to the DSMs current database level.

### **DSM Reloading Model.**

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

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

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

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

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

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

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

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

DSM cards do the following:

- Detect the need for stage 1 loading and send a status message to the EPAP.
- Identify the first record DSM was able to read in the above status message if a record stream is already in progress.
- Handle the record stream regardless of the starting point (that is, records starting with the middle record of the middle table).
- Expect tables to be sent in a particular order and therefore detect any gap in the record stream.
- Send a status message if a gap is detected. Stage 1 loading is essentially reset to the last update received.
- Handle wrapping from the last record from the last table to the first record of the first table.o the last update received.
- Know when they have received all the required records to proceed to stage 2 loading.

- Send a status message when stage 1 loading is complete, indicating the database level at the beginning of stage 1.
- Detect when the master RTDB crosses a memory boundary during stage 1 loading; the card automatically reboots and then auto-inhibits.

**EPAP Status and Error Reporting via Maintenance Blocks.** The EPAPs forward all status and error messages to the DSMs 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 you receive when you issue a `rept-stat-mps` command.

### ***Network Connections***

Several customer- and Tekelec-installed private networks are required to support the A-Port feature. These networks are:

- Customer provisioning network
- EPAP sync network
- DSM networks
- Dial-up network

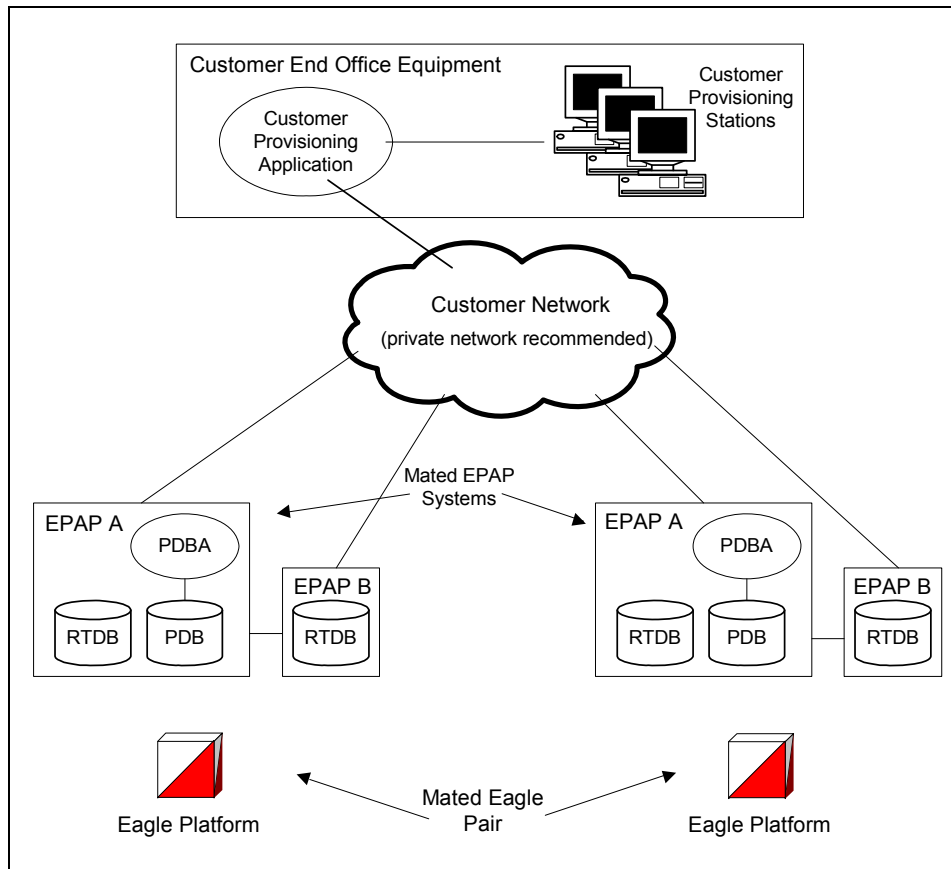
The following discussion is an overview of these private networks. It expands on the networks in the A-Port architecture diagram shown in Figure 2-4. (For details about configuring these networks, refer to the *EPAP Administration Manual*.)

**Customer Provisioning Network.** The customer network carries the following traffic:

- Customer queries and responses to the PDB via the PDBI from the customer provisioning network
- Updates between PDBs if 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 2-4.

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

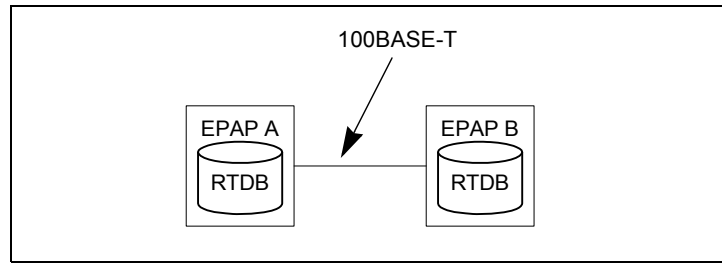


Although a dedicated network is recommended, it is possible that unrelated customer traffic can use the network as well. The determination, either to have a dedicated network or to allow other customer traffic, should be based on available external Ethernet bandwidth and network performance considerations.

**EPAP Sync Network.** The EPAP sync network carries RTDB and maintenance application traffic between active and standby EPAP servers on an EPAP system. It synchronizes the contents of the RTDBs of both EPAP A and B. The EPAP network is a single Ethernet cable between EPAP A and EPAP B running at 100BASE-T, as shown in Figure 2-5.



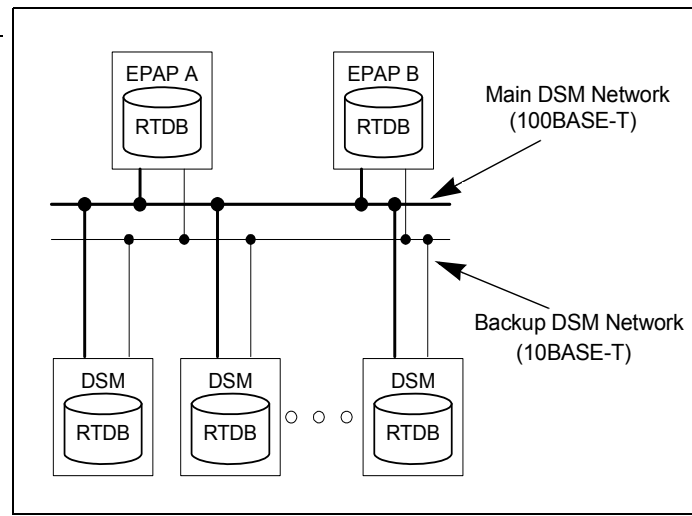
**Figure 2-5.** EPAP Sync Network



**DSM Networks.** The DSM networks are shown in Figure 2-6. They carry provisioning data from the Real Time Data Bases (RTDBs) from the active EPAP to the DSM cards. They also carry reload and maintenance traffic to the DSMs.

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

**Figure 2-6.** Customer Provisioning Network



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

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

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

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

The fourth octet of the address is specified as follows:

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

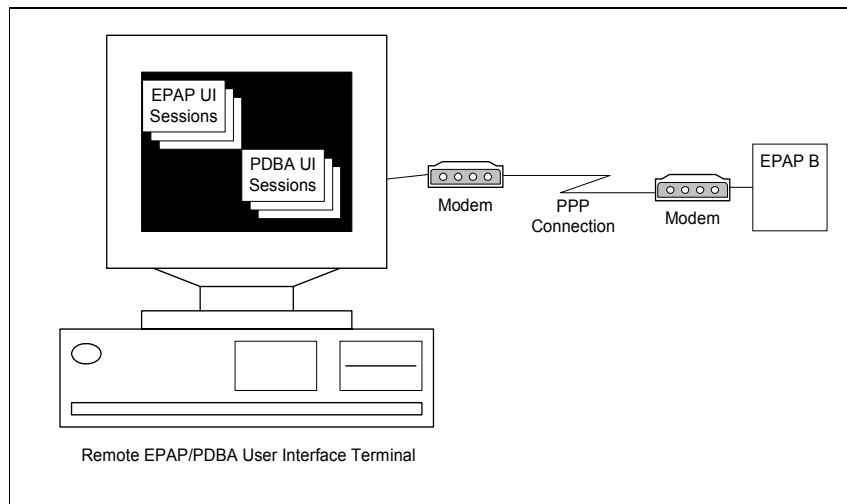
Table 2-1 summarizes the contents of each octet.

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

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

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

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



## **Serviceability Hints**

### **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 at real time, 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 PC (and/or SSN) 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 at real time, 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.

### **A-Port Considerations**

The following list contains considerations you should think over before installing and operating the A-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 A-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 propounded and that SCCP CDPA has the full DN of the subscriber.
4. A-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 A-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 A-Port subscriber 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 A-Port node is required to support only an MNP within such a portability cluster.
8. 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.
9. All non-call related messages impacted by MNP contain the MSISDN number in the SCCP CdPA. In the case of the SRI message, A-Port may get the number from the MAP leve.
10. TCAP operation codes uniquely distinguish Loc\_req messages and do not change from one phase (or version) of MAP to another.
11. 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.
12. The parameters of the SRI ACK message generated by A-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", A-Port generates an SRI ACK contains IMSI, MSRN, MDN, and NPS parameters, despite the MDN and NPS parameters not being defined for phase 1 or 2.
13. If SRFIMSI is not provisioned with an RN entity and an incoming message is an SRI message, A-Port sets IMSI parameter as zero digits when the MAP phase is 1 or 2.
14. A-Port uses the MTP route for the SRI ACK response, even when the final GTT is performed on the response.
15. When the concatenated number (RN + MDN) option is selected for encoding the Routing Info (MSRN) in SRI ACK, A-Port encodes the complete concatenated number, because the concatenated number length may otherwise exceed 16 digits, which is the maximum allowed in MSRN.

## General Requirements

### *Numbering*

1. Incoming called party numbers (from the SCCP portion) destined for A-Port processing are conditioned to fit the GDB requirements where possible:
  - If the GTT selectors available in the incoming message match an entry in the A-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.
  - If the GTT selectors available in the incoming message match an entry in the A-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.
2. Numbers with fewer than five digits after the above conditioning are not used for A-Port. In this case, a UIM is issued, and the message falls through to GTT.
3. Numbers with more than 15 digits after the above conditioning are not used for A-Port. In this case, a UIM is issued, and the message falls through to GTT.

### *Maintenance*

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

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

- **DSM Main Board Verification**

An AMD-K6 (or better) main board is required to support the A-Port VSCCP application on the DSM card. EAGLE 5 ISS maintenance stores the validity status of the VSCCP card's main board configuration.

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

When the VSCCP application is initializing, it 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 VSCCP 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 A-Port application, loading of the VSCCP card is automatically inhibited.

- **DSM Applique Memory Verification**

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



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

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

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

When the hardware configuration for a DSM card is determined to be invalid for the A-Port application, SCM automatically inhibits loading for that specific DSM card. A major alarm is generated indicating that card loading for that DSM card has failed and has been automatically inhibited (that is, prevented from reloading again). Refer to “A-Port Alarms” on page 5-11, for the specific alarm that is generated. When card loading has been inhibited, the primary state of the card is set to oos-mt-dsbld, and the secondary state of the card is set to MEA (Mismatch of Equipment and Attributes).

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

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

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

- **Unstable Loading Mode**

At some point, having a number of invalid DSM cards results in some of the LIMs (Link Interface Module) being denied SCCP services. There is a threshold that needs to be monitored: if the number of valid DSMs 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 other reasons why an EAGLE 5 ISS might be in an unstable loading mode, refer to Chapter 5, "Loading Mode Support Status Reporting.", page 5-4.

### *Maintenance Commands*

The following commands are used for A-Port maintenance.

- The debug command `ent-trace` traps A-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 MDN and entity ID, the comparison is based on the search key built from the CdPA GTAI (Global Title Address Information) after any conditioning. The existing GT SCCP trigger also applies to A-Port messages.
- The command `rept-stat-sccp` reports current A-Port statistics. A MSU is considered to be a A-Port MSU after SRVSEL. This command reports A-Port statistics on a single SCCP card basis or on a A-Port system basis.

For more information, refer to Chapter 5, "Maintenance and Measurements".

### *A-Port Loading Mode Support*

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

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

### *Audit Requirements*

The A-Port audit does not change EAGLE 5 ISS's compliance to STP audit requirements, to which it currently adheres. A-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 audit mechanisms for A-Port tables residing on the EPAP platform that are downloaded to the DSM cards. The audit mechanisms consist of the following.

- On each DSM card and on the standby EPAP, a background audit calculates checksums for each A-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 DSM cards and the standby EPAP. If the database levels do not match, the standby EPAP or DSM card issues a *diff level* alarm.

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

## A-Port Protocol

A-Port supports both Message Transfer Part (MTP) routed, if enabled, and Global Title (GT) routed messages. GT routed messages perform SRVSEL lookup after Signaling Connection Control Part (SCCP) verification. GT routed messages support Unit Data Transfer (UDT) and non-segmented Extended Unit data (XUDT) message types.

### Main Functions

A-Port and MNPCRP provide the following main functions:

#### Message Discrimination

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

#### RN Prefix Deletion - SCCP

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

- RN + DN
- CC+RN+DN

Consequently when the SNAI is either RNIDN, RNNDN, or RNSDN, A-Port compares the decoded MDN number with the list of provisioned home RN prefixes defined in the RTDB. If a match is found, A-Port strips off the RN digits from the number.

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

When the SNAI is CCRNDN, A-Port first compares the CC to the DEFCC list:

- If CC is not equal to the DEFCC, the message falls through to GTT.
- If CC=DEFCC then, A-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 A-Port strips off the RN digits from the number. If no match is found, the no-prefix deletion is performed and A-Port processing continues.

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

The decoded MAP MDN digits can have a RN concatenated with the MDN number in two forms:

- RN + DN
- CC+RN+DN

The MAP NAI is used to determine the type: International, National or Subscriber. If MNP CRP is OFF, RN prefix deletion is not attempted. If MNP CRP is ON, then RN prefix deletion is attempted on all MDNs. If the MAP NAI indicates International, then a check is performed for the DEFCC prefix on the MDN. If DEFCC is detected, then HomeRN deletion is attempted using the CC+RN+DN format. All other MDNs will use the RN+DN format. A-Port compares the decoded MDN number with the list of provisioned home RN prefixes defined in the RTDB. If a match is found, the A-Port strips off the RN digits from the number. If no match is found, then no prefix deletion is performed and A-Port processing continues with number conditioning.

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

### **Number Conditioning**

The RTDB stores international MDNs only. The received MDN number or SCCP CDPA digits may need to be converted to an international number to do a database lookup.

A-Port performs number conditioning upon successful decode and verification of the message. HomeRN and IEC or NEC prefixes are removed. The MDN is conditioned to international number format based on the service nature of address (SNAI for SCCP, TCAPSNAI for TCAP, or MTPLOCREQNAI for MTP.)

### **Database Lookup**

A-Port performs database lookup using the conditioned DN digits encoded in Called Party. The database lookup yields one of the following four possible outcomes:

- Match is Found with Network Entity Assigned  
For subscriber entries with a RN and PT≠ 0, LOCREQ and any IS41 messages are relayed. GTT is applied to any GSM or non-TCAP message.  
For subscriber entries with a SP, or a RN and PT= 0, LOCREQ and any IS41 messages are relayed. GTT is applied to any GSM or non-TCAP message.
- Match is Found Without NE.

A data entry in the database is found if a subscriber entry in database (either an individual DN entry or a DN block) matches the conditioned Called Party.

If an entry is found without a NE assigned and PT= **1, 2, or No PT**, the LOCREQ is returned without a NE.

The LOCREQ is routed via GTT if an entry is found without a NE assigned and PT= **0 or 5**. GTT is applied to any IS41 if an entry is found without a NE assigned. The EAGLE only modifies the MTP and SCCP information as required by standard GTT and keeps the TCAP portion of the message intact.

- Number conditioning fails, or if the DN is not found in the RTDB database, or the DN is found with non-A-Port data.

Either the number has never been ported or it is an unknown number. The EAGLE 5 ISS routes the message via normal GTT/MTP routing. The EAGLE 5 ISS only modifies the MTP and SCCP information as required by normal GTT/MTP routing, if required, and keeps the TCAP portion of the message intact.

Normal routing is performing GTT if the incoming message is sent to the EAGLE 5 ISS Self Point Code. Normal routing is routing the message to the MTP DPC if the incoming message is MTP-routed (the MTP DPC of the message is not the EAGLE 5 ISS Self Point Code)

- A-Port modifies the TCAP information for LOCREQ messages only when a HomeRN was deleted from the TCAP DN and **LOCREQRMHRN = YES**. Any gaps in the data caused by a change in field length will be resolved by shifting the remaining information up. Any IEC or NEC code is left.

Since a DN may be the target of the A-Port, G-Port, or Migration message processing in a hybrid network (where an operator owns both GSM and IS41 network), message processing call disposition is based on what applications are turned on. Table 2-2 summarizes A-Port message processing.

**Table 2-2.** A-Port Message Processing

| NE/PT                        | LOCREQ             | Any IS41 | Any GSM or non-TCAP |
|------------------------------|--------------------|----------|---------------------|
| RN and PT ≠ 0                | ACK (RN from EPAP) | Relay    | GTT                 |
| SP or (RN and PT= 0)         | Relay              | Relay    | GTT                 |
| No NE and PT= 1, 2, or No PT | ACK (no NE)        | GTT      | GTT                 |
| No NE and PT= 1 or 5         | GTT                | GTT      | GTT                 |
| No DN entry found            | GTT                | GTT      | GTT                 |

Database lookup results in the following:

1. Applying 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. In the case where a received IS41 message is relayed, the EAGLE formulates the SCCP CdPA GTA field of the outgoing message according to DigitAction specified. If DigitAction = none, the EAGLE 5 ISS does not overwrite the SCCP CdPA GTA. For all other values, the EAGLE 5 ISS formats the SCCP CdPA GTA according to the value assigned to DigitAction. Table 2-3 identifies the required DigitAction options as well as the samples of how the SCCP CdPA GTA of an outgoing message is formatted for each of the options. The illustration assumes the RN/SP ID is 1404 and default country code is 886.

**Table 2-3.** DigitAction Applications

| DigitAction | Value in Incoming CdPA GTA | Value in Outgoing CdPA GTA | Meaning  |
|-------------|----------------------------|----------------------------|--|
| none        | 886944000213               | 886944000213               | No change to the Called Party GTA (default)                      |
| prefix      | 886944000213               | 1404886944000213           | Prefix Called Party GTA with the entity id                       |
| replace     | 886944000213               | 1404                       | Replace Called Party GTA with the entity id                      |
| insert      | 886944000213               | 8861404944000213           | Insert entity id after country code. (CC + Entity Id + NDC + SN) |
| delccprefix | 886944000213               | 1404944000213              | Delete country code and add prefix                               |
| delcc       | 886944000213               | 944000213                  | Delete country code  |

**Table 2-3.** DigitAction Applications (Continued)

| <b>DigitAction</b> | <b>Value in Incoming CdPA GTA</b> | <b>Value in Outgoing CdPA GTA</b> | <b>Meaning</b>                              |
|--------------------|-----------------------------------|-----------------------------------|---|
| 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 LOCREQ is returned:

1. When a response/ACK is returned, the EAGLE5 ISS follows the LOCREQ encoding rules along with the following enhancements for added flexibility:
2. Allow users to specify which TCAP LOCREQ parameter (the TCAP Outgoing Called Party parameter) encodes the RN (and/or DN) information
3. Allow users to specify the Digit Type value to encode the TCAP Outgoing Called Party parameter
4. Allow users to specify the value to encode the Nature of Number field of the TCAP Outgoing Called Party parameter;
5. Allow users to specify the value to encode the Numbering Plan field of the TCAP Outgoing Called Party parameter;
6. Allow users to specify the digit encoding format of the LOCREQ TCAP Outgoing Called Party parameter
7. Allow users to specify the MSCID values to be encoded in the LOCREQ message;
8. Allow users to specify the ESN values to be encoded in the LOCREQ message;
9. Allow users to specify how the digits of the LOCREQ MIN parameter shall be encoded.

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

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

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

## Service State

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

## MNP Re-Routing

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

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

## MNP Capability Point Codes

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

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

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

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

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

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

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

MNP 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 MNP re-route. When the MNP service is *OFFLINE*, MNP messages fall through to GTT based on the GTT option. This option is set to YES by default.

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

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

Before changing MNP service to *OFFLINE*, it should be decided what kind of re-routing will be used during the outage. The EAGLE 5 ISS supports re-routing data to alternate point codes or falling thru 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 MNP traffic. This is the recommended option. Up to 7 alternate MNP nodes can be provisioned to re-route all the incoming MNP traffic. Once provisioned, the MNP service can be changed to *OFFLINE*. This example has any incoming MNP traffic being load-shared to point codes based on the relative cost.

```
chg-sccp-serv:serv=mnp:pci1=1-1-1:rc1=10:pci2=2-2-2:rc2=10:pci3=3-3-3:rc3=10:pci4=4-4-4:rc4=10
chg-sccp-serv:serv=mnp:pci1=1-1-1:rc1=10:pci2=2-2-2:rc2=10:pci3=3-3-3:rc3=10:pci4=4-4-4:rc4=10
chg-sccp-serv:serv=mnp:pci1=5-5-5:rc1=10:pci2=6-6-6:rc2=10:pci3=7-7-7:rc3=10:pci4=8-8-8:rc4=10
chg-sccp-serv:serv=mnp:state=offline
```

#### *Option 2*

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

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

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

Table 2-4 shows the actions taken when the MNP service is offline, a message arrives at the affected node requiring MNP service, and SCCP cards are available.

**Table 2-4.** MNP SCCP Service Re-Route Capability Summary

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

**Table 2-4. MNP SCCP Service Re-Route Capability Summary (Continued)**

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

**MTP Routed SCCP Traffic for A-Port**

A-Port supports MTP routed SCCP messages. LOCREQ messages are supported. This feature cannot be turned ON unless at least one of the following is turned ON:

- A-Port
- IGM
- G-Flex

Use of MTP Msgs for SCCP Apps feature adversely affects the SCCP capacity, as all of these messages are counted under SCCP capacity.

Once this feature is turned ON, all SCCP messages are routed to SCCP cards. The SCCP card then performs SCCP decode/verification. If the MTP routed messages have CDPA GTI = 0 and A-Port is turned ON, then the message is sent for A-Port processing. If MNP service is OFFLINE, then MTP routing is performed on the messages.

If the MTP routed messages have CDPA GTI  $\neq$  0, then SRVSEL lookup is performed using the SCCP CDPA information. If the result of the lookup is MNP service, the message is sent to MNP handling. If a service selector is not defined or does not match, or if the service is OFFLINE, then MTP routing is performed on the messages. The MNP SCCP Service re-route is not performed on MTP routed messages.

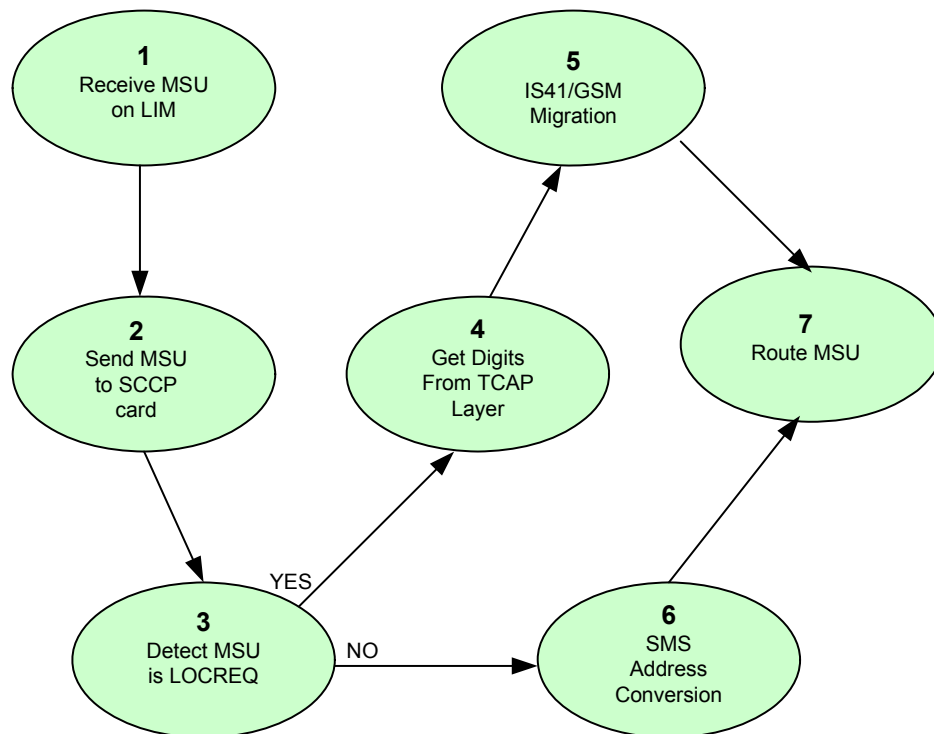


MNP checks to see if the TCAP portion of the message is ITU or ANSI. If the message is ITU TCAP then normal routing (or G-Flex if provisioned) is performed on the message. If the message has ANSI TCAP, then A-Port general TCAP/ MAP verification is performed if A-Port or IGM is turned ON.

SMS Address conversion is not affected by the MTP Msgs for SCCP Apps feature; SMS conversion handles only Registration Notification and SMS Notification messages.

A feature access key (FAK) for part number 893017401 is required to enable the MTP Msgs for SCCP Apps feature.

**Figure 2-8.** Message Control Flow



1. The MSU is received by the EAGLE 5 ISS
2. The MSU is sent to the SCCP Function.
3. The SCCP card examines the MSU and determines if it is a LOCREQ message.
4. For LOCREQ, the TCAP Digit Parameter contains the digits to apply to Migration. This is a mandatory parameter. The digits are in encoded.

5. IS41/GSM Migration is applied to the digits to determine if the subscriber is migrated. If so, a LOCREQ Return Result is generated to the OPC. If not, the LOCREQ is routed.
6. If the message is not a LOCREQ, ITUN-ANSI SMS Address Conversion is applied. SMS Address conversion feature does not have any impact because on this feature because SMS conversion handles only Registration Notification and SMS Notification messages.
7. The MSU is routed. MTP and SCCP conversion are performed if crossing a network boundary.

# EAGLE 5 ISS A-Port Commands

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## Introduction

This chapter describes the Commands for maintenance, measurements, and administration of the A-Port features. EAGLE 5 ISS A-Port commands provide for the provisioning, operations, and maintenance activities of the EAGLE 5 ISS DSM cards and associated network connections.

## EAGLE 5 ISS Commands for A-Port

This section includes the EAGLE 5 ISS commands that are either entirely new or modified for the A-Port feature. This chapter contains a brief description of the functions they provide and appropriate examples of their use. User commands are listed in Table 3-1.

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

**Table 3-1.** Commands for EAGLE 5 ISS A-Port

| <b>EAGLE 5 ISS Commands for A-Port Feature</b> |                  |                |                |
|--|------------------|----------------|----------------|
| act-gpl  | copy-gpl         | inh-alm        | rept-stat-trbl |
| alw-card                                       | dlt-map          | inh-card       | rtrv-ctrl-feat |
| chg-ctrl-feat                                  | dlt-card         | rept-ftp-meas  | rtrv-card      |
| chg-db   | dlt-sccp-serv    | rept-meas      | rtrv-gpl       |
| chg-gpl  | dlt-srvsel       | rept-stat-alm  | rtrv-is41opts  |
| chg-is41opts                                   | dlt-sid          | rept-stat-db   | rtrv-measopts  |
| chg-measopts                                   | enable-ctrl-feat | rept-stat-gpl  | rtrv-sccp-serv |
| chg-sccp-serv                                  | ent-card         | rept-stat-meas | rtrv-sid       |
| chg-sid  | ent-map          | rept-stat-mps  | rtrv-srvsel    |
| chg-srvsel                                     | ent-srvsel       | rept-stat-sccp | unhb-alm       |
|  |                  | rept-stat-sys  |                |

### EAGLE 5 ISS IS41 Options Commands

The A-Port system options (is41opts) commands are used to change and report on the values of one or more of the STP node level processing option indicators maintained in the IS41option tables. All values are assigned initially to system defaults at STP installation time, and they can be updated later using the `chg-is41opts` command.

- **chg-is41opts: Change IS41 Options Command** – The `chg-is41opts` command changes IS41-specific options in the database. This command updates the IS41OPTS table. The default parameter values are always overwritten when specified. Refer to the *Commands Manual* for details of this command

**Table 3-2.** `chg-is41opts` Parameters - Class = DATABASE

| <b>Parameter</b> | <b>Optional/<br/>Mandatory</b> | <b>Range</b> | <b>Description</b>   |
|------------------|--------------------------------|--------------|--|
| esnmfg           | Optional                       | 0-255, none  | TCAP locreq esn manufacture's code. Used to specify the value to be encoded in the TCAP locreq ESN parameter, manufacture's code part. |

**Table 3-2. chg-is41opts Parameters - Class = DATABASE (Continued)**

| Parameter    | Optional/<br>Mandatory | Range  | Description  |
|--------------|------------------------|--|--|
| esnsn        | Optional               | 0-16777215   | TCAP locreq esn serial number. Used to specify the value to be encoded in the TCAP locreq ESN parameter, serial number part.   |
| iec          | Optional               | digit string 1-5 digits, none                              | International escape code  |
| locreqdn     | Optional               | tcap, sccp   | Use this parameter to define whether the Called Party will be obtained from the SCCP layer or the TCAP layer of a received LOCREQ for database lookup                              |
| locreqrmhrn  | Optional               | yes, no  | Locreq RM HRN. Used to specify if HomeRN is to be removed from the TCAP Outgoing Called party for a relayed LOCREQ message.  |
| mscmktid     | Optional               | 0-65535  | Locreq MSCID market id. Used to specify the value to be encoded in locreq MSCID parameter for Market ID.   |
| mscswitch    | Optional               | 0-255  | Locreq mscid market id switch part is used to specify the value to be encoded in locreq MSCID parameter, market id switch part   |
| mtplocreqnai | Optional               | ccrndn, frmsg, intl, natl, rnidn, rnndn, rnsdn, sub}, none | Message Translation Part LOCREQ nature of address indicator. Used to define how Called Party obtained from the TCAP layer of a received MTP-routed LOCREQ message, is interpreted. |

**Table 3-2. chg-is41opts Parameters - Class = DATABASE (Continued)**

| <b>Parameter</b> | <b>Optional/<br/>Mandatory</b> | <b>Range</b>   | <b>Description</b>   |
|------------------|--------------------------------|--|--|
| nec              | Optional                       | digit string 1-5 digits,<br>none                           | National escape code   |
| rspcdpari        | Optional                       | frmsg, gt, ssn   | Response Called Party Routing Indicator. Use this parameter to specify the value of the Routing Indicator bit to encode the SCCP CdPA GTA of a returned locreq message.  |
| rspcgpanai       | Optional                       | ccrndn, frmsg, intl, natl, rnidn, rnndn, rnsdn, sub}, none | Response calling party nature of address indicator. Used to specify a new NAI value to override the NAI value specified in the SCCP CdPA of a received LOCREQ/SMSREQ if the message is to be relayed after database lookup.          |
| rspcgpanp        | Optional                       | 0-15, none   | Response calling party numbering plan. Used to specify a new Numbering Plan value to override the Numbering Plan value specified in the SCCP CdPA of a received LOCREQ/SMSREQ if the message is to be relayed after database lookup. |
| rspcgpapcp       | Optional                       | frmsg, included, not included                              | Response Calling Party Point Code Present. Used to specify the value of the Point Code Present bit to encode the SCCP CgPA GTA of a returned locreq message  |

**Table 3-2. chg-is41opts Parameters - Class = DATABASE (Continued)**

| Parameter  | Optional/<br>Mandatory | Range   | Description  |
|------------|------------------------|---|--|
| rspcgpari  | Optional               | frmsg, gt, ssn                                      | Response Calling Party Routing Indicator. Used to specify the value of the Routing Indicator bit to encode the SCCP CgPA GTA of a returned locreq message.   |
| rspcgpatt  | Optional               | 0-255, none   | Response calling party translation type. Used to specify a new TT value to override the TT value specified in the SCCP CdPA of a received LOCREQ/SMSREQ if the message is to be relayed after database lookup. |
| rspdig     | Optional               | ccrndn, hrnrndn, rn, rndn                           | Use this parameter to specify the digit encoding format of the locreq TCAP Outgoing Called Party parameter on a per EAGLE 5 ISS node basis.  |
| rspdigtype | Optional               | 0-255   | Response digit type. Used to specify DigitType value to encode the TCAP Outgoing Called Party parameter.   |
| rspmin     | Optional               | homern, nothomern, tendelhomern, tenhomern, tenzero | Response locreq min parameter encoding. Used to specify how the digits of the locreq MIN parameter are to be encoded.  |
| rspnon     | Optional               | 0-255, none   | MSRN nature of number. Used to specify the Nature of Number value of the TCAP Outgoing Called Party parameter.   |

**Table 3-2. chg-is41opts Parameters - Class = DATABASE (Continued)**

| Parameter    | Optional/<br>Mandatory | Range  | Description   |
|--------------|------------------------|--|---|
| rspnp        | Optional               | 0-15, none   | MSRN numbering plan. Used to specify the Numbering Plan values of the TCAP Outgoing Called Party parameter.   |
| rspparm      | Optional               | ddigit, rtdigit, tlist                                     | Response parameter. Used to specify which TCAP locreq parameter (TCAP Outgoing Called Party) will encode the RN and/or DN information.  |
| smsreqbypass | Optional               | yes, no  | Use this parameter to specify whether a received SMSREQ that passes the MNP Service Selector (serv=mnp parameter is specified) will be subject to A-Port message processing.  |
| tcapsnai     | Optional               | ccrndn, frmsg, intl, natl, rnidn, rnndn, rnsdn, sub}, none | Use this parameter to specify how Called Party, obtained from the TCAP layer of a received LOCREQ message shall be interpreted, either based on the Nature of Number encoded in the TCAP Digits[Dialed] parameter, or based on the selection specified by the mtplocreqnai parameter. |

- **rtrv-is41opts: Retrieve IS41 Options Command** – The `rtrv-is41opts` command displays the IS41 option indicators maintained in the IS41OPTS table.

The following IS41 options are displayed.

```
rtrv-is41opts
```

```
tekelecstp 06-08-15 10:33:44 EST EAGLE 36.0.0
```

```
IS41 OPTIONS
```

```
-----
```



```

SMSREQBYPASS      = NO
LOCREQDN          = TCAP
IEC               = 0
NEC               = 00
RSPCGPARI         = FRMSG
RSPCGPAPCP        = FRMSG
RSPCDPARI         = FRMSG
RSPCDPAPCP        = FRMSG
RSPCGPANAI        = 0
RSPCGPANP         = 0
RSPCGPATT         = 0
MTPLOCREQNAI      = SUB
RSPPARM           = DDIGIT
RSPDIG            = RN
RSPNON            = 0
RSPNP             = 0
RSPMIN            = NOTHOMERN
MSCMKTID          = 32300
MSCSWITCH         = 20
ESNMFG            = 0
ESNSN             = 0
RSPDIGTYPE        = 0
LOCREQRMHRN       = NO
TCAPSNAI          = SUB

```

## EAGLE 5 ISS A-Port Service Selector Commands

The A-Port service selector (srvsel) commands are used to provision, remove, change, and report on the applicable service selectors required to change a service entry for DSM services. These commands provide some flexibility when provisioning the type of messages that require A-Port processing. There are four variants, each of which is described in the following sections: **ent-srvsel**, **chg-srvsel**, **dlt-srvsel**, and **rtrv-srvsel**. For further details on the EAGLE 5 ISS service selector commands (such as command rules and output format), refer to the *Commands Manual*.

- **ent-srvsel: Enter A-Port Service Selectors Command** – The **ent-srvsel** command specifies that the applicable A-Port service selectors indicating A-Port processing are required. The A-Port FAK must be enabled before entering this command. The available parameters follow:

**Table 3-3.** **ent-srvsel** Parameters - Class = DATABASE

| Parameter                        | Optional/<br>Mandatory | Range    | Description            |
|----------------------------------|------------------------|----------|------------------------|
| gti, gtia, gtii,<br>gtin, gtin24 | Mandatory              | 2, 4     | Global Title Indicator |
| serv                             | Mandatory              | mnp      | DSM service            |
| ssn                              | Mandatory              | 0-255, * | Subsystem number       |

**Table 3-3. ent-srvsel Parameters - Class = DATABASE (Continued)**

| Parameter | Optional/<br>Mandatory | Range  | Description                         |
|-----------|------------------------|--|-------------------------------------|
| tt        | Mandatory              | 0-255  | Translation Type                    |
| nai       | Optional               | 1sub, rsvd, natl, intl                               | Nature Of Address Indicator         |
| naiv      | Optional               | 0-127  | NAI Value                           |
| np        | Optional               | 1e164, generic, x121, f69, e210, e212, e214, private | Numbering Plan                      |
| npv       | Optional               | 0-15   | Numbering Plan Value                |
| snai      | Optional               | 1sub, natl, intl, rnidn, rnndn, rnsdn, ccrndn        | Service Nature of Address Indicator |
| snp       | Optional               | 1e164, e212, e214                                    | Service Numbering Plan              |

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

**Table 3-4. chg-srvsel Parameters - Class = DATABASE**

| Parameter                     | Optional/<br>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               | 1sub, rsvd, natl, intl                               | Nature Of Address Indicator |
| naiv                          | Optional               | 0-127  | NAI Value                   |
| np                            | Optional               | 1e164, generic, x121, f69, e210, e212, e214, private | Numbering Plan              |
| npv                           | Optional               | 0-15   | Numbering Plan Value        |

**Table 3-4.**    `chg-srvsel` Parameters - Class = DATABASE (Continued)

| Parameter | Optional/<br>Mandatory | Range   | Description                                |
|-----------|------------------------|---|--|
| nserv     | Mandatory              | eir, gflex, gport, inpq,<br>inpmr, mnpsms,<br>smsmr, idps, idpr,<br>mnp | New DSM service                            |
| nsnai     | Optional               | 1sub, natl, intl, rnidn,<br>rnndn, rnsdn, ccndn                         | New Service Nature of<br>Address Indicator |
| nsnp      | Optional               | 1e164, e212, e214   | New Service<br>Numbering Plan              |

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

**Table 3-5.**    `dlt-srvsel` Parameters - Class = DATABASE

| Parameter                        | Optional/<br>Mandatory | Range  | Description                    |
|----------------------------------|------------------------|--|--------------------------------|
| gti, gtia, gtii,<br>gtin, gtin24 | Mandatory              | 2, 4   | Global Title Indicator         |
| tt                               | Mandatory              | 0-255  | Translation Type               |
| ssn                              | Mandatory              | 0-255, *   | Subsystem number               |
| nai                              | Optional               | 1sub, rsvd, natl, intl                                     | Nature Of Address<br>Indicator |
| naiv                             | Optional               | 0-127  | NAI Value                      |
| np                               | Optional               | 1e164, generic, x121,<br>f69, e210, e212, e214,<br>private | Numbering Plan                 |
| npv                              | Optional               | 0-15   | Numbering Plan Value           |

- **rtrv-srvsel: Retrieve A-Port Service Selector Command** – The `rtrv-srvsel` command displays a list of administered A-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 3-6.** rtrv-srvsel Parameters - Class = DATABASE

| Parameter                        | Optional/<br>Mandatory | Range  | Description                            |
|----------------------------------|------------------------|--|--|
| gti, gtia, gtii,<br>gtin, gtin24 | Optional               | 2, 4   | Global Title Indicator                 |
| nai                              | Optional               | sub, rsvd, natl, intl                                  | Nature Of Address<br>Indicator         |
| naiv                             | Optional               | 0-127  | NAI Value                              |
| np                               | Optional               | e164, generic, x121, f69,<br>e210, e212, e214, private | Numbering Plan                         |
| npv                              | Optional               | 0-15   | Numbering Plan Value                   |
| serv                             | Optional               | mnp  | DSM service                            |
| snai                             | Optional               | 1sub, natl, intl, rnidn,<br>rnndn, rnsdn, ccrndn       | Service Nature of<br>Address Indicator |
| snp                              | Optional               | 1e164, e212, e214                                      | Service Numbering Plan                 |
| ssn                              | Mandatory              | 0-255, *   | Subsystem number                       |
| tt                               | Optional               | 0-255  | Translation Type                       |

### EAGLE 5 ISS Feature Key Control Commands

These commands are used to enable, update, view, and control the A-Port feature. A Feature Access Key is used to turn the A-Port feature on. This feature must be purchased in order to have access to the Feature Access Key, which must be used when enabling these features.

There is no temporary key associated with this feature and once the feature is on it cannot be turned off. There are two steps that will be taken to turn the A-Port feature on. The first step is to enable the feature. The second step is to turn the status to **on**.

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

The part number 893016601 is used to enable A-Port feature on the EAGLE 5 ISS.

- **enable-ctrl-feat: Enable Control Feature Command** – The `enable-ctrl-feat` command is used for the permanent enabling of the A-Port feature. An example of the command using the A-Port part number follows:

```
enable-ctrl-feat:partnum=893016601:fak=<Feature Access Key>
```

- **chg-ctrl-feat: Change Control Feature Command** – The **chg-ctrl-feat** command is used to activate the A-Port feature. This command requires the A-Port feature to be enabled as a prerequisite. The A-Port feature cannot be enabled if any ASMs or TSMs are in the system.

```
chg-ctrl-feat:partnum=893016601:status=on
```

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

The following features have been permanently enabled:

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

The following features have been temporarily enabled:

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

The following features have expired temporary keys:

| Feature Name | Part Num  |
|--------------|-----------|
| OnOffFeatV   | 893492401 |

;

## EAGLE 5 ISS MNP SCCP Service Commands

The **sccp-serv** commands allow for services to be taken ON and OFF line and their processing load to be shifted to other designated nodes. These commands also support the assignment of PCs to PC groups used for MNP re-route assignment. There are three variants, each of which is described in the following sections: **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 Translation - Global Title Translations* manual.

For further details on the EAGLE 5 ISS MNP SCCP service commands (such as command rules and output format), refer to the *Commands Manual*.

- **chg-sccp-serv: Change MNP 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, G-Port, MNP) 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 3-7.** chg-sccp-serv Parameters - Class = DATABASE

| Parameter                           | Optional/<br>Mandatory | Range                       | Description              |
|-------------------------------------|------------------------|-----------------------------|--------------------------|
| serv                                | Mandatory              | gport, gflex, mnp           | Service                  |
| state                               | Optional               | offline, online             | Status                   |
| gtt                                 | Optional               | no, yes                     | Global Title Translation |
| pc1, pca1,<br>pci1, pcn1,<br>pcn241 | Optional               | Refer to Commands<br>Manual | Post GTT-translated PC   |
| rc1                                 | Optional               | 00-99                       | Relative Cost            |
| pc2, pca2,<br>pci2, pcn2,<br>pcn242 | Optional               | Refer to Commands<br>Manual | Post GTT-translated PC   |
| rc2                                 | Optional               | 00-99                       | Relative Cost            |
| pc3, pca3,<br>pci3, pcn3,<br>pcn243 | Optional               | Refer to Commands<br>Manual | Post GTT-translated PC   |
| rc3                                 | Optional               | 00-99                       | Relative Cost            |
| pc4, pca4,<br>pci4, pcn4,<br>pcn244 | Optional               | Refer to Commands<br>Manual | Post GTT-translated PC   |
| rc4                                 | Optional               | 00-99                       | Relative Cost            |

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

**Table 3-8.** dlt-sccp-serv Parameters - Class = DATABASE

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

- **rtrv-sccp-serv: Retrieve MNP 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 MNPt service is Online and there are ANSI and ITU-I point codes in the service set.

```
tekelecstp 05-12-20 08:51:53 EST 36.0.0-55.43.0
rtrv-sccp-serv
Command entered at terminal #4.
```

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

```
-----
Service      : MNP
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
```

;

## Maintenance and Measurements User Interface Commands

This section provides a description of the user interface for maintenance and measurements for the A-Port feature. The commands that follow allow provisioning, operations, and maintenance activities for DSM cards.

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

Commands described here include:

- “chg-sid / dlt-sid”
- “ent-map / dlt-map”
- “rept-stat-sys”
- “rept-stat-sccp”
- “rept-stat-mps”
- “rept-ftp-meas”
- “rept-meas”
- “rept-stat-meas”
- “rtrv-measopts / chg-measopts”
- “rept-stat-trbl”
- “rept-stat-alm”
- “chg-db”
- “rept-stat-db”
- “inh-card / alw-card”
- “ent-card / rtrv-card / dlt-card”
- “chg-gpl / act-gpl / rtrv-gpl / rept-stat-gpl / copy-gpl”
- “inh-alm / unhb-alm”

### rept-stat-sys

This command is used to determine the location of troubles in the MNP subsystem. The display shows the number items that are in service (IS-NR) and the how many are in another state (IS-ANR, OOS-MT, OOS-MT-DSBLD). Refer to the *Commands Manual* for details of this command.

A sample output follows:

```
eagle10605 01-07-25 02:32:46 EST Rel 36.0.0-49.10.0
  MAINTENANCE STATUS REPORT
    Maintenance Baseline established.
    Routing Baseline established.
    SCCP Baseline established.
```



|            |        |   |         |    |       |   |      |   |
|------------|--------|---|---------|----|-------|---|------|---|
| ALARMS:    | CRIT=  | 9 | MAJR=   | 10 | MINR= | 3 | INH= | 2 |
| OAM 1113   | IS-NR  |   | Active  |    |       |   | INH= | 0 |
| OAM 1115   | IS-NR  |   | Standby |    |       |   | INH= | 0 |
| LIM CARD   | IS-NR= | 3 | Other=  |    | 0     |   | INH= | 0 |
| X25 CARD   | IS-NR= | 0 | Other=  |    | 0     |   | INH= | 0 |
| SCCP CARD  | IS-NR= | 1 | Other=  |    | 0     |   | INH= | 0 |
| GLS CARD   | IS-NR= | 0 | Other=  |    | 0     |   | INH= | 0 |
| SLAN CARD  | IS-NR= | 0 | Other=  |    | 0     |   | INH= | 0 |
| EMDC CARD  | IS-NR= | 2 | Other=  |    | 0     |   | INH= | 0 |
| MCPM CARD  | IS-NR= | 2 | Other=  |    | 0     |   | INH= | 0 |
| IMT        | IS-NR= | 2 | Other=  |    | 0     |   |      |   |
| HMUX       | IS-NR= | 2 | Other=  |    | 0     |   | INH= | 0 |
| HIPR       | IS-NR= | 2 | Other=  |    | 0     |   | INH= | 0 |
| SLK        | IS-NR= | 0 | Other=  |    | 6     |   | INH= | 0 |
| DLK        | IS-NR= | 0 | Other=  |    | 0     |   | INH= | 0 |
| LINK SET   | IS-NR= | 0 | Other=  |    | 4     |   | INH= | 0 |
| NDC IP LK  | IS-NR= | 4 | Other=  |    | 0     |   | INH= | 0 |
| MCPM IP LK | IS-NR= | 2 | Other=  |    | 0     |   | INH= | 0 |
| SS7 DPC    | IS-NR= | 0 | Other=  |    | 6     |   | INH= | 0 |
| X25 DPC    | IS-NR= | 0 | Other=  |    | 0     |   | INH= | 0 |
| CLUST DPC  | IS-NR= | 0 | Other=  |    | 1     |   | INH= | 0 |
| XLIST DPC  | IS-NR= | 0 | Other=  |    | 0     |   |      |   |
| DPC SS     | Actv = | 0 | Other=  |    | 0     |   |      |   |
| SEAS SS    | IS-NR= | 0 | Other=  |    | 0     |   |      |   |
| SEAS X25   | IS-NR= | 0 | Other=  |    | 0     |   | INH= | 0 |
| LSMS SS    | IS-NR= | 0 | Other=  |    | 0     |   |      |   |
| LSMS Conn  | IS-NR= | 0 | Other=  |    | 0     |   | INH= | 0 |
| NDC SS     | IS-NR= | 1 | Other=  |    | 0     |   |      |   |
| NDC Q.3    | IS-NR= | 0 | Other=  |    | 2     |   | INH= | 1 |
| TERMINAL   | IS-NR= | 2 | Other=  |    | 14    |   | INH= | 0 |
| MPS        | IS-NR= | 2 | Other=  |    | 0     |   |      |   |
| EIR SS     | IS-NR= | 1 | Other=  |    | 0     |   |      |   |

### rept-stat-sccp

The output for the **rept-stat-sccp** command displays the VSCCP cards and the GTT, G-Flex, MNP, INP, and EIR services executing on those cards. This command also displays any cards that are denied SCCP service. When turned on, the A-Port and IGM features share statistic status with the G-Port feature. If only the G-Port feature is on, the display title is GPORT. If the A-Port or IGM feature are on, with or without the G-Port feature, the display title for the statistic status changes from GPORT to MNP.

The **loc** parameter displays detailed view of the status of SCCP services provided by a specific SCCP or VSCCP card. Fields are omitted if an associated feature is not turned on.

The **mode** parameter targets the general SCCP traffic performance for both SCCP and VSCCP cards. The report supplies message rates for group ticket voucher (TVG) performance.

Refer to the *Commands Manual* for details of this command.

The following sample output shows the output of the **rept-stat-sccp** command with the G-Flex, G-Port, INP, and A-Port features on. The EIR feature is not enabled, and the ansigflex system option is disabled:

```
tekelecstp 000623 13:34:22 EST EAGLE5 35.0.0
  SCCP SUBSYSTEM REPORT IS-NR          Active
    SCCP ALARM STATUS = No Alarms
INPQ SUBSYSTEM REPORT IS-ANR          Restricted -----
  ASSUMING MATE'S LOAD
    INPQ: SSN STATUS = Allowed      MATE SSN STATUS = Prohibited
    INPQ ALARM STATUS = No Alarms
GFLEX SERVICE REPORT IS-ANR          Active
  GFLEX ALARM STATUS = No Alarms
MNP SERVICE REPORT IS-ANR          Active
  MNP ALARM STATUS = No Alarms

SCCP Cards Configured=4  Cards IS-NR=2
System TPS Alarm Threshold = 100% Total Capacity
System Peak SCCP Load = 3000 TPS
System Total SCCP Capacity = 5000 TPS

CARD   VERSION      PST           SST           AST           MSU USAGE  CPU USAGE
-----
1212   101-001-000  IS-NR        Active        ALMINH        45%         30%
1301 P 101-001-000  IS-NR        Active        -----        35%         40%
1305   -----      OOS-MT       Isolated      -----        0%          0%
2112   -----      OOS-MT-DSBLD Manual      -----        0%          0%
-----
SCCP Service Average MSU Capacity = 40%      Average CPU Capacity = 35%

AVERAGE CPU USAGE PER SERVICE:
  GTT   = 15%  GFLEX = 5%  MNP = 10%
  INPMR = 2%  INPQ  = 3%

TOTAL SERVICE STATISTICS:

SERVICE  SUCCESS  ERRORS  FAIL  REROUTE\  FORWARD  TOTAL
          1995    5    RATIO  WARNINGS  TO GTT
GTT:      1995    5    0%      -        -      2000
GFLEX:     500    1    0%      4        10     515
MNP:       800    0    0%      2         3     805
INPMR:     50    5    0%      0        15     70
INPQ:     499    1    0%      -         -     500

Command Completed.
```

### rept-stat-mps

This command is used to display the overall status of the application running on the MPS (multi-purpose server).

If the G-Port, G-Flex, A-Port, or Migration feature is turned on, the status of the GSM and EPAP are displayed.

Refer to the *Commands Manual* for details of this command.

The following sample output follows:

```
Integrat40 00-06-24 10:37:22 EST Rel 36.0.0-49.10.0

          VERSION      PST           SST           AST
```

```

EPAP A          027-015-000  IS-NR          Active      -----
CRITICAL PLATFORM  ALARM DATA = No Alarms
MAJOR   PLATFORM  ALARM DATA = No Alarms
MINOR   PLATFORM  ALARM DATA = No Alarms
CRITICAL APPLICATION ALARM DATA = No Alarms
MAJOR   APPLICATION ALARM DATA = No Alarms
MINOR   APPLICATION ALARM DATA = No Alarms
ALARM STATUS = No Alarms

```

```

                                VERSION      PST          SST          AST
EPAP B          027-015-000  OOS-MT          Fault      Standby
CRITICAL PLATFORM  ALARM DATA = No Alarms
MAJOR   PLATFORM  ALARM DATA = h'0123456789ABCDEF
MINOR   PLATFORM  ALARM DATA = h'0123456789ABCDEF
CRITICAL APPLICATION ALARM DATA = No Alarms
MAJOR   APPLICATION ALARM DATA = h'0123456789ABCDEF
MINOR   APPLICATION ALARM DATA = No Alarms
ALARM STATUS = ** 0371 Major Platform Failure(s)

```

```

CARD  PST          SST          EIR STAT
1106 P IS-NR        Active      ACT
1201  IS-ANR        Active      SWDL
1205  OOS-MT-DSBLD Manual      -----
1302  OOS-MT        Isolated   -----
1310  IS-ANR        Standby     SWDL

```

```

CARD 1106 ALARM STATUS = No Alarms
DSM PORT A:      ALARM STATUS      = No Alarms
DSM PORT B:      ALARM STATUS      = No Alarms
CARD 1201 ALARM STATUS = No Alarms
DSM PORT A:      ALARM STATUS      = ** 0084 IP Connection Unavailable
DSM PORT B:      ALARM STATUS      = ** 0084 IP Connection Unavailable
CARD 1205 ALARM STATUS = No Alarms
DSM PORT A:      ALARM STATUS      = ** 0084 IP Connection Unavailable
DSM PORT B:      ALARM STATUS      = ** 0084 IP Connection Unavailable
CARD 1302 ALARM STATUS = ** 0013 Card is isolated from the system
DSM PORT A:      ALARM STATUS      = ** 0084 IP Connection Unavailable
DSM PORT B:      ALARM STATUS      = ** 0084 IP Connection Unavailable
CARD 1310 ALARM STATUS = No Alarms
DSM PORT A:      ALARM STATUS      = ** 0084 IP Connection Unavailable
DSM PORT B:      ALARM STATUS      = ** 0084 IP Connection Unavailable

```

Command Completed.

;

## rept-stat-trbl

This command displays a summary the device trouble notifications. The severity of each alarm is indicated in the output report. Refer to the *Commands Manual* for details of this command.

A sample output follows:

eagle10207 02-08-23 10:09:59 EST Rel 36.0.0-49.10.0

| SEQN      | UAM | AL   | DEVICE | ELEMENT | TROUBLE TEXT                     |
|-----------|-----|------|--------|---------|----------------------------------|
| 0001.0013 | **  | CARD | 1201   | GLS     | Card is isolated from the system |
| 0002.0013 | **  | CARD | 1211   | SS7ANSI | Card is isolated from the system |
| 0011.0013 | **  | CARD | 1101   | SCCP    | Card is isolated from the system |
| 0013.0013 | **  | CARD | 1103   | GLS     | Card is isolated from the system |

```

0015.0013 ** CARD 1105 VSCCP          Card is isolated from the system
0018.0013 ** CARD 1115 OAM            Card is isolated from the system
0019.0236 ** SLK 1211,B    ls1134     REPT-LKF: not aligned
0020.0236 ** SLK 1311,A    ls1134567  REPT-LKF: not aligned
0021.0236 ** SLK 1312,A    ls113456   REPT-LKF: not aligned
0022.0236 ** SLK 1313,A    ls11345    REPT-LKF: not aligned
0023.0236 ** SLK 1314,A    ls113467   REPT-LKF: not aligned
0024.0236 ** SLK 1315,A    ls11234567 REPT-LKF: not aligned
0025.0236 ** SLK 1316,A    ls11345678 REPT-LKF: not aligned
0026.0318 ** LSN ls11234567          REPT-LKSTO: link set prohibited
0027.0318 ** LSN ls11345678          REPT-LKSTO: link set prohibited
0028.0318 ** LSN ls1134567           REPT-LKSTO: link set prohibited
0029.0318 ** LSN ls113456            REPT-LKSTO: link set prohibited
0030.0318 ** LSN ls11345            REPT-LKSTO: link set prohibited
0035.0318 ** LSN ls113467           REPT-LKSTO: link set prohibited
0032.0318 ** LSN ls1134             REPT-LKSTO: link set prohibited
0033.0336 ** SCCP SYSTEM             LIM(s) have been denied SCCP service
0034.0349 *C SEAS SYSTEM             SEAS unavailable
0035.0356 *C LSMS SYSTEM             LSMS unavailable
0036.0455 *C EIR SYSTEM             EIR Subsystem is not available
0019.0236 *C T1PORT 1301,1          REPT-T1F:FAC-T1   LOS failure
Command Completed.

```

## rept-stat-alm

This command includes the alarm totals of the A-Port subsystem and DSM/EPAP IP links. Refer to the *Commands Manual* for details of this command. Here is an example of the command and output.

```
rept-stat-alm
```

```
Command Accepted - Processing
```

```

eagle10605 99-06-24 23:59:39 EAGLE 35.0.0
rept-stat-alm
Command entered at terminal #10.

```

```
;
```

```

eagle10605 99-06-24 23:59:39 EAGLE 35.0.0
ALARM  TRANSFER= RMC
ALARM  MODE      CRIT= AUDIBLE      MAJR= AUDIBLE      MINR= AUDIBLE
ALARM  FRAME 1   CRIT= 9             MAJR= 12           MINR= 2
ALARM  FRAME 2   CRIT= 0             MAJR= 0            MINR= 0
ALARM  FRAME 3   CRIT= 0             MAJR= 0            MINR= 0
ALARM  FRAME 4   CRIT= 0             MAJR= 0            MINR= 0
ALARM  FRAME 5   CRIT= 0             MAJR= 0            MINR= 0
ALARM  FRAME 6   CRIT= 0             MAJR= 0            MINR= 0
ALARM  FRAME GPF CRIT= 1             MAJR= 2            MINR= 1
PERM.  INH. ALARMS CRIT= 0           MAJR= 0            MINR= 0
TEMP.  INH. ALARMS CRIT= 0           MAJR= 0            MINR= 0
ACTIVE ALARMS     CRIT= 10           MAJR= 14           MINR= 3
TOTAL ALARMS      CRIT= 10           MAJR= 14           MINR= 3
Command Completed.

```

```
;
```

### **chg-db**

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

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

This command displays the status information for the EAGLE 5 ISS databases. This includes the level information for each DSM network card, and for the active and standby EPAP databases. It reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birthdates and levels. It is enhanced to show the status of the PDB and RTDB databases if the A-Port feature is activated. For details about this command, refer to the *Commands Manual*.

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

The **inh-card** command is used to change the state of the card from in-service normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD). A craftsperson then can test the DCM/LIM/ACM/ASM/DSM/GPSM-II/MIM card or physically remove it from the shelf.

The **alw-card** command is used to change the card from OOS-MT-DSBLD (out-of-service maintenance-disabled) to IS-NR (in-service normal) if the loading is successful.

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

### **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. This command verifies that if the A-Port feature is turned on, that the gpl that is being provisioned is a VSCCP gpl, and if it is, an error is displayed and the **ent-card** command is rejected.

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

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

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

### **ent-map / dlt-map**

These commands are used to provision, remove, change, and report on the mate point code and subsystem number and its attributes. A mate point code defines an adjacent signaling point, which is considered the mated signal transfer point (STP) to the EAGLE 5 ISS.

These commands are updated to allow both ITU-N and ITU-I true point codes to be defined for the same SSN. Refer to the *Commands Manual* for details of these commands.

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

These commands are used to change and report on the self-identification of the EAGLE 5 ISS. The self-identification identifies the EAGLE 5 ISS to other signaling points in the network. The **mnp** CPC type is used for A-Port. Refer to the *Commands Manual* for details of this command.

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

The command-handling and scroll area output for these commands include the VSCCP GPL. Refer to the *Commands Manual* for details of these commands.

Here are samples of the reports produced by these commands.

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

```
Command entered at terminal #3.
;
tekelecstp 99-10-24 06:54:39 EAGLE 35.0.0
VSCCP upload to 1114 completed
VSCCP upload to 1116 completed
;
```

```
act-gpl:appl=vsccp:ver=101-3-0
```

```
Command entered at terminal #3.
;
tekelecstp 99-10-24 06:54:39 EAGLE 35.0.0
VSCCP activate on 1114 completed
VSCCP activate on 1116 completed
;
```

```
rtrv-gpl:appl=vsccp
```

```
Command entered at terminal #3.
;
tekelecstp 99-10-04 07:01:08 EAGLE 35.0.0
GPL Auditing ON

APPL  CARD  RELEASE      APPROVED      TRIAL      REMOVE TRIAL
VSCCP 1114   101-001-000  101-003-000  101-001-000 101-003-000
VSCCP 1116   101-001-000  101-003-000  101-003-000 -----
;
```

```
rept-stat-gpl:appl=vsccp
```

```
Command entered at terminal #3.
;
tekelecstp 99-10-04 12:55:50 EAGLE 35.0.0
APPL  CARD      RUNNING      APPROVED      TRIAL
VSCCP 1205      101-003-000 ALM    101-003-000  101-003-000
VSCCP 1211      101-001-000 ALM+   101-003-000  -----
Command Completed.
```

;

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

These commands allow both Port A and Port B to be specified for the dev=dlk. This allows alarms to be inhibited on the DSM ports. Refer to the *Commands Manual* for details of these commands.

### **rept-ftp-meas**

This command provides on-demand measurements reporting capabilities. This command initiates generation and FTP transfer of a measurements report from the MCPM to the FTP server. The **enttype=np** supports A-Port measurements. The combination of this enttype and a report type determines which on-demand A-Port report is generated. Refer to the *Commands Manual* for details of this command.

This command provides on-demand measurements reporting capabilities. This command initiates generation and FTP transfer of a measurements report from the MCPM to the FTP server. The **rept-ftp-meas** command is modified to accept a new A-Port enttype. The combination of this enttype and a report type determines which on-demand A-Port report is generated. There are only two report types that are accepted in conjunction with enttype=eir: MTCH and MTCD. The A-Port enttype is only valid with the A-Port feature enabled. Refer to the *Commands Manual* for details of this command.

### **rept-meas**

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

### **rept-stat-meas**

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

### **rtrv-measopts / chg-measopts**

The **chg-measopts** command provides the user with the capability to enable and disable measurement options related to the Measurements Platform. Use this command for the following functions:

- Enable the Measurements Platform collection function
- Turn on or turn off the 15 Minute Measurements collection function
- Enable or disable the automatic generation and FTP transfer of scheduled measurements reports to the FTP server
- Turn on or off the CLLI-based file name option for measurements reports files

The **rtrv-measopts** command displays the current state of the Measurements Platform options.

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



# A-Port Feature Activation

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## Introduction



**CAUTION:** For an in-service environment, contact Customer Care Center (see “Customer Assistance” on page 1-10) before continuing to activate A-Port. For an environment that is not yet in-service, you may continue with this procedure.

The A-Port FAK cannot be turned on if any of the DSMs have less than 4 GB of memory installed. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

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

The A-Port features optimizes the use of subscriber numbers and number ranges in a IS-41 Mobile Network by providing a logical link between any Mobile Directory Number (MDN) and any International Mobile Station Identifier (IMSI). This feature allows subscribers to be moved easily from one Home Location Register (HLR) to another. The A-Port feature applies to ITU-N ANSI networks.

The A-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.



**CAUTION:** Once a feature has been turned on with the `enable-ctrl-feat` command, it cannot be turned off. Since features may overwrite other features or create changes in the database, assure that you have a license and full technical support from Tekelec before turning on this or any feature.

The A-Port feature requires a DSM card running the VSCCP application. Systems with TSM cards running the SCCP application need to be upgraded to 4 GB DSM cards prior to turning on the A-Port feature.

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

Procedures described in the remainder of this section apply only to the A-Port feature and can only be performed if the A-Port feature is enabled.

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

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

## Prerequisites

The A-Port feature activation assumes that at least one of the following features are provisioned.

- Global Title Translation (GTT),
- Enhanced Global Title Translation (EGTT)
- Variable-Length Global Title Translation (VGTT)

Refer to the Database Administration Manual Global Title Translation - Features for provisioning procedures.

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

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

The A-Port feature activation assumes that 4 Gb DSM cards need to be installed and TSM cards to be removed are identified:

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

**NOTE: TSM cards use one card slot; DSM cards require two card slots, odd-even.**

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

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

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



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

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



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

For in-service systems that already have the G-Port, G-Flex and/or INP feature enabled, only perform steps 70 through 88 to turn on the A-Port feature. With the G-Port, G-Flex and/or INP feature enabled, the DSM cards already contain the RTDB database.

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

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

## Feature Activation Overview

This section provides an overview of the A-Port feature activation procedure. The procedure is described in detail in section “Feature Activation Procedure” on page 4-9.

The feature activation consists of these sections:

- Configure system for HLR destinations in steps 1 through 28.
- Install DSM cards in available slots and configure for VSCCP in steps 29 through 44.
- Replace TSM cards configured for SCCP with DSM cards configured for VSCCP and inhibit/remove any remaining SCCP cards in steps 45 through 69.
- Turn on and configure the A-Port feature in steps 70 through 88.

Steps 1 through 28 configure the system to be able to communicate with the system of the HLR database. The route to this database may already be configured. Perform these steps to verify that you have entered all HLR destinations for A-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 steps 2 through 7.
2. Use `rtrv-sid` command to display current PCs and CPCs
3. Use `rtrv-dstn` command to display current DPCs.
4. Use `rtrv-rte` command to display current route configurations.
5. Identify PCs and CPCs; determine new PC and CPC to be entered in step 9.
6. Use `rtrv-stpopts` command to display PC or CPC format if ITU-N network.
7. Use `rtrv-map` command to display PCs of mated applications in database; remove system PC from table if necessary (refer to *Database Administration Manual Global Title Translation Global Title Translation, Removing A Mated Application*)



**CAUTION:** Changing a system’s point code 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 steps 9 through 28.
9. Use `chg-sid` command to configure PC and CPC by network type.

10. Use `init-sys` command to initialize system if changes were made in step 9 to any `pca/pci/pcn` parameter.



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

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



**CAUTION:** When adding DSM cards in an in-service environment, you must take care not to interrupt traffic. Before replacing SCCP cards with DSMs, first install a VSCCP card in an available odd-even double-slot prior to removing SCCP cards to make additional room for other DSM cards.

29. Install and configure DSM card(s) in available odd-even slots as needed using steps 30 through 44.
30. Install DSM card(s) in available odd-even slots and verify green IMT bus Led.
31. Use `ent-card` command to enter DSM card(s) as VSCCP card(s) into database.
32. Use `rtrv-card` command to display new VSCCP card(s) in database.
33. Use `rtrv-ip-lnk` command to display current link parameters associated with the VSCCP card.
34. Use `chg-ip-lnk` command to set the IP address port and speed associated with the VSCCP card.
35. Use `rtrv-ip-lnk` command to display changed link parameters.
36. Use `rtrv-ip-host` command to display current IP host information in database.
37. Use `ent-ip-host` command to add host name and IP address for each VSCCP link.
38. Use `rtrv-ip-host` command to display changed IP host information.
39. Use `chg-ip-card` command to set local domain and IP router address if necessary.
40. Use `rtrv-ip-card` command to display changed VSCCP card information.
41. Use `alw-card` command to boot DSM card in TSM emulation mode.
42. Use `rept-stat-card` command to display IS-NR status of VSCCP card.
43. Use `pass` command to test presence of EPAP hosts on network.
44. Repeat steps 30 through 43 to add all DSM cards (N+1) to be installed in available slots. Go to the next step to start replacing TSM cards.
45. Replace TSM card(s) with DSM cards if applicable, and add DSM card(s) to database using steps 46 through 68.
46. Use `rtrv-card` command to display TSM cards running the SCCP application (SCCP cards) in database.
47. Use `rept-stat-card` command to display SCCP cards in IS-NR status.

48. Use `inh-card` command to inhibit SCCP card(s)
49. Use `rept-stat-card` command to display OOS-MT-DSBLD status of SCCP card(s).
50. Use `dlt-card` command to delete SCCP card(s) from database.
51. Use `rtrv-card` command to verify removal of SCCP cards from database.
52. Remove first TSM card from shelf.
53. Remove second TSM card from shelf.
54. Install DSM card in shelf and verify green IMT bus LEDs.
55. Use `ent-card` command to enter DSM card as VSCCP card into database.
56. Use `rtrv-card` command to display new VSCCP card in database.
57. Use `rtrv-ip-lnk` command to display current link parameters associated with VSCCP card.
58. Use `chg-ip-lnk` command to set the IP address port and speed associated with VSCCP card.
59. Use `rtrv-ip-lnk` command to display changed link parameters associated with the VSCCP card.
60. Use `alw-card` command to boot DSM card in TSM emulation mode.
61. Use `rtrv-ip-host` command to display IP host information in database.
62. Use `ent-ip-host` command to add host name and IP address for VSCCP link.
63. Use `rtrv-ip-host` command to display changed IP host information in database.
64. Use `chg-ip-card` command to set local domain and IP router address if necessary.
65. Use `rtrv-ip-card` command to display changed VSCCP card information.
66. Use `rept-stat-card` command to display IS-NR status of VSCCP card.
67. Use `pass` command to test presence of EPAP hosts on network.
68. Repeat steps 46 through 67 to replace all adjacent TSM cards identified in the prerequisites and to be replaced with DSM cards.
69. Repeat steps 48 through 52 to inhibit any remaining TSM cards running the SCCP application and remove them from database and shelf.

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



**CAUTION: Contact Tekelec Technical Services at this point for assistance in completing this A-Port activation procedure (see “Customer Assistance” on page 1-10). Do not proceed without consulting with Tekelec Technical Services.**

70. Turn on and configure the A-Port feature using steps 71 through 88.
71. Use `enable-ctrl-feat` command to enable the A-Port feature.
72. Use `chg-ctrl-feat` command to turn on the A-Port feature.  
**NOTE: Step 75 through 83 describe the commands that administer the A-Port protocol flow to support:**
  - A-Port LOCREQ (Ported-out MDNs)
  - A-Port LOCREQ (Foreign MDNs not known to be ported)
  - A-Port Message Relay (Ported-in, non-porting MDNs)
73. Use `enable-ctrl-feat` command to enable the optional MTP MSGS for SCCP Apps feature, if required.
74. Use `chg-ctrl-feat` command to turn on the optional MTP MSGS for SCCP Apps feature, if required.
75. Use `chg-stpopts` command to enter default country code (CC) and default network destination code (NDC) if handling non-international numbers.
76. Use `rtrv-stpopts` command to verify changes of CC and NDC.
77. Use `chg-is41opts` command to change IS41 options.
78. Use `rtrv-is41opts` command to verify changes to IS41 options.
79. Use the `ent-homern` command to enter any Home RNs that are prefixed to DNs for incoming A-Port MR messages.
80. Use `rtrv-homern` command to verify routing number prefixes.
81. Use the `rtrv-srvsel` command to read the service selector combinations.
82. Use `ent-srvsel` command to enter MNP service selectors.
83. Use `rtrv-srvsel` command to verify changes to MNP service selectors



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

84. Use `init-card:loc=<DSM card>` command to load RTDB, OAM, GPL, and GTT data to VSCCP card.
85. Use `rept-stat-card` command to display IS-NR status of VSCCP card.
86. Repeat steps 84 and 85 to reboot each DSM card.

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



- 87. Use `chg-sccp-serv:serv=mnps:state=online` to set the MNP service to online.
- 88. Confirm success of activation procedure with `rept-stat-sccp`, `rept-stat-mps`, and `rept-stat-db:display=all` commands.

EPAP can now administer A-Port entity objects and A-Port subscribers. For the details about performing these actions, refer to the EPAP Administration Manual.

The detailed A-Port activation procedure is described next.

## Feature Activation Procedure



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

### Procedure 4-1.

- Before changing a true point code (PC) and adding a capability point code (CPC) for the A-Port feature, display the current values of the self-identification configuration (shown in step 2), the destination point codes (DPCs) (shown in step 3), and the routes and linksets assigned to the DPCs (shown in step 4). The A-Port feature applies to ITU-N ANSI networks.

- Display the current self identification of the system (PC and CPC) using the `rtrv-sid` command. This is an example of the possible output:

```
tklcl081301 06-10-05 11:43:02 EST EAGLE5 36.0.0

PCA          PCI          PCN          CLLI          PCTYPE
006-010-006  5-010-5          5-010-5-aa   tklcl081301   ANSI

CPCA (MNP)
006-012-000

CPCI (MNP)
5-012-0

CPCN (MNP)
5-012-0-aa          5-012-0-ms

CPCN24 (MNP)
006-012-000

;
```

This example retrieved all capability point codes with `cpctype=mnps`.

3. Display the current destination point codes in the destination point code table (**dpc/dpca**) using the **rtrv-dstn** command. This is an example of the possible output:

```

tklc1191001 06-05-11 08:02:13 EST EAGLE5 36.0.0

  DPCA          CLLI          BEI  ELEI    ALIASI          ALIASN/N24  DOMAIN
  008-030-008   stpa038a     no   ---  -----  -----  SS7
  006-010-006   stpc016a     no   ---  -----  -----  SS7
  042-052-012   tklca4212a2  no   ---    4-075-2    4-075-2-aa  SS7
  042-054-012   tklca4212a4  no   ---    4-077-2    4-077-2-aa  SS7
  042-056-012   tklca4212a6  no   ---    4-079-2    4-079-2-aa  SS7
  255-*-*       mobrncr001a  ---  ---  -----  -----  SS7
  255-225-*     mobrncr002a  no   no   -----  -----  SS7
  225-225-199   mobrnte001a  no   ---    7-255-7    7-255-7-aa  SS7

  DPCI          CLLI          BEI  ELEI    ALIASA          ALIASN/N24  DOMAIN
  7-030-7       stpa037i     no   ---  -----  -----  SS7
s-7-030-7      -----  no   ---  -----  -----  SS7
  5-010-5       stpc015i     no   ---  -----  -----  SS7

  DPCN24        CLLI          BEI  ELEI    ALIASA          ALIASI        DOMAIN
  008-030-008   stpa038c     no   ---  -----  -----  SS7
  006-010-006   stpc016c     no   ---  -----  -----  SS7
  006-090-006   stpd096c     no   ---  -----  -----  SS7
  006-132-002   sc3a040i00  no   ---  -----  -----  SS7

DESTINATION ENTRIES ALLOCATED:  6000
FULL DPC(s) :                   664
EXCEPTION DPC(s) :              5272
NETWORK DPC(s) :                  1
CLUSTER DPC(s) :                  1
TOTAL DPC(s) :                   5938
CAPACITY (% FULL) :              99%
ALIASES ALLOCATED:              12000
ALIASES USED:                    1185
CAPACITY (% FULL) :              10%
X-LIST ENTRIES ALLOCATED:        500

```

The example shows a truncated display of all provisioned destinations.

4. Display the current route configuration using the **rtrv-rte** command. This is an example of the possible output:

```

rlghncxa03w 01-03-07 11:43:04 GMT EAGLE 36.0.0

DPCA          ALIASI          ALIASN          CLLI    LSN          RC APCA
-----
DPCI          ALIASN          ALIASA          CLLI    LSN          RC APCI
2-100-1       121111          -----  idp1    ls100001     10 1-234-5
              ls100002     10 1-234-6
              ls100003     20 1-234-7
              ls100004     30 1-234-1
              ls100005     40 1-234-2
              ls100006     50 1-234-3

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

```

5. If the system's point code (**pc**/**pca**) or capability point code (**cpc**/**cpca**) to be configured in this procedure is shown in step 2, step 3, or step 4, choose another point code to configure with this procedure (step 9).
- 
6. If configuring the system point code or capability point code (**pc** or **cpca**) of an ITU-N ANSI network, view the current value of the ANSI point code format. Otherwise continue with step 7.

Enter the **rtrv-stpopts** command and specify the point code format option **npcfmti**. The **npcfmti** option identifies how the point code is entered into the database and how it is displayed in any outputs. The value is shown in the **NPCFMTI** field. This is an example of the possible output:

```
rlghncxa03w 01-03-17 16:02:05 GMT EAGLE 36.0.0
STP OPTIONS
-----
MTPT31CTL          1
MTPLTI             yes
MTPLTCTDPCQ        3
MTPLTST            10000
MTPXLQ             500
MTPXLET            0100
MTPXLOT            90%
MTDPDPCQ           1750
TFATFRPR           1000
MTPRSI             yes
MTPRSIT            5000
MTPLPRST           yes
MTPT10ALT           30000
SLSCNV             perlS
UIMRD              yes
CRITALMINH         no
DISPACTALMS        no
NPCFMTI            4-4-4-2
DEFCC              49
DEFNDC             177
DSMAUD             on
```

If you wish to change the format of the ANSI point code, go to the “ANSI Point Code” section in the *EAGLE 5 ISS Database Administration Manual Global Title Translation - SS7*. Then continue with step 7.

- 
7. Display the mated applications in the database using the **rtrv-map** command. These are examples of possible output:

```
rlghncxa03w 04-01-07 11:43:04 EST EAGLE 36.0.0
MAP TABLE IS 1 % FULL (1 of 3000)

PCA          SSN  RC MPCA          SSN MATERC MULT SRM MRC GRP NAME SSO
002-002-002  10  10                                YES YES ----- ON
                                002-002-003 20  10 SHR YES YES ----- ON
```

If the system's point code is shown in the **rtrv-map** command output (in the **PCA**, **PCI**, **PCN**, **MPCA**, **MPCI**, or **MPCN** fields), remove the system's point code from the mated application table. Refer to procedure “Removing a Mated Application” in the *EAGLE 5 ISS Database Administration Manual Global Title Translation - Features*.

If the system's point code 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 4) and not in the destination point code table (see output of the `rtrv-dstn` command in step 3).

---

8. Change PC, CPC, DPC, route, linkset, and LIM card configurations for the HLR database using steps 9 through 28.
- 



**CAUTION:** Changing a system's point code 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 system's point code (`pc/pca`) and capability point code (`cpc/cpca`) by network type using the `chg-sid` command. For example, enter one of these commands:

```
chg-sid:pc=002-002-002:pca=003-002-002
```

```
chg-sid:cpc=10-20-30:cpca=20-20-30
```

where:

`pc/pca` – The point code used to uniquely identify the system.

`cpc/cpca` – 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 01-03-07 00:57:31 GMT EAGLE 36.0.0  
CHG-SID: MASP A - COMPLTD
```

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

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

---



**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 <Italics>EAGLE 5 ISS Commands Manual in the Related Commands section for each of the above `rept-stat` commands.

10. Re initialize the system by entering the `init-sys` command if changes were made in step 9 to any `pca/pci/pcn` parameter.

**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 01-03-07 00:57:31 GMT EAGLE 36.0.0
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 01-03-07 00:57:31 GMT EAGLE 36.0.0
Init System command issued at terminal #3
```

From the time that the `init-sys` command is accepted, you must wait approximately two minutes before you can perform step 11 (logging into the system). If the terminal is in the VT-100/VT-320 mode, the terminal display will be refreshed with non-zero alarm counts. During this two-minute interval, an intermediate screen refresh occurs, which is caused by the MASP's role change from active to standby and from standby to active. This screen refresh is typically a partial refresh and the alarm indicators are set to zero.

If you are logged into the system in the KSR mode, the only response you will receive of being able to log into the system is the message 'UAM 0009, MASP became active'. UAM 0009 could be issued twice due to a possible transient MASP role change (switching from active to standby). Following the execution of the `init-sys` command, the MASP that was active before the `init-sys` command was entered will be the active MASP again when the system has finished re initializing.

---

11. Verify the SID changes using the **rtrv-sid** command. This is an example of the possible output:

```
tekelecstp 04-06-14 15:18:11 EST EAGLE 36.0.0
PCA          PCI          PCN          CLLI          PCTYPE
003-002-002  1-023-4      01234      tekelecstp    ANSI
              s-1-023-4    s-01234

CPCI
s-4-056-0

CPCN
s-00456
```

---

12. Enter a destination point code for the HLR location in the Destination Point Code table by network type using the **ent-dstn** command. For example, enter one of these commands:

```
ent-dstn:dpc=002-100-002
ent-dstn:dpc=002-111-002
```

where:

**dpci/dpcn** – The destination point code being added to the database

The system returns this message:

```
rlghncxa03w 01-03-17 15:35:05 GMT EAGLE 36.0.0
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 12. For example, enter one of these commands:

```
rtrv-dstn:dpci=002-100-002
rtrv-dstn:dpc=002-111-002
```

This is an example of the possible output for DPCs.

```
rtrv-dstn:dpc=002-100-002

RLGHNCXA03W 01-03-30 21:16:37 GMT EAGLE 36.0.0
DPC          CLLI          BEI ELEI  ALIASA          ALIASN          DOMAIN
002-100-002  -----          no  ---  -----          002-111-002    SS7

          SPC          NCAI
          -----          no

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

This is an example of the possible output for DPCAs.

```
rtrv-dstn:dpcn=002-111-002

RLGHNCXA03W 01-03-30 21:16:37 GMT EAGLE 36.0.0
DPCA          CLLI          BEI ELEI  ALIASA          ALIASI          DOMAIN
002-111-002  -----          no  ---  -----          002-100-002    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:apc=002-200-002:lst=c
ent-ls:lsn=ls500001:apca=002-112-002:lst=c
```

where:

**lsn** – The name of the linkset

**apc/apca** – 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 01-03-17 16:23:21 GMT EAGLE 36.0.0
Link set table is ( 114 of 1024) 12% full
ENT-LS: MASP A - COMPLTD
```

---

15. Verify the changes using the **rtrv-ls** command and specifying the linkset name. For example, enter one of these commands:

```
rtrv-ls:lsn=ls400001
rtrv-ls:lsn=ls500001
```

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

```

                                L3T SLT                                GWS GWS GWS
LSN      APC      (SS7)  SCRn  SET  SET  BEI  LST  LNKS  ACT  MES  DIS  SLSCI  NIS
ls400001  002-200-002  scr1  1    1   yes a   1    off off off  ---  off

                                CLLI                                TFATCABMLQ  MTPRSE  ASL8
                                -----  --  ---  ----

                                IPGWAPC  MATELSN  IPTPS    LSUSEALM  SLKUSEALM
                                no  -----  ---  ---  ---

                                LOC  PORT  SLC  TYPE      L2T      L1      PCR  PCR
                                1205  a    0   LIMV35    SET  BPS  MODE  TSET  ECM  N1  N2
                                1205  a    0   LIMV35    1    56000  ---  ---  BASIC  ---  -----
Link set table is (114 of 1024) 12% full
```

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

```

                                L3T SLT                                GWS GWS GWS
LSN          APC      (SS7)  SCRN  SET SET BEI LST LNKS  ACT MES DIS SLSCI NIS
ls500001     002-112-002  scr3  1   1   yes a   1   off off off ---  off

                                CLLI                                TFATCABMLQ  MTPRSE  ASL8
                                -----  --  ---  ----

                                IPGWAPC MATELSN  IPTPS    LSUSEALM  SLKUSEALM
                                no          -----  ---  ----

                                LOC  PORT SLC TYPE      L2T          L1          PCR  PCR
                                1205  a    0  LIMV35    SET  BPS      MODE TSET  ECM  N1  N2
                                Link set table is (114 of 1024) 12% full

```

16. Add the LIM cards to the database using the **ent-card** command. For this example, enter these commands:

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

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

where:

**loc** - specifies the slot number for the card.

**type** - specifies that the card is a LIMOCU card.

**appl** - specifies that the application is CCS7ITU.

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

```

RLGHNCXA03W 01-03-12 09:12:36 GMT EAGLE 36.0.0
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
```

These are examples of the possible output:

```

RLGHNCXA03W 01-03-30 09:12:36 GMT EAGLE 36.0.0
CARD  TYPE      APPL      PORT A LSET (SLC)  PORT B LSET (SLC)
1105  LIMOCU      CCS7ITU  -----  (--)  -----  (--)

RLGHNCXA03W 01-03-30 09:12:36 GMT EAGLE 36.0.0
CARD  TYPE      APPL      PORT A LSET (SLC)  PORT B LSET (SLC)
1106  LIMOCU      CCS7ITU  -----  (--)  -----  (--)

```



18. Assign signaling links to the LIM cards using the `ent-slk` command. For example, enter these commands:

```
ent-slk:loc=1105:port=a:lsn=1s400001:slc=0:l2tset=1
```

```
ent-slk:loc=1106:port=a:lsn=1s500001:slc=0:l2tset=1
```

where:

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

**port** – The port 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 01-03-07 08:29:03 GMT EAGLE 36.0.0
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 26.

---

19. Verify the changes using the `rtrv-slk` command, specifying the card location and port of the signaling link entered in step 18.

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

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

This is an example of the possible output.

```
RLGHNCXA03W 01-03-19 21:16:37 GMT EAGLE 36.0.0
L2T      L1
LOC  PORT  LSN      SLC  TYPE  SET  BPS  MODE  TSET  ECM  PCR  PCR
1105  A    1s400001  0   LIMOCU  1   56000  ---  ---  BASIC  ---  -----

RLGHNCXA03W 01-03-19 21:16:37 GMT EAGLE 36.0.0
L2T      L1
LOC  PORT  LSN      SLC  TYPE  SET  BPS  MODE  TSET  ECM  PCR  PCR
1106  A    1s500001  0   LIMOCU  1   56000  ---  ---  BASIC  ---  -----
```

---

20. Add a route for the new DPC by network type using the **ent-rte** command. For example, enter one of these commands:

```
ent-rte:dpc=002-100-002:lsn=ls400001:rc=10
ent-rte:dpc=002-111-002:lsn=ls500001:rc=10
```

where:

**dpc/dpca** – 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 01-03-07 08:28:30 GMT EAGLE 36.0.0
ENT-RTE: MASP A - COMPLTD
```

21. Verify the changes using the **rtrv-rte** command and specifying the destination point code of the route. This is an example of the possible output:

```
rlghncxa03w 01-03-07 11:43:04 GMT EAGLE 36.0.0
DPCA        ALIASI        ALIASN        CLLI        LSN        RC  APCA
-----
DPC          ALIASN        ALIASA        CLLI        LSN        RC  APC
002-100-001  121111        240-111-111  idp1        ls100001   10  1-234-5
                                ls100002   10  1-234-6
                                ls100003   20  1-234-7
                                ls100004   30  1-234-1
                                ls100005   40  1-234-2
                                ls100006   50  1-234-3
002-100-002                                121111        240-111-111  idp1
ls400001 10 1-200-2

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

22. Add a mated application to the database by network type using the **ent-map** command. For this example, enter this command:

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

where:

**pci/pcn** – The point code of the primary signaling point that is to receive the message.

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

**rc** – The relative cost

**mpc/mpca/mpci/mpcn** – The point code of the backup signaling point that is to receive the message.

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

**materc** – Mate relative cost.

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

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

```
RLGHNCXA03W 01-03-07 00:28:31 GMT EAGLE 36.0.0
ENT-MAP: MASP A - COMPLTD
```

---

**23. Verify the changes using the `rtrv-map` command. These are examples of possible output.**

```
rlghncxa03w 01-03-07 11:43:04 GMT EAGLE 36.0.0
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 01-03-07 11:43:04 GMT EAGLE 36.0.0
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 16 by using the `alw-card` command. For example, enter these commands:**

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

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

This message appears:

```
RLGHNCXA03W 01-03-30 21:20:37 GMT EAGLE 36.0.0
Card has been allowed.
```

---

**25. Verify the in-service normal (IS-NR) status of the cards using the `rept-stat-card` command. This is an example of the possible output:**

```
RLGHNCXA03W 01-03-27 16:43:42 GMT EAGLE 36.0.0
CARD  VERSION          TYPE  APPL      PST          SST          AST
1101  100-000-00003-000  TSM    SCCP      IS-NR        Active       ---
1102  100-000-00003-000  TSM    SCCP      IS-NR        Active       ---
1103  100-000-00003-000  ACMENET STPLAN    IS-NR        Active       ---
1104  100-000-00003-000  ACMENET GLS     IS-NR        Active       ---
1105  100-000-00003-000  LIMOCU  CCS7ITU   IS-NR        Active       ---
1106  100-000-00003-000  LIMOCU  CCS7ITU   IS-NR        Active       ---
1113  100-000-00002-000  MCAP    OAM       IS-NR        Active       ---
1114  100-000-00002-000  TDM     IS-NR      IS-NR        Active       ---
1115  100-000-00002-000  MCAP    OAM       IS-NR        Active       ---
1116  100-000-00002-000  TDM     IS-NR      IS-NR        Active       ---
1117  100-000-00002-000  MDAL    IS-NR      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 18 using the **act-slk** command. For example, enter these commands

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

```
act-slk:loc=1106:port=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 01-03-07 11:11:28 GMT EAGLE 36.0.0
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 01-03-30 21:16:37 GMT EAGLE 36.0.0
SLK      LSN      CLLI      PST      SST      AST
1105,A   1s400001  -----  IS-NR    Avail    ----
Command Completed.

RLGHNCXA03W 01-03-30 21:16:37 GMT EAGLE 36.0.0
SLK      LSN      CLLI      PST      SST      AST
1106,A   1s500001  -----  IS-NR    Avail    ----
Command Completed
```

---

- 28.** Display the new LIM cards in the database using the **rtrv-card** command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-15 16:34:56 GMT EAGLE 36.0.0
CARD  TYPE      APPL      PORT A LSET (SLC)  PORT B LSET (SLC)
1101  TSM         SCCP      -----          (--)          (--)
1102  TSM         SCCP      -----          (--)          (--)
1103  ACMENET     STPLAN    -----          (--)          (--)
1104  ACMENET     GLS       -----          (--)          (--)
1105  LIMOCU      CCS7ITU   1s400001  (00)          (--)          (--)
1106  LIMOCU      CCS7ITU   1s500001  (00)          (--)          (--)
1113  MCAP        OAM
1114  TDM
1115  MCAP        OAM
1116  TDM
1117  MDAL
1201  LIMDS0      SS7ANSI   lsn1          (00)          lsn2          (01)
1202  LIMV35      SS7GX25   lsn1          (00)          lsn2          (01)
1203  LIMV35      SS7ANSI   lsn2          (00)          lsn1          (01)
1204  LIMATM      ATMANSI   atm1          (00)          atm2          (01)
1205  DCM         IPLIM     ipgwy1        (00)          ipgwy3        (01)
1207  DCM         SS7IPGW   ipgwy2        (00)          ipgwy4        (01)
1303  DCM         IPLIM     ipgwy1        (00)          ipgwy3        (01)
1305  DCM         SS7IPGW   ipgwy4        (00)          ipgwy4        (01)
```

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

---



**CAUTION:** When adding DSM cards in an in-service environment, you must take care not to interrupt traffic. Before replacing SCCP cards with DSMs, first install a VSCCP card in an available odd-even double-slot prior to removing SCCP cards to make additional room for other DSM cards.

- 29.** Install and configure DSM card(s) as needed in available odd-even slots using steps 30 through 44. For our example, install a DSM card in slots 1107 and 1108.
- 

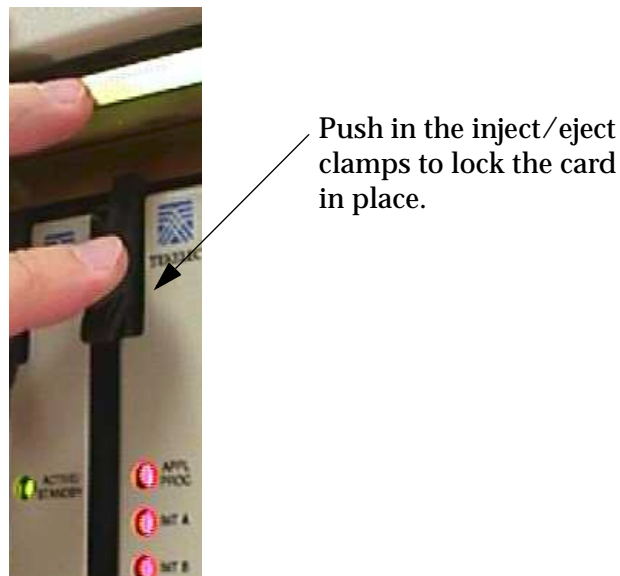
- 30.** Install the DSM card in slots 1107 and 1108. The DSM card requires two slots and must be installed in an odd slot with an adjacent empty even slot on its right side.
- a.** Open the ejector levers on the DSM card. Carefully align the card's edges with the top and bottom card guides. Then push 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's faceplate using constant pressure until you feel the card's progress cease.



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

- c.** Push in the top and bottom inject/eject clamps. This locks the card in place and ensures a strong connection with the pins on the target shelf backplane.

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



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

- 31.** Add the DSM card to the database and configure it as VSCCP card using the `ent-card` command. For this example, enter this command.

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

where:

**loc** - specifies the slot number for the card. The slot number must be an odd number.

**type** - specifies that the card is a DSM card.

**appl** - specifies that the application is VSCCP.

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

```
RLGHNCXA03W 01-03-12 09:12:36 GMT EAGLE 36.0.0  
ENT-CARD: MASP A - COMPLTD
```

---

- 32.** Verify the VSCCP card using the `rtrv-card` command with the card location specified. For this example, enter this command:

```
rtrv-card:loc=1107
```

This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 09:12:36 GMT EAGLE 36.0.0
```

| CARD | TYPE | APPL  | PORT A LSET (SLC) | PORT B LSET (SLC) |
|------|------|-------|-------------------|-------------------|
| 1107 | DSM  | VSCCP | ----- (--)        | ----- (--)        |

---

33. Display the current link parameters associated with the VSCCP card in the database by entering the `rtrv-ip-lnk` command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 21:14:37 GMT EAGLE 36.0.0
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 VSCCP card in the database using the `chg-ip-lnk` command. For this example, enter these commands:

```
chg-ip-lnk:loc=1107:port=a:duplex=half:ipaddr=192.168.122.1
:mactype=dix:speed=100:mcast=yes:submask=255.255.255.0
```

```
chg-ip-lnk:loc=1107:port=b:duplex=half:ipaddr=192.168.123.1
:mactype=dix:speed=10:mcast=yes:submask=255.255.255.0
```

where:

**loc** – The card location of the VSCCP card within the EAGLE 5 ISS.

**port** – The port ID. The port parameter of the `chg-ip-lnk` command specifies the physical interface of the DSM card.

**ipaddr** – IP address assigned to the port. This is a TCP/IP address expressed in standard “dot notation.” IP addresses consist of the system’s network number and the machine’s unique host number.

**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 01-03-30 21:18:37 GMT EAGLE 36.0.0
CHG-IP-LNK: MASP A - COMPLTD
```

---

35. Verify the IP address port and speed associated with the VSCCP card in the database by entering the `rtrv-ip-lnk` command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 21:14:37 GMT EAGLE 36.0.0
LOC  PORT  IPADDR      SUBMASK      DUPLEX  SPEED  MACTYPE  AUTO  MCAST
1107  A    192.168.122.1  255.255.255.0  HALF    100    DIX      NO    YES
1107  B    192.168.123.1  255.255.255.0  HALF    10     DIX      NO    YES
```

---

36. Display the current IP host information in the database by entering the `rtrv-ip-host` command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 21:17:37 GMT EAGLE 36.0.0

IPADDR      HOST
192.1.1.32   KC_HLR2
192.1.1.50   DN_MSC1
192.1.1.52   DN_MSC2
```

---

37. Add the host name and IP address for each VSCCP link using the `ent-ip-host` command. For example, enter these commands:

```
ent-ip-host:host=vsccp_1107_a:ipaddr=192.168.122.1
ent-ip-host:host=vsccp_1107_b:ipaddr=192.168.123.1
```

where:

**host** - specifies the host name. Each VSCCP link must be specified separately.

**ipaddr** - specifies the IP network address for each EPAP. The first three octets of the IP address must be the same as MPS A and B ports, respectively. The fourth octet identifies the DSM card and must have a unique octet identifier for the card's IP address; we recommend numbering the DSM cards sequentially, using values 1 to 25. (This example shows the assignment of the first DSM card.)

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

```
RLGHNCXA03W 01-03-30 21:18:37 GMT EAGLE 36.0.0
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 01-03-30 21:19:37 GMT EAGLE 36.0.0

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 A-Port customer private networks do not require setting up a default router for the DSM card. However, if your network configuration does require a default router to connect the DSM card communication to the EPAP, then only one default router is assignable to each DSM card. Assign the default router address to each DSM card as shown in this step.



39. Enter local domain and IP router address for the VSCCP 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 VSCCP 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 01-03-30 21:20:37 GMT EAGLE 36.0.0
CHG-IP-CARD: MASP A - COMPLTD
```

40. Verify the new TCP/IP parameters associated with the VSCCP card in the database by entering the **rtrv-ip-card** command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 21:21:37 GMT EAGLE 36.0.0
LOC 1107
  SRCHORDR LOCAL
  DNSA -----
  DNSB -----
  DEFROUTER 192.168.122.250
  DOMAIN    NC.TEKELEC.COM
```

41. Boot the DSM card that was added in step 31 in TSM emulation mode by using the **alw-card** command. For example, enter this command:

```
RLGHNCXA03W 01-03-30 21:14:37 GMT EAGLE 36.0.0
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
```

42. Verify the in-service normal (IS-NR) status of the VSCCP card using the **rept-stat-card** command. This is an example of the possible output.

```
RLGHNCXA03W 01-03-27 16:43:42 GMT EAGLE 36.0.0
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 36.0.0
pass: loc=1107: cmd="ping 192.168.122.100"
Command entered at terminal #1.
;
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 36.0.0
PASS: Command sent to card
;
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 36.0.0
PING command in progress
;
rlghncxa03w 00-06-27 08:30:46 GMT EAGLE 36.0.0
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 Technical Services (see “Customer Assistance” on page 1-10).

---

- 44.** Repeat steps 30 through 43 to add all DSM cards (N+1) to be installed in available slots. Go to the next step to start replacing TSM cards with DSM cards.
- 

- 45.** Replace TSM card(s) with DSM cards if applicable and add DSM card(s) to the database using steps 46 through 68. In this procedure, we are removing two existing adjacent TSM cards and replace them with a double-slot DSM card in slots 1101 and 1102.

**NOTE:** When adding DSM cards in an in-service environment, you must take care not to interrupt traffic. Before replacing SCCP cards with DSMs, first install a VSCCP card in an available double-slot.

---

46. Display the TSM cards running the SCCP application in the database using the **rtrv-card** command. This is an example of the possible output:

```

RLGHNCXA03W 01-03-15 16:34:56 GMT EAGLE 36.0.0
CARD   TYPE      APPL      PORT A LSET (SLC)  PORT B LSET (SLC)
1101   TSM        SCCP      -----  (--)  -----  (--)
1102   TSM        SCCP      -----  (--)  -----  (--)
1103   ACMENET    STPLAN    -----  (--)  -----  (--)
1104   ACMENET    GLS       -----  (--)  -----  (--)
1105   LIMOCU     CCS7ITU   1s300001  (00)  -----  (--)
1106   LIMOCU     CCS7ITU   1s400001  (00)  -----  (--)
1107   DSM        VSCCP     1s300001  (00)  -----  (--)
1113   MCAP       OAM
1114   TDM
1115   MCAP       OAM
1116   TDM
1117   MDAL
1201   LIMDS0     SS7ANSI   lsn1      (00)   lsn2      (01)
1202   LIMV35     SS7GX25   lsn1      (00)   -----  (--)
1203   LIMV35     SS7ANSI   lsn2      (00)   lsn1      (01)
1204   LIMATM     ATMANSI   atm1      (00)   -----  (--)
1205   DCM        IPLIM     ipgwy1    (00)   ipgwy3    (01)
1207   DCM        SS7IPGW   ipgwy2    (00)   -----  (--)
1303   DCM        IPLIM     ipgwy1    (00)   ipgwy3    (01)
1305   DCM        SS7IPGW   ipgwy4    (00)   -----  (--)

```

Determine the cards to be removed from the database. In this procedure, we will remove the SCCP cards in card locations **1101** and **1102**.

47. Display the SCCP 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
```

This is an example of the possible output:

```

RLGHNCXA03W 01-03-27 16:43:42 GMT EAGLE 36.0.0
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 SCCP 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 01-03-12 09:12:36 GMT EAGLE 36.0.0  
Card has been inhibited.
```

---

49. Verify that the SCCP cards are in the Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD) state with the **rept-stat-card** command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-27 16:43:42 GMT EAGLE 36.0.0
```

| 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     | 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   | --- |

---

50. Remove the SCCP 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 01-03-12 09:12:36 GMT EAGLE 36.0.0  
DLT-CARD: MASP A - COMPLTD
```

---

51. Verify that the SCCP cards are removed from the database using the **rtrv-card** command and specifying the cards that were removed in step 50. For this example, enter these commands:

```
rtrv-card:loc=1101
```

```
rtrv-card:loc=1102
```

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

```
E2144 Cmd Rej: Location invalid for hardware configuration
```

---

**52. Locate the TSM card to be removed from the shelf.**

Because the TSM card takes just one slot and the DSM card requires two slots, the DSM card must be installed in an odd slot that is adjacent to an even slot on its right side. In this procedure, we will remove two TSM cards from slots 1101 and 1102 to make space for one DSM card.

- a. Push the inject/eject clamps outward from the card's faceplate (top clamp in the "UP" position, bottom clamp in the "DOWN" position). Pull the levers away from the shelf until they are parallel to the floor. Gently pull the card towards you until the card clears the shelf.

**Figure 4-2. Push Inject/Eject Clamps Outward**



- b. 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 52 to remove the second TSM card.**

---

**54. Install the DSM card in slots 1101 and 1102.**

- a. Open the ejector levers on the DSM card. Carefully align the card's 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's faceplate using constant pressure until you feel the card's progress cease.

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

- c. Push in the top and bottom inject/eject clamps. This locks the card in place and ensures a strong connection with the pins on the target shelf backplane.

**Figure 4-3.** Push in Inject/Eject Clamps



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 DSM card to the MPS. Refer to the Installation Manual for details.

- 
- 55.** Add the DSM card to the database and assign the VSCCP application using the `ent-card` command. For this example, enter this command:

```
ent-card:loc=1101:type=dsm:appl=vsccp
```

where:

`loc` - specifies the slot number for the card. The slot number must be an odd number.

`type` - specifies that the card is a DSM card.

`appl` - specifies that the application is VSCCP.

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

```
RLGHNCXA03W 01-03-12 09:12:36 GMT EAGLE 36.0.0
ENT-CARD: MASP A - COMPLTD
```

---

56. Display the new VSCCP card using the **rtrv-card** command with the card location specified. For this example, enter this command:

```
rtrv-card:loc=1101
```

This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 09:12:36 GMT EAGLE 36.0.0
CARD   TYPE          APPL      PORT A LSET (SLC)    PORT B LSET (SLC)
1101 DSM              VSCCP      -----      (--)      -----      (--)
```

---

57. Display the current link parameters associated with the VSCCP card in the database by entering the **rtrv-ip-lnk** command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 21:14:37 GMT EAGLE 36.0.0
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 VSCCP card in the database using the **chg-ip-lnk** command. For this example, enter these commands:

```
chg-ip-lnk:loc=1101:port=a:duplex=half:ipaddr=192.168.122.2
:mactype=dix:speed=100:mcast=yes:submask=255.255.255.0
```

```
chg-ip-lnk:loc=1101:port=b:duplex=half:ipaddr=192.168.123.2
:mactype=dix:speed=10:mcast=yes:submask=255.255.255.0
```

where:

**loc** – The card location of the card within the EAGLE 5 ISS.

**port** – The port ID. The port parameter of the **chg-ip-lnk** command specifies the physical interface of the DSM card.

**ipaddr** – IP address assigned to the port. This is a TCP/IP address expressed in standard “dot notation.” IP addresses consist of the system’s network number and the machine’s unique host number.

**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 01-03-30 21:18:37 GMT EAGLE 36.0.0
CHG-IP-LNK: MASP A - COMPLTD
```

---

59. Verify the new link parameters associated with the VSCCP card in the database by entering the **rtrv-ip-lnk** command. The following is an example of the possible output.

```
RLGHNCXA03W 01-03-30 21:14:37 GMT EAGLE 36.0.0
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 01-03-30 21:17:37 GMT EAGLE 36.0.0
```

```
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=vscpp_1101_a:ipaddr=192.168.122.2
ent-ip-host:host=vscpp_1101_b:ipaddr=192.168.123.2
```

where:

**host** - specifies the host name. Each VSCCP link must be specified separately.

**ipaddr** - specifies the IP network address for each EPAP. The first three octets of the IP address must be the same as MPS A and B ports, respectively. The fourth octet identifies the DSM card and must have a unique octet identifier for the card's IP address; we recommend numbering the DSM cards sequentially, using values 1 to 25. (This example shows the assignment of the second DSM card.)

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

```
RLGHNCXA03W 01-03-30 21:18:37 GMT EAGLE 36.0.0
ENT-IP-HOST: MASP A - COMPLTD
```

---



62. Verify the new IP host information in the database by entering the `rtrv-ip-host` command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 21:19:37 GMT EAGLE 36.0.0
```

| 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 A-Port customer private networks do not require setting up a default router for the DSM card. However, if your network configuration does require a default router to connect the DSM card communication to the EPAP, then only one default router is assignable to each DSM card. Assign the default router address to each DSM card as shown in this step.

63. Enter local domain and IP router address for the VSCCP 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 01-03-30 21:20:37 GMT EAGLE 36.0.0
CHG-IP-CARD: MASP A - COMPLTD
```

---

64. Verify the local domain and IP router address associated with the VSCCP card in the database by entering the `rtrv-ip-card` command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-30 21:21:37 GMT EAGLE 36.0.0
LOC 1101
SRCHORDR LOCAL
DNSA -----
DNSB -----
DEFROUTER 192.168.122.250
DOMAIN NC.TEKELEC.COM
```

---

- 65.** Boot the DSM card that was inhibited in step 48 in TSM emulation mode by using the **alw-card** command. For example, enter this command:

```
alw-card:loc=1101
```

This message appears:

```
RLGHNCXA03W 01-03-30 21:20:37 GMT EAGLE 36.0.0
Card has been allowed
```

- 66.** Verify the in-service normal (IS-NR) status of the VSCCP card using the **rept-stat-card** command. This is an example of the possible output:

```
RLGHNCXA03W 01-03-27 16:43:42 GMT EAGLE 36.0.0
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   ---
```

- 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 36.0.0
pass: loc=1101: cmd="ping 192.168.122.100"
Command entered at terminal #1.
;
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 36.0.0
PASS: Command sent to card
;
rlghncxa03w 00-06-27 08:30:44 GMT EAGLE 36.0.0
PING command in progress
;
rlghncxa03w 00-06-27 08:30:46 GMT EAGLE 36.0.0
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 Technical Services (see “Customer Assistance” on page 1-10).

---

- 68.** Repeat steps 46 through 67 to replace all adjacent TSM cards identified in the prerequisites and to be replaced with DSM cards.
- 

- 69.** Repeat steps 48 through 53 to inhibit any remaining TSM cards running the SCCP application and remove them from database and shelf.

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

---



**CAUTION:** At this point in the procedure, contact Tekelec Technical Services for assistance in completing this A-Port activation procedure (see “Customer Assistance” on page 1-10).  
Do not proceed without consulting with Technical Services

---

- 70.** Turn on and configure the A-Port feature using steps 71 through 87.
- 

- 71.** Enter the `enable-ctrl-feat` command to enable the A-Port feature.

```
enable-ctrl-feat:partnum=893016601:fak=<Feature Access Key>
```

---

- 72.** Enter the `chg-ctrl-feat` command to activate the A-Port feature.

```
chg-ctrl-feat:partnum=893016601:status=ON
```

---

- 73.** Enter the `enable-ctrl-feat` command to enable the MTP MSGS for SCCP Apps feature.

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

---

- 74.** Enter the `chg-ctrl-feat` command to activate the MTP MSGS for SCCP Apps feature.

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

---

- 75.** Enter the default country code (CC) and default network destination code (NDC) to convert the nature of address indicator (NAI) of MDNs to the international format (`nai=intl`) with the `chg-stpopts` command. The parameters in this command are used for number conditioning. For example, enter this command:

```
chg-stpopts:defcc=49:defndc=177:dsmaud=on:npcfmti=14-9-2-1
```

where:

`defcc` – The default country code.

**defndc** – The default network destination code.

**dsmaud** – The DSM audit running state (on or off).

**npcfmt1** – The ITU National Point Code Format Identifier, which identifies how the ITU-N point code is entered into the database and how it is displayed in all EAGLE 5 ISS outputs. This code is a 14-bit integer.

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

```
rlghncxa03w 01-03-07 00:57:31 GMT EAGLE 36.0.0
CHG-STPOPTS: MASP A - COMPLTD
```

---

**76. Verify the new country code and network destination code using the **rtrv-stpopts** command. This is an example of the possible output:**

```
rlghncxa03w 04-04-17 16:02:05 EST EAGLE 36.0.0
STP OPTIONS
-----
MTPT31CTL                1
MTPLTI                   yes
MTPLTCTDPCQ              3
MTPLTST                 10000
MTPXLQ                   500
MTPXLET                  0100
MTPXLOT                  90%
MTPDPCQ                  8000
TFATFRPR                 1000
MTPRSI                   yes
MTPRSIT                  5000
MTPLPRST                 yes
MTPT10ALT                30000
UIMRD                    yes
SLSCNV                   perls
CRITALMINH               yes
DISPACTALMS              no
NPCFMTI                  14-9-2-1
GSMDFLT                  PASS
GSMDECERR                 PASS
DEFCC                     49
DEFNDC                   177
DSMAUD                    on
RPTLNPMRSS               yes
RANDSLs                  all
GR2878RGLBL              no
RSTRDEV                   on
SECMTPMATE                off
SECMTPSID                 off
SECMTPSNM                 notify
SECSCCPSCMG              notify
CNVCGDA                   yes
CNVCGDI                   yes
CNVCGDN                   yes
CNVCGDN24                 yes
GTCNVDFLT                yes
ANSIGFLEX                 yes
```

77. Change the IS41 system options in the database. For example, enter this command:

```
chg-is41opts:rspcgpanai=7:rspcgpanp=15:rspdig=ccrndn
```

where:

**rspcgpanai** - specifies a new NAI value to override the NAI value specified in the SCCP CdPA of a received LOCREQ/SMSREQ if the message is to be relayed after database lookup

**rspcgpanp** - defines the numbering plan value of the MNP\_SRF.

**rspdig** - specifies the digit encoding format of the LOCREQ TCAP Outgoing Called Party parameter on a per EAGLE 5 ISS node basis

The system returns the following message:

```
rlghncxa03w 00-08-20 09:04:14 GMT EAGLE 36.0.0
CHG-IS41OPTS: MASP A - COMPLTD
```

78. Verify the changes using the **rtrv-is41opts** command. This command displays all is41 options from the database. This is an example of the possible output:

```
tekelecstp 06-08-15 10:33:44 EST EAGLE 36.0.0
```

```
IS41 OPTIONS
-----
SMSREQBYPASS      = NO
LOCREQDN          = TCAP
IEC               = 0
NEC               = 00
RSPCGPARI         = FRMSG
RSPCGPAPCP        = FRMSG
RSPCDPARI         = FRMSG
RSPCDPAPCP        = FRMSG
RSPCGPANAI        = 7
RSPCGPANP         = 15
RSPCGPATT         = 0
MTPLOCREQNAI      = SUB
RSPPARM           = DDIGIT
RSPDIG            = CCRNDN
RSPNON            = 0
RSPNP             = 0
RSPMIN            = NOTHOMERN
MSCMKTID          = 32300
MSCSWITCH         = 20
ESNMFG            = 0
ESNSN             = 0
RSPDIGTYPE        = 0
LOCREQRMHRN       = NO
TCAPSNAI          = SUB
```

- 79.** 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 A-Port messages. 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 01-03-07 00:28:31 GMT EAGLE 36.0.0
HOMERN table is (1 of 100) 1% full
ENT-HOMERN: MASP A - COMPLTD
```

---

- 80.** 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 01-03-28 00:29:31 GMT EAGLE 36.0.0.0
RN
-----
216780909087654
76345098
c10234567
c222
cabade
abc
abc123

HOMERN table is (6 of 100) 6% full
```

---

- 81.** Verify the changes using the **rtrv-srvsel** command. This command retrieves a list of administered service selector combinations. This is an example of the possible output:

```
rlghncxa03w 00-06-20 09:09:14 GMT EAGLE 36.0.0
GTII TT NP NAI NPV NAIV SSN SNP SNAI SERV
4 1 e214 intl --- --- 3 --- --- gport
```

---

- 82.** Use the **ent-srvsel** command to enter the A-Port service selectors by network type. This command assigns applicable service selectors required to specify the service entry for DSM services. For example, enter the following command:

```
ent-srvsel:gtia=2:tt=1:snp=e164:snai=intl:serv=mnps:nai=intl
:np=e164:ssn=9
```

where:

**gtia** - 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 01-03-07 00:28:31 GMT EAGLE 36.0.0
Service Selector table is (114 of 1024) 11% full
ENT-SRVSEL: MASP A - COMPLTD
```

---

- 83.** 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:gtai=2**

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

| GTAI | TT | NP   | NAI  | NPV | NAIV | SNP  | SNAI | SERV |
|------|----|------|------|-----|------|------|------|------|
| 2    | 0  | e164 | intl | --- | ---  | e164 | intl | mnp  |
| 2    | 1  | e164 | intl | --- | ---  | e164 | intl | mnp  |

---



**CAUTION:** When you have an in-service environment and you are replacing TSM cards with DSM cards, initialize one DSM card at a time. Verify its return to IS-NR state before initializing another DSM card. This precaution keeps cards in service and 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, A-Port, and INP traffic is routed based on the global title in the RTDB. Rebooting a DSM card running the VSCCP application causes both the OAM and RTDB databases on the DSM card to reload

- 84.** Reload a DSM card using the **init-card** command. For example, enter this command:

**init-card:loc=1101**

The system returns the following message

```
rlghncxa03w 01-03-07 00:28:31 GMT EAGLE 36.0.0
Command entered at terminal #3.
Init Card command issued to card 1101
```

---

**85.** Verify its return to IS-NR state with the **rept-stat-card** command. (Wait until in-service state is restored.) This is an example of the possible output:

```

RLGHNCXA03W 01-03-07 00:30:42 GMT EAGLE 36.0.0
CARD  VERSION      TYPE  APPL  PST      SST      AST
1101  100-000-00003-000  DSM   VS CCP  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     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   ---

```

**86.** After the **init-card** and the **rept-stat-card** commands show that service is successfully restored, repeat steps 82 and 85 for each DSM card in your system.

**87.** Enter the **chg-sccp-serv:serv=mnps:state=online** command to set the MNP service state online.

**88.** Confirm that essential activation procedures are successful.

- Use **rept-stat-sccp** to verify all your DSM cards are loaded and are IS-NR (in-service normal) status.
- Use **rept-stat-mps** to verify all your DSM cards and the EPAP are connected and operational.
- Use **rept-stat-db:display=all** to verify database levels are identical for the EPAP PDB and RTDB and the RTDBs on the DSM cards.

The A-Port feature is now installed, activated, and ready for operations.



## Activating the 1100 TPS/DSM for ITU NP Feature

This procedure is used enable and turn on the 1100 TPS/DSM for ITU NP feature. This feature provides up to 26,400 transactions per second when the maximum number of DSM cards are installed in the EAGLE 5 ISS and one or more EPAP-related features (such as G-Port, G-Flex, A-Port, INP, EIR, Migration) are enabled and turned on.

This feature can be enabled only for DSMs that are rated at 850 transactions per second (TPS).



**CAUTION:** The increase of the DSM capacity, 1100 TPS per DSM, assumes incoming traffic consists of at least 30% of GTT routed traffic that does not require EPAP based lookup. If more than 70% of incoming traffic requires EPAP based lookup, Group Ticket Voucher (TVG) may shutdown and overall TVG capacity of 1100 for the card may not be met.

The feature access key is based on the feature's part number and the serial number of the EAGLE 5 ISS, making the feature access key site-specific.

The `enable-ctrl-feat` command enables the 1100 TPS/DSM for ITU NP feature by inputting the feature's access key and the feature's part number with these parameters:

**:fak** – The feature access key provided by Tekelec. The feature access key contains 13 alphanumeric characters and is not case sensitive.

**:partnum** – The Tekelec-issued part number of the 1100 TPS/DSM for ITU NP feature, 893018001.

This feature cannot be enabled with a temporary feature access key.

The 1100 TPS/DSM for ITU NP feature cannot be enabled if:

- 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 1100 TPS/DSM for ITU NP feature cannot be enabled unless the EAGLE 5 ISS contains DSM cards.

The `enable-ctrl-feat` command requires that the database contain a valid serial number for the EAGLE 5 ISS, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The EAGLE 5 ISS is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the EAGLE 5 ISS is on-site, with the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

`:serial` – The serial number assigned to the EAGLE 5 ISS. The serial number is not case sensitive.

`:lock` – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

**NOTE:** To enter and lock the EAGLE 5 ISS's serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should 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).

Once the 1100 TPS/DSM for ITU NP feature has been enabled, the feature must be turned on with the `chg-ctrl-feat` command. The `chg-ctrl-feat` command uses these parameters:

`:partnum` – The Tekelec-issued part number of the 1100 TPS/DSM or ITU NP feature, 893019101.

`:status=on` – used to turn the 1100 TPS/DSM for ITU NP feature on.

This feature increases the processing capacity of SCCP traffic for an EAGLE 5 ISS processing EPAP-based traffic to 26,400 transactions per second. To achieve this increase in SCCP processing capacity, a maximum of 25 DSM cards must be provisioned and installed in the EAGLE 5 ISS.

## Procedure

---

1. Display the status of the 1100 TPS/DSM feature by entering the `rtrv-ctrl-feat` command. The 1100 TPS/DSM for INP NP feature is enabled. The following is an example of the possible output:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
```

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     | <b>20 days 8 hrs 57 mins</b> |

The following features have expired temporary keys:

| Feature Name | Part Num  |
|--------------|-----------|
| OnOffFeatV   | 893492401 |

If the **rtrv-ctrl-feat** output shows that the 1100 TPS/DSM for ITU NP feature is enabled, shown by the entry 1100 TPS/DSM for ITU NP, and its status is **on**, no further action is necessary.

If the feature is enabled, and its status is **off**, skip steps 2 through 9, and go to step 10.

If the **rtrv-ctrl-feat** output shows that the LNP feature is enabled, this procedure cannot be performed. The 1100 TPS/DSM for ITU NP feature cannot be enabled if the LNP feature is enabled.

If the 1100 TPS/DSM for ITU NP and LNP features are not enabled, go to step 2.

- 
2. To enable the 1100 TPS/DSM ITU NP feature, the ANSI G-Flex feature cannot be turned on. To verify the status of the ANSI G-Flex option, you must first enter the **rtrv-feat** command.

The G-Flex feature is shown by the entry G-Flex as the **rtrv-feat** command with **rtrv-feat** output.

If the G-Flex feature is turned off, skip to step 4.

If the G-Flex feature is turned on, go to step 3.

---

3. To enable the 1100 TPS/DSM for ITU NP feature, the ANSI G-Flex option cannot be enabled. To verify the status of the ANSI G-Flex option, enter the `rtrv-stpopts` command.

The ANSI G-Flex option is shown by the entry **ANSIGFLEX** in the `rtrv-stpopts` output. If the **ANSIGFLEX** option is displayed in the `rtrv-stpopts` output, the G-Flex and GTT features are turned on.

If the **ANSIGFLEX** value is **yes**, the ANSI G-Flex option is enabled and this procedure cannot be performed.

If the **ANSIGFLEX** value is **no**, the ANSI G-Flex option is not enabled. Skip step 4 and go to step 5.

- 
4. To enable the 1100 TPS/DSM for ITU NP feature, the GTT feature must be turned on. The GTT feature is shown by the entry **GTT** in the `rtrv-feat` output executed in step 2.

If the GTT feature is turned on, go to step 5.

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 on and to add the required number of DSM cards to the database. After the "Adding an SCCP card" has been performed, skip step 5, and go to step 6.

- 
5. Verify the number of DSM 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 36.0.0
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
```

If the required number of DSM cards are provisioned in the database, go to step 6.

If the required number of DSM cards are not provisioned in the database, perform the "Adding an SCCP card" in the *Database Administration Manual - Global Title Translation* to add the required number of DSM cards to the database. After the "Adding an SCCP card" has been performed, go to step 6.

- 
6. 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 36.0.0
```

```
System serial number = nt00001231

System serial number is not locked.

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
Command Completed
```

---

**NOTE:** If the serial number is correct and locked, skip steps 7, 8, and 9, and go to step 10. If the serial number is correct but not locked, skip steps 7 and 8, and go to step 9. If the serial number is not correct, but is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. Refer to “Customer Care Center” on page 1-10 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's correct serial number>
```

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

---

8. Verify that the serial number entered into step 7 was entered correctly using the `rtrv-serial-num` command. This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
System serial number = nt00001231
```

```
System serial number is not locked.
```

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
Command Completed
```

If the serial number was not entered correctly, repeat steps 7 and 8 and re-enter the correct serial number.

---

9. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in step 6, if the serial number shown in step 6 is correct, or with the serial number shown in step 8, if the serial number was changed in step 6, 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, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

---

10. Enable the 1100 TPS/DSM for ITU NP feature with the permanent key by entering the `enable-ctrl-feat` command. For this example, enter this command.

```
enable-ctrl-feat:partnum=893018001:fak=<1100 TPS/DSM for ITU NP
feature access key>
```

**NOTE:** The values for the feature access key (the `fak` parameter) are provided by Tekelec. If you do not have the feature access key for the 1100 TPS/DSM for ITU NP feature, contact your Tekelec Sales Representative or Account Representative.

When the `enable-ctrl-feat` command has successfully completed, this message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

---

**NOTE:** If you do not wish to turn the 1100 TPS/DSM for ITU NP feature on, skip this step and go to step 12. If you do not turn this feature on, the transaction rate will remain at 850 TPS/DSM.

11. Turn on the 1100 TPS/DSM for ITU NP feature with the `chg-ctrl-feat` command, specifying the 1100 TPS/DSM for ITU NP feature part number used in step 10 and the `status=on` parameter. For this example, enter this command:

```
chg-ctrl-feat:partnum=893018001:status=on
```

The following output message appears:

**CAUTION:** Rated TPS for this feature supports an engineered GTT traffic mix of no more than 70 percent EPAP-based traffic. Re-enter the command within 30 seconds to confirm change.



**CAUTION:** If the EPAP-based traffic is higher than 70% of all traffic on the EAGLE 5ISS, the DSM cards performance may not reach 1100 TPS per DSM.

Reenter the `chg-ctrl-feat` command to turn the feature ON.

```
chg-ctrl-feat:partnum=893018001:status=on
```

When this command has successfully completed, the following message should appear:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
CHG-CTRL-FEAT: MASP B - COMPLTD
```

---

12. Verify the changes by entering the **rtrv-ctrl-feat** command with the 1100 TPS/DSM for ITU NP feature part number specified in steps 10 or 11. Enter this command.

```
rtrv-ctrl-feat:partnum=893018001
```

The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 36.0.0
```

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 |

13. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. 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.
```

14. If you wish to turn off TPS/DSM for INP NP feature, turn off the 1100 TPS/DSM for ITU NP feature with the **chg-ctrl-feat** command, specifying the 1100 TPS/DSM feature part number used in step 11 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. Re-enter the command within 30 seconds to  
confirm.
```

Reenter the **chg-ctrl-feat** command to turn the feature OFF.

```
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 36.0.0  
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 are installed in the EAGLE 5 ISS and one or more EPAP-related features (such as G-Port) are enabled and turned on.

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 E5-SM4G Throughput Capacity 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 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 ANSI G-Flex STP Option is enabled.
- The Eagle 5 Integrated Monitoring Support (E5IS) feature is turned on.
- The STPLAN feature is turned on.
- The GTT feature is not turned on.

The E5-SM4G Throughput Capacity feature cannot be enabled unless the EAGLE 5 ISS contains E5-SM4G cards, and E5-SM4G cards cannot be installed in the EAGLE 5 ISS unless HIPR cards are installed in all shelves. Enter the `rept-stat-gp1:gp1=hipr` command to verify if HIPR cards are installed in all shelves.

The status of the LNP feature is shown with the `rtrv-ctrl-feat` command output.

The status of the GTT, E5IS, and STPLAN features is shown in the `rtrv-feat` command output.

The status of the ANSI G-Flex STP Option is shown in the `rtrv-stpopts` command output.



The `enable-ctrl-feat` command requires that the database contain a valid serial number for the EAGLE 5 ISS, and that this serial number is locked. This can be verified with the `rtrv-serial-num` command. The EAGLE 5 ISS is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the EAGLE 5 ISS is on-site, with the `ent-serial-num` command. The `ent-serial-num` command uses these parameters.

**:serial** – The serial number assigned to the EAGLE 5 ISS. The serial number is not case sensitive.

**:lock** – Specifies whether or not the serial number is locked. This parameter has only one value, `yes`, which locks the serial number. Once the serial number is locked, it cannot be changed.

**NOTE:** To enter and lock the EAGLE 5 ISS's serial number, the `ent-serial-num` command must be entered twice, once to add the correct serial number to the database with the `serial` parameter, then again with the `serial` and the `lock=yes` parameters to lock the serial number. You should 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).

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.

## Procedure

---

1. Display the status of the E5-SM4G Throughput Capacity 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 37.0.0
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     |
|------------------------|-----------|--------|----------|-----------------------|
| 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 steps 2 through 9, and go to step 10.

If the `rtrv-ctrl-feat` output shows that the LNP feature is enabled, this procedure cannot be performed. The E5-SM4G Throughput Capacity feature cannot be enabled if the LNP feature is enabled.

If the E5-SM4G Throughput Capacity and LNP features are not enabled, go to step 2.

- 
2. To enable the E5-SM4G Throughput Capacity feature, neither the E5IS feature nor the STPLAN feature can be turned on. To verify the status of the E5IS and STPLAN features, enter the `rtrv-feat` command.

The E5IS feature is shown by the entry E5IS in the `rtrv-feat` output.

The STPLAN feature is shown by the entry LAN in the `rtrv-feat` output.

If the E5IS or STPLAN feature is turned on, this procedure cannot be performed.

If the E5IS and STPLAN features are turned off, go to step 3.

---

**NOTE:** If the `rtrv-feat` output in step 2 shows that the G-Flex feature is not turned on, shown by the entry `GFLEX = off`, skip this step and go to step 4. If the G-Flex feature is off, the `ANSIGFELX` option is not displayed in the `rtrv-stpopts` output.

3. To enable the E5-SM4G Throughput Capacity feature, the ANSI G-Flex option cannot be enabled. To verify the status of the ANSI G-Flex option, enter the `rtrv-stpopts` command.

The ANSI G-Flex option is shown by the entry **ANSIGFLEX** in the `rtrv-stpopts` output. If the **ANSIGFLEX** option is displayed in the `rtrv-stpopts` output, the G-Flex and GTT features are turned on.

If the **ANSIGFLEX** value is **yes**, the ANSI G-Flex option is enabled and this procedure cannot be performed.

If the **ANSIGFLEX** value is **no**, the ANSI G-Flex option is not enabled. Skip step 4 and go to step 5.

- 
4. To enable the E5-SM4G Throughput Capacity feature, the GTT feature must be turned on. The GTT feature is shown by the entry **GTT** in the `rtrv-feat` output executed in step 2.

If the GTT feature is turned on, go to step 5.

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 on and to add the required number of E5-SM4G cards to the database. After the "Adding an SCCP card" has been performed, skip step 5, and go to step 6.

- 
5. Verify the number of E5-SM4G cards that are provisioned in the database using the `rept-stat-gpl:gpl=sccphc` command. This is an example of the possible output.

```
rlghncxa03w 07-05-01 11:40:26 GMT EAGLE5 37.0.0
GPL      CARD      RUNNING      APPROVED      TRIAL
SCCPHC   1201      126-002-000  126-002-000  126-003-000
SCCPHC   1203      126-002-000  126-002-000  126-003-000
SCCPHC   1207      126-002-000  126-002-000  126-003-000
SCCPHC   1213      126-002-000  126-002-000  126-003-000
SCCPHC   1215      126-002-000  126-002-000  126-003-000
SCCPHC   1305      126-002-000  126-002-000  126-003-000
SCCPHC   1313      126-002-000  126-002-000  126-003-000
SCCPHC   2103      126-002-000  126-002-000  126-003-000
Command Completed
```

If the required number of E5-SM4G cards are provisioned in the database, go to step 6.

If the required number of E5-SM4G cards are not provisioned in the database, perform the "Adding an SCCP card" in the *Database Administration Manual - Global Title Translation* to add the required number of E5-SM4G cards to the database. After the "Adding an SCCP card" has been performed, go to step 6.

- 
6. Verify whether HIPR cards are installed on all the EAGLE 5 ISS shelves using 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 the shelves, go to step 7.

If HIPR cards are not installed on all the shelves, refer to the *Installation Manual - EAGLE 5 ISS* and install the HIPR cards. Once the HIPR cards have been installed, go to step 7.

- 
7. 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 37.0.0
System serial number = nt00001231

System serial number is not locked.

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

---

**NOTE:** If the serial number is correct and locked, skip steps 8, 9, and 10, and go to step 11. If the serial number is correct but not locked, skip steps 8 and 9, and go to step 10. 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 1-10 for the contact information. The serial number can be found on a label affixed to the control shelf (shelf 1100).

8. 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 should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

- 
9. Verify that the serial number entered into step 8 was entered correctly using the `rtrv-serial-num` command. This is an example of the possible output.

```
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 steps 8 and 9 and re-enter the correct serial number.

---

10. Lock the serial number in the database by entering the `ent-serial-num` command with the serial number shown in step 7, if the serial number shown in step 7 is correct, or with the serial number shown in step 9, if the serial number was changed in step 6, 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, the following message should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

---

11. Enable the E5-SM4G Throughput Capacity feature with the permanent key by entering the `enable-ctrl-feat` command. For this example, enter this 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 you do not have the feature access key for the E5-SM4G Throughput Capacity feature, contact your Tekelec Sales Representative or Account Representative.

When the `enable-ctrl-feat` command has successfully completed, this message should appear.

```
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 this step and go to step 13.

12. Turn the E5-SM4G Throughput Capacity feature with the `chg-ctrl-feat` command, specifying the E5-SM4G Throughput Capacity feature part number used in step 11 and the `status=on` parameter. For this example, enter this 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 should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
CHG-CTRL-FEAT: MASP B - COMPLTD
```

---

- 13.** Verify the changes by entering the **rtrv-ctrl-feat** command with the E5-SM4G Throughput Capacity feature part number specified in steps 11 or 12. Enter this command.

```
rtrv-ctrl-feat:partnum=893019101
```

The following is an example of the possible output.

```
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     |
|------------------------|-----------|--------|----------|-----------------------|
| MNP Circ Route Prevent | 893007001 | On     | ----     | 20 days 8 hrs 57 mins |

The following features have expired temporary keys:

| Feature Name        | Partnum |
|---------------------|---------|
| Zero entries found. |         |

- 
- 14.** Backup the new changes using the **chg-db:action=backup:dest=fixed** command. 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.
```

---

# Maintenance and Measurements

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## Hardware Requirements

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



**CAUTION:** Having a mix of SCCP and VSCCP card types is not permitted with the A-Port feature enabled, that is, VSCCP cards and SCCP cards cannot coexist in a system operating the A-Port feature.

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

The A-Port feature also requires a T1000 AS based MPS system.

## EPAP Status and Alarms

EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 ISS terminals, so maintenance, measurements, and status information are routed through a DSM. EPAP sends two types of messages to the DSM: EPAP maintenance blocks and DSM status requests. Each is discussed in the following sections.

### EPAP Maintenance Blocks

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

The EPAP sends maintenance blocks that contain (at least) the following information.

- Status of EPAP 'A' - actual states are active, standby, and down (inoperative). Maintenance blocks include a field so this information can be forwarded to the EPAP A Device Control Block (DCB), where it is available for the output of the `rept-stat-mps` command.
- Status of EPAP 'B' - actual states are active, standby, and down (inoperative). Maintenance blocks include a field so this information can be forwarded to the EPAP B DCB, where it is available for the output of the `rept-stat-mps` command.
- Identification of active EPAP - a field to identify the active EPAP.
- Congestion indicator - an indicator showing provisioning link congestion. The link between the EPAPs and the external source of provisioning data can become congested in high provisioning traffic situations. When this occurs and subsequently as the congestion clears, the EPAP sends maintenance blocks to the DSM. The EPAP must ensure that no more than one maintenance block per second is sent to the primary DSM if the only reason is to report a change in congestion status.
- Alarm conditions - an error code field. If the EPAP needs to report an alarm condition, it puts an appropriate UAM identifier in this field.
- Current MPS database size - a field indicating the current RTDB size. The DSM uses this information to calculate the percentage of memory utilized by the RTDB.

### DSM Status Requests

When the EPAP needs to know the status of a DSM, it can send a DSM Status Request to that DSM. Since status messages are sent over UDP, the EPAP broadcasts the DSM Status Request and all DSMs return their status.



## DSM Status Reporting to the EPAP

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

### DSM Status Messages – When Sent

The EPAP needs to know the current status of various aspects of the DSMs. Accordingly, the DSM sends a DSM status message to the EPAP when the following events occur:

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

### DSM Status Message Fields

The DSM status message provides the following information to the EPAP:

- **DSM Memory Size.** When the DSM is initialized, it determines the amount of applique memory present. The EPAP uses this value to determine if the DSM has enough memory to hold the RTDB.  
Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.
- **Load Mode Status.** This is a flag indicating whether or not 80% of the IS-NR LIMs have access to SCCP services.

## A-Port System Status Reports

Status reporting described here includes the following:

- System status
- A-Port status
- DSM memory capacity status
- Loading mode support status

## System Status Reporting

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

The `rept-stat-sccp` command supports the DSM cards running the VSCCP application and reports A-Port statistics.

## A-Port Status Reporting

The `rept-stat-mps` command supports A-Port system reporting. `rept-stat-mps` concentrates on reporting the status of the A-Port provisioning system. See “Maintenance and Measurements User Interface Commands” on page 3-14, for more details. A-Port statistics are placed in the `rept-stat-sccp` command.

## DSM Memory Capacity Status Reporting

As mentioned in the ““DSM Status Reporting to the EPAP” on page 5-3, the DSM sends a message to the EPAP containing the amount of memory on the DSM board. The EPAP determines whether the DSM has enough memory to store the RTDB and sends an ack or nak back to the DSM indicating whether or not the DSM has an adequate amount of memory. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

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

The `rept-stat-mps:loc=xxx` command shows the amount of memory used by the RTDB as a percent of available DSM memory.

## Loading Mode Support Status Reporting

The OAM application determines whether or not the system is in an unstable loading mode since it knows the state of all LIM, SCCP, and DSM cards in the system. When the loading mode is unstable, the `rept-stat-sys` command reports the existence of the unstable loading mode and the specific conditions that caused it. Refer to “Loading Mode Support” on page 5-6, for more details.

## Code and Application Data Loading

In general, administrative updates can occur while a DSM card is loading. The DSM card should also remain in an in-transition state if the STP portion of the database has completed loading and is waiting for the RTDB to download.

## **DSM Code Loading**

The EAGLE 5 ISS OAM performs code loading of the DSM card.

## **EPAP Application Data Loading**

The A-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 STP data loading, the VSCCP GPL verifies its hardware configuration during initialization to determine if it has the capacity to support the RTDB.

The VSCCP GPL application data loader registers all tables for loading, independent of the A-Port feature provisioning and main board / applique hardware configuration. As a result, load requests are always identical. During loading, multiple DSM load requests can then be combined into a single download, reducing the overall download time. The DSM card stores or discards RTDB table data based on whether or not it has RTDB-capable hardware for features like G-Port, G-Flex, Migration, INP, and EIR.

The OAM, on the other hand, downloads or sets memory boundaries for the A-Port options, entity, and service selector tables only if the A-Port feature is provisioned. When the A-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-A-Port Data Initialization**

If the DSM card's hardware configuration cannot support the RTDB, the A-Port tables are marked as absent during Service Management System initialization. Memory is not reserved for the A-Port table data. Additionally, the A-Port tables are registered with the application data loader (ADL) specifying a data discard function. A-Port table data is discarded during loading by the ADL discard function, rather than storing it in memory.

## **A-Port Data Initialization**

If the DSM card detects A-Port-capable hardware, the A-Port tables are registered with ADL specifying a data load function. Any A-Port table data downloaded are stored in memory during loading.

## **EPAP-DSM Loading Interface**

The DSM must convey to the EPAP that it needs to download the RTDB. This is done when the DSM sends a Full Download Request message to the EPAP.

## **Loading Mode Support**

### **80% Threshold of Support**

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

### **VSCCP Capacity**

An insufficient number of VSCCP cards that are is-nr or oos-mt-dsbld relative to 80% of the number of provisioned LIMs is called a “failure to provide adequate SCCP capacity.”

### **Insufficient SCCP Service**

It is also possible for LIMs or VSCCP cards to be inhibited or to have problems that prevent them from operating normally. If enough VSCCP cards are out of service, it may not be possible for the remaining is-nr VSCCP cards to service at least 80% of the number of is-nr LIMs. This is called “insufficient SCCP service.” When this occurs, some of the LIMs are denied SCCP service. It is possible to inhibit LIMs to bring the ratio back to 16:1 (or better).

### **Conditions That Create an Unstable Loading Mode**

Current system implementation interrupts and aborts card loading upon execution of an STP database chg command. Loading mode support denies the execution of STP 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-dsbld.
- The number of is-nr and oos-mt-dsbld sccp cards is insufficient to service at least 80% of all provisioned LIMs.
- Insufficient SCCP service occurs when an insufficient number of is-nr VSCCP cards are available to service at least 80% of the number of is-nr LIMs.
- LIM cards are being denied SCCP service and any VSCCP cards are in an abnormal state (oos-mt, is-anr).

## **Actions Taken When the System is 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 reports the existence of the unstable loading mode and the specific trigger that caused it.

- No STP database updates allowed.

When in an unstable loading mode, the EAGLE 5 ISS does not accept STP database updates. When updates are rejected, the reason is given as: E3112 Cmd Rej: Loading Mode unstable due to SCCP service is deficient.

The `inh-card` and `alw-card` commands can be used to alter SCCP service levels to achieve the 80% threshold. This can be repeated for each card until the system is able to supply SCCP services to at least 80% of the is-nr LIMs. The remaining 20% LIM or supporting VSCCP cards may remain out of service until the stream of STP 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 comes in during STP database loading, the DSM aborts the current loading, issues a class 01D7 obit, and reboots. Figure 5-1 shows an example.

**Figure 5-1. Obit Message for Abort of Card Loading**

```
tekelecstp 97-04-08 12:29:04 EAGLE 36.0.0
-----
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

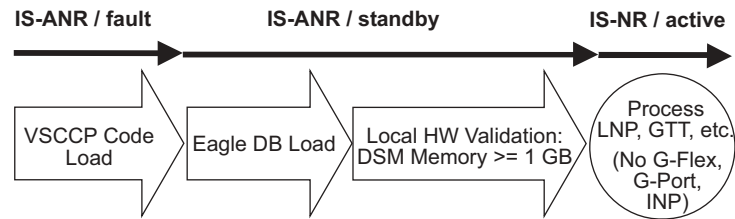
Use the force option to execute commands that would put the system in unstable loading mode. If executing the **ent-card** or **inh-card** commands would cause the system to enter an unstable loading mode, use the force option on the command.

### State Transitions during Start-Up

Figures 5-2 through 5-8 show the transitions that a DSM card goes through as it boots, loads code and data, and runs various VSCCP services. These figures do not illustrate every possible situation, but they do include the most common scenarios involving the A-Port feature.

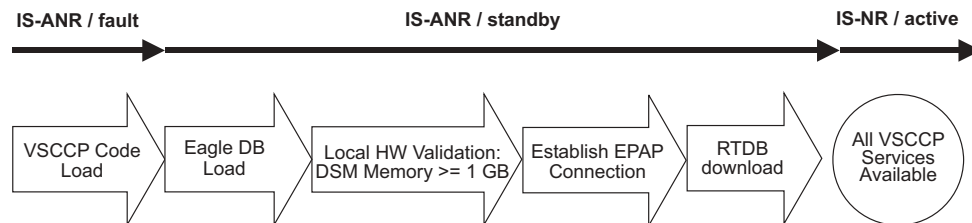
In Figure 5-2, the A-Port feature is not enabled, and the DSM card can operate in TSM emulation mode, although it does not provide A-Port operation.

**Figure 5-2.** A-Port Not Enabled, DSM Running in TSM Emulation



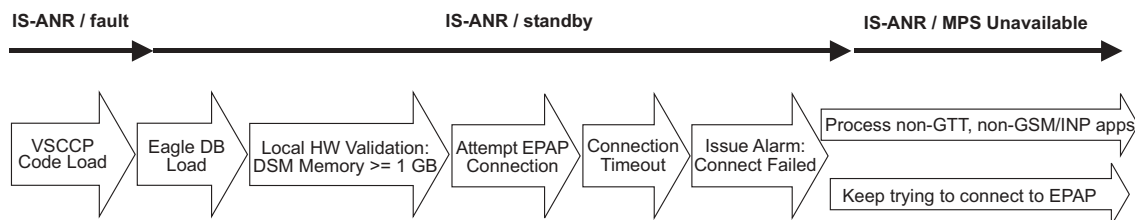
In Figure 5-3, the A-Port feature is enabled, and the DSM card memory is 4 GB and is connected to the EPAP. A normal DSM card operating sequence occurs, providing A-Port service.

**Figure 5-3.** A-Port Enabled, Normal Operating Sequence



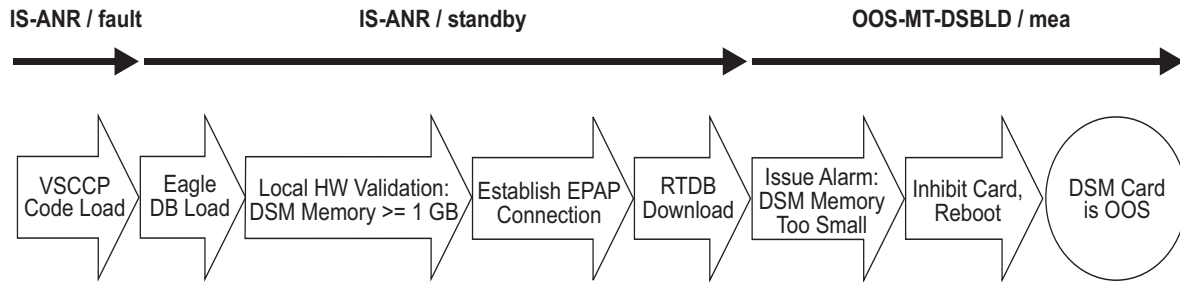
In Figure 5-4, the A-Port feature is enabled, the DSM card memory is 4 GB, but the DSM card is unable to connect EPAP; the A-Port cannot begin operation.

**Figure 5-4.** A-Port Enabled, but DSM Not Connected to EPAP



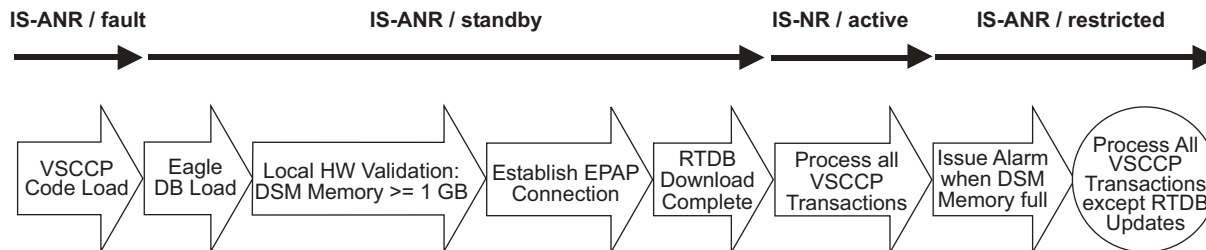
In Figure 5-5, the A-Port feature is enabled, the DSM card has the required 4 GB memory and is connected to the EPAP, but the DSM card is too small for the required database; A-Port cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

**Figure 5-5.** A-Port Enabled, but DSM Memory Insufficient for Database



In Figure 5-6, the A-Port feature is enabled, the DSM card is connected to the EPAP, but the RTDB grows eventually to exceed the capacity of the DSM card memory, despite its memory size of 4 GB (an alarm is issued when the DSM memory becomes full from the RTDB update). The A-Port cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

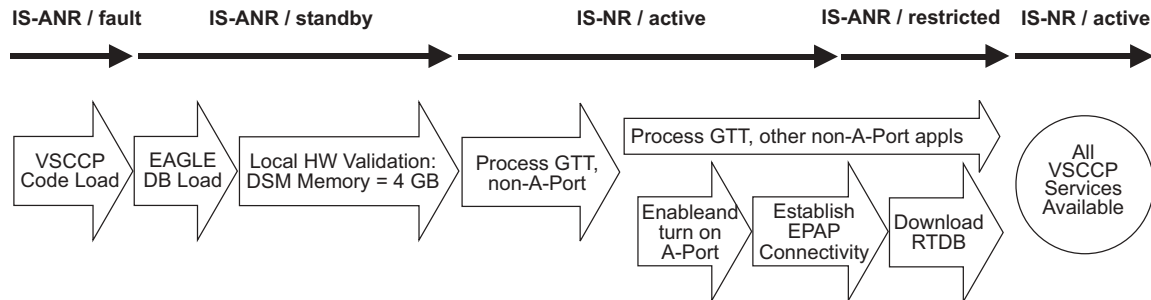
**Figure 5-6.** A-Port Enabled, but Database Exceeds DSM Memory



In Figure 5-7, the A-Port feature is not initially enabled; the DSM card memory is 4 GB but no EPAP connection; the DSM card is running other applications when the A-Port feature is enabled and turned on; the DSM has sufficient memory to provide A-Port service.

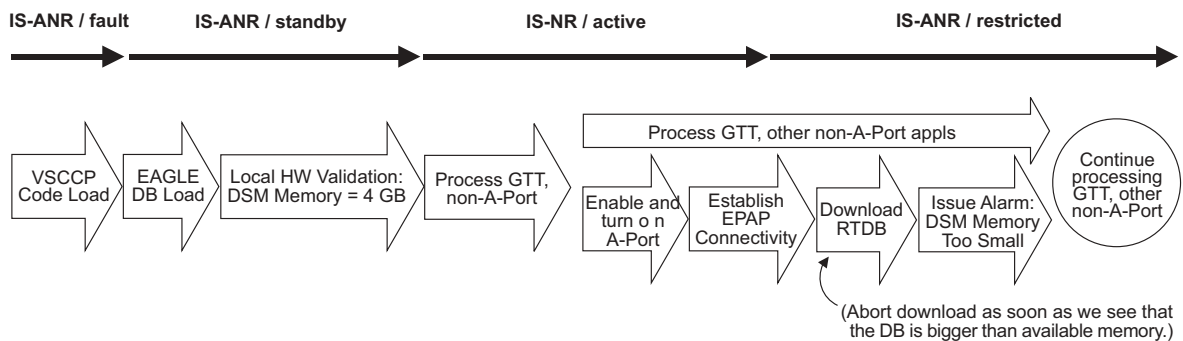


**Figure 5-7.** A-Port Not Enabled at First, but then Activated on DSM



In Figure 5-8, the A-Port feature is not initially enabled; the DSM card memory is 4 GB but no EPAP connection, and is running other applications when the A-Port feature is turned on. However, the DSM card memory is insufficient for the needed database, and the cannot provide A-Port operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

**Figure 5-8.** A-Port Activation Unsuccessful due to Insufficient Database



## A-Port Alarms

All A-Port related UAMs are output to the Maintenance Output Group. The *Maintenance Manual* contains a complete description of all UAMs. Table 5-1 contains a listing of UAMs used to support the A-Port feature.

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

**Table 5-1. A-Port Related UAMs**

| <b>UAM</b> | <b>Severity</b> | <b>Message Text</b>                    | <b>MPS or EAGLE 5 ISS</b> |
|------------|-----------------|--|---------------------------|
| 0013       | Major           | Card is isolated from system           | EAGLE 5 ISS               |
| 0084       | Major           | IP Connection Unavailable              | EAGLE 5 ISS               |
| 0085       | None            | IP Connection Available                | EAGLE 5 ISS               |
| 0099       | Major           | Incompatible HW for provisioned slot   | EAGLE 5 ISS               |
| 0250       | None            | MPS available                          | MPS                       |
| 0261       | Critical        | MPS unavailable                        | MPS                       |
| 0328       | None            | SCCP is available                      | EAGLE 5 ISS               |
| 0329       | None            | SCCP capacity normal, card(s) abnormal | EAGLE 5 ISS               |
| 0330       | Major           | SCCP TPS Threshold exceeded            | EAGLE 5 ISS               |
| 0331       | Critical        | SCCP is not available                  | EAGLE 5 ISS               |
| 0335       | None            | SCCP is removed                        | EAGLE 5 ISS               |
| 0336       | Major           | LIM(s) have been denied SCCP service   | EAGLE 5 ISS               |
| 0370       | Critical        | Critical Platform Failure(s)           | MPS                       |
| 0371       | Critical        | Critical Application Failure(s)        | MPS                       |
| 0372       | Major           | Major Platform Failure(s)              | MPS                       |
| 0373       | Major           | Major Application Failure(s)           | MPS                       |
| 0374       | Minor           | Minor Platform Failure(s)              | MPS                       |
| 0375       | Minor           | Minor Application Failure(s)           | MPS                       |
| 0422       | Major           | Insufficient extended memory           | EAGLE 5 ISS               |
| 0423       | None            | Card reload attempted                  | EAGLE 5 ISS               |
| 0441       | Major           | Incorrect MBD - CPU                    | EAGLE 5 ISS               |
| 0442       | Critical        | RTDB database capacity is 95% full     | EAGLE 5 ISS               |
| 0443       | Major           | RTDB database is corrupted             | EAGLE 5 ISS               |
| 0444       | Minor           | RTDB database is inconsistent          | EAGLE 5 ISS               |
| 0445       | None            | RTDB database has been corrected       | EAGLE 5 ISS               |
| 0446       | Major           | RTDB Database capacity is 80% full     | EAGLE 5 ISS               |
| 0447       | None            | RTDB database capacity alarm cleared   | EAGLE 5 ISS               |
| 0448       | Minor           | RTDB database is incoherent            | EAGLE 5 ISS               |
| 0449       | Major           | RTDB resynchronization in progress     | EAGLE 5 ISS               |
| 0451       | Major           | RTDB reload is required                | EAGLE 5 ISS               |
| 0526       | None            | Service is available                   | EAGLE 5 ISS               |

**Table 5-1.** A-Port Related UAMs (Continued)

| UAM  | Severity | Message Text             | MPS or EAGLE 5 ISS |
|------|----------|--------------------------|--------------------|
| 0527 | Minor    | Service abnormal         | EAGLE 5 ISS        |
| 0528 | Critical | Service is not available | EAGLE 5 ISS        |
| 0529 | Critical | Service is disabled      | EAGLE 5 ISS        |
| 0530 | None     | Service is removed       | EAGLE 5 ISS        |

### DSM-EPAP Link

Two alarms are used to indicate the DSM-to-EPAP link status. Refer to the *Signaling Products Maintenance Manual* for more information and corrective procedures for the following alarms.

- **UAM 0084** - IP Connection Unavailable

This message indicates that an IP application socket is out of service due to a IP link down (Ethernet problem) or due to the DSM card.

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
** 5676.0084 ** DSM B 1101      IP Connection Unavailable
```

- **UAM 0085** - IP Connection Available

This message indicates that a previously broken link between the EPAP and DSM card is now functioning properly.

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
5676.0085 DSM B 1101      IP Connection Available
```

### MPS (EPAP) Alarms

The following alarms are output on the EAGLE 5 ISS and include an alarm data string in the output. Refer to the *MPS Platform Software and Maintenance Manual* (except where noted) for more information and corrective procedures for the following MPS related alarms.

- **UAM 0261** - MPS unavailable

This message indicates that the EAGLE 5 ISS is unable to communicate with the MPS or the MPS has an internal failure. Refer to the *Maintenance Manual* for the corrective action procedure.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
*C 0259.0261 *C MPS B      MPS unavailable
```

- **UAM 0370** - Critical Platform Failure (s)

This message indicates the application running in the MPS server has detected a critical platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'1xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
*C 0259.0370 *C MPS B Critical Platform Failure(s)
ALARM DATA = h'1000000000000008'
```

- **UAM 0371 - Critical Application Failure (s)**

This message indicates the application running in the MPS server has detected a critical application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'2xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
*C 0259.0371 *C MPS B Critical Application Failure(s)
ALARM DATA = h'2000000000000001'
```

- **UAM 0372 - Major Platform Failure (s)**

This message indicates the application running in the MPS server has detected a major platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'3xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
** 0259.0372 ** MPS B Major Platform Failure(s)
ALARM DATA = h'3000000000000002'
```

- **UAM 0373 - Major Application Failure (s)**

This message indicates the application running in the MPS server has detected a major application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'4xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
** 0259.0373 ** MPS B Major Application Failure(s)
ALARM DATA = h'4000000000000008'
```

- **UAM 0374 - Minor Platform Failure (s)**

This message indicates the application running in the MPS server has detected a minor platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'5xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
* 0259.0374 * MPS B Minor Platform Failure(s)
ALARM DATA = h'5000000000000004'
```

- **UAM 0375 - Minor Application Failure (s)**

This message indicates the application running in the MPS server has detected a minor application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'6xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 36.0.0
* 0259.0375 * MPS B Minor Application Failure(s)
ALARM DATA = h'6000000000000001'
```

## Card Related MPS Alarms

The following alarms are output on the EAGLE 5 ISS. Refer to the *Signaling Products Maintenance Manual* for more information and corrective procedures for the following card related MPS alarms.

- **UAM 0013** - Card is isolated from system

This indicates a card has become isolated and is unable to communicate to other cards in the system. This could be caused by a defective card, a power failure occurred on the card, or the system software has ordered a reset.

This also appears when the card has been manually reset by a command.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
** 0012.0013 ** CARD 1101 SCCP Card is isolated from the system
ASSY SN: 102199815a1234
```

- **UAM 0099** - Incompatible HW for provisioned slot

This indicates a DCM or DSM card does not have an extended memory. This card is automatically inhibited.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
** 0012.0099 ** CARD 1101 VSCCP Incompatible hardware for provisioned slot
ASSY SN: 102199815a1234
```

- **UAM 0422** - Insufficient extended memory

At least one SCCP card does not have enough memory for the A-Port application. Loading of the SCCP card is automatically inhibited.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
** 0012.0422 ** CARD 1108 SCCP Insufficient extended memory
```

- **UAM 0423** - Card reload attempted

Card loading is no longer inhibited. The once inhibited card is now attempting to load.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
0012.0423 CARD 1108 SCCP Card reload attempted
```

- **UAM 0441** - Incorrect main board - CPU

A DSM card does not have the required hardware configuration for the A-Port application.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
** 0012.0441 ** CARD 1108 VSCCP    Incorrect MBD - CPU
```

- **UAM 0442** - Insufficient RTDB database capacity

At least one DSM card does not have at least 4Gb of memory or does not have enough capacity for the RTDB. Loading of the DSM card is automatically inhibited.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
*C 0012.0442 *C CARD 1108 VSCCP    RTDB database capacity is 95% full
```

- **UAM 0443** - RTDB database is corrupted

A RTDB database is corrupt. The calculated checksum did not match the checksum value stored for one or more records.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
** 0012.0443 ** CARD 1108 VSCCP    RTDB database is corrupted
```

- **UAM 0444** - RTDB database is inconsistent

One or more DSM card's real time database is not identical to the current real time database on the active EPAP fixed disks.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
* 0012.0444 * CARD 1108 VSCCP    RTDB database is inconsistent
```

- **UAM 0445** - RTDB database has been corrected

This message indicates that a problem with the RTDB has been corrected.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
0012.0445 CARD 1108 VSCCP    RTDB database has been corrected
```

- **UAM 0446** - RTDB Database capacity is 80% full

This message is displayed when a DSM card detects that its daughterboard memory is at least 80% full.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
** 0012.0446 ** CARD 1108 VSCCP    RTDB Database capacity is 80% full
```

- **UAM 0447** - RTDB database capacity alarm cleared

This message indicates that a problem with the RTDB memory has been corrected.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
0012.0447 CARD 1108 VSCCP RTDB database capacity alarm cleared
```

- **UAM 0448** - RTDB database is incoherent

This message indicates that the RTDB database download is in-process.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
* 0012.0448 * CARD 1108 VSCCP RTDB database is incoherent
```

- **UAM 0449** - RTDB resynchronization in progress

This message indicates that the MPS database resynchronization is in-process.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
** 0012.0449 ** CARD 1108 VSCCP RTDB resynchronization in progress
```

- **UAM 0451** - RTDB reload is required

The RTDB database on the DSM card needs to be reloaded because the resynch log does not contain all of the required updates.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
** 0012.0451 ** CARD 1108 VSCCP RTDB reload is required
```

## A-Port Subsystem Alarms

The following alarms are output on the EAGLE 5 ISS for the A-Port subsystem.

- **UAM 0526** - Service is available

A problem with the specified SCCP service has been corrected. All SCCP cards are IS-NR and have a service status of Active.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
0056.0526 MNP SERVICE Service is available
```

- **UAM 0527** - Service abnormal

One or more of the cards providing the specified SCCP service do not have a service status of Active.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
* 0056.0527 * MNP SERVICE Service abnormal
```

- **UAM 0528** - Service is not available

The A-Port service is not available. No IS-NR SCCP cards are associated the A-Port service. No SCCP cards providing the A-Port service have a service status of Active.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
*C 0056.0528 *C MNP SERVICE      Service is not available
```

- **UAM 0529** - Service is disabled

The A-Port service has been manually disabled with the chg-sccp-serv command. All IS-NR cards providing the A-Port have service status of Offline.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
*C 0056.0529 *C MNP SERVICE      Service is disabled
```

- **UAM 0530** - Service is removed

The A-Port SCCP service is not equipped. No SCCP cards are configured with the A-Port service.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 36.0.0
0056.0530  MNP SERVICE      Service is removed
```

## A-Port UIMs

The EAGLE 5 ISS Maintenance Manual contains a complete description of all UIM text and formats. If A-Port is provisioned, then the following UIMs (Tables 5-2) are used.

**Table 5-2.** A-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                                |



**Table 5-2. A-Port UIMs (Continued)**

| <b>UIM</b> | <b>Text</b>  | <b>Description</b>   | <b>Action</b>  | <b>Output Group<br/>(UI Output<br/>Direction)</b> |
|------------|--|--|--|---|
| 1039       | SCCP rsp<br>did not<br>route - bad<br>Selectors    | The SCCP response did not route due to invalid selectors   | Provision the CGPA GTI, TT, NP, and NAI in the EGTT selector table                           | gtt   |
| 1130       | LOCREQ<br>rcvd -<br>IS412GSM<br>not<br>provisioned | The IS-41 to GSM Migration prefix (specified by the IS412GSM parameter) is not provisioned on this system.   | The IS412GSM prefix must be specified in the GSMOPTS table.                                  | gtt   |
| 1131       | Invalid<br>digits in IS41<br>MAP Digits<br>parms   | The EAGLE 5 ISS encountered an error in decoding the digits parameter in the LocationRequest message.  | Correct the digits parameter   | gtt   |
| 1169       | SCCP rcvd<br>inv TCAP<br>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<br>subsystem                          |
| 1227       | SCCP did<br>not route -<br>DPC not in<br>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<br>not route -<br>SS not in<br>MAP tbl    | This message indicates that SCCP did not route a message because the destination subsystem was not in the Mated Application (MAP) table. The message was discarded.  | No action is necessary.  | gtt   |
| 1242       | Conv to intl<br>num<br>- Dflt CC not<br>found      | Conversion to international number failed because default CC was not found   | Define the default CC with<br><code>chg-stpopts</code><br><code>:defcc=xxx</code>            | application<br>subsystem                          |
| 1243       | Conv to intl<br>num<br>- Dflt NC not<br>found      | Conversion to international number failed because default NC was not found   | Define the default NDC with<br><code>chg-stpopts</code><br><code>:defndc=xxxxxx</code>       | application<br>subsystem                          |

**Table 5-2. A-Port UIMs (Continued)**

| <b>UIM</b> | <b>Text</b>                            | <b>Description</b>   | <b>Action</b>  | <b>Output Group (UI Output Direction)</b> |
|------------|--|--|--|---|
| 1246       | Invalid length of conditioned digits   | Invalid length of conditioned digits (length of conditioned international number is less than 5 or greater than 15)                    | Use an international number with length in the acceptable range                            | application subsystem                     |
| 1256       | MNP Circular Route Detected            | This message indicates the network has incorrect number portability data for a subscriber.   | Verify and update number portability data.   | application subsystem                     |
| 1294       | Invalid digits in MAP MSISDN parameter | No digits found in MAP MSISDN parameter  | Specify valid digits in the MSISDN   | application subsystem                     |
| 1295       | Translation PC is EAGLE's              | PC translation is invalid because it is one of EAGLE 5 ISS's PCs   | Change the point code  | application subsystem                     |
| 1296       | Translation PC type is ANSI            | PC translation is invalid because it is an ANSI point code   | Change the point code  | application subsystem                     |
| 1297       | Invalid length of prefix/suffix digits | Attempted digit action of prefixing entity ID is invalid because combined length of entity ID and GT digits was greater than 21 digits | Change the attempted digit action or decrease the length of the entity ID and/or GT digits | application subsystem                     |
| 1341       | SRI rcvd - GSM2IS41 not provisioned    | MIGRPFX=SINGLE and GSM2IS41 prefix is NONE. The GSM to IS-41 Migration prefix is not provisioned on this system.                       | The GSM2IS41 prefix must be specified in the GSMOPTS table.                                | gtt                                       |

## A-Port Related Measurements

Refer to the *Maintenance Manual* for detailed measurement usage information.

### OAM Based Measurements

A-Port measurements are available via the FTA (File Transfer Area) 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 EAGLE 5 ISS's RS-232 I/O ports. The link is illustrated in Figure 2-7 “Dial-Up PPP Network” on page 2-18”.

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

- Activate File Transfer: `act-file-trns`
- Copy to or from Transfer Area: `copy-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, Migration, A-Port, and G-PORT measurements data. The interface to the customer's 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 MSUs (Message Signaling Units) are supported for the A-Port feature (Table 5-3).

**Table 5-3. Pegs for Per System A-Port Measurements**

| Event Name | Description                                  | Type   | Unit      |
|------------|--|--------|-----------|
| APSMSRCV   | Number of SMS Request messages received      | System | Peg count |
| APSMSREL   | Number of SMS Request messages relayed       | System | Peg count |
| GPSRRCV    | Number of call-related SRI messages received | System | Peg count |

**Table 5-3. Pegs for Per System A-Port Measurements (Continued)**

| <b>Event Name</b> | <b>Description</b>   | <b>Type</b> | <b>Unit</b> |
|-------------------|--|-------------|-------------|
| GPSRGTT           | Number of call-related SRI messages that fell through to GTT           | System      | Peg count   |
| GPSRREP           | Number of call-related SRI messages that received A-Port service       | System      | Peg count   |
| GPSRERR           | Number of call-related messages that cause errors and SRI Negative ACK | System      | Peg count   |
| IS41LRERR         | Number of IS-41 Location Request - Error response messages sent.       | System      | Peg count   |
| IS41LRMRCV        | Number of IS-41 Location Request messages received.                    | System      | Peg count   |
| IS41LRRTRN        | Number of IS-41 Location Request - Return Result messages sent         | System      | Peg count   |

The following Pegs per SSP measurement peg counts of MSUs are supported for the A-Port feature (Table 5-4).

**Table 5-4. Pegs for Per SSP A-Port Measurements**

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

The following Pegs for both Per System and Per SSP measurement peg counts of MSUs are supported for the A-Port feature (Table 5-5).

**Table 5-5.** Pegs for Per System and Per SSP A-Ports Measurements

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

### Measurement Reports

Measurements are available with these report commands. Refer to the *Commands Manual* for detailed usage information.

The commands are specified as follows, where **xxx** is a three-letter abbreviation for a day of the week (MON, TUE, WED, THU, FRI, SAT, or SUN) and **yy** is an hour of the day:

- 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`



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