Tekelec EAGLE® 5 Integrated Signaling System

Release 41.0

Feature Manual - ATINP

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Patents

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

Your Tekelec Sales Representative can provide you with information about how to order additional discs.

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Chapter 1

Introduction

Topics:

This chapter contains a brief description of the ATINP feature. The contents include sections about the manual scope, audience, and organization; how to find related publications; and how to contact Tekelec for assistance.

Introduction

Before number portability, SCPs and other querying nodes could easily determine which network the subscriber belonged to based on the digits dialed by the caller. With number portability, subscriber digits cannot be relied upon to determine the subscriber's network.

Anytime Interrogation Number Portability Query (ATINP) is an EAGLE 5 ISS feature that provides a method for querying entities to obtain number portability and routing information for subscribers directly from an EAGLE 5 ISS.

ATINP provides number portability functions for decoding the information in the incoming ATI query message, number conditioning before the RTDB lookup, determining the success or failure of the RTDB lookup, and formatting the Return Result or Error Response based on the result of the lookup. ATINP is fully compliant with the ATI standards for Global Number Portability in 3GPP TS 23.066 V7.0.0 (2007-06), *Support of Mobile Number Portability*.

The ATINPQ local subsystem in the EAGLE 5 ISS processes ITU-TCAP ATI messages with the requested information parameter "MNP Requested Info". The EAGLE 5 ISS responds with an ATI ACK message that contains number portability and routing information, or with an ATI NACK message if the requested information cannot be provided. The original ATI query is discarded.

ATINP is an EPAP-based feature that requires EPAP provisioning data from the Realtime Database (RTDB). Subscriber data is transferred from customer databases to the EPAP. The EPAP formats the RTDB and loads it to each Service Module card on the EAGLE 5 ISS. The RTDB data is used in obtaining number portability information and in determining how to correctly format the ATI ACK response message. See *MPS/EPAP Platform* on page 16 in this manual for more information about EPAP.

Scope and Audience

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

Manual Organization

This document is organized into the following chapters:

- *Introduction* on page 1, contains general information about the ATINP documentation, the organization of this manual, and how to get technical assistance.
- *Feature Description* on page 9, provides a functional description of the ATINP feature, including network perspectives, assumptions and limitations, a database overview, Service Module provisioning and reloading, ATINP user interface, and an audit overview.
- *EAGLE 5 ISS ATINP Commands* on page 21, describes the commands that support the ATINP feature.

- *ATINP Configuration* on page 43, describes EAGLE 5 ISS provisioning for the ATINP feature.
- *Maintenance and Measurements* on page 73, describes maintenance and measurements, including EPAP status and alarms, hardware verification messages, system status reports and commands, code and application data loading, and alarms.

Related Publications

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

Documentation Availability, Packaging, and Updates

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

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

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

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

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

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

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

Documentation Admonishments

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

Table 1: Admonishments

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

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The Tekelec Customer Care Center is your initial point of contact for all product support needs. A representative takes your call or email, creates a Customer Service Request (CSR) and directs your requests to the Tekelec Technical Assistance Center (TAC). Each CSR includes an individual tracking number. Together with TAC Engineers, the representative will help you resolve your request.

The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

Tekelec TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

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

Tekelec - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

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1-919-460-2150 (outside continental USA and Canada)

TAC Regional Support Office Hours:

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

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

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

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

Locate Product Documentation on the Customer Support Site

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

1. Log into the Tekelec **new** Customer Support site at *support.tekelec.com*.

   Note: If you have not registered for this new site, click the **Register Here** link. Have your customer number available. The response time for registration requests is 24 to 48 hours.

2. Click the **Product Support** tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.

Chapter 2

Feature Description

Topics:

This chapter describes the functions provided by the ATINP feature, including MSU protocol handling, ATI message decoding, and response message formatting.

The chapter includes an overview of the EAGLE Provisioning Application Processor (EPAP). EPAP provides the Realtime Database (RTDB) that is used in the database lookup functions.

ATINP Feature Overview

ATINP Functions

The ATINP feature provides number portability functions for decoding the incoming ATI message, conditioning the MSISDN to International format if needed, performing the RTDB lookup, and determining the result of the lookup.

ATINP configuration options affect the following functions and values:

- Number conditioning of the incoming MSISDN digits before RTDB lookup is performed
- Determination of a successful RTDB lookup
- Controlling whether the IMSI, MSISDN, and Routing Number parameters will be included or not included in the ATI ACK response message.
- Formatting of the IMSI, MSISDN, and Routing Number parameters in the ATI ACK response message, and the maximum number of digits to be used from the SRFISMSI or entity ID in the encoding format.
- Default routing number and outbound message digits delimiter to be used in outbound message formats

Response message handling functions determine whether a success or failure response is needed (or no response), format the information in the response message, send the response, and issue any required UIMs and network management messages.

ATINP Considerations

The GTT feature must be on before the ATINP feature can be enabled.

The ATINPQ Local Subsystem

Local subsystems in the EAGLE 5 ISS are maintainable entities for query and response that are used when the STP acts as an SCP. Specific point codes can be defined for routing to local subsystems independently of the STP in the network. A local subsystem can be taken online and offline as needed in the system.

The ATINPQ local subsystem in the EAGLE 5 ISS processes ITU-TCAP ATI messages with the requested information parameter "MNP Requested Info". The EAGLE 5 ISS responds with an ATI ACK message that contains number portability and routing information, or with an ATI NACK message if the requested information cannot be provided. The original ATI query is discarded.

ATINP supports ANSI MTP/SCCP and ITU-TCAP ATI query or ITU MTP/SCCP and ITU-TCAP ATI query.

For ATINP, EAGLE 5 ISS supports ANSI, ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare capability point code types. ITU-N24 point codes are not supported. Capability point codes for the ATINPQ local subsystem can be configured only after the ATINP feature is enabled.

The ATINPQ local subsystem can have a mate subsystem and a concerned point code group assigned to it. The ATINPQ local subsystem cannot be set to Load Shared mode (as end nodes do

not perform load sharing), but can be set only to Dominant or Solitary mode. The ATINPQ local subsystem can be entered in MAP table if the ATINP feature is enabled.

The ATINPQ local subsystem can be taken online and offline using the procedures in *Changing the State of a Subsystem Application* on page 65.

Messages for the ATINPQ Local Subsystem

Messages for the ATINPQ local subsystem can arrive Rt-on-SSN or Rt-on-GT. All MSUs must contain either the EAGLE 5 ISS true or secondary point code (TSPC), or the ATINPQ capability point code (CPC) in the DPC field of the message. Traditionally, messages for local subsystems were allowed to have the DPC as the EAGLE 5 ISS STP CPC. However, it is strongly recommended to use the ATINPQ CPC for ATI queries, and not the CPC of the STP for network management issues that can arise.

Rt-on-SSN Handling

If the message arrives Rt-on-SSN, it must contain the EAGLE 5 ISS ATINPQ subsystem number in the Called Party Subsystem field of the message.

If the ATINPQ local subsystem is online, the DPC field can contain either the EAGLE 5 ISS true or secondary point code or the ATINPQ capability point code. Any response message will use the true or secondary point code assigned to the EAGLE 5 ISS as the OPC. Because the EAGLE 5 ISS cannot generate an SSP when a message arrives Rt-on-SSN for the EAGLE 5 ISS CPC, nodes sending Rt-on-SSN traffic should use the true or secondary point code.

If the ATINPQ local subsystem is offline and the mated subsystem is available, the EAGLE 5 ISS will generate a network management message to force the network to transition traffic to the mate.

Rt-on-GT Handling

Rt-on-GT MSUs can arrive either with SCCP CdPA information that matches an EAGLE 5 ISS service selector, or with a GTA address that has been provisioned to translate to the ATINPQ local subsystem.

If the ATINPQ subsystem is online, the DPC field can contain either the EAGLE 5 ISS true or secondary point code or the ATINPQ capability point code. The query is directed to the local subsystem and processed. Any response message will use the true or secondary point code assigned to the EAGLE 5 ISS as the OPC.

If the ATINPQ local subsystem is offline and the mated subsystem is available, the EAGLE 5 ISS will act as both STP and SCP, and reroute the message to the mated subsystem. If a Rt-on-GT message arrives for the EAGLE 5 ISS true or secondary point code, the EAGLE 5 ISS cannot generate a TFP. The EAGLE 5 ISS handles and reroutes these messages, instead of forcing the adjacent node to route to the mate. Therefore, nodes that send Rt-on-GT traffic to an EAGLE 5 ISS should use anf ATINPQ CPC, not the EAGLE 5 ISS TSPC.

Network Management Responses

The EAGLE 5 ISS must reply to network management queries about the current state of the local subsystem. When the local subsystem changes state, network management messages are sent to the CSPC group.

Multiple Local Subsystems

The EAGLE 5 ISS supports more than one local subsystem, allowing local subsystems for two or more EPAP-based features to operate at the same time in the system. For example, local subsystems for the ATINP feature and the EIR feature can coexist in the system.

ATINP Protocol Handling of MSUs

ATINP supports SCCP UDT and non-segmented XUDT Class 0 and Class 1 messages.

The high-level ATINP message processing flow, after the MSU reaches the active local subsystem is:

1. Decode and verify the incoming ATI message.

   The requestedInfo parameter must be MNPRequestedInfo

   The incoming MSISDN must have at least one digit.

   The information in each MSU is decoded and verified on the LIM card. SCCP messages to the EAGLE 5 ISS (Service Indicator = 3) are forwarded to Service Module cards for processing.

   Response messages and UIMs (see *ATINPQ Subsystem UIMs* on page 80) can be generated for various common decode errors and for some ATINP-specific decode errors. Some malformed messages do not generate any response.

2. Condition the incoming MSISDN to international format if it is not considered to be international already.

   An MSISDN of 15 digits or less and a numbering plan of ISDN/Telephony (0x1) will be conditioned to International format if needed.

   The MSISDN is considered to be in International format if either of the following conditions is true:

   - The ATINP option SNAI=INTL is provisioned (see *EAGLE 5 ISS ATINP Options Commands* on page 25).
   - The ATINP option SNAI=NAI is provisioned and the Nature of Address field in the MSISDN is INTL (0x1) or Network Specific Number (0x3).

     An MSISDN of more tan 15 digits is not conditioned for lookup. If the provisioned value of the ATINPTYPE option is ALWAYS, a response is sent for "MSISDN NOT Found in NPDB".

     A trailing Stop Digit (0xF) in the MSISDN is treated as filler and will not be considered as part of the MSISDN during lookup.

3. Search the RTDB to locate the conditioned MSISDN.

   If the conditioned MSISDN is not found in the individual entries, the range entries are searched (odd/even number lookups are supported).

4. Determine whether the lookup is considered successful, based on provisioned ATINP options.

   The provisioned ATINPTYPE option value determines whether the lookup is considered to be successful. See *Table 2: RTDB Lookup Success Determination* on page 13.

5. If the lookup is successful, use the lookup information and ATINP options to encode the ATI ACK response message, and route the response to the originator of the ATI query. See *EAGLE 5 ISS ATINP Options Commands* on page 25

   Note: In a successful DN lookup, if ASD is part of one of the entities, Additional Subscriber Data will be considered in formatting of the outgoing response message.

6. If the lookup is not successful, send an ATI NACK response message with the appropriate error code.
7. Discard the original ATI message.

See *EAGLE 5 ISS ATINP Options Commands* on page 25 for option descriptions and response formats.

Table 2: RTDB Lookup Success Determination

ATINPTYPE Option	DN found in RTDB	Entity Found	Entity Type	Portability Type	Lookup Success
ALWAYS	N/A	N/A	N/A	N/A	Success
ANY	No	N/A	N/A	N/A	Failure
	Yes	No	N/A	N/A	Success
		Yes	SP	N/A	Success
			RN	N/A	Success
			GRN	0xFF	Success
			VMS	0xFF	Success
			All other cases are considered lookup failure.		

ATINP Return Result Message

A Return Result message ("ATI ACK" message) is used to return the result of the ATI NP Query when the RTDB lookup is considered to be successful.

The Return Result message can include Routing Number digits, MSISDN digits, IMSI digits, and Number Portability Status, depending on RTDB lookup results and ATINP configuration option values. *EAGLE 5 ISS ATINP Options Commands* on page 25 describes the options and the encoding results for each option value.

Routing Number

If the ATIACKRN option value is not **none**, routing number information is included in the response message.

A default routing number can be provisioned using the ATIDFLTRN option, to be used in the outgoing message formats when an RN is not returned from the RTDB lookup. Additional Subscriber Data is included in some of the formats of the return result information if it is available in the found Entity.

An outbound message digits delimiter and a maximum number of digits to be used from Entity data can be provisioned for use in the encoding formats.

A maximum of 40 digits will be encoded in the routeingNumber field. Though the specified length of routeingNumber is 1-5 bytes, ATINP allows encoding of up to 40 digits, based on the ATIACKRN ATINP option value. if the format results in more than 40 digits, the digits will be truncated to satisfy the 40-digit limit. If truncation of digits occurs, UIM 1403 “LSS: Dgts truncated in encd parms” will be generated.

If an odd number of digits is encoded, a filler of 0xF is used as the last digit.

IMSI Digits

If the ATIACKIMSI option value is not **none**, IMSI digits are included in the response, as indicated by the following ATIACKIMSI values:

- SRFIMSI - If an Entity was found during lookup and SRFIMSI was provisioned in the Entity, then the IMSI digits are encoded as the SRFIMSI value.
- ASD - If an Entity was found during RTDB lookup and ASD (Additional Subscriber Data) was provisioned in the EPAP Entity, then IMSI digits are encoded as the ASD. If ASD is not available, the IMSI parameter will not be encoded in the response message.

If an odd number of digits is encoded, a filler of 0xF is used as the last digit.

MSISDN

If the ATIACKMSISDN option value is not **none**, MSISDN digits are included in the response. The digits can be either the MSISDN from the incoming message, Additional Subscriber Data found in the EPAP Entity, or a combination of MSISDN, ASD, and digits delimiter.

A maximum of 40 digits will be encoded in the MSISDN digits field. Though the specified length of MSISDN is 1-9 bytes – 1 byte for nature of address/numbering plan, eight bytes for digits, ATINP will allow encoding of up to 40 digits for this field, based on the ATIACKMSISDN ATINP option value. If the format results in more than 40 digits, the digits will be truncated to satisfy the 40 digit limit. UIM 1403: “LSS: Dgts truncated in encd parms” will be generated.

If an odd number of digits was encoded, a filler of 0xF is used as the last digit. The Nature of Address field will be copied from the incoming MSISDN.

Number Portability Status

The portability type of the MSISDN can represent the following types of numbers:

- An own number ported out
- An own number not ported out
- A foreign number ported in
- A foreign number ported to foreign network
- Foreign number not known to be ported

Because the existing EPAP portability does not support options for “Own number not ported out” and “Foreign number ported in”, this feature cannot distinguish between these two types of numbers that belong to own network. Using configured data, a best fit match will be made for returning number portability status (encoded value is in parentheses), as follows:

Table 3: Encoded Number Portability Status value

Encoded Number Portability Status value	Criterion
Not Known To Be Ported (0)	• MSISDN not found in the NPDB • MSISDN found with no entity and EPAP portability type (PT) provisioned as one of the following values: • MSISDN and Entity found in NPDB with Entity type = RN, PT = 0, and IGM feature is OFF. • MSISDN and Entity found in NPDB with Entity type = RN, and PT=0xFF (none - NO STATUS). **Note:** This says that if a routing number was not found in NPDB (no Entity) then the MNP SRF cannot provide any useful information to the querying node about the network that owns this MSISDN. The querying node uses its available digits to route the call. PT=5 implies migrated customer (own network) and PT=3, 4, and 6-35 are prepaid servers that are also own subscribers.
Own Number Ported Out (1)	MSISDN and Entity found in NPDB with Entity type=RN and PT=1 (OWN NUMBER PORTED OUT)
Foreign Number Ported To Foreign Network (2)	MSISDN and Entity found in NPDB with Entity type=RN and PT=2 (FOREIGN NUMBER PORTED TO FOREIGN NETWORK)
Own Number Not Ported Out (4)	• MSISDN and Entity found in NPDB with Entity type other than RN. (Non-RN Entity type in general implies own subscriber). **Note:** The combinations of 1 RN and 1 VMS ID, and 1 RN and 1 GRN, are valid combinations for network entities. In this case, the Entity type is considered to be RN (presumably, our own network is providing voice mail support for a foreign number). • MSISDN found in NPDB with no Entity and PT=Migrated (5) • MSISDN found in NPDB with no Entity but PT=Prepaid (3, 4, 6-35). • MSISDN and Entity found in NPDB with Entity type=RN, PT=0, and IGM feature is turned ON (migrated subscriber is considered own subscriber).

Encoded Number Portability Status value	Criterion
	• MSISDN and Entity found in NPDB with Entity type=RN, and PT=5 (migrated) or PT=Prepaid (3,4,6-35).
Foreign Number Ported In (5)	Not Supported. (Imported) Numbers that meet criteria for "Own Number Not Ported Out" have portability status value of 4.

ATINP Error Response MSU Encoding

The EAGLE 5 ISS can return any of the following error messages after processing an ATI message:

- Return Error

  A response message with a Return Error component is referred to as an ATI NACK message or Return Error message. A Return Error component is used for the receipt of an ATI message when the ATINP feature is turned off (ATINP must be enabled – if ATINP is disabled, the message will not reach the subsystem), for ATI lookup problems, and for some decoding issues.

  Refer to 3GPP TS 29.002 version 6.15.0, ETSI TS 129 002 V6.15.0 (2005-12), *Digital Cellular Telecommunications System (Phase2+); Mobile Application Part (MAP) Specification* .

- Reject

  Reject messages are used for decoding errors in the Component portion of the original MSU.

- U-Abort

  U-Abort messages are used for decode errors in the Dialog or Component portion of the original MSU.

- P-Abort

  P-Abort messages are used for certain errors detected during decode of the Transaction portion of the original MSU.

Reject, P-Abort, and U-Abort error codes are described in ITU-T Recommendation Q.773, *Transaction Capabilities Formats and Encoding*.

MPS/EPAP Platform

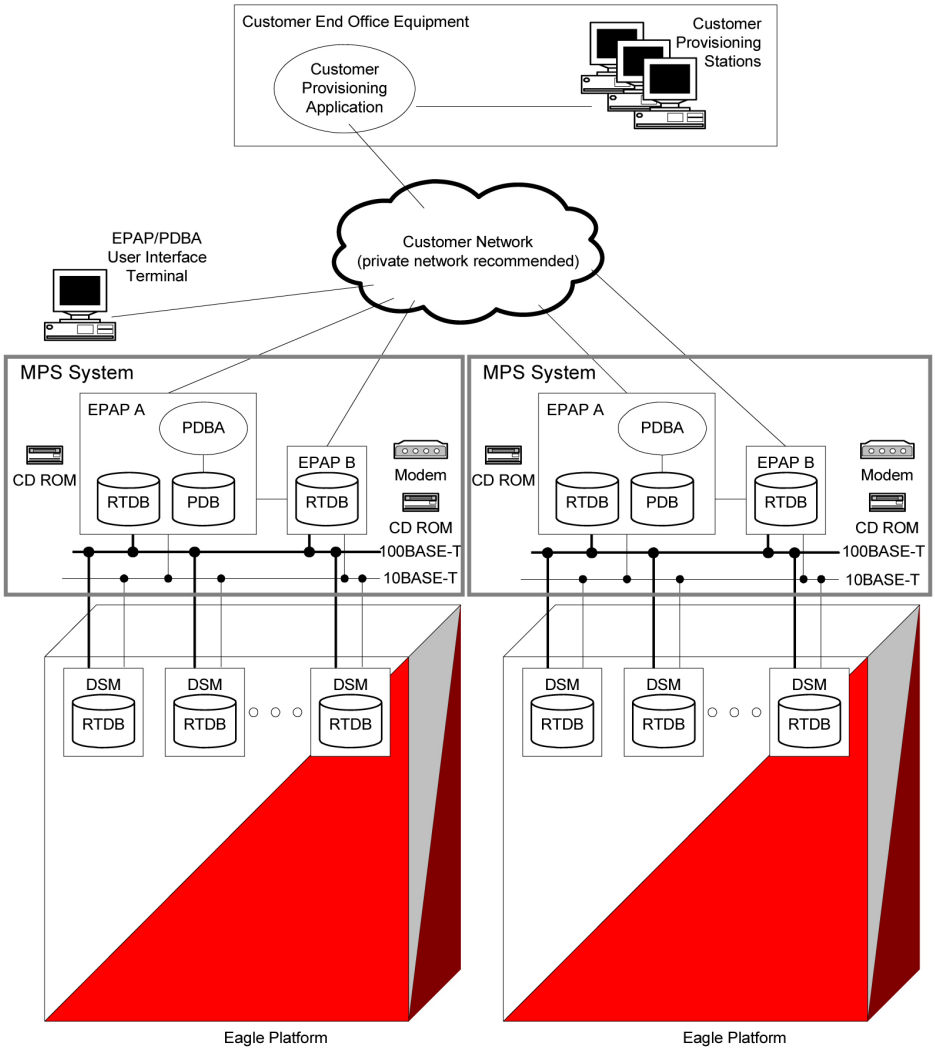
Tekelec provides the MPS (Multi-Purpose Server) platform as a subsystem of the EAGLE 5 ISS. The MPS provides support for EPAP-based features.

The MPS is composed of hardware and software components that interact to create a secure and reliable platform. (For details about the MPS hardware, refer to the *Tekelec 1000 Application Server Hardware Manual*.) The MPS provides the means of interfacing the customer provisioning application with the EAGLE 5 ISS. It connects the customer with the EAGLE 5 ISS and accepts the customer number portability data, while accommodating numbers of varying lengths.

The EAGLE Provisioning Application Processor (EPAP) is software that runs on the MPS hardware platform. It collects and organizes customer provisioning data, and forwards it to the EAGLE 5 ISS Service Module cards (DSM cards and E5-SM4G cards). *Figure 1: MPS/EPAP Platform Architecture* on page 17 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 on Service Module cards.

Note: The EAGLE 5 ISS supports more than one type of hardware card that provides the DSM function. The term Service Module card is used to mean any hardware card that supports the DSM function. If a Service Module card or an E5-SM4G card is specifically required, the required card is indicated. For more information about the hardware cards that support the DSM function, refer to the *Hardware Manual - EAGLE 5 ISS*.

Figure 1: MPS/EPAP Platform Architecture



Design Overview and System Layout

Figure 1: MPS/EPAP Platform Architecture on page 17 illustrates the overall system architecture and identifies the different tasks, databases and interfaces involved. The system consists of two

mated MPS servers. Each MPS contains two EPAP platforms, EPAP A and EPAP B, each containing a Realtime Database (RTDB), a Provisioning Database (PDB), servers, optical media , modems, and network hubs. Each MPS and its EPAPs may be thought of as an 'EPAP system'; the EPAP system and the mated EAGLE 5 ISS is referred to as the 'mated EPAP system'. Each EPAP system is a T1000 AS system with a total of four Ethernet interfaces: one from each EPAP to the 100Base-T Ethernet and one from each EPAP to the 10Base-T Ethernet.

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

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

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

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

Major modules on the EPAP are the

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

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

Functional Overview

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

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

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 EPAP-based features. It performs the following two basic functions in support of EPAP-based features:

- Accept and store data provisioned by the customer
- Update and reload subscriber databases on the Service Module cards

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

The EPAP platform maintains an exact copy of the Realtime Database (RTDB) required by the EAGLE 5 ISS Service Module cards, provisions the EAGLE 5 ISS Service Module 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. 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 Service Module 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 EPAP-based features require. 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 RTDB in order to provision the EAGLE 5 ISS Service Module cards. The EPAP server must comply with the hardware requirements in the *T1000 Application Server Hardware Manual*. *MPS/EPAP Platform* on page 16 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 as well as through an RS232 direct terminal connection to the EPAP. Refer to the *T1000 Application Server Hardware Manual* for details about the hardware devices and network connections.

Chapter 3

EAGLE 5 ISS ATINP Commands

Topics:

This chapter contains brief descriptions of the EAGLE 5 ISS commands that are used for the configuration, maintenance, and measurements for the ATI Number Portability Query (ATINP) feature.

EAGLE 5 ISS Commands for ATINP

This chapter describes the EAGLE 5 ISS commands that are used for the configuration, maintenance, and measurements for the ATI Number Portability Query (ATINP) feature.

Refer to the *Commands Manual* for complete descriptions of the following commands, including parameter names, valid values, and output examples for the commands.

Table 4: Commands used for ATINP

Type	Commands
System Serial Number	ent/rtrv-serial-num
Card	ent/dlt/rtrv/alw/inh/init/rept-stat-card
Feature Control	enable/chg/rtrv-ctrl-feat
STP Options	chg/rtrv-stpopts
EAGLE 5 ISS STP Self Identification	chg/rtrv-sid
Mated Application (MAP)	chg/dlt/ent/rtrv-map
Subsystem Application	chg/dlt/ent/rtrv-ss-appl
Service Selector	chg/dlt/ent/rtrv-srvsel
ATINP Options	chg/rtrv-atinpqopts
Local Subsystem Activation	alw/inh-map-ss
Retrieve, Report Status, and Maintenance	chg-th-alm, ent-trace, init-network, init-sys, rept-stat-alm, rept-stat-db, rept-stat-sys, rep-stat-trbl, rtrv-data, rtdb, rtrv-tbl-capacity
Measurements	chg/rtrv-measopts, chg/rtrv-mtc-measopts, rept-stat-meas, rept-ftp-meas, act-ftp-trns

EAGLE 5 ISS Card Commands

The `ent/dlt/rtrv/alw/inh-card` commands are used to add, remove, display information about, allow operation of, and stop operation of cards in the system.

The `ent-card` command is used to add cards to the database. For Service Module cards (DSM cards and E5-SM4G cards) the command specifies the card location, the card type (**dsm**), and the application that runs on the card (**vsccp**).

The `dlt-card` command is used to remove provisioned cards from the database, before they are physically removed from the card location in the shelf.

The `rtrv-card` command is used to display information about the cards that are provisioned in the database. When the command is entered with no parameters, all cards that are provisioned in the database are listed. The command can be entered with the loc parameter to display information about a specific Service Module card.

The `alw-card` command is used to cause a card to begin operation in the system. The card status is changed from Out-of-Service-Maintenance-Disabled (OOS-MT-DSBLD) to In-Service-Normal (IS-NR) if the GPL loading is successful. When the command is entered with the loc parameter, the approved version of the **vsccp** GPL is loaded on the specified card.

The `inh-card` command is used to cause a card to stop operation in the system. When the card status has changed from In-Service Normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD), the card can be physically removed from the shelf. The force parameter must be used to inhibit the last card that is supporting an SCCP subsystem or MPS-to-DSM network connection.

The `rept-stat-card` command is used to report the operating status of all cards or of a specific card in the system.

EAGLE 5 ISS Serial Number Commands

Before any controlled features can be enabled, the database must contain a valid and locked serial number for the EAGLE 5 ISS. The system 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 after the system is on-site.

The `ent/rtrv-serial-num` commands are used to enter, lock, and display the status of the system serial number. The serial number must be entered once in the `ent-serial-num` command without the lock parameter, and entered again with the lock=yes parameter. The serial number cannot be changed after it is locked.

EAGLE 5 ISS System (STP) Options Commands

The `chg/rtrv-stpopts` commands are used to define, change, and report on the values of one or more of the STP system-level processing option indicators that are maintained in the STPOPTS table. System default values for the options are assigned initially at STP installation time. The values can be updated using the `chg-stpopts` command.

Before the enabled ATINP feature can be turned on, the values for the default country code (defcc) parameter value must be changed from none to the appropriate value for the system that is using ATINP.

After the ATINP feature is enabled, the default country code value cannot be changed to none.

The DSM checksum audit (dsmaud) parameter is supported for ATINP.

EAGLE 5 ISS Feature Control Commands

The `chg/rtrv-feat` commands are used to turn on and display the on/off status of features, such as the GTT feature, that are controlled with feature bits. After a feature that is controlled with a feature bit is turned on, the feature cannot be turned off.

The `enable/chg/rtrv-ctrl-feat` commands are used to enable, turn on, and display the status of features that are controlled by feature access keys. The feature access key is based on the feature part number and the serial number of the system that uses the feature, making the feature access key site-specific. When a feature is enabled by entering the `enable-ctrl-feat` command with the feature part number and feature access key, the feature is recognized by the system. Other actions might be required to make the feature fully operational, such as turning the feature on, installing hardware, and provisioning information in database tables.

Some features can be enabled with a temporary part number and feature access key for a limited trial of the feature. When the trial period expires, the feature must be enabled with a permanent part number and feature access key to continue use of the feature.

EAGLE 5 ISS Self ID and Capability Point Code Commands

The `chg/rtrv-sid` commands are used to define and display the self-identification (true) and capability point codes of the system. The commands also define and display the common language location identifier (CLLI).

The self-identification identifies the system to the other signaling points in the network, using true point codes and capability point codes.

Capability point codes are used by the SS7 protocol to identify a group of functionally related STPs in the signaling network to which the STP belongs.

The common language location identifier (CLLI) identifies the system in terms of its physical location.

For the ATINPQ local subsystem, the EAGLE 5 ISS supports ANSI, ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare capability point code types, including group codes. ITU-N24 capability point codes are not supported.

EAGLE 5 ISS Mated Application Commands

Local subsystems must be entered into the MAP table. The ATINPQ local subsystem can have a mate subsystem and a concerned point code group assigned to it. The mated application relationship information maintained by the system is used to support the routing of SCCP management SSP/SSA messages.

The `ent/chg/dlt/rtrv-map` commands are used to enter, change, delete, and display a true point code and a subsystem number for the local subsystem.

The ATINPQ local subsystem cannot be set to Load Shared mode (as end nodes do not perform load sharing), but can be set only to Dominant or Solitary mode.

Refer to the procedures in the *Database Administration Manual - Global Title Translation* and to the `ent/chg/dlt/rtrv-map` command descriptions in the *Commands Manual* to provision MAP table entries for local subsystems.

EAGLE 5 ISS Local Subsystem Commands

The `chg/dlt/rtrv-ss-appl` commands are used to reserve a subsystem number for a local subsystem application, to delete the local subsystem application, to change the online/offline status of the subsystem application, and to display the local subsystem application status in the database.

The local subsystem application for the ATINP feature is ATINPQ.

EAGLE 5 ISS Service Selector Commands

The `ent/chg/dlt/rtrv-srvsel` service selector commands are used to provision, remove, change, and display the applicable service selectors required for a service entry for DSM services. These commands provide some flexibility when provisioning the type of messages that require ATINP processing.

Complete descriptions of these commands are shown in the *Commands Manual*, including parameter names, valid values, and output examples for the commands.

- The `ent-srvsel` (Enter Service Selector) command specifies the applicable service selectors to define an ATINP DSM service entry.

  The asterisk value (*) for the subsystem number is supported for the ATINPQ subsystem.
  The Service Numbering Plan (snp) and Service Nature of Address Indicator (snai) parameters are not needed in ATINP service selectors.
  The Global Title Indicator (gti/gtii/gtin) value can be either 2 or 4.

- The `chg-srvsel` (Change Service Selector) command specifies the applicable selectors to change an existing ATINP service entry.
- The `dlt-srvsel` (Delete Service Selector) command specifies the applicable selectors to delete an existing service entry.

  Note: If the service selector being removed does not show values for the np and nai parameters, or the npv and naiv parameters, and you want to use these parameters with the `dlt-srvsel` command, refer to the command description in the *Commands Manual* for the np and nai values that correspond to the npv and naiv values for the service selector being removed.

- The `rtrv-srvsel` (Retrieve Service Selector) command displays a list of provisioned 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 the nature of address indicator. The output can be filtered by specifying various optional parameters, including the number of entries to display.

EAGLE 5 ISS ATINP Options Commands

The `chg/rtrv-atinpqopts` commands define and display ATINP options that are provisioned in the ATINPQOPTS table. The ATINP options are used for the following functions:

- Specify the format of the IMSI, MSISDN, and Routing Number parameters in the ATI ACK response message, and the maximum number of digits to be used from the SRFIMSI or Entity ID in the encoding format.
- Determine whether the IMSI, MSISDN, or Routing Number parameter is included or not included in the ATI ACK response message.
- Specify the default routing number and outbound message digits delimiter to be used in outbound message formats.
- Specify the number conditioning to be performed on the MSISDN digits in the incoming ATI query message before RTDB lookup is performed, and indicate the determination of a successful RTDB lookup.

The `chg-atinpqopts` command uses the following parameters to provision the data in the ATINPQOPTS table (RTDB is the Tekelec implementation of the NPDB):

Table 5: ATINP Options

Option	Value	Action in the STP
ATINPTYPE - specifies when an RTDB lookup is successful	ANY	MSISDN lookup is considered successful when any match is found (RN, SP, and match with no entity, GRN with PT=0xFF). See *ATINP Protocol Handling of MSUs* on page 12 for a description of determination of success. **Note:** This specifically excludes the case when MSISDN was not found in RTDB.
	ALWAYS	The lookup is always considered to be successful whether or not MSISDN was found in RTDB match.
ATIDLM - specifies whether delimiter digits or no delimiter is to be used in encoding outbound digits in ATI ACK response	NONE	This option can be set to NONE at any time by the user. The default value is NONE.
	HEX (1-15 digits)	
ATIDFLTRN - Default Routing Number used in encoding outgoing formats in ATI ACK response in cases where an RN is not returned from an RTDB lookup	NONE	The specific encoding is described further in other option value descriptions. This option can be set to NONE at any time. The default value is NONE.
	HEX (1-15 digits)	
SNAI - specifies either that the NAI of the incoming MSISDN digits is considered to be International or International regardless of the NAI value in the incoming MSISDN, or that the NAI value determines whether number conditioning to International format is needed before RTDB lookup.	INTL	The NAI of the incoming MSISDN digits will be considered to be International. No conditioning will be performed on the MSISDN before RTDB lookup.
	NAT	The NAI of the incoming MSISDN digits will be considered to be National. The MSISDN will be conditioned to international format before RTDB lookup by pre-pending the STPOPTS default country code (DEFCC) parameter value.

Option	Value	Action in the STP
		Note: The STPOPTS DEFCC parameter must be provisioned to a value other than NONE before the ATINP feature can be turned ON. The DEFCC value cannot be set to NONE after the ATINP feature is turned ON.
	NAI	The NAI field of the MSISDN parameter will determine whether number conditioning is required before RTDB lookup . If NAI is INTL (0x01) or Network Specific Number (0x3), then the number will be considered to be International and no conditioning is performed before RTDB lookup. If NAI is not considered INTL, it will be considered to be National. The STPOPTS default country code (DEFCC) value will be pre-pended to the MSISDN to condition it to international format before RTDB lookup. This is the default value.
ATIACKRN - specifies the formatting of the Routing Number digits in the ATI ACK response.	NONE	The Routing Number parameter will not be included in the response.
	RN	If an Entity was found in RTDB lookup and Entity type was RN, encode Routing Number digits as the found Entity ID. The Routing Number digits will be encoded as the ATIDFLTRN option value instead of the Entity ID, if the ATIDFLTRN value is not NONE and one of the following conditions is true: • MSISDN was found but No Entity found in RTDB

Option	Value	Action in the STP
		• MSISDN was not found in RTDB (Only in the case of ATINPTYPE=ALWAYS. For ATINPTYPE=ANY, this will result in a lookup failure.) • Entity was found with type SP In all other cases, the Routing Number parameter will not be included in the response. This is the default value.
	RNSP	If an Entity was found in RTDB lookup and Entity type was either SP or RN, encode Routing Number digits as the found Entity ID. The Routing Number digits will be encoded as the ATIDFLTRN option value if the ATIDFLTRN value is not NONE and one of the following conditions is true: • MSISDN found but Entity was not found. • MSISDN was not found in RTDB (Only in case of ATINPTYPE=ALWAYS. For ATINPTYPE=ANY, this will result in a lookup failure). • Entity of type other than SP or RN was found. In all other cases, the Routing Number parameter will not be included in the response.
	ASDDLMRNSP	Encode the Routing Number as ASD (If available from lookup Entity) + ATIDLM (If not NONE) + RNSP. RNSP is encoded as described for the ATIACKRN=RNSP value. If formatting results in 0 digits or only DLM digits, the

Option	Value	Action in the STP
		Routing Number parameter will not be included in the response message. If ATIDLM is not NONE, and ASD digits are available, DLM will be included even if RN/SP does not have any digits (resulting in ASD+DLM). The ASD field is returned in the Entity lookup data (if Entity was found). If the ASD field is not provisioned in EPAP, it will not be included in any formats specifying ASD.
	RNSPDLMASD	Encode Routing Number digits as RN/SP + ATIDLM (If not NONE) + ASD (If available from lookup Entity). RN/SP is encoded as described for the ATIACKRN=RNSP option. If formatting results in 0 digits or only DLM digits, the Routing Number will not be included in the response message. If ATIDLM is not NONE, and ASD digits are available, DLM will be included even if RN/SP does not have any digits (resulting in DLM+ASD).
	SRFIMSI	Encode Routing Number digits as SRFIMSI configured in the entity data. If SRFIMSI was not found (MSISDN not found in RTDB, or MSISDN found but no Entity found, or Entity found but SRFIMSI not configured) then the Routing Number will not be included in the response message.
	SRFIMSIDLMASD	Encode Routing Number digits as SRFIMSI + ATIDLM (If not

Option	Value	Action in the STP
		NONE) + ASD (If available from lookup Entity). SRFIMSI is encoded as described for the ATIACKRN=SRFIMSI option. If formatting results in 0 digits or only DLM digits, the Routing Number will not be included in the response message. If ATIDLM is not NONE and ASD digits are available, DLM will be included even if SRFIMSI does not have any digits (resulting in DLM+ASD).
	ASDDLMSRFIMSI	Encode Routing Number as ASD (If available from lookup Entity) + ATIDLM (If not NONE) + SRFIMSI.. SRFIMSI is encoded as described for the ATIACKRN=SRFIMSI option. If formatting results in 0 digits or only DLM digits, the Routing Number parameter will be not be included in the response message. If ATIDLM is not NONE, and ASD digits are available, DLM will be included even if SRFIMSI does not have any digits (resulting in ASD+DLM). The ASD field is returned in the Entity lookup data (if Entity was found). If the ASD field is not provisioned in EPAP, it will not be included in any formats specifying ASD.
ATIACKMSISDN - specifies the inclusion and formatting of the MSISDN in the ATI ACK response message.	NONE	MSISDN parameter is not included in the ATI ACK response.
	MSISDN	MSISDN digits in the ATI ACK response will be encoded as the

Option	Value	Action in the STP
		MSISDN from the incoming ATI query. This is the default value. **Note:** If the RTDB lookup matched on odd number of digits, then the MSISDN will be encoded with what was matched in the RTDB (without the trailing 0).
	ASD	The MSISDN in the ATI ACK response will be encoded as the ASD (Additional Subscriber Data) if the MSISDN was found during RTDB lookup and ASD was provisioned in EPAP. If ASD is not available, the MSISDN parameter will not be included in the response message.
	ASDDLMMSISDN	The MSISDN digits in the ATI ACK response message will be encoded as ASD (if available) + ATIDLM (if not NONE) + MSISDN from incoming message. **Note:** If the RTDB lookup matched an odd number of digits, then the encoded MSISDN will be what was matched in the RTDB (without the trailing 0).
ATIACKIMSI - used for IMSI parameter encoding in the ATI ACK message	NONE	The IMSI parameter will not be included in the ATI ACK response message. This is the default value.
	SRFIMSI	If an Entity was found during lookup and • If SRFIMSI is provisioned in the Entity, then encode the outgoing IMSI digits as the SRFIMSI. • If SRFIMSI is not provisioned in the Entity,

Option	Value	Action in the STP
		then do not include the IMSI parameter in the ATI ACK response.
	ASD	The IMSI digits in the ATI ACK response will be encoded as the ASD (Additional Subscriber Data) if ASD is found during RTDB lookup and ASD was provisioned in the EPAP . If ASD is not available, the IMSI parameter will not be included in the response message.
ENTITYLEN - maximum number of digits to be used from RTDB lookup data (SRFIMSI or Entity ID) to encode Routing Number digits in the encoding format specified by the ATIACKRN option. If Entity ID or SRFIMSI is not being used by the specified ATIACKRN format, this option does not apply.	NONE	The SRFIMSI or Entity ID will be used without modification in the ATIACKRN format specified. This is the default value.
	Decimal (1-15)	For example, if the SRFIMSIASDDLM format is specified, and ENTITYLEN = 5, SRFIMSI from Entity is "1234567890" (10 digits), ASD = "123", and DLM="55", then a maximum of 5 digits will be used from SRFIMSI to encode the format as "12345" + "123" + "55". If ENTITYLEN = "NONE" then all 10 digits from SRFIMSI would have been used. The same applies to formats that will encode an Entity ID.

EAGLE 5 ISS Local Subsystem Activation Commands

The `alw/inh-map-ss` commands allow and inhibit (or shut down) the operation of a mated application subsystem. The subsystem number for the local subsystem application must be specified in the command.

Allowing causes the subsystem to become operational in the system.

Inhibiting stops the operation of (shuts down) a mated application subsystem. The specified subsystem attempts a coordinated shutdown. If the coordinated shutdown fails, a UIM is issued

indicating the shutdown failed. If the force parameter is specified in the command, the subsystem is forced to shut down, and a coordinated shutdown is not performed.

Maintenance Commands

This section describes the following commands that can be used for maintenance when an EPAP-based feature is on.

Detailed command descriptions in the *Commands Manual* include parameters, valid values, and output examples.

rept-stat-sys

This command reports the status of system entities, including cards and subsystems. The display shows the number of these items that are in service (IS-NR) and how many are in another state (IS-ANR, OOS-MT, OOS-MT-DSBLD). An entry for a subsystem appears when the feature is on in the system. Refer to the *Commands Manual* for a complete description of this command.

```
eagle10605 08-05-25 02:32:46 EST EAGLE 39.2.0
    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
       SCCP    CARD IS-NR= 3  Other= 0 INH= 0
       GLS     CARD IS-NR= 0  Other= 0 INH= 0
       SLAN    CARD IS-NR= 0  Other= 0 INH= 0
       VXWSLAN CARD IS-NR= 0  Other= 0 INH= 0
       EMDC    CARD IS-NR= 0  Other= 0 INH= 0
       SS7IPGW CARD IS-NR= 0  Other= 0 INH= 0
       IPGWI   CARD IS-NR= 0  Other= 0 INH= 0
       IPLIM   CARD IS-NR= 0  Other= 0 INH= 0
       IPLIMI  CARD IS-NR= 0  Other= 0 INH= 0
       HMUX    CARD IS-NR= 0  Other= 0 INH= 0
       HIPR         IS-NR= 2  Other= 0 INH= 0
       IMT          IS-NR= 2  Other= 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
      DSM IP LK    IS-NR= 0  Other= 0 INH= 0
      MCPM    CARD IS-NR= 0  Other= 0 INH= 0
      EROUTE  CARD IS-NR= 0  Other= 0 INH= 0
      CLOCK        IS-NR= 2  Other= 0 INH= 0
      HS CLOCK     IS-NR= 2  Other= 0 INH= 0
      MCPM IP LK   IS-NR= 2  Other= 0 INH= 0
      SCTP ASSOC   IS-NR= 0  Other= 0 INH= 0
      APPL SERVER  IS-NR= 0  Other= 0 INH= 0
      SS7 DPC      IS-NR= 0  Other= 6 INH= 0
      CLUST DPC    IS-NR= 0  Other= 1 INH= 0
      RTX          IS-NR= 2  Other= 1 INH= 0
      XLIST DPC    IS-NR= 0  Other= 0
      DPC SS       Actv = 0  Other= 0
      SEAS SS      IS-NR= 0  Other= 2
      SEAS X25     IS-NR= 0  Other= 2 INH= 0
      LSMS SS      IS-NR= 0  Other= 2
      LSMS Conn    IS-NR= 0  Other= 2 INH= 0
      TERMINAL     IS-NR= 2  Other= 14 INH= 0
      MPS          IS-NR= 2  Other= 0
      SECURITY SS  IS-NR= 1  Other= 0
      EIR SS       IS-NR= 1  Other= 0
      RTD SS       IS-NR= 0  Other= 1
      ATINPQ SS    IS-NR= 1  Other= 0
;
```

rept-stat-sccp

This command reports local subsystem operating status, CPU usage related to the subsystem, and Service Module card status. When the loc parameter is specified, the command displays detailed card traffic statistics. Refer to the *Commands Manual* for a complete description of this command.

```
   tklc1170501 08-08-18 10:16:24 EST  EAGLE5 39.2.0
   SCCP SUBSYSTEM REPORT IS-NR          Active     -----
        SCCP ALARM STATUS = No Alarms
   GFLEX SERVICE REPORT IS-NR           Active     -----
        GFLEX ALARM STATUS = No Alarms
   GPORT SERVICE REPORT IS-NR           Active     -----
        GPORT ALARM STATUS = No Alarms
   ATINPQ SUBSYSTEM REPORT IS-NR         Active     -----
        ATINPQ: SSN STATUS = Allowed     MATE SSN STATUS = ----------
        ATINPQ ALARM STATUS = No Alarms

   SCCP Cards Configured=25      Cards IS-NR=25
   System Daily Peak SCCP Load       15639  TPS 06-09-18 06:14:24
   System Overall Peak SCCP Load     21062  TPS 06-09-15 14:24:38
   System Total SCCP Capacity        21250  TPS (21250  max SCCP Capacity)
   System SCCP Capacity Calc. Method (N)
   System TPS Alarm Threshold       17000  TPS ( 80% System   N SCCP Capacity)


   CARD   VERSION      PST           SST        AST       MSU   CPU
                                                          USAGE USAGE
   ------------------------------------------------------------------
   1217   126-030-000  IS-NR         Active     -----     100%   45%
   1317   126-030-000  IS-NR         Active     -----     100%   51%
   2217   126-030-000  IS-NR         Active     -----     100%   42%
   3201   126-030-000  IS-NR         Active     -----      54%   25%
   3203   126-030-000  IS-NR         Active     -----      55%   25%
   3205   126-030-000  IS-NR         Active     -----      57%   27%
   3207   126-030-000  IS-NR         Active     -----      69%   29%
   3211   126-030-000  IS-NR         Active     -----      85%   35%
```

```
    3213   126-030-000  IS-NR         Active     -----      94%   37%
    3215   126-030-000  IS-NR         Active     -----      86%   35%
    3217   126-030-000  IS-NR         Active     -----      74%   31%
    4217   126-030-000  IS-NR         Active     -----      64%   28%
    4317   126-030-000  IS-NR         Active     -----     100%   41%
    5117   126-030-000  IS-NR         Active     -----     100%   40%
    5317   126-030-000  IS-NR         Active     -----      56%   25%
    6101 P 126-030-000  IS-NR         Active     -----      57%   32%
    6103   126-030-000  IS-NR         Active     -----      63%   27%
    6105   126-030-000  IS-NR         Active     -----      69%   37%
    6107   126-030-000  IS-NR         Active     -----      66%   29%
    6111   126-030-000  IS-NR         Active     -----      59%   27%
    6113   126-030-000  IS-NR         Active     -----      55%   34%
    6115   126-030-000  IS-NR         Active     -----      55%   26%
    6117   126-030-000  IS-NR         Active     -----      54%   26%
    1105   126-030-000  IS-NR         Active     -----      55%   26%
    1107   126-030-000  IS-NR         Active     -----      55%   26%
    ------------------------------------------------------------------
    SCCP Service Average MSU Capacity =  71%   Average CPU Capacity =  32%

    AVERAGE CPU USAGE PER SERVICE:
      GTT   =   1%  GFLEX =   4%  GPORT =   0%
      ATINPQ=   2%

    TOTAL SERVICE STATISTICS:
                                      FAIL     REROUTE\      FORWARD
      SERVICE    SUCCESS    ERRORS   RATIO     WARNINGS       TO GTT     TOTAL

      GTT:          3510        15      0%            -             -      3525

      GFLEX:      100043         0      0%            0             0    100043

      GPORT:      312203         0      0%           15          1879    314097

      ATINPQ:      23157         0      0%            -             -     23157



    Command Completed.
;
```

rept-stat-mps

This command displays the overall status of the application running on the MPS (multi-purpose server). Command output for the various reports of this command include feature status and status for specific cards when the feature is on. Refer to the *Commands Manual* for a complete description of this command.

Overall status:

```
    rlghncxa03w 08-09-07 11:27:34 EST  EAGLE 39.2.0
                       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       GSM STAT   ATINP STAT
    1106 P IS-NR        Active    ACT        ACT
    1201   IS-ANR       Active    SWDL       SWDL
    1205   OOS-MT-DSBLD Manual    -------    -------
    1302   OOS-MT       Isolated  -------    -------
    1310   IS-ANR       Standby   SWDL       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.
;
```

Status for a specific card:

```
    Integrat40 08-09-07 11:37:24 EST  EAGLE5 39.2.0
    CARD   VERSION       TYPE    PST            SST          AST
    1205   -----------   DSM     OOS-MT-DSBLD   Manual       -----
      DSM PORT A                 OOS-MT         Unavail      -----
                ALARM STATUS       = **  0084 IP Connection Unavailable
      DSM PORT B                 OOS-MT         Unavail      -----
                ALARM STATUS       = **  0084 IP Connection Unavailable
      GSM STAT           = -------
      ATINP STAT         = -------
      CARD ALARM STATUS  = No Alarms.
      DSM MEMORY USAGE   = 0%
    Command Completed.
;
```

rept-stat-trbl

This command output includes a summary of any trouble notifications for the ATINPQ local subsystem. The severity of each alarm is indicated in the output report. Refer to the *Commands Manual* for a complete description of this command.

```
    rlghncxa03w 07-02-03 09:50:17 EST  EAGLE5 37.6.0
    SEQN UAM  AL DEVICE    ELEMENT       TROUBLE TEXT
    0002.0143  * CARD 1113 EOAM          System release GPL(s) not approved
    3661.0048  * TERMINAL    1          Terminal failed
    3674.0155  * DLK 1107,A   STPLAN     STPLAN connection unavailable
    3677.0312  * DPC    001-115-001      DPC is restricted
    3678.0002  * GPL SYSTEM BPDCM        Card is not running approved GPL
    3683.0176  * SECULOG 1116            Stdby security log -- upload required
```

```
   3684.0013 ** CARD 1305 SS7IPGW       Card is isolated from the system
   3688.0236 ** SLK 1203,A   lslg2      REPT-LKF: not aligned
   3692.0318 ** LSN e5e6                REPT-LKSTO: link set prohibited
   3697.0539 ** ENET 1305,A             Ethernet Interface Down
   3698.0539 ** ENET 1305,B             Ethernet Interface Down
   3699.0539 ** ENET 1307,B             Ethernet Interface Down
   3700.0536  * IP7 assoc1234567890     IP Connection Excess Retransmits
   0915.0541 *C RTD SYSTEM              MSU cksum error threshold exceeded

   0915.0541 *C RTD SYSTEM              MSU cksum error threshold exceeded
   0916.0565 *C ATINPQ SYSTEM           ATINPQ Subsystem is not available
   Command Completed.
;
```

rept-stat-alm

This command output includes the alarm totals for the ATINPQ local subsystem and DSM/EPAP IP links. Refer to the *Commands Manual* for a complete description of this command.

```
   rlghncxa03w 08-05-27 15:00:53 EST  EAGLE 39.2.0
   ALARM  TRANSFER= LMC
   ALARM  MODE      CRIT= AUDIBLE     MAJR= SILENT     MINR= AUDIBLE
   ALARM  FRAME 1      CRIT=   7         MAJR=   0         MINR=  10
   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 OAP    CRIT=   0         MAJR=   0         MINR=   0
   ALARM  FRAME GPF    CRIT=   0         MAJR=   0         MINR=   0
   PERM. INH. ALARMS   CRIT=   2         MAJR=   0         MINR=   0
   TEMP. INH. ALARMS   CRIT=   3         MAJR=   0         MINR=   0
   TIMED.INH. ALARMS   CRIT=   0         MAJR=   0         MINR=   0
   ACTIVE ALARMS       CRIT=   2         MAJR=   0         MINR=  10
   TOTAL ALARMS        CRIT=   7         MAJR=   0         MINR=  10

   Command Completed.
;
```

rept-stat-db

This command displays the status information for the EAGLE 5 ISS databases. This includes the level information for each Service Module 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 birth dates and levels. It shows the status of the PDB and RTDB databases when one or more EPAP-based features are enabled. For a complete description of this command, refer to the *Commands Manual*.

```
   tekelecstp 08-08-29 08:55:54 NZST  EAGLE 39.2.0
                  EPAP A  ( ACTV )
                   C  BIRTHDATE          LEVEL       EXCEPTION
                   -  -----------------  ----------  -------------
  PDB              Y  07-08-29 08:20:04       12345        -
  RTDB             Y  07-08-29 08:20:04       12345        -
  RTDB-EAGLE       Y  07-08-29 08:20:04       12345        -

                  EPAP B ( STDBY )
                   C  BIRTHDATE          LEVEL       EXCEPTION
                   -  -----------------  ----------  -------------
  PDB              Y  07-08-29 08:20:04       12345        -
  RTDB             Y  07-08-29 08:20:04       12345        -
```

```
   RTDB-EAGLE       Y  07-08-29 08:20:04       12345        -

                  EAGLE RTDB REPORT
    CARD/APPL  LOC   C  BIRTHDATE          LEVEL       EXCEPTION    IN-SRVC
    ---------  ----  -  -----------------  ----------  ------------ -----------

   VSCCP      1201  Y  07-08-29 08:20:04        12345        -      10d 23h 21m

   VSCCP      1203  Y  07-08-29 08:20:04        12345        -      10d 23h 21m

   VSCCP      1105  Y  07-08-29 08:20:04        12345        -       5d  3h  1m
;
```

rtrv-tbl-capacity

The `rtrv-tbl-capacity` command retrieves table use capacity summary information. For each table listed, the number of table entry elements in use and the total allowed number of table elements is presented, along with a percent (%) full value. Information is shown for some tables only if the feature that uses the table is enabled.

```
    tklc1090701 07-05-24 14:22:01 EST  EAGLE 37.6.0

    DSTN     table is (     5940 of      6000)  99% full
    XLIST    table is (        0 of       500)   0% full
    SPC      table is (        4 of        40)  10% full
    LS       table is (      738 of      1024)  72% full
    SLK      table is (      360 of      2000)  18% full
    IP-LNK   table is (        6 of       512)   1% full
    MAP      table is (      336 of      1024)  33% full
    GTA      table is (   269999 of    269999) 100% full
    SSNSELID table is (        0 of     10000)   0% full
    SCRSET   table is (       40 of       255)  16% full
    RTEKEY   table is (        0 of      1000)   0% full
    AS       table is (        0 of       250)   0% full
    MRN      table is (      768 of      5988)  13% full
    SCCPSRV  table is (       12 of        96)  13% full
    VFLXRN   table is (        1 of     10000)   1% full
    VFLXCD   table is (        1 of      4950)   1% full
    VFLXVID  table is (        1 of      1000)   1% full

;
```

inh-card/alw-card

The `inh-card` command is used to change the operating state of the card from In-Service Normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD). A craftsperson can then test the card or physically remove it from the shelf.

The `alw-card` command is used to change the card from OOS-MT-DSBLD (Out-of-Service Maintenance-Disabled) to IS-NR (In-Service Normal) if card loading is successful.

Refer to the *Commands Manual* for a complete description of these commands.

inh-alm/unhb-alm

The `inh/unhb-alm` commands are used to allow and inhibit alarms on the Service Module card ports. The commands allow both Port A and Port B to be specified. Refer to the *Commands Manual* for a complete description of these commands.

rtrv-data-rtdb

This command retrieves Entity data, DN data, IMEI data, IMSI data, TN data, NPANXX data, and LRN data from the RTDB on an active Service Module card.

If the loc parameter is specified and the target card is an active Service Module card, the RTDB data is retrieved from that card.

If the loc parameter is not specified, the RTDB data is retrieved on the active Service Module card that has the lowest IMT address.

The RTDB status on the active Service Module card can be coherent or incoherent.

Measurements Commands

This section describes the following commands that are used for scheduling and generating EAGLE 5 ISS measurements reports.

- chg/rtrv-mtc-measopts
- chg/rtrv-measopts
- rept-ftp-meas
- rept-stat- meas

Detailed command descriptions in the *Commands Manual* include parameters, valid values, and output examples

chg-mtc-measopts

The `chg-mtc-measopts` command provides the capability to activate and deactivate the automatic generation and FTP transfer of daily and hourly measurements reports from the Measurements Platform.

The mtcdatinpq option and the mtchatinpq option of the command activate or deactivate the automatic generation and FTP transfer of the hourly and daily maintenance measurement reports for the ATI Number Portability Query (ATINP) feature. By default, both of the ATINP options are disabled and cannot be changed unless the ATINP feature is on.

The `rtrv-mtc-measopts` command displays the on or off status of the reports in the system.

Refer to the *Commands Manual* for a complete description of this command. Refer to the *Maintenance* manual for descriptions of the daily and hourly measurements reports.

chg-measopts

The `chg-measopts` command provides the ability to enable the Measurements Platform collection option after the Measurements Platform feature is turned on, and the ability to schedule automatic generation and FTP transfer of measurements reports. The Measurements Platform collection option cannot be disabled after it is enabled.

Note: Daily and hourly measurements report options for ATINP are configured and displayed with the chg-mtc-meas and rtrv-mtc-meas commands.

The `rtrv-measopts` command displays the on and off status of the Measurements Platform options and reports.

Refer to the *Commands Manual* for a complete description of these commands, and to the *Maintenance* manual for descriptions of measurements reports.

rept-ftp-meas

The `rept-ftp-meas` command initiates on-demand generation and FTP transfer of a measurements report from the Measurements Platform to the customer FTP server.

The `rept-ftp-meas` command accepts an ATINPQ entity type and the MTCH and MTCD report types. The combination of the entity type and report type determines which on-demand report is generated. The ATINPQ entity type is valid only when the ATINP feature is on.

Refer to the *Commands Manual* for a complete description of this command, and to the *Maintenance* manual for descriptions of the reports.

rept-stat-meas

This command reports the status of the Measurements subsystem, including card location and state, alarm level, and subsystem state. Refer to the *Commands Manual* for a complete description of this command.

```
    tekelecstp 08-08-29 08:55:54 NZST  EAGLE 39.2.0
                        PST            SST       AST

    MEAS SS             OOS-MT       Fault    -----

    ALARM STATUS =   ** 0516  MEAS degraded with card out of service



    CARD   VERSION         TYPE    PST           SST        AST
    1107  P 101-9-000      MCPM    IS-NR         Active     -----
       IP Link A                   IS-NR         Active     Available
    1109   101-9-000       MCPM    OOS-MT        Fault      -----
       IP Link A                   OOS-MT        Fault      Unavailable

    CARD 1107 ALARM STATUS = No Alarms
    CARD 1109 ALARM STATUS = Card is isolated from the system
    Command Completed.
;
```

EAGLE 5 ISS Debug Commands

The *Commands Manual* contains descriptions of debug commands that can be used in assessing and modifying system status and operation. Most of the debug commands are used only under the direction of Tekelec support personnel.

The `ent-trace` command can be used to trace MSUs sent to Service Module cards that are running the VSCCP application. The EAGLE 5 ISS traps MSUs that meet the specified tracing criteria, which include DN, some point codes, Entity ID, and message verification and message processing errors.

Refer to the *Commands Manual* for a complete description of the *ent-trace* command.

Chapter 4

ATINP Configuration

Topics:

This chapter provides procedures for configuring the ATINP feature for use in the EAGLE 5 ISS.

Introduction

The ATINP feature is configured on the EAGLE 5 ISS and on the EPAP. This chapter covers the EAGLE 5 ISS configuration only. The EPAP configuration is covered in the *EPAP Administration Manual*.

The EAGLE 5 ISS configuration of the ATINP feature consists of the following tasks:

- Verify that the EAGLE 5 ISS contains sufficient DSM cards or E5-SM4G cards, or both, running the VSCCP application. See *Adding a Service Module Card* on page 45.

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.

- Enable the ATINP feature, set system STP options, and turn on the ATINP feature. See *Enabling ATINP, Setting STP Options, and Turning On ATINP* on page 47.
- Change the self identification of the EAGLE 5 ISS node to include ITU-I and ITU-N true point codes and ATINP capability point codes. See *Provisioning True Point Code and Capability Point Code* on page 50 and refer to the procedures in the *Database Administration Manual - SS7*.
- Provision mated applications for the ATINP feature that contain the EAGLE 5 ISS ITU-I and ITU-N true point codes, the ATINP capability point codes, and the ATINPQ subsystem number. Refer to the procedures in the *Database Administration Manual - Global Title Translation*.
- Provision the ATINPQ local subsystem application. See *Adding the ATINPQ Local Subsystem Application* on page 52.
- Provision the service selector mechanism to route MSUs to the ATINP subsystem. See *Adding an ATINP Service Selector* on page 57.
- Provision ATINP options. See *Provisioning the ATINP Options* on page 62.
- Activate the ATINP local subsystem. See *Activating the ATINPQ Local Subsystem* on page 63.
- Configure the Measurements Platform if measurements are to be collected for ATINPQ. See *Configuring the Measurements Platform* on page 72.

Provisioning Service Module Cards

EPAP-based features require “Service Module cards” running the VSCCP application.

Any of the following cards can be used as Service Module cards running the VSCCP application in the system:

- DSM 4G – a DSM card with 4 gigabytes of memory
- E5-SM4G - an EPM-based card with 4 gigabytes of memory

This section contains procedures for adding Service Module cards to the system.

Adding a Service Module Card

This procedure uses the `ent-card` command to add Service Module cards to the database, to support the Global Title Translation (GTT) feature, the Enhanced Global Title Translation (EGTT) feature, and EPAP-based features.

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.

A Service Module card can be inserted only in an odd/even numbered pair of empty card slots of an EAGLE 5 ISS shelf. Slots 09 and 10 of each shelf contain an HMUX card or a HIPR card. A Service Module cannot be inserted in slots 09 and 10. Service Module cards can be inserted in the control shelf, but only in slots 01, 03, 05, 07, and 11. A Service Module card occupies two card slots, so the even-numbered card slot to the right of the odd-numbered slot where the Service Module card has been inserted must be empty. The Service Module card is connected to the network through the odd-numbered card slot connector.

Table 6: Service Module Card Locations

Location of the Service Module	Empty Card Location	Location of the Service Module	Empty Card Location
Slot 01	Slot 02	Slot 11	Slot 12
Slot 03	Slot 04	Slot 13	Slot 14
Slot 05	Slot 06	Slot 15	Slot 16
Slot 07	Slot 08	Slot 17	Slot 18

The shelf to which the card is to be added must already be provisioned in the database. This can be verified with the `rtrv-shlf` command. If the shelf is not in the database, refer to the procedure for adding a shelf in the *Database Administration Manual – System Management*.

The card cannot be added to the database if the specified card location already has a card assigned to it.

The system can contain a maximum of 25 Service Module cards for EPAP-based features.

Note: This manual contains brief descriptions of the commands that are used in these procedures to configure EPAP-based features. Refer to the *Commands Manual* for complete descriptions of the commands that are used in this procedure. The complete descriptions include all valid parameter values and output examples.

1. Verify that the GTT feature is on. Enter the `rtrv-feat` command.

   If the GTT feature is on, the GTT = on field appears in the command output.

Note: The `rtrv-feat` command output contains other fields that are not used by this procedure. To see all the fields displayed by the `rtrv-feat` command, refer to the `rtrv-feat` command description in the *Commands Manual*.

- If the GTT feature is on, shown by the entry GTT = on in the `rtrv-feat` command output, continue with *Step 2* on page 46.
- If the GTT feature is off, shown by the entry GTT = off in the `rtrv-feat` command output, use the procedures in the *Database Administration Manual - GTT* to turn on the GTT feature. Then continue with *Step 2* on page 46.

2. Display the cards in the system, by entering the `rtrv-card` command. Odd-even pairs of card locations that do not contain cards (are not listed in the output or are not HMUX or HIPR card locations) could be used for Service Module cards.

```
   rlghncxa03w 08-03-15 16:34:56 EST  EAGLE 39.2.0
   CARD   TYPE      APPL      LSET NAME     LINK SLC LSET NAME     LINK SLC
   1201   LIMDS0    SS7ANSI   LS1           A    0   LS1           B
   1102   DSM       VSCCP     ------------  A    --  ------------  B    --
   1113   GPSM      OAM
   1114   TDM-A
   1115   GPSM      OAM
   1116   TDM-B
   1117   MDAL

;
```

3. If an E5-SM4G card is being added, verify that card locations 09 and 10 contain HIPR cards in the shelf where the E5-SM4G card will be installed.

   Enter the `rept-stat-gpl:gpl=hipr` command to list the installed HIPR cards in the system.

   - If the shelf contains HIPR cards, continue with *Step 4* on page 46.
   - If the shelf does not contain HIPR cards, refer to the *Installation Manual - EAGLE 5 ISS* to install HIPR cards in the shelf. Continue with *Step 4* on page 46.

   Note: Cards should be distributed throughout the system for proper power distribution. Refer to the *Installation Manual - EAGLE 5 ISS* for the shelf power distribution.

4. Verify that the Service Module card has been physically installed into the proper location.

   CAUTION: If the version of the BPDCM GPL on the Service Module card does not match the BPDCM GPL version in the database when the Service Module card is inserted into the card slot, UAM 0002 is generated indicating that these GPL versions do not match. If UAM 0002 has been generated, perform the alarm clearing procedure for UAM 0002 in the *Maintenance* manual before proceeding with this procedure.

5. Add the Service Module card to the database, using the `ent-card` command.
   `ent-card:loc=1301:type=dsm:appl=vsccp`
6. Verify the temperature threshold settings for an E5-SM4G card by performing the "Changing the High-Capacity Card Temperature Alarm Thresholds" procedure in the *Database Administration Manual - SS7*.
7. Verify the changes by entering the `rtrv-card` command with the card location specified.
   `rtrv-card:loc=1102`

```
   rlghncxa03w 08-03-15 16:34:56 EST  EAGLE 39.2.0
   CARD   TYPE      APPL      LSET NAME     LINK SLC LSET NAME     LINK SLC
```

```
    1301   DSM      VSCCP     ------------  A    --  ------------  B
;
```

8. Back up the database changes, by entering the following command.

   `chg-db:action=backup:dest=fixed`

   The following 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.
```

9. Repeat this procedure for each Service Module card that needs to be added to the system.

Enabling ATINP, Setting STP Options, and Turning On ATINP

This procedure is used to enable the ATINP feature, set the system STP options, and turn on the ATINP feature in the EAGLE 5 ISS.

The ATINP feature must be enabled using the ATINP feature part number 893022101 and the feature access key.

Note: Each feature must be purchased before you can receive the feature access key to use to enable the feature. If you are not sure if you have purchased the feature and received the feature access key, contact your Tekelec Sales Representative or Account Representative.

When the ATINP feature is enabled, it is permanently enabled. The ATINP feature cannot be temporarily enabled. After the ATINP feature is enabled and turned on, the ATINP feature can be turned off again.

CAUTION: The ATINP feature cannot be enabled if the LNP feature is on. Enter the `rtrv-ctrl-feat` command to verify whether or not the LNP feature is on. If the LNP feature is on, shown with a quantity greater than zero for the LNP ported TNs field in the command output, this procedure cannot be performed.

Before the ATINP feature can be enabled, the following conditions must exist in the system:

- The ATINP feature requires Service Module cards running the VSCCP application to be configured in the system. If there are no Service Module cards present in the EAGLE 5 ISS, they must be added before the ATINP feature can be enabled and turned on. See *Adding a Service Module Card* on page 45.

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

- The database must contain a valid and locked serial number for the EAGLE 5 ISS. The system 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 after the system is on-site.
- The GTT feature must be turned on.
- The ansigflex system option cannot be enabled.

After the ATINP feature has been enabled, the STP options for the default country code must be changed from **none** to an appropriate value for ATINP. The `chg-stpopts` and `rtrv-stpopts` commands support the defcc and dsmaud parameters for the ATINP feature.

The default country code (defcc) parameter can be provisioned for ATINP after the ATINP feature is enabled. The defcc value must be changed from **none** to appropriated values before the ATINP feature can be turned on in the system. (See the `chg-stpopts` command in the *Commands Manual*.)

In the `rtrv-stpopts` command output:

- The defcc parameter is displayed with value **none** when the ATINP feature is enabled
- The dsmaud parameter is displayed with value off when the ATINP feature is turned on

Provisioning of ATINP options and other information can be done after the feature is enabled and before the feature is turned on.

After the ATINP feature has been enabled, the STP options are set, and database provisioning is complete, the ATINP feature status must be set to on (the feature must be "turned on").

After the feature is turned on:

- The defcc parameter value cannot be set to **none**.
- The DSM audit running state (dsmaud) parameter of the `chg-stpopts` command can be provisioned for ATINP.

1. Verify that the GTT feature is on. Enter the `rtrv-feat` command. If the GTT feature is on, the GTT = on field appears in the command output.

   Note: The `rtrv-feat` command output contains other fields that are not used by this procedure. To see all the fields displayed by the `rtrv-feat` command, refer to the `rtrv-feat` command description in the *Commands Manual*.

   - If the GTT feature is on, go to *Step 3* on page 48.
   - If the GTT feature is off, continue with *Step 2* on page 48.

   Note: After the GTT feature or GWS feature has been turned on with the `chg-feat` command, it cannot be turned off.

2. Turn the GTT feature on, by entering the following command.
   `chg-feat:gtt=on`

   Refer to the *Database Administration Manual - Global Title Translation* for more information about turning on and using the GTT feature.

3. Display the status of the features that are controlled with feature access keys. Enter the `rtrv-ctrl-feat` command. The output lists the enabled features in the system and shows the on/off status for each feature.

```
    rlghncxa03w 08-08-29 16:40:40 EST  EAGLE5 39.2.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on           64
    E5-SM4G Throughput Cap    893019101  on         ----
;
```

   If the `rtrv-ctrl-feat` output shows a LNP ported TNs quantity entry, this procedure cannot be performed.

   If the ATINP entry appears in the `rtrv-ctrl-feat` output with status on, performing this procedure is not necessary.

4. Verify that Service Module cards are configured in the database. Enter the `rtrv-card` command to display the cards in the database. Service Module cards are shown with the entries DSM in the TYPE field and VSCCP in the APPL field of the output.

```
    rlghncxa03w 08-03-15 16:34:56 EST  EAGLE 39.2.0
    CARD   TYPE      APPL      LSET NAME     LINK SLC LSET NAME     LINK SLC
    1201   LIMDS0    SS7ANSI   LS1           A    0   LS1           B
    1102   DSM       VSCCP     ------------  A    --  ------------  B    --
    1113   GPSM      OAM
    1114   TDM-A
    1115   GPSM      OAM
    1116   TDM-B
    1117   MDAL

;
```

   If Service Module cards are not shown in the output of the `rtrv-card` command, go to the *Adding a Service Module Card* on page 45 and add the necessary Service Module cards, making sure that the Service Module cards meet the requirements.

5. Verify that the system serial number is correct and locked. Enter the `rtrv-serial-num` command to display the system serial number and the lock status.

   - If the serial number is correct and locked, continue with *Step 6* on page 49.
   - If the serial number shown in the output is not correct, enter the correct serial number into the database, using the `ent-serial-num` command without the lock parameter. Enter the `rtrv-serial-num` command again to verify that the correct serial number is entered.

     `ent-serial-num:serial=<system serial number>`

     `rtrv-serial-num`

   - If the serial number is correct but is not locked, lock the serial number. Enter the `ent-serial-num` command, specifying the serial number shown in the `rtrv-serial-num` command output and the lock=yes parameter.

     `ent-serial-num:serial=<system serial number>:lock=yes`

6. Enable the ATINP feature, by entering the `enable-ctrl-feat` command.
   `enable-ctrl-feat:partnum=893022101:fak=<feature access key>`

   Note: The feature access key (the fak parameter) is provided by Tekelec. If you do not have the controlled feature part number or the feature access key for the ATINP feature, contact your Tekelec Sales Representative or Account Representative.

   When the feature is enabled, the ATINP entry appears in the output of the `rtrv-ctrl-feat` command.

```
    rlghncxa03w 08-08-29 16:40:40 EST  EAGLE5 39.2.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on            64
    ATINP                     893022101  off         ----
    E5-SM4G Throughput Cap    893019101  on          ----
;
```

7. Verify that the defcc STP option parameter value is not **none**. Enter the `rtrv-stpopts` command.

   - If the value is not **none**, continue with *Step 8* on page 50..

- If the parameter value is **none**, use the `chg-stpopts` command to provision a new value. Then continue with *Step 8* on page 50.

Note: Database provisioning of PATINP options can be done here, before the PATINP feature is turned on in the system.

8. Turn on the ATINP feature, by entering the `chg-ctrl-feat` command.
`chg-ctrl-feat:partnum=893022101:status=on`

   When the feature is turned on, the status changes to on in the `rtrv-ctrl-feat` command output.

```
    rlghncxa03w 08-08-29 16:40:40 EST  EAGLE5 39.2.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on            64
    ATINP                     893022101  on          ----
    E5-SM4G Throughput Cap    893019101  on          ----
;
```

9. Back up the database changes, by entering the following command.
`chg-db:action=backup:dest=fixed`

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

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

Provisioning True Point Code and Capability Point Code

This procedure explains briefly how to provision EAGLE 5 ISS true point codes, and capability point codes for EPAP-based features. Refer to the detailed procedures in the *Database Administration Manual - SS7* for provisioning true and capability point codes, and the CLLI if needed.

1. Display the true and capability point codes in the system. Enter the `rtrv-sid` command.

```
    tekelecstp 08-07-22 15:07:48 EST  EAGLE 39.2.0

       PCA            PCI          PCN               CLLI             PCTYPE

       -----------     -------      -----              tekelecstp        ANSI
;
```

2. Verify that the desired EPAP-based feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command.

```
    rlghncxa03w 08-07-29 16:40:40 EST  EAGLE5 39.2.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012701  on            64
    ATINP                     893022101  on          ----
    E5-SM4G Throughput Cap    893019101  on          ----
;
```

- If the feature entry appears in the command output, and the feature status is on, continue with *Step 3* on page 51.
- If the feature entry does not appear in the command output or if the feature status in the entry is off, go to the procedure in this manual to enable and turn on the EPAP-based feature. Continue with *Step 3* on page 51.

3. Change the true point codes and capability point codes as needed, using the `chg-sid` command.
4. Verify the changes with the `rtrv-sid` command.

```
    tekelecstp 08-08-22 15:07:48 EST  EAGLE 39.2.0

       PCA             PCI          PCN               CLLI             PCTYPE

       001-001-001      2-002-2      01234              tekelecstp        ANSI


       CPCA (ATINP)
       004-004-004

       CPCI (ATINP)
       5-012-0

       CPCN (ATINP)
       12345

;
```

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

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

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

Provisioning a Mated Application using True Point Code

Before the ATINPQ local subsystem application can be added to the database:

- The EAGLE 5 ISS true point codes appropriate for the network type must be defined in the system (ANSI, ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare are supported). See *Provisioning True Point Code and Capability Point Code* on page 50.
- The provisioned true point codes and a subsystem number must be entered into the Mated Application (MAP) table.

  When multiple point code types are assigned to a local subsystem, they must have the same subsystem number. The subsystem number is linked to a service type. In order for all point code types to reach the local subsystem, the MSU must have this one subsystem number.

Use the procedures in the *Database Administration Manual – Global Title Translation* to add an EAGLE 5 ISS true point code and the subsystem number to a solitary or dominant mated application.

The ATINPQ subsystem can have a mate subsystem and a concerned point code group assigned to it in the MAP table.

The ATINPQ subsystem mated application cannot be set to Load Shared mode (as end nodes do not perform load sharing), but can be set only to Dominant or Solitary mode.

If multiple point code types for ATINPQ are provisioned in the MAP table, then the point code type for the Subsystem Out-of-Service Request message (SOR) is determined using the following order:

1. ANSI
2. ITU-N
3. ITU-N Spare
4. ITU-I
5. ITU-I Spare

Provisioning the ATINPQ Local Subsystem

The following procedures in this section are used to add, remove, or change the online/offline status of a local subsystem application:

- *Adding the ATINPQ Local Subsystem Application* on page 52
- *Removing the ATINPQ Local Subsystem Application* on page 54
- *Taking the Subsystem Application Offline* on page 66
- *Taking the Subsystem Application Online* on page 69

Note: The EAGLE 5 ISS supports the operation of two or more local subsystems for EPAP-based features in the system at one time. For example, the local subsystems for ATINP and EIR can coexist in the system.

Adding the ATINPQ Local Subsystem Application

This procedure is used to reserve a subsystem number for the ATINPQ subsystem application, and to place the ATINPQ subsystem application either online or offline.

Before the ATINPQ subsystem application can be added to the database, the following conditions must exist in the system:

- The ATINP feature must be enabled and turned on. See *Enabling ATINP, Setting STP Options, and Turning On ATINP* on page 47.
- The application specified by the appl parameter (atinpq) cannot already be in the SS-APPL database table.
- The EAGLE 5 ISS ITU-I and 14-bit ITU-N true point code and an assigned subsystem number must be in the MAP table. Only one subsystem number for the application can be defined. See *Provisioning a Mated Application using True Point Code* on page 51 and the procedures in the *Database Administration Manual – Global Title Translation* for provisioning solitary and dominant mated applications.

If the stat parameter is not specified in the command, the application will be offline.

The examples in this procedure reserve the subsystem number 100 for the ATINPQ subsystem application and set the ATINPQ subsystem application status to online.

1. Verify that the ATINP feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command.

```
    rlghncxa03w 08-08-29 16:40:40 EST  EAGLE5 39.2.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on            64
    ATINP                     893024401  on          ----
    E5-SM4G Throughput Cap    893019101  on          ----
;
```

   - If the ATINP feature is enabled and turned on, the ATINP entry shows a status of on. Continue with *Step 2* on page 53
   - If the ATINP feature is not enabled or turned on, go to the procedure in *Enabling ATINP, Setting STP Options, and Turning On ATINP* on page 47 to enable and turn on the feature.

     Return to this procedure and continue with *Step 2* on page 53.

2. Verify that EAGLE 5 ISS true point codes are defined in the system. Enter the `rtrv-sid` command. The EAGLE 5 ISS true point codes are shown in the PCA, PCI, and PCN fields of the `rtrv-sid` output.

```
    tekelecstp 08-08-22 15:07:48 EST  EAGLE 39.2.0

       PCA            PCI          PCN               CLLI             PCTYPE

       001-001-001     2-002-2      01234              tekelecstp        ANSI


       CPCA (ATINPQ)
       004-004-004

       CPCI (ATINPQ)
       5-012-0

       CPCN (ATINPQ)
       12345

;
```

   If the `rtrv-sid` output does not show entries in the PCA, PCI or PCN fields, or if the true point code values need to be changed, See *Provisioning True Point Code and Capability Point Code* on page 50 and the "Changing the Self-Identification of the System" procedure in the *Database Administration Manual - SS7* to add the correct point code values.

   Continue with *Step 3* on page 53.

3. Verify that the EAGLE 5 ISS true point codes (from *Step 2* on page 53) and a subsystem number that can be used for ATINPQ are available in the MAP table. Enter the `rtrv-map` command.

   If EAGLE 5 ISS true point codes and ATINPQ subsystem number are not shown in the `rtrv-map` output, go to the "Provisioning a Mated Application" procedure in the *Database Administration Manual – Global Title Translation* and add the EAGLE 5 ISS true point codes and a subsystem to a mated application..

4. Verify that the ATINPQ application is not already defined the database. Enter the `rtrv-ss-appl` command. The ATINPQ entry should not appear in the output.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT

    SS-APPL TABLE IS 0% FULL (0 OF 4)
;
```

5. Add the ATINPQ application and subsystem number, using the `ent-ss-appl` command.

   If the stat parameter is not specified, the status defaults to offline.

   `ent-ss-appl:appl=atinpq:ssn=100:stat=online`

6. Verify the changes, by entering the `rtrv-ss-appl` command.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT
    ATINPQ 100   online

    SS-APPL TABLE IS 25% FULL (1 OF 4)
;
```

7. Back up the changes using the chg-db:action=backup:dest=fixed command. The following messages appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

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

Removing the ATINPQ Local Subsystem Application

This procedure is used to remove a subsystem application from the database. The subsystem application to be removed must be in the database and the subsystem must be out of service.

1. Display the subsystem application number for the ATINPQ application in the database, by entering the `rtrv-ss-appl` command.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT
    ATINPQ 11   online

    SS-APPL TABLE IS 25% FULL (1 OF 4)
;
```

2. Display the operating status of the ATINPQ subsystem, by entering the `rept-stat-sccp` command.

   If the ATINPQ subsystem is out of service, shown by the entry `ATINPQ SUBSYSTEM REPORT OOS-MT-DSBLD` in the `rept-stat-sccp` output, go to *Step 5* on page 56.

```
    tklc1170501 08-08-18 10:16:24 EST  EAGLE5 39.2.0
    SCCP SUBSYSTEM REPORT IS-NR          Active     -----
         SCCP ALARM STATUS = No Alarms
    ATINPQ SUBSYSTEM REPORT IS-NR         Active     -----
         ATINP: SSN STATUS = Allowed     MATE SSN STATUS = ----------
         ATINP ALARM STATUS = No Alarms
    GFLEX SERVICE REPORT IS-NR           Active     -----
         GFLEX ALARM STATUS = No Alarms
    GPORT SERVICE REPORT IS-NR           Active     -----
         GPORT ALARM STATUS = No Alarms

    SCCP Cards Configured=25      Cards IS-NR=25
    System Daily Peak SCCP Load       15639  TPS 06-09-18 06:14:24
    System Overall Peak SCCP Load     21062  TPS 06-09-15 14:24:38
    System Total SCCP Capacity        21250  TPS (21250  max SCCP Capacity)
    System SCCP Capacity Calc. Method (N)
    System TPS Alarm Threshold        17000  TPS ( 80% System   N SCCP
Capacity)
```

```
    CARD   VERSION      PST           SST        AST       MSU   CPU
                                                           USAGE USAGE
    ------------------------------------------------------------------
    1217   126-030-000  IS-NR         Active     -----     100%   45%
    1317   126-030-000  IS-NR         Active     -----     100%   51%
    2217   126-030-000  IS-NR         Active     -----     100%   42%
    3201   126-030-000  IS-NR         Active     -----      54%   25%
    3203   126-030-000  IS-NR         Active     -----      55%   25%
    3205   126-030-000  IS-NR         Active     -----      57%   27%
    3207   126-030-000  IS-NR         Active     -----      69%   29%
    3211   126-030-000  IS-NR         Active     -----      85%   35%
    3213   126-030-000  IS-NR         Active     -----      94%   37%
    3215   126-030-000  IS-NR         Active     -----      86%   35%
    3217   126-030-000  IS-NR         Active     -----      74%   31%
    4217   126-030-000  IS-NR         Active     -----      64%   28%
    4317   126-030-000  IS-NR         Active     -----     100%   41%
    5117   126-030-000  IS-NR         Active     -----     100%   40%
    5317   126-030-000  IS-NR         Active     -----      56%   25%
    6101 P 126-030-000  IS-NR         Active     -----      57%   32%
    6103   126-030-000  IS-NR         Active     -----      63%   27%
    6105   126-030-000  IS-NR         Active     -----      69%   37%
    6107   126-030-000  IS-NR         Active     -----      66%   29%
    6111   126-030-000  IS-NR         Active     -----      59%   27%
    6113   126-030-000  IS-NR         Active     -----      55%   34%
    6115   126-030-000  IS-NR         Active     -----      55%   26%
    6117   126-030-000  IS-NR         Active     -----      54%   26%
    1105   126-030-000  IS-NR         Active     -----      55%   26%
    1107   126-030-000  IS-NR         Active     -----      55%   26%
    ------------------------------------------------------------------
    SCCP Service Average MSU Capacity =  71%   Average CPU Capacity =  32%

    AVERAGE CPU USAGE PER SERVICE:
      GTT   =   1%  GFLEX =   4%  GPORT =   0%
      ATINPQ =  2%

    TOTAL SERVICE STATISTICS:
                                    FAIL     REROUTE\      FORWARD
      SERVICE    SUCCESS    ERRORS   RATIO     WARNINGS        TO GTT
TOTAL
      GTT:          3510        15      0%            -             -
3525
     GFLEX:      100043         0      0%            0             0    100043

     GPORT:      312203         0      0%           15          1879    314097

      ATINPQ:      23157         0      0%            -             -
23157


    Command Completed.
;
```

3. Place the ATINPQ subsystem application out of service. Enter the `inh-map-ss` command and specify the ATINPQ subsystem number displayed in *Step 1* on page 54.
   `inh-map-ss:ssn=100`

```
rlghncxa03w 08-06-28 14:42:38 GMT EAGLE 39.2.0
Inhibit map subsystem command sent to all SCCP cards.
Command Completed.
```

When this command has successfully completed, the following message appears. If the force=yes parameter is not specified, wait for a message that indicates the subsystem is inhibited.

```
rlghncxa03w 08-06-28 14:42:38 GMT EAGLE 39.2.0
Inhibit map subsystem command sent to all SCCP cards.
Command Completed.
```

4. Verify that the ATINPQ subsystem is out of service (OOS-MT-DSBLD), by entering the `rept-stat-sccp` command. If the ATINPQ subsystem is not out of service, return to *Step 3* on page 55 and enter the `inh-map-ss` command with the force=yes parameter specified.

```
    e1030701 08-07-18 02:44:41 EST  EAGLE 39.2.0
    SCCP SUBSYSTEM REPORT IS-NR         Active     -----
      SCCP ALARM STATUS = No Alarms
    ATINPQ SUBSYSTEM REPORT OOS-MT_DSBLD Active     -----
         ATINPQ: SSN STATUS = Inhibited     MATE SSN STATUS = ----------
         ATINPQ ALARM STATUS = *C  0529 Service is disabled

    SCCP Cards Configured= 1      Cards IS-NR= 1
    System Daily Peak SCCP Load       0      TPS 00-00-15 00:41:06
    System Overall Peak SCCP Load     0      TPS 00-00-00 00:00:00
    System Total SCCP Capacity        1100   TPS (1100   max SCCP Capacity)
    System SCCP Capacity Calc. Method (N)
    System TPS Alarm Threshold        880    TPS ( 80% System   N SCCP
Capacity)

    CARD   VERSION      PST           SST        AST       MSU   CPU
                                                           USAGE USAGE
    ------------------------------------------------------------------
    1105 P 039-007-001  IS-NR         Active     -----       0%    6%
    ------------------------------------------------------------------
    SCCP Service Average MSU Capacity =   0%   Average CPU Capacity =   6%

    AVERAGE CPU USAGE PER SERVICE:
      GTT   =   0%  ATINPQ =   0

    TOTAL SERVICE STATISTICS:
                                      FAIL     REROUTE\       FORWARD
      SERVICE    SUCCESS    ERRORS   RATIO    WARNINGS        TO GTT
TOTAL
      GTT:             0         0      0%           -             -
  0
      ATINPQ           0         0      0%           0             0
  0

    Command Completed.
;
```

5. Remove the ATINPQ subsystem application from the database, by entering the `dlt-ss-appl` command.
   `dlt-ss-appl:appl=atinpq`
6. Verify the changes by entering the `rtrv-ss-appl` command. The deleted entry should not appear in the output.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT

    SS-APPL TABLE IS 0% FULL (0 OF 4)
;
```

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

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

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

Provisioning the ATINP Service Selector

The procedures in this section describe how to add, change, and remove a service selector. The information is indicated that is specific to ATINP.

The commands that are used in these procedures are described briefly in *EAGLE 5 ISS Service Selector Commands* on page 24, and in detail in the *Commands Manual*.

Adding an ATINP Service Selector

This procedure is used to add a service selector for the ATINP feature.

The ATINP feature must be enabled and turned on before an ATINP service selector can be added.

1. Verify that the ATINP feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command.

   If the ATINP feature is enabled and turned on, the status of the ATINP entry is on.

```
    rlghncxa03w 08-08-29 16:40:40 EST  EAGLE5 39.2.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on           64
    ATINP                     893024401  on         ----
    E5-SM4G Throughput Cap    893019101  on         ----
;
```

   - If the ATINP feature is enabled and turned on, continue with *Step 2* on page 57.
   - If the ATINP feature is not enabled or turned on, go to *Enabling ATINP, Setting STP Options, and Turning On ATINP* on page 47 to enable and turn on the ATINP feature. Then continue with *Step 2* on page 57.

2. Display any existing ATINP service selectors in the database, by entering the `rtrv-srvsel:serv=atinp` command.

```
    rlghncxa03w 08-06-28 14:42:38 GMT  EAGLE 39.2.0

    GTII  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     1    e164     intl  3    ---   ---    atinp
    4     2    e164     intl  *    ---   ---    atinp


    GTIN  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     4    e164     natl  4    ---   ---    atinp


    SRV SELECTOR table is (3 of 20992) 1 % full
;
```

3. Add new ATINP service selectors, using the `ent-srvsel` command. For example, enter commands like these:

   `ent-srvsel:serv=atinp:tt=35:ssn=100:gtin=4:np=e214:nai=natl`

   `ent-srvsel:serv=atinp:tt=57:ssn=75:gtin=2`

4. Verify the changes by entering the `rtrv-srvsel` command with the parameters and values used in *Step 3* on page 58.

```
    rlghncxa03w 08-06-28 14:42:38 GMT  EAGLE 39.2.0

    GTII  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     1    e164     intl  3    ---   ---    atinp
    4     2    e164     intl  *    ---   ---    atinp


    GTIN  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     4    e164     natl  4    ---   ---    atinp
    4     35   e214     natl  100  ---   ---    atinp
    2     57   ---      ---   75   ---   ---    atinp


    SRV SELECTOR table is (5 of 20992) 1 % full
;
```

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

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

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

Removing a Service Selector

This procedure is used to remove a service selector from the database.

The GTI, GTII, GTIN, tt, and ssn parameter values can be used to limit the amount of information displayed with the `rtrv-srvsel` command.

1. Display the service selectors in the database, by entering the `rtrv-srvsel` command.

```
    rlghncxa03w 08-06-28 14:42:38 GMT  EAGLE 39.2.0
    GTII  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     1    e214     intl  4    e164  intl   gport

    4     1    e214     intl  5    e164  intl   smsmr

    4     2    e214     intl  5    e164  intl   mnpsms

    4     2    e164     intl       ---   ---    vflex


    GTIN  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     4    e214     natl  75   e164  intl   gflex
```

```
    4     9    e214     natl  100  e164  intl   gflex
    4     35   e214     natl  100  ---   ---    atinp
    2     57   e214     natl  75   ---   ---    vflex


    SRV SELECTOR table is (8 of 20992)   1 % full
;
```

2. Remove the service selector from the database, using the `dlt-srvsel` command. For example, enter commands like these.

   `dlt-srvsel:serv=atinp:tt=35:ssn=100:gtin=4:np=e214:nai=natl`

   `dlt-srvsel:serv=atinp:tt=57:ssn=75:gtin=2`

   To remove a service selector, the GTI, GTII, GTIN, tt, and ssn parameter values must be entered as shown in the `rtrv-srvsel` command output.

3. Verify the changes by entering the `rtrv-srvsel` command with the parameters and values used in *Step 2* on page 59.

   `rtrv-srvsel:serv=atinp:tt=35:ssn=100:gtin=4:np=e214:nai=natl`

```
    rlghncxa03w 08-06-28 14:42:38 GMT  EAGLE 39.2.0


    GTIN  TT   NP       NAI   SSN  SNP   SNAI   SERV

    No SRV Selector found in range
;
```

   `rtrv-srvsel:serv=atinp:tt=57:ssn=75:gtin=2`

```
    tekelecstp 08-08-28 16:35:22 EST  EAGLE 39.2.0
    GTII  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
    No SRV Selector found in range
;
```

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

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

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

Changing an Existing Service Selector to an ATINP Service Selector

This procedure is used to change an existing non-ATINP service selector to a ATINP service selector.

The only parameters that can be changed using this procedure are:

:nserv

New DSM service type, ATINP

:nsnp

An ATINP service selector cannot contain an SNP value; if the service selector being changed contains an SNP value, this value must be changed to **none** with this parameter.

:nsnai

An ATINP service selector cannot contain an SNAI value; if the service selector being changed contains an SNAI value, this value must be changed to **none** with this parameter.

The `chg-srvsel` command requires that the following parameters be specified with the values shown in the `rtrv-srvsel` output for the service selector that is being changed. If any of these parameter values need to be changed for a ATINP service selector, use the procedure in *Removing a Service Selector* on page 58 to remove the existing service selector. Then use the procedure in *Adding an ATINP Service Selector* on page 57 to add the new ATINP service selector with the new parameter information.

:gtii/gtin/gtin24

Global title indicator for ITU international (gtii), ITU national using 14-bit point codes (gtin), and ITU national using 24-bit point codes (gtin24).

:tt

Translation type

:ssn

Subsystem number

:nai

Nature of address indicator

:naiv

Nature of address indicator value

:np

Numbering plan

:npv

Numbering plan value

1. Display the service selectors in the database, using the `rtrv-srvsel` command.

```
rlghncxa03w 08-06-28 14:42:38 GMT  EAGLE 39.2.0


GTII  TT   NP       NAI   SSN  SNP   SNAI   SERV
4     1    e214     intl  4    e164  intl   gport
4     1    e214     intl  5    e164  intl   smsmr
4     2    e214     intl  5    e164  intl   mnpsms
4     2    e164     intl  *    ---   ---    vflex
```

```
    GTIN  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     4    e214     natl  34   e164  intl   gflex

    4     9    e214     natl  ---  e164  intl   gflex


    SRV SELECTOR table is (6 of 20992)   1 % full

;
```

2. Verify that the ATINP feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command. If the ATINP feature is enabled and turned on, the status of the ATINP entry is on.

```
    rlghncxa03w 08-08-29 16:40:40 EST  EAGLE5 39.2.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on            64
    ATINP                     893024401  on          ----
    E5-SM4G Throughput Cap    893019101  on          ----
;
```

   - If the ATINP feature is enabled and turned on, continue with *Step 3* on page 61.
   - If the ATINP feature is not enabled or turned on, go to *Enabling ATINP, Setting STP Options, and Turning On ATINP* on page 47 to enable and turn on the ATINP feature. Then continue with *Step 3* on page 61.

3. Change the service selector, using a `chg-srvsel` command similar to the following example.
`chg-srvsel:gtin=4:tt=4:np=e214:nai=natl:ssn=34:nsnp=none:nsnai=none:nserv=atinp`

   Note: If the SNP, or SNAI parameter values are shown as dashes in the `rtrv-srvsel` output, these parameters cannot be specified with the `chg-srvsel` command. If the gtii/gtin/gtin24 parameter value is 2, the np, nai, npv, and naiv parameters cannot be specified with the `chg-srvsel` command.

   If the gtii/gtin/gtin24 parameter value is 4, either the np and nai, or the npv and naiv parameters must be specified with the `chg-srvsel`command. The np and nai parameters can be specified in place of the npv and naiv parameters, and the npv and naiv parameters can be specified in place of the np and naiv parameters as long as parameter values be specified correspond to the values shown in the `rtrv-srvsel`output. Refer to the `chg-srvsel` command description in the *Commands Manual*.

4. Verify the changes by entering the `rtrv-srvsel` command with the serv=atinp parameter and the values for the other parameter that were used in *Step 3* on page 61.

`rtrv-srvsel:gtin=4:tt=4:np=e214:nai=natl:ssn=34:serv=atinp`

```
    rlghncxa03w 08-06-28 14:42:38 GMT  EAGLE 39.2.0


    GTIN  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     4    e214     natl  34   ---   ---    atinp

    SRV SELECTOR table is (6 of 20992)   1 % full

;
```

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

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

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

Provisioning the ATINP Options

1. Verify that the ATINP feature is enabled, by entering the `rtrv-ctrl-feat` command.

   If the ATINP feature has not been turned on, the status in the ATINP entry is off.

```
    rlghncxa03w 08-08-29 16:40:40 EST  EAGLE5 39.2.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on            64
    E5-SM4G Throughput Cap    893019101  on          ----
    ATINP                     893022101  off         ----
;
```

   - If the ATINP feature is not enabled (the ATINP entry does not appear in the output), go to *Enabling ATINP, Setting STP Options, and Turning On ATINP* on page 47 to enable the ATINP feature. Then continue with *Step 2* on page 62.
   - If the ATINP feature is enabled, continue with *Step 2* on page 62.

2. Display the current settings of the ATINP options, using the `rtrv-atinpqopts` command.

```
    tekelecstp 08-05-04 07:53:46 EST  EAGLE 39.2.0

    ATINP OPTIONS
    ---------------------
    ATIACKIMSI   = NONE
    ATIACKMSISDN = MSISDN
    ATIACKRN     = RN
    SNAI         = INTL
    ATIDLM       = NONE
    ATIDFLTRN    = NONE
    ATINPTYPE    = ANY
;
```

3. Change the ATINP options to the desired settings, by entering the `chg-atinpqopts` command with at least one of the ATINP option parameters specified..

   Refer to *EAGLE 5 ISS ATINP Options Commands* on page 25 in this manual and to the `chg-atinpqopts` command description in the *Commands Manual* for valid parameter values, input examples, and rules for entering the command correctly.

```
chg-atinpqopts:atinptype=<type>:snai=<snai>:atidlm=<delimiter>
```

4. Verify the changes, by entering the `rtrv-atinpqopts` command.

```
    tekelecstp 08-05-04 07:53:46 EST  EAGLE 39.2.0

    ATINP OPTIONS
    ---------------------
    ATIACKIMSI   = NONE
```

```
    ATIACKMSISDN = MSISDN
    ATIACKRN     = RN
    SNAI         = NAT
    ATIDLM       = 254565819324258
    ATIDFLTRN    = NONE
    ATINPTYPE    = ALWAYS
;
```

5. If the ATINP feature was not turned on (status is off in the output in *Step 1* on page 62), go to *Enabling ATINP, Setting STP Options, and Turning On ATINP* on page 47 to turn on the feature.
6. Back up the changes, using the `chg-db:action=backup:dest=fixed` command.

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

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

Activating the ATINPQ Local Subsystem

The procedure in this section explains how to activate the ATINPQ local subsystem.

When all feature configuration is complete, the ATINPQ subsystem application must taken online and the local subsystem must be activated to allow it to begin operation.

When the local subsystem operating state is Inhibited, the `chg-ss-appl` command can be used to change the online or offline database state of the subsystem. The `rtrv-ss-appl` command displays the online or offline provisioned value.

When the first Service Module card is loaded, this state tells whether the subsystem should be considered allowed (online) or inhibited (offline). This is a database state. If the command is accepted, then the change is made to the tables and can be read after an `init-sys` command is entered to initialize the system.

When the Service Module cards are in-service and the subsystem application is online, the `alw/inh-map-ss` commands can be used to change the dynamic operating state of the local subsystem to allowed or inhibited. The `inh-map-ss` command does not necessarily force a state change, because it can fail if the mate does not send an SOG. The force=yes parameter must be specified to bypass the SOR/SOG exchange and inhibit immediately. (There is no `rtrv-map-ss` command.)

The procedures in *Changing the State of a Subsystem Application* on page 65 explain how to take a local subsystem online and offline.

Table 7: Subsystem Allow/Inhibit

Command\ Subsystem State	Offline	Online
`alw-map-ss`	Command is rejected because the subsystem must be online to be in the Allowed state.	Attempts to make the local subsystem active.

Command\ Subsystem State	Offline	Online
inh-map-ss	Command accepted, but no action because offline implies inhibited.	Attempts to inhibit the local subsystem. Use of the force=yes parameter bypasses the SOR/SOG exchange and inhibits immediately.
`chg-ss-appl:appl=atinpq :nstat=online`	Changes local subsystem status to online.	No change to local subsystem status in the database.
`chg-ss-appl:appl=atinpq :nstat=offline`	Command is rejected because the subsystem must be inhibited to go offline.	Changes local subsystem database status to offline.

1. Display the online/offline status of the ATINPQ subsystem application, by entering the `rtrv-ss-appl` command.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT
    ATINPQ 11   offline

    SS-APPL TABLE IS 25% FULL (1 OF 4)
;
```

2. Change the ATINPQ subsystem status to online.
`chg-ss-appl:appl=atinpq:nstat=online`
3. Enter the command to allow the ATINPQ subsystem to begin operation.
`alw-map-ss:ssn=<ATINPQ ssn>`

```
    integrat40 08-05-24 10:37:22 EST  EAGLE5 39.2.0
    Allow map subsystem command sent to all SCCP cards.
    Command Completed.
;
```

4. Display the operating status of the ATINPQ subsystem, by entering the `rept-stat-sccp` command.

```
    tklc1170501 08-08-18 10:16:24 EST  EAGLE5 39.2.0
    SCCP SUBSYSTEM REPORT IS-NR          Active     -----
         SCCP ALARM STATUS = No Alarms
    ATINPQ SUBSYSTEM REPORT IS-NR        Active     -----
         ATINPQ: SSN STATUS = Allowed    MATE SSN STATUS = ----------
         ATINPQ ALARM STATUS = No Alarms
    GFLEX SERVICE REPORT IS-NR           Active     -----
         GFLEX ALARM STATUS = No Alarms
    GPORT SERVICE REPORT IS-NR           Active     -----
         GPORT ALARM STATUS = No Alarms

    SCCP Cards Configured=25      Cards IS-NR=25
    System Daily Peak SCCP Load       15639  TPS 06-09-18 06:14:24
    System Overall Peak SCCP Load     21062  TPS 06-09-15 14:24:38
    System Total SCCP Capacity        21250  TPS (21250  max SCCP Capacity)
    System SCCP Capacity Calc. Method (N)
    System TPS Alarm Threshold        17000  TPS ( 80% System   N SCCP
Capacity)

    CARD   VERSION      PST           SST        AST       MSU   CPU
                                                           USAGE USAGE
    ------------------------------------------------------------------
    1217   126-030-000  IS-NR         Active     -----     100%   45%
```

```
    1317   126-030-000  IS-NR         Active     -----     100%   51%
    2217   126-030-000  IS-NR         Active     -----     100%   42%
    3201   126-030-000  IS-NR         Active     -----      54%   25%
    3203   126-030-000  IS-NR         Active     -----      55%   25%
    3205   126-030-000  IS-NR         Active     -----      57%   27%
    3207   126-030-000  IS-NR         Active     -----      69%   29%
    3211   126-030-000  IS-NR         Active     -----      85%   35%
    3213   126-030-000  IS-NR         Active     -----      94%   37%
    3215   126-030-000  IS-NR         Active     -----      86%   35%
    3217   126-030-000  IS-NR         Active     -----      74%   31%
    4217   126-030-000  IS-NR         Active     -----      64%   28%
    4317   126-030-000  IS-NR         Active     -----     100%   41%
    5117   126-030-000  IS-NR         Active     -----     100%   40%
    5317   126-030-000  IS-NR         Active     -----      56%   25%
    6101 P 126-030-000  IS-NR         Active     -----      57%   32%
    6103   126-030-000  IS-NR         Active     -----      63%   27%
    6105   126-030-000  IS-NR         Active     -----      69%   37%
    6107   126-030-000  IS-NR         Active     -----      66%   29%
    6111   126-030-000  IS-NR         Active     -----      59%   27%
    6113   126-030-000  IS-NR         Active     -----      55%   34%
    6115   126-030-000  IS-NR         Active     -----      55%   26%
    6117   126-030-000  IS-NR         Active     -----      54%   26%
    1105   126-030-000  IS-NR         Active     -----      55%   26%
    1107   126-030-000  IS-NR         Active     -----      55%   26%
    ------------------------------------------------------------------
    SCCP Service Average MSU Capacity =  71%   Average CPU Capacity =  32%

    AVERAGE CPU USAGE PER SERVICE:
      GTT   =   1%  GFLEX =   4%  GPORT =   0%
      ATINPQ=   2%

    TOTAL SERVICE STATISTICS:
                                    FAIL     REROUTE\      FORWARD
      SERVICE    SUCCESS    ERRORS   RATIO     WARNINGS        TO GTT
TOTAL
      GTT:          3510        15      0%            -             -
3525
     GFLEX:      100043         0      0%            0             0    100043

     GPORT:      312203         0      0%           15          1879    314097

      ATINPQ:      23157         0      0%            -             -
23157


    Command Completed.
;
```

Changing the State of a Subsystem Application

The procedures in this section are used to set the state of an existing subsystem application to either online or offline.

The online or offline status of the subsystem application is shown in the STAT field of the `rtrv-ss-appl` command output.

The `rept-stat-sccp` command displays the operating state (in or out of service) of the subsystem.

If the subsystem application is to be taken online, the subsystem application must be offline.

When the subsystem is taken online (regardless of how the subsystem was taken offline), the EAGLE 5 ISS sends SNR/SSA. A UAM is generated, indicating that the subsystem is ALLOWED.

If the subsystem application is to be taken offline, the subsystem application must be online. The subsystem must be taken out of service (OOS-MT-DSBLD) with the `inh-map-ss` command before it can be taken offline.

A subsystem application can be taken offline using coordinated state change, or forced offline without using coordinated state change.

When the `inh-map-ss` command is entered for the subsystem, a coordinated shutdown is attempted. If the coordinated shutdown fails, a UIM is generated, indicating that the shutdown failed. If the force parameter is specified, the subsystem is forced to shut down; a coordinated shutdown is not performed.

For coordinated state change, SCMG sends an SOR message to the mated subsystem and will start a T_{coord} timer (30 seconds). If SCMG receives an SOG message from the mated subsystem before the T_{coord} timer expires, SCMG will broadcast SSPs to the concerned point code group, send SBR/SSP, and take the subsystem offline. A UAM is generated, indicating that the subsystem is PROHIBITED. If the SOG is not received before T_{coord} expires, then the inhibit request is denied and a UIM is generated.

When the subsystem is taken offline without coordinated state change, the EAGLE 5 ISS sends SBR/SSPs. A UAM is generated, indicating that the subsystem is PROHIBITED.

When the EAGLE 5 ISS receives an SOR message from its mated subsystem, it will reply with an SOG message if both of the following conditions are met:

- The local subsystem is available
- The total load on the DSM subsystem is less than 45% of its capacity

If either of these conditions is not met, the EAGLE 5 ISS will not reply to the SOR message.

Taking the Subsystem Application Offline

Use the procedure in this section to take a subsystem application offline.

1. Verify the state of the subsystem application - online or offline, by entering the rtrv-ss-appl command.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT
    ATINPQ 11   online

    SS-APPL TABLE IS 25% FULL (1 OF 4)
;
```

   If the ATINPQ subsystem application is offline, this procedure does not need to be performed.

2. Display the operating status of the subsystem by entering the `rept-stat-sccp` command.

```
    tklc1170501 08-08-18 10:16:24 EST  EAGLE5 39.2.0
    SCCP SUBSYSTEM REPORT IS-NR          Active     -----
         SCCP ALARM STATUS = No Alarms
    ATINPQ SUBSYSTEM REPORT IS-NR         Active     -----
         ATINPQ: SSN STATUS = Allowed     MATE SSN STATUS = ----------
         ATINPQ ALARM STATUS = No Alarms
    GFLEX SERVICE REPORT IS-NR           Active     -----
         GFLEX ALARM STATUS = No Alarms
    GPORT SERVICE REPORT IS-NR           Active     -----
         GPORT ALARM STATUS = No Alarms
```

```
    SCCP Cards Configured=25      Cards IS-NR=25
    System Daily Peak SCCP Load       15639  TPS 06-09-18 06:14:24
    System Overall Peak SCCP Load     21062  TPS 06-09-15 14:24:38
    System Total SCCP Capacity        21250  TPS (21250  max SCCP Capacity)
    System SCCP Capacity Calc. Method (N)
    System TPS Alarm Threshold        17000  TPS ( 80% System   N SCCP
Capacity)

    CARD   VERSION      PST           SST        AST       MSU   CPU
                                                           USAGE USAGE
    ------------------------------------------------------------------
    1217   126-030-000  IS-NR         Active     -----     100%   45%
    1317   126-030-000  IS-NR         Active     -----     100%   51%
    2217   126-030-000  IS-NR         Active     -----     100%   42%
    3201   126-030-000  IS-NR         Active     -----      54%   25%
    3203   126-030-000  IS-NR         Active     -----      55%   25%
    3205   126-030-000  IS-NR         Active     -----      57%   27%
    3207   126-030-000  IS-NR         Active     -----      69%   29%
    3211   126-030-000  IS-NR         Active     -----      85%   35%
    3213   126-030-000  IS-NR         Active     -----      94%   37%
    3215   126-030-000  IS-NR         Active     -----      86%   35%
    3217   126-030-000  IS-NR         Active     -----      74%   31%
    4217   126-030-000  IS-NR         Active     -----      64%   28%
    4317   126-030-000  IS-NR         Active     -----     100%   41%
    5117   126-030-000  IS-NR         Active     -----     100%   40%
    5317   126-030-000  IS-NR         Active     -----      56%   25%
    6101 P 126-030-000  IS-NR         Active     -----      57%   32%
    6103   126-030-000  IS-NR         Active     -----      63%   27%
    6105   126-030-000  IS-NR         Active     -----      69%   37%
    6107   126-030-000  IS-NR         Active     -----      66%   29%
    6111   126-030-000  IS-NR         Active     -----      59%   27%
    6113   126-030-000  IS-NR         Active     -----      55%   34%
    6115   126-030-000  IS-NR         Active     -----      55%   26%
    6117   126-030-000  IS-NR         Active     -----      54%   26%
    1105   126-030-000  IS-NR         Active     -----      55%   26%
    1107   126-030-000  IS-NR         Active     -----      55%   26%
    ------------------------------------------------------------------
    SCCP Service Average MSU Capacity =  71%   Average CPU Capacity =  32%

    AVERAGE CPU USAGE PER SERVICE:
      GTT   =   1%  GFLEX =   4%  GPORT =   0%
      ATINPQ =  2%

    TOTAL SERVICE STATISTICS:
                                      FAIL     REROUTE\      FORWARD
      SERVICE    SUCCESS    ERRORS   RATIO    WARNINGS        TO GTT
TOTAL
      GTT:          3510        15      0%           -             -
3525
     GFLEX:       100043         0      0%           0             0    100043

     GPORT:       312203         0      0%          15          1879    314097

      ATINPQ:      23157         0      0%           -             -
23157


    Command Completed.
;
```

3. Place the subsystem out of service. Specify the subsystem number displayed in the output in *Step 1* on page 66.

```
inh-map-ss:ssn=100
```

```
    rlghncxa03w 08-06-28 14:42:38 GMT EAGLE 39.2.0
    Inhibit map subsystem command sent to all SCCP cards.
    Command Completed.
;
```

4. Verify that the subsystem is out of service, by entering the `rept-stat-sccp` command.

```
    tklc1170501 08-08-18 10:16:24 EST  EAGLE5 39.2.0
    SCCP SUBSYSTEM REPORT IS-NR          Active     -----
         SCCP ALARM STATUS = No Alarms
    ATINPQ SUBSYSTEM REPORT OOS-MT-DSBLD  Active     -----
         ATINPQ: SSN STATUS = Inhibited   MATE SSN STATUS = ----------
         ATINPQ ALARM STATUS = No Alarms
    GFLEX SERVICE REPORT IS-NR           Active     -----
         GFLEX ALARM STATUS = No Alarms
    GPORT SERVICE REPORT IS-NR           Active     -----
         GPORT ALARM STATUS = No Alarms

    SCCP Cards Configured=25      Cards IS-NR=25
    System Daily Peak SCCP Load       15639  TPS 06-09-18 06:14:24
    System Overall Peak SCCP Load     21062  TPS 06-09-15 14:24:38
    System Total SCCP Capacity        21250  TPS (21250  max SCCP Capacity)
    System SCCP Capacity Calc. Method (N)
    System TPS Alarm Threshold        17000  TPS ( 80% System   N SCCP
Capacity)

    CARD   VERSION      PST           SST        AST       MSU   CPU
                                                           USAGE USAGE
    ------------------------------------------------------------------
    1217   126-030-000  IS-NR         Active     -----     100%   45%
    1317   126-030-000  IS-NR         Active     -----     100%   51%
    2217   126-030-000  IS-NR         Active     -----     100%   42%
    3201   126-030-000  IS-NR         Active     -----      54%   25%
    3203   126-030-000  IS-NR         Active     -----      55%   25%
    3205   126-030-000  IS-NR         Active     -----      57%   27%
    3207   126-030-000  IS-NR         Active     -----      69%   29%
    3211   126-030-000  IS-NR         Active     -----      85%   35%
    3213   126-030-000  IS-NR         Active     -----      94%   37%
    3215   126-030-000  IS-NR         Active     -----      86%   35%
    3217   126-030-000  IS-NR         Active     -----      74%   31%
    4217   126-030-000  IS-NR         Active     -----      64%   28%
    4317   126-030-000  IS-NR         Active     -----     100%   41%
    5117   126-030-000  IS-NR         Active     -----     100%   40%
    5317   126-030-000  IS-NR         Active     -----      56%   25%
    6101 P 126-030-000  IS-NR         Active     -----      57%   32%
    6103   126-030-000  IS-NR         Active     -----      63%   27%
    6105   126-030-000  IS-NR         Active     -----      69%   37%
    6107   126-030-000  IS-NR         Active     -----      66%   29%
    6111   126-030-000  IS-NR         Active     -----      59%   27%
    6113   126-030-000  IS-NR         Active     -----      55%   34%
    6115   126-030-000  IS-NR         Active     -----      55%   26%
    6117   126-030-000  IS-NR         Active     -----      54%   26%
    1105   126-030-000  IS-NR         Active     -----      55%   26%
    1107   126-030-000  IS-NR         Active     -----      55%   26%
    ------------------------------------------------------------------
    SCCP Service Average MSU Capacity =  71%   Average CPU Capacity =  32%

    AVERAGE CPU USAGE PER SERVICE:
      GTT   =   1%  GFLEX =   4%  GPORT =   0%
      ATINPQ =  2%

    TOTAL SERVICE STATISTICS:
                                      FAIL     REROUTE\      FORWARD
```

```
      SERVICE    SUCCESS    ERRORS   RATIO     WARNINGS        TO GTT
TOTAL
      GTT:          3510        15      0%            -             -
3525
     GFLEX:      100043         0      0%            0             0    100043

     GPORT:      312203         0      0%           15          1879    314097

      ATINPQ:      23157          0      0%            -             -
23157


    Command Completed.
;
```

5. Take the subsystem offline. Enter the `chg-ss-appl` command with the nstat=offline parameter.
   `chg-ss-appl:appl=atinpq:nstat=offline`
6. Verify the changes by entering the `rtrv-ss-appl` command.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT
    ATINPQ 11   offline

    SS-APPL TABLE IS 25% FULL (1 OF 4)
;
```

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

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

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

Taking the Subsystem Application Online

Use the procedure in this section to take the subsystem application online.

1. Verify the state of the subsystem application - online or offline, by entering the rtrv-ss-appl command.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT
    ATINPQ 11   offline

    SS-APPL TABLE IS 25% FULL (1 OF 4)
;
```

   If the ATINPQ subsystem is online, this procedure does not need to be performed.

2. Display the operating status of the subsystem by entering the `rept-stat-sccp` command.

```
    tklc1170501 08-08-18 10:16:24 EST  EAGLE5 39.26.0
    SCCP SUBSYSTEM REPORT IS-NR          Active     -----
         SCCP ALARM STATUS = No Alarms
    ATINPQ SUBSYSTEM REPORT OOS-MT-DSBLD  Active     -----
         ATINPQ: SSN STATUS = Inhibited   MATE SSN STATUS = ----------
         ATINPQ ALARM STATUS = No Alarms
    ATINPQ SERVICE REPORT IS-NR           Active     -----
         GFLEX ALARM STATUS = No Alarms
    GPORT SERVICE REPORT IS-NR           Active     -----
```

```
         GPORT ALARM STATUS = No Alarms

    SCCP Cards Configured=25      Cards IS-NR=25
    System Daily Peak SCCP Load       15639  TPS 06-09-18 06:14:24
    System Overall Peak SCCP Load     21062  TPS 06-09-15 14:24:38
    System Total SCCP Capacity        21250  TPS (21250  max SCCP Capacity)
    System SCCP Capacity Calc. Method (N)
    System TPS Alarm Threshold        17000  TPS ( 80% System   N SCCP
Capacity)

    CARD   VERSION      PST           SST        AST       MSU   CPU
                                                           USAGE USAGE
    ------------------------------------------------------------------
    1217   126-030-000  IS-NR         Active     -----     100%   45%
    1317   126-030-000  IS-NR         Active     -----     100%   51%
    2217   126-030-000  IS-NR         Active     -----     100%   42%
    3201   126-030-000  IS-NR         Active     -----      54%   25%
    3203   126-030-000  IS-NR         Active     -----      55%   25%
    3205   126-030-000  IS-NR         Active     -----      57%   27%
    3207   126-030-000  IS-NR         Active     -----      69%   29%
    3211   126-030-000  IS-NR         Active     -----      85%   35%
    3213   126-030-000  IS-NR         Active     -----      94%   37%
    3215   126-030-000  IS-NR         Active     -----      86%   35%
    3217   126-030-000  IS-NR         Active     -----      74%   31%
    4217   126-030-000  IS-NR         Active     -----      64%   28%
    4317   126-030-000  IS-NR         Active     -----     100%   41%
    5117   126-030-000  IS-NR         Active     -----     100%   40%
    5317   126-030-000  IS-NR         Active     -----      56%   25%
    6101 P 126-030-000  IS-NR         Active     -----      57%   32%
    6103   126-030-000  IS-NR         Active     -----      63%   27%
    6105   126-030-000  IS-NR         Active     -----      69%   37%
    6107   126-030-000  IS-NR         Active     -----      66%   29%
    6111   126-030-000  IS-NR         Active     -----      59%   27%
    6113   126-030-000  IS-NR         Active     -----      55%   34%
    6115   126-030-000  IS-NR         Active     -----      55%   26%
    6117   126-030-000  IS-NR         Active     -----      54%   26%
    1105   126-030-000  IS-NR         Active     -----      55%   26%
    1107   126-030-000  IS-NR         Active     -----      55%   26%
    ------------------------------------------------------------------
    SCCP Service Average MSU Capacity =  71%   Average CPU Capacity =  32%

    AVERAGE CPU USAGE PER SERVICE:
      GTT   =   1%  GFLEX =   4%  GPORT =   0%
      ATINPQ =  2%

    TOTAL SERVICE STATISTICS:
                                        FAIL     REROUTE\      FORWARD
      SERVICE    SUCCESS    ERRORS    RATIO     WARNINGS        TO GTT
TOTAL
      GTT:          3510        15      0%            -             -
3525
     GFLEX:      100043         0      0%            0             0    100043

     GPORT:      312203         0      0%           15          1879    314097

      ATINPQ       23157         0      0%            -             -
23157


    Command Completed.
;
```

3. Take the subsystem application online. Enter the `chg-ss-appl` command with the nstat=online parameter.

```
chg-ss-appl:appl=atinpq:nstat=online
```

4. Verify the changes by entering the `rtrv-ss-appl` command.

```
    tekelecstp 08-07-25 08:02:22 EST  EAGLE 39.2.0
    APPL   SSN  STAT
    ATINPQ  11   online

    SS-APPL TABLE IS 25% FULL (1 OF 4)
;
```

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

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

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

Activating the E5-SM4G Throughput Capacity Feature

The E5-SM4G Throughput Capacity 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 are enabled and turned on.

The E5-SM4G Throughput Capacity feature must be enabled using the E5-SM4G Throughput Capacity feature part number 893019101 and the feature access key.

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

Note: The E5-SM4G Throughput Capacity feature must be purchased before you can receive the feature access key to use to enable the E5-SM4G Throughput Capacity feature. If you are not sure if you have purchased the E5-SM4G Throughput Capacity feature and received the feature access key, contact your Tekelec Sales Representative or Account Representative.

After the E5-SM4G Throughput Capacity feature is enabled and turned on, the E5-SM4G Throughput Capacity feature cannot be turned off. When the E5-SM4G Throughput Capacity feature is enabled, it is permanently enabled. The E5-SM4G Throughput Capacity feature cannot be temporarily enabled.

Before the E5-SM4G Throughput Capacity feature can be enabled, the following conditions must exist in the system:

- The E5-SM4G Throughput Capacity feature requires 25 E5-SM4G cards running the VSCCP application to be configured in the system. This feature increases the processing capacity of SCCP traffic for an EAGLE 5 ISS processing EPAP-based traffic to 75,000 transactions per second. If there are no E5-SM4G cards present in the EAGLE 5 ISS, they must be added before the E5-SM4G Throughput Capacity feature can be enabled and turned on. See *Adding a Service Module Card* on page 45.

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.

- HIPR cards must be installed in card locations 09 and 10 in all shelves that contain E5-SM4G cards.
- The database must contain a valid and locked serial number for the EAGLE 5 ISS. The system 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 after the system is on-site.
- The GTT feature must be turned on.

After the E5-SM4G Throughput Capacity feature has been enabled, the E5-SM4G Throughput Capacity feature status must be set to on (the feature must be "turned on").

Configuring the Measurements Platform

The EAGLE 5 ISS can collect daily and hourly measurements for the ATINPQ service of the ATINP feature. ATINPQ measurements are collected only by the EAGLE 5 ISS Measurements Platform. UI measurements reports are not available for ATINPQ.

See *ATINP Measurements* on page 81 in this manual for information about measurements for ATINP.

Refer to the *Maintenance* manual for descriptions of the measurements reports for ATINP.

Refer to the procedures in the *Database Administration Manual - System Management* for configuring the Measurements Platform feature and the EAGLE OA&M IP Security feature in the EAGLE 5 ISS.

Chapter 5

Maintenance and Measurements

Topics:

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

Hardware Requirements

EPAP-related features require Service Module cards (DSM cards or E5-SM4G cards) running the VSCCP application. The EAGLE 5 ISS can be equipped with from 1 to 25 Service Module cards to support EPAP-related features.

CAUTION:

EPAP-related features require EPAP running in a T1000 AS based MPS system.

EPAP Status and Alarms

Because EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 ISS terminals, maintenance, measurements, and status information are routed through a Service Module card. EPAP sends two types of messages to the Service Module card: *EPAP Maintenance Blocks* on page 74 and *DSM Status Requests* on page 75. Each message type is discussed in the following sections.

EPAP Maintenance Blocks

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

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

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

- Current MPS Database Size - a field indicating the current RTDB size. The Service Module card uses this information to calculate the percentage of memory utilized by the RTDB.

DSM Status Requests

When the EPAP needs to know the status of a Service Module card, it sends a DSM status request to that Service Module card. Because status messages are sent over UDP, the EPAP broadcasts the DSM status request (to all Service Module cards) and each Service Module card returns its status to the EPAP.

DSM Status Reporting to the EPAP

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

DSM Status Messages – When Sent

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

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

DSM Status Messages Fields

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

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

  Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module card database capacity requirements.
- **Load Mode Status**. This indicator indicates whether or not 80% of the IS-NR (In-Service Normal) LIMs have access to SCCP services.

ATINPQ Subsystem Alarms (UAMs)

This section contains a list of EAGLE 5 ISS UAMs that support the ATINPQ local subsystem . All ATINPQ-related UAMs are generated to the APSS Output Group and use the ATINP System format.

Refer to the *Maintenance* Manual for descriptions and corrective procedures for EAGLE 5 ISS-related alarms.

Refer to the *MPS Platform Software and Maintenance Manual - EAGLE 5 ISS with T1000 AS* for descriptions and corrective procedures for MPS-related alarms.

Table 8: ATINPQ UAMs

UAM	Severity	Message Text	Alarm Condition
0565	Critical	ATINPQ Subsystem is not available	No SCCP cards have an ATINPQ status of Active (all are OOS or loading)
0566	Critical	ATINPQ Subsystem is disabled	All IS-NR SCCP cards have ATINPQ status of offline (with at least 1 card IS-NR). An inh-map-ss command has been executed.
0567	Minor	ATINPQ Subsystm normal, cards(s) abnorml	1 SCCP card has ATINPQ status of Active and there are 1 or more cards with ATINPQ status other the Active (offline or loading)
0568	None	ATINPQ Subsystem is available	All SCCP cards are IS-NR and have an ATINPQ status of Active
0569	None	ATINPQ Subsystem is removed	Last SCCP card deleted

EPAP System Status Reports

This section describes the following EPAP status reporting:

- System status
- EPAP-based feature status
- DSM memory capacity status
- Loading mode support status

System Status Reporting

The `rept-stat-sys` command and the `rept-stat-sccp` command supports the Service Module cards running the VSCCP application. EPAP-based feature statistics are reported in the `rept-stat-sccp` command. Refer to the *Commands Manual* for descriptions of the commands and their output .

MPS Status Reporting

The `rept-stat-mps` command reports the status of the MPS system, particularly the provisioning system. See *Maintenance Commands* on page 33 for more details.

DSM Memory Capacity Status Reporting

As mentioned in the *DSM Status Reporting to the EPAP* on page 75, the Service Module card sends a message to the EPAP containing the amount of memory on the Service Module board. The EPAP determines whether the DSM has enough memory to store the RTDB and sends an ack or nak back to the Service Module card indicating whether or not the Service Module card has an adequate amount of memory. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

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

Loading Mode Support Status Reporting

The OAM application determines whether or not the system is in an unstable loading mode because it knows the state of all LIM and Service Module cards in the system. When the loading mode is unstable, the `rept-stat-sys` command reports the existence of the unstable loading mode and the specific conditions that caused it. See *EPAP Application Data Loading* on page 77 for more details.

Code and Application Data Loading

In general, administrative updates can occur while a Service Module card is loading. The Service Module card should 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 Service Module card.

EPAP Application Data Loading

In order to support both RTDB and EAGLE 5 ISS data loading, the VSCCP GPL verifies its hardware configuration during initialization to determine if it has the capacity to support the RTDB.

The VSCCP GPL application data loader registers all tables for loading, independent of feature provisioning and main board and applique hardware configuration. As a result, load requests are always identical. During loading, multiple Service Module card load requests are combined into

a single download, reducing the overall download time. The Service Module card card stores or discards RTDB table data based on whether or not it has RTDB-capable hardware for EPAP-based features.

The OAM, on the other hand, downloads or sets memory boundaries for configuration options and service selector tables only for provisioned features. When a feature is not provisioned, the OAM does not attempt to read its tables from disk. Instead, empty tables (tables without entries) are downloaded. All other tables requested for loading are read from disk and downloaded routinely.

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 Service Module cards that are in an IS-NR or OOS-MT-DSBLD state relative to 80% of the number of provisioned LIMs is called a "failure to provide adequate SCCP capacity."

Insufficient SCCP Service

It is possible for LIM cards or Service Module cards to be inhibited or to have problems that prevent them from operating normally. If enough Service Module cards are out of service, it may not be possible for the remaining IS-NR Service Module cards to service at least 80% of the number of IS-NR LIM cards. This is called "insufficient SCCP service." When this occurs, some of the LIM cards 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 stops card loading upon execution of an STP database `chg` command. Loading mode support denies the execution of EAGLE 5 ISS database `chg` commands when the system is in an unstable loading mode. An unstable loading mode exists when any of the following conditions are true:

- The system's maintenance baseline has not been established.
- Less than 80% of the number of LIMs provisioned are in an IS-NR or OOS-MT-DSBLD state.
- The number of IS-NR and OOS-MT-DSBLD Service Module cards is insufficient to service at least 80% of all provisioned LIMs.
- Insufficient SCCP service occurs when an insufficient number of IS-NR Service Module cards are available to service at least 80% of the number of IS-NR LIMs.
- LIM cards are being denied SCCP service and any Service Module cards are in an abnormal state (OOS-MT-DSBLD, 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.
- The `rept-stat-sys` command 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 EAGLE 5 ISS database updates allowed.

  When in an unstable loading mode, the EAGLE 5 ISS does not accept 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 LIM cards. The remaining 20% LIM or supporting Service Module cards may remain out of service until the stream of database updates ceases. This stream of updates can be temporarily interrupted to allow the remaining 20% of the system to come in service.

  Once an EAGLE 5 ISS database has been loaded, that database can be updated (as long as the system is not in an unstable loading mode). However, if an database update comes in during EAGLE 5 ISS database loading, the Service Module card stops the current loading, issues a class 01D7 obit, and reboots. The obit is shown in the following example.

  Figure 2: Obit Message for Abort of Card Loading

```
tekelecstp 97-04-08 12:29:04 EAGLE 35.0.0
------------------------------------------------------------------------
     Card 1317   Module RADB_MGR.C  Line  337  Class 01d7
        Card 1317   Module RADB_MGR.C  Line  337  Class 01d7
        Register Dump :
            EFL=00000246    CS =0058        EIP=0000808d    SS =0060
            EAX=000a6ff3    ECX=000a0005    EDX=00000000    EBX=000a6fa0
            ESP=00108828    EBP=0010882c    ESI=001f1e10    EDI=00000000
            DS =0060        ES =0060        FS =0060        GS =0060

        Stack Dump :
        [SP+1E]=001f    [SP+16]=0000    [SP+0E]=000a    [SP+06]=0010
        [SP+1C]=1e10    [SP+14]=0004    [SP+0C]=6fa0    [SP+04]=8850
        [SP+1A]=0010    [SP+12]=001f    [SP+0A]=0004    [SP+02]=0001
        [SP+18]=886c    [SP+10]=4928    [SP+08]=7ec3    [SP+00]=504b

        User Data Dump :

        14 02 fa ed 01 01 1d 01 5a 01 00                    ........Z..

    Report Date:97-04-08  Time:12:29:04
```

Using the force Option

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

ATINPQ Subsystem UIMs

This section contains a list of EAGLE 5 ISS UIMs that support the ATINPQ local subsystem.

Refer to the *Maintenance* manual for a complete description of all UIM text and formats.

Table 9: ATINPQ UIMs

UIM	Text	Description	Action
1395	Inh ATINPQ SS request alrdy outstanding	A second attempt to inhibit the ATINPQ subsystem has been made while the first is still being processed.	None - the second attempt will be ignored
1396	Failure Inhibiting ATINPQ SS	The attempted inhibit of the ATINPQ subsystem failed. A response SOG was not received from the mate.	No action necessary.
1397	LSS: Missing Mandatory Parameter	A required parameter was missing in the ATI NP query.	Verify that the incoming ATI NP query has Subscriber Identity and Requested Info parameters.
1398	ATINPQ: Badly formatted Subs Id	The Subscriber Identity parameter in the ATI NP query was found to be mistyped.	Verify that the Subscriber Identity parameter length is at least 2 bytes (1 byte length field of MSISDN). If greater than 2 bytes, the Subscriber Identity length must be equal to 2 + the length of the MSISDN.
1399	ATINPQ: Subscriber Identity not MSISDN	The Choice for Subscriber Identity in the ATI NP query is not the MSISDN.	
1400	LSS: Invalid MSISDN digits length	The MSISDN length in Subscriber Information was 0, or the MSISDN had only one 0xF (filler) digit.	

UIM	Text	Description	Action
1401	LSS: Unsupported numbering plan	The Numbering Plan in the MSISDN from the Subscriber Identity in the incoming ATI NP query is not supported (not ISDN/Telephony - 0x1).	
1402	ATINPQ: Invalid Requested Info	The Requested Info parameter in the incoming ATI NP query was invalid. Either the length of the Requested Info parameter does not contain MNP Requested Info, or the parameter is badly formatted.	
1403	LSS: Dgts truncated in encd parms	One or more encoded digits parameter in the ATI ACK response had to be truncated to tit maximum allowed encoded digits.	Verify the expected number of digits in routeingNumber and MSISDN fields. These depend on the combination of requested formatting for routeingNumber and MSISDN fields (ATINPQOPTS, ATIACKRN, and ATIACKMSISDN options), digits in incoming ATI NP query, and the result of RTDB lookup.

ATINP Measurements

Refer to the *Maintenance* manual for detailed measurement usage information.

The EAGLE 5 ISS Measurements Platform supports the collection and retrieval of measurements related to the ATINP feature and the ATINPQ local subsystem. The ATINP measurements are collected only with the Measurements Platform feature enabled and the Measurements Platform collection option on.

The data for these measurements originates in the Service Module cards (DSM and E5-SM4G cards). Following collection, scheduled reports are automatically generated and transferred to a customer FTP server. The EAGLE OA&M IP Security feature must be on to provide a secure FTP interface. Refer to the procedures in the *Database Administration Manual - System Management* for configuring the Measurements Platform and the EAGLE OA&M IP Security feature in the EAGLE 5 ISS.

The MCP application collects measurements data each hour following the hour boundary (0000, 0100, 0200, etc.). The collected data is retained in the appropriate data store. The retention period for hourly measurements data is 24 hours. The measurements data collected each hour is aggregated into a daily sum total that is reported in the daily report. The retention period for daily measurements data is 7 days. Existing FTP file server reports are overwritten by subsequent requests that produce the identical file name.

Reports can be scheduled or generated on demand. The `chg-mtc-measopts` command is used to schedule automatic generation of reports for ATINP daily and hourly measurements, and the `rept-ftp-meas` command is used to generate and FTP transfer the reports on demand. See *Measurements Commands* on page 39 and refer to the *Commands Manual* for descriptions of these commands.measurements

Per System totals and Per SSP totals are collected for ATINP. The totals are reported in the Hourly Maintenance Measurements (MTCHATINP) report and Daily Maintenance Measurements (MTCDATINP) report.

Table 10: Pegs for Per System and Per SSP

Peg	Description
ATINPQRCV	Total number of queries received for the ATINPQ service, when the incoming message opcode is ATI.
ATIPNQACK	Total number of ATI ACK messages sent by the ATINPQ service
ATIPNQERR	Total number of incoming ATI messages that did not result in either ATI ACK or ATI NACK with Error Code of either Unknown Subscriber or ATI Not Allowed. (The ATI NACK is considered to be a TC_END TCAP message with a Return Error component.)

Glossary

A

ACK	Data Acknowledgement
ASD	Additional Subscriber Data Additional data that is associated with a subscriber (DN) or a range of subscribers.
ATI	Any Time Interrogation An ATI message allows an external server to interrogate an HLR and obtain information about the location and/or state of a GSM subscriber.
ATINP	ATI Number Portability Query feature
ATINPQ	ATI Number Portability Query (Name of the local subsystem)

C

CSPC	Concerned Signaling Point Code The point code that receives subsystem allowed and subsystem prohibited status messages about a particular global title translation node. These messages are broadcast from SCCP management.

D

DCB	Device Control Block

E

E

EPAP	EAGLE Provisioning Application Processor

G

GRN	Generic Routing Number

I

IGM	IS41 GSM Migration
IMSI	International Mobile Subscriber Identity
IS-ANR	In Service - Abnormal The entity is in service but only able to perform a limited subset of its normal service functions.
IS-NR	In Service - Normal

L

LIM	Link Interface Module Provides access to remote SS7, IP and other network elements, such as a Signaling Control Point (SCP) through a variety of signaling interfaces (DS0, MPL, E1/T1 MIM, LIM-ATM, E1-ATM, IPLIMx, IPGWx). The LIMs consist of a main assembly and possibly, an interface appliqué board. These appliqués provide level one and some level two functionality on SS7 signaling links.

M

MAP	Mobile Application Part
MCP	Measurement Collection Processor

M

	This application is used by the MCPM card for the Measurements Platform feature.
MPS	Multi-Purpose Server The Multi-Purpose Server provides database/reload functionality and a variety of high capacity/high speed offboard database functions for applications. The MPS resides in the General Purpose Frame.
MSISDN	Mobile Station International Subscriber Directory Number The MSISDN is thenetwork specific subscriber number of a mobile communications subscriber. This is normally the phone number that is used to reach the subscriber.

N

NAI	Nature of Address Indicator Standard method of identifying users who request access to a network.
NPDB	Number Portability Database

O

OOS-MT	Out of Service - Maintenance The entity is out of service and is not available to perform its normal service function. The maintenance system is actively working to restore the entity to service.
OOS-MT-DSBLD	Out of Service - Maintenance Disabled The entity is out of service and the maintenance system is preventing

O

	the entity from performing its normal service function.

P

PDB	Provisioning Database

R

RN	Routing Number
RTDB	Real Time Database

S

SCP	Service Control Point Service Control Points (SCP) are network intelligence centers where databases or call processing information is stored. The primary function of SCPs is to respond to queries from other SPs by retrieving the requested information from the appropriate database, and sending it back to the originator of the request.
	Secure Copy
SOG	Subsystem Out-of-Service Grant
	Service Order Gateway
SOR	Support of Optimal Routing
	System Out of Service Request
SP	Service Provider
	Signaling Point
SSN	Subsystem Number
	The subsystem number of a given point code. The subsystem number identifies the SCP application that

S

	should receive the message, or the subsystem number of the destination point code to be assigned to the LNP subsystem of the EAGLE 5 ISS. A value of the routing indicator portion of the global title translation data commands indicating that no further global title translation is required for the specified entry.
STP	Signal Transfer Point STPs are ultra-reliable, high speed packet switches at the heart of SS7 networks, which terminate all link types except F-links. STPs are nearly always deployed in mated pairs for reliability reasons. Their primary functions are to provide access to SS7 networks and to provide routing of signaling messages within and among signaling networks.

T

TFP	TransFer Prohibited (Msg) A procedure included in the signaling route management (functionality) used to inform a signaling point of the unavailability of a signaling route.
TSPC	True or Secondary Point Code

U

UAM	Unsolicited Alarm Message.
UIM	Unsolicited Information Message

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