Oracle® Communications
EAGLE ATINP User's Guide

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Oracle Communications EAGLE ATINP User's Guide, Release 47.1

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- **Product Support**:
  The generic product related information and resolution of product related queries.

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  – Significant reduction in system capacity or traffic handling capability

  – Loss of the system's ability to perform automatic system reconfiguration

  – Inability to restart a processor or the system

  – Corruption of system databases that requires service affecting corrective actions

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Acronyms

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

Table   Acronyms

Acronym	Definition
AC	Area Code
ASD	Additional Subscriber Data
ATINP	Anytime Interrogation Number Portability
CAS	Customer Access Support
CPC	Capability Point Code
GRN	Generic Routing Number
MASP	Maintenance and Administration Subsystem Processor
RTDB	Real Time Database

What's New in This Guide

This section introduces the documentation updates for Release 47.1 in Oracle Communications EAGLE ATINP User's Guide.

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There are no updates in this document for this release.

1

Introduction

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 Oracle for assistance.

1.1 Overview

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 Oracle Communications EAGLE feature that provides a method for querying entities to obtain number portability, routing information, or location information for subscribers directly from an EAGLE.

ATINP provides number portability functions for decoding the information in the incoming ATI query message, number conditioning before the Real Time Database (**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*.

ATINP supports the use of Additional Subscriber Data (**ASD**) in formatting response messages.

ATINP supports Service Portability functions that allow a subscriber to keep the same phone number when switching from one type of network or service technology to another within the same operator's network. With Service Portability, the subscriber remains with the same operator, but receives service from a different network technology supported by that operator or moves from one physical network to another, with both networks operated by the same service provider. The **Service Portability** (S-Port) feature allows RTDB **GRN** Entity digits to be used as Service Portability prefixes for own-network GSM and IS41 subscribers in response digit formats.

ATINP supports functions to cluster **CNL**s into groups referred to as **ROP**s, which can be used to simplify routing and simple billing analysis in cases where the number of supported CNLs is very large. The Generic Routing Number field is used to store ROP information.

The ATINPQ local subsystem in the EAGLE processes ITU-TCAP ATI messages with the requested information parameter *MNP Requested Info* or *Location Information*. The EAGLE responds with an **ATI ACK** message that contains either number portability and routing information or location information, or responds 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 Oracle Communications EAGLE Application Processor (EPAP) provisioning data from the Real Time 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. The RTDB data is used in obtaining number portability information and in determining how to correctly format the ATI ACK response message.

1.2 Scope and Audience

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

1.3 References

For more information, refer to the following documents:

- *Application B Card Hardware and Installation Guide*

- *EPAP Administration Guide*

- *Hardware Reference*

- *Commands User's Guide*

- *Database Administration - GTT User's Guide*

- *Database Administration - SS7 User's Guide*

- *Database Administration - System Management User's Guide*

- *Measurements Reference*

- *Unsolicited Alarm and Information Messages Reference*

- *EPAP Alarms and Maintenance Guide*

2
Feature Description

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 Oracle Communications EAGLE Application Processor (EPAP). EPAP provides the Realtime Database (RTDB) that is used in the database lookup functions.

2.1 ATINP Feature Overview

ATINP Functions

The ATINP feature provides number portability functions and Service 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, Routing Number, and Location parameters will be included or not included in the ATI ACK response message
- Controlling the length of formatted digits for Location Information queries
- Formatting of the IMSI, MSISDN, Routing Number, and Location 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
- Use of GRN digits as Routing Number digits in the ATI ACK response message for own-network subscribers (example: using GRN digits for ROP information)

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 ATINP feature must be enabled before configuration options can be provisioned in the ATINPQOPTS table for ATINP. The Service Portability feature must be also enabled before the ATINPQOPTS SPORTTYPE configuration option can be provisioned to use Service Portability with ATINP.

The ATINP feature and the Service Portability feature must be turned on before Service Portability processing will occur for ATI Query messages.

> **Note:**
>
> The Service Portability feature, the IDP A-party Blocklist feature, support for ROP data, and ATINP support for Location Information use GRN data for different purposes. The IDP A-party Blocklist feature is mutually exclusive with the Service Portability feature, and this restriction is enforced in feature provisioning. Feature provisioning does not enforce the restriction that the Service Portability feature is mutually exclusive with ROP data support and ATINP support for Location Information.

2.2 The ATINPQ Local Subsystem

Local subsystems in the EAGLE 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 processes ITU-TCAP ATI messages with the requested information parameter *MNP Requested Info* or *Location Information*. The EAGLE responds with an ATI ACK message that contains number portability and routing information or location information, or responds with an ATI NACK message if the requested information cannot be provided. The original ATI query is discarded.

If RequestedInfo contains *MNP Requested Info* and *Location Information* or other requests (for example: *subscriberState*), then RequestedInfo is considered to contain only *MNP Requested Info*. The other requests will be ignored. Refer to Table 2-1 for handling of multiple requests in RequestedInfo. A *Location Information* query is processed only if ATINP is enabled and turned on and the ATISUPPLOCINFO option is set to ON.

Table 2-1   Handling of Multiple Requests in RequestedInfo

MNP Requested Info	Location Information	any other request	Request handled by ATINPQ Subsystem
No	No	Yes	UIM 1402: ATINPQ: Invalid Requested Info will be generated and an error response will be sent
Yes	No	No	MNP Requested Info
Yes	Yes	No	MNP Requested Info
Yes	Yes	Yes	MNP Requested Info
No	Yes	No	Location Information
No	Yes	Yes	Location Information

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

For ATINP, EAGLE 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.

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 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 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 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 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 as the OPC. Because the EAGLE cannot generate an SSP when a message arrives Rt-on-SSN for the EAGLE 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 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 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 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 as the OPC.

If the ATINPQ local subsystem is offline and the mated subsystem is available, the EAGLE 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 true or secondary point code, the EAGLE cannot generate a **TFP**. The EAGLE 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 should use anf ATINPQ CPC, not the EAGLE **TSPC**.

Network Management Responses

The EAGLE 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 supports provisioning Capability Point Codes for two or more local subsystems, 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.

Though queries meant for any local system will still be processed if they are sent with DPC = STP CPC, it is strongly recommended not to use the STP CPC for such queries. Instead, the CPC for the appropriate subsystem should be used as the DPC of the message. For instance, for LNP queries use the LNP CPC, not the STP CPC. For ATI queries, use the ATINPQ CPC, and so on.

2.3 ATINP Configuration Options

The ATINP configuration options described in Table 2-2 are used for the following functions:

- Specify the format of the **IMSI**, **MSISDN**, Routing Number, or Location 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, Routing Number, or Location 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.

- Specify Service Portability processing that can be performed for ATI messages.

Table 2-2   ATINP Options

Option	Value	Action in the STP
ATIACKIMSI - used for IMSI parameter encoding in the ATI ACK message	NONE	This is the default value. The IMSI parameter is not included in the ATI ACK response message.
	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, then do not include the IMSI parameter in the ATI ACK response.
	ASD	The IMSI digits in the ATI ACK response are 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 is not included in the response message.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	GRN	The IMSI digits in the ATI ACK response are encoded as the GRN if GRN is supported and found during RTDB lookup and GRN was provisioned in the EPAP. If GRN is not supported or not provisioned, the IMSI parameter is not included in the response message.
ATIACKMSISDN - specifies the inclusion and formatting of the MSISDN in the ATI ACK response	NONE	MSISDN parameter is not included in the ATI ACK response.
	MSISDN	This is the default value. MSISDN digits in the ATI ACK response are encoded as the MSISDN from the incoming ATI query. If the RTDB lookup matched on odd number of digits, then the MSISDN is encoded with the match in the RTDB without the trailing 0.
	ASD	The MSISDN in the ATI ACK response is 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 is not included in the ATI ACK response.
	ASDDLMMSISDN	The MSISDN digits in the ATI ACK response message are encoded as ASD (if available) + ATIDLM (if not NONE) + MSISDN from the incoming message. If the RTDB lookup matched on odd number of digits, then the MSISDN is encoded with the match in the RTDB without the trailing 0.
	GRN	The MSISDN digits in the ATI ACK response message are encoded as GRN if supported and found during RTDB lookup, and provisioned in the EPAP. If GRN is not supported or not provisioned, the MSISDN parameter is not encoded in the ATI ACK response.
	GRNDLMMSISDN	The MSISDN digits in the ATI ACK response are encoded as GRN (if supported and available) + ATIDLM (if not NONE) + MSISDN from the incoming message. When GRN field is supported, it is returned in the entity lookup data if GRN entity was found. If GRN field is not supported or not available by EPAP, it is not included in any formats specifying GRN. If the RTDB lookup matched on odd number of digits, then the MSISDN is encoded with the match in the RTDB without the trailing 0.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
ATIACKRN - specifies the formatting of the Routing Number digits in the ATI ACK response	NONE	The Routing Number parameter is not included in the response.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	RN	This option value is expected to be used when Service Portability is used with ATINP.
		If Entity type RN was found in RTDB lookup, the subscriber is generally considered to be a foreign subscriber.
		The exception is the case when Entity data is RN with PT=0, and either the IGM feature is on or the Service Portability feature is enabled; the subscriber is considered to be an own-network IS41 subscriber in this case. The Entity type is considered to be SP.
		Foreign Subscribers
		Encode Routing Number digits as the found Entity ID. (Not affected by Service Portability processing.)
		Own Subscriber
		If the Service Portability feature is ON, the Entity type is SP (GSM subscriber), the SPORTTYPE option value is GSM or ALL, and GRN is available, encode the Routing Number as GRN. If GRN is not available, a UIM is generated and the Routing Number is not included in the response.
		If the Service Portability feature is ON, the Entity type is SP (GSM subscriber), the SPORTTYPE option value is IS41 or NONE, the behavior is the same as when the Service Portability feature is OFF.
		If the Service Portability feature is ON, the Entity type is RN and PT = 0 (IS41 subscriber), the SPORTTYPE option value is IS41 or ALL, and GRN is available, encode the Routing Number as GRN. If GRN is not available, a UIM is generated and the Routing Number is not included in the response.
		If the Service Portability feature is ON, the Entity type is RN and PT = 0 (IS41 subscriber), the SPORTTYPE option value is GSM or NONE, the behavior is the same as when the Service Portability feature is OFF.
		If the Service Portability feature is ON, and a DN is not found in the RTDB, the DN is found but no Entity is found, or the DN is found and the Entity type is not SP or RN with PT = 0, the behavior is the same as when the Service Portability feature is OFF
		When the Service Portability feature is OFF, the Routing Number digits are encoded as the ATIDFLTRN option value instead of the Entity ID, if the ATIDFLTRN value is not

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
		NONE and one of the following conditions is true: • MSISDN was found but No Entity found in RTDB. • MSISDN was not found in RTDB (only in the case of ATINPTYPE=ALWAYS; for ATINPTYPE=ANY, this results in a lookup failure). • Entity was found with type SP or considered to be type SP. In all other cases, the Routing Number parameter is not included in the ATI ACK 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 are 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 results in a lookup failure). • Entity of type other than SP or RN was found. In all other cases, the Routing Number parameter is not 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 Routing Number parameter is not included in the response message. If ATIDLM is not NONE, and ASD digits are available, DLM is 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 is not included in any formats specifying ASD.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	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 is not included in the response message.
		If ATIDLM is not NONE and ASD digits are available, DLM is 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, MSISDN found but no Entity found, or Entity found but SRFIMSI not configured), then the Routing Number is not included in the response message.
	SRFIMSIDLMASD	Encode Routing Number digits as SRFIMSI + ATIDLM (if not 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 is not included in the response message.
		If ATIDLM is not NONE and ASD digits are available, DLM is 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 is not included in the response message.
		If ATIDLM is not NONE and ASD digits are available, DLM is 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 is not included in any formats specifying ASD.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	GRNDLMRNSP	Encode Routing Number as GRN (if supported and available from lookup Entity) + ATIDLM (if not NONE) + RNSP. RNSP is encoded as described for the ATIACKRN = RNSP option.
		If formatting results in 0 digits or only DLM digits, the Routing Number parameter is not included in the response message.
		If ATIDLM is not NONE and GRN digits are available, DLM is included even if RN/SP does not have any digits, resulting in GRN+DLM.
		The GRN field is returned in the Entity lookup data, if GRN Entity was found. If the GRN field is not provisioned in EPAP, it is not included in any formats specifying GRN.
	RNSPDLMGRN	Encode Routing Number as RN/SP + ATIDLM (if not NONE) + GRN (if supported and 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 parameter is not included in the response message.
		If ATIDLM is not NONE and GRN digits are available, DLM is included even if RN/SP does not have any digits, resulting in DLM+GRN.
		The GRN field is returned in the Entity lookup data, if GRN Entity was found. If the GRN field is not provisioned in EPAP, it is not included in any formats specifying GRN.
	SRFIMSIDLMGRN	Encode Routing Number as SRFIMSI + ATIDLM (if not NONE) + GRN (if supported and available from lookup entity). **Note**: SRFIMSI digits configured with RN or SP entity data are used only to encode the Routing Number.
		SRFIMSI is encoded as described for the ATIACKRN = SRFIMSI option.
		If formatting results in 0 digits or only DLM digits, the Routing Number parameter is not included in the response message.
		If ATIDLM is not NONE and GRN digits are available, DLM is included even if SRFIMSI does not have any digits, resulting in DLM+GRN.
		The GRN field is returned in the Entity lookup data, if GRN Entity was found. If the GRN field is not provisioned in EPAP, it is not included in any formats specifying GRN.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	GRNDLMSRFIMSI	Encode Routing Number as GRN (if supported and available from lookup entity) + ATIDLM (if not NONE) + SRFIMSI. SRFIMSI digits configured with RN or SP entity data are used only to encode the Routing Number.
		SRFIMSI is encoded as described for the ATIACKRN = SRFIMSI option.
		If formatting results in 0 digits or only DLM digits, the Routing Number parameter is not included in the response message.
		If ATIDLM is not NONE and GRN digits are available, DLM is included even if SRFIMSI does not have any digits, resulting in GRN+DLM.
		The GRN field is returned in the Entity lookup data, if GRN Entity was found. If the GRN field is not provisioned in EPAP, it is not included in any formats specifying GRN.
ATIACKVLRNUM - specifies the formatting of the vlr-number within Location Information in the ATI ACK response; affects protocol processing only if ATINP feature is turned on	ASD	The vlr-number is encoded as ASD configured in the Entity data.
		If ASD was not found (for example: MSISDN is not found in RTDB or MSISDN is found but no ASD is found), then the vlr-number is encoded as incoming MSISDN.
	ASDDLMRNSP	The vlr-number is encoded as ASD, if available from RTDB lookup + ATINPQOPTS:ATIDLM (if not NONE) + RNSP. The RNSP part is encoded as described in the option ATIACKVLRNUM = RNSP, except for the MSISDN encoding if RN/SP is not found.
		If ATIDLM is not NONE and ASD digits are available, DLM is included even if RN/SP does not have any digits (resulting in ASD+DLM).
		If the formatting results in no digits or only DLM digits, the vlr-number is encoded with only MSISDN in the response.

Note:

If vlr-number does n

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
o t h a v e a n y d i g it s t o e n c o d e d d u e t o E n ti t y n o t f o u n d o r A T I D F L T R N n o	ASDDLMSRFIMSI	The routing number is encoded as ASD (if available from RTDB lookup) + ATINPQOPTS:ATIDLM (if not NONE) + SRFIMSI. The SRFIMSI part is encoded as described in the option ATIACKVLRNUM = SRFIMSI.
		If ATIDLM is not NONE and ASD digits are available, DLM is included even if SRFIMSI does not have any digits (resulting in DLM+ASD).
		If the formatting results in no digits or only DLM digits, the vlr-number is encoded with only MSISDN in the response.
	ASDMSISDN	The vlr-number in the ATI ACK response is encoded as ASD (if found during RTDB lookup) + incoming MSISDN.
		If ASD was not found (for example: MSISDN is not found in RTDB or MSISDN is found but no ASD is found), then the vlr-number is encoded as incoming MSISDN.
	GRNDLMSRFIMSI	The vlr-number is encoded as GRN (if available from RTDB lookup) + ATINPQOPTS:ATIDLM (if not NONE) + SRFIMSI. The SRFIMSI part is encoded as described in the option ATIACKVLRNUM= SRFIMSI.
		If ATIDLM is not NONE and GRN digits are available, DLM is included even if SRFIMSI does not have any digits (resulting in GRN+DLM).
		If the formatting results in no digits or only DLM digits, the vlr-number is encoded with only MSISDN in the response.
	GRNDLMRNSP	The vlr-number is encodedas GRN (if available from RTDB lookup) + ATINPQOPTS:ATIDLM (if not NONE) + RNSP. The RNSP part is encoded as described in the option ATIACKVLRNUM = RNSP, except for the MSISDN encoding if RN/SP is not found.
		If ATIDLM is not NONE and GRN digits are available, DLM is included even if RN/SP does not have any digits (resulting in GRN+DLM).
		If the formatting results in no digits or only DLM digits, the vlr-number is encoded with only MSISDN in the response.
	MSISDN	The vlr-number in the ATI ACK response is encoded as the incoming MSISDN.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	RN	If Entity = RN was found in RTDB lookup, the subscriber is considered to be a foreign subscriber, except in the special case when Entity = RN/PT=0 and either the IGM feature is turned on or the S-Port feature was enabled. If the S-Port feature was enabled, the subscriber is considered IS41 Own Subscriber and is not considered to be a foreign subscriber.

✎ *t p r o v i s i o n e d , t h e n t h e i n c o m i n g M S I S D N i s e n c o d e d a s v l r - n u m b e r.*

For Foreign Subscriber

Encode vlr-number digits as found in Entity (RN). This specifies that the vlr-number in the ATI ACK response is encoded as RN, if found during RTDB lookup. This is not affected by Service Portability (S-Port).

For Own Subscriber

When the Service Portability feature (S-Port) is ON:

IF Entity type SP is found (considered GSM subscribers)

IF SPORTTYPE = GSM or ALL,

IF EPAP *GRN* is available,

THEN Encode vlr-number as EPAP *GRN*.

ELSE

- UIM: 1426 S-Port: Missing GRN for srvc prtd subs
- Standard ATI ACK response is encoded with MSISDN as vlr-number.

ELSE (SPORTTYPE = IS41 or NONE)

Same behavior as when Service Portability is off

ELSE IF Entity is found with data RN/PT=0 (IS-41 subscribers):

IF SPORTTYPE = IS41 or ALL,

IF EPAP *GRN* is available,

THEN Encode vlr-number as EPAP *GRN*.

ELSE

- UIM: 1426: S-Port: Missing GRN for srvc prtd subs
- Standard ATI response is encoded with MSISDN as vlr-number.

ELSE (SPORTTYPE = GSM or NONE)

Same behavior as when Service Portability is off

ELSE

(implies S-Port is ON and either:

- DN not found in RTDB, or
- DN found and no entity, or

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
		• DN found and Entity neither SP nor RN/0)
		Same behavior as when Service Portability is off
		When the Service Portability feature (S-Port) is OFF:
		IF ATINPQOPTS:ATIDFLTRN is not NONE and any of the following is true:
		• MSISDN was found but no Entity was found in RTDB.
		• MSISDN was not found in RTDB. (This applies only when ATINPTYPE=ALWAYS. For ATINPTYPE=ANY, this results in an RTDB lookup failure.)
		• Entity was found with type SP. (If IGM is ON or S-Port is enabled, and Entity is RN/PT=0,then this is considered to be Entity type SP, not RN.)
		THEN ATIDFLTRN is used in place of the Entity. The vlr-number digits are encoded as ATIDFLTRN.
		ELSE The vlr-number parameter is encoded as incoming MSISDN in the response.
	RNMSISDN	The vlr-number in the ATI ACK response is encoded as RN, if found during RTDB lookup, + incoming MSISDN.
		IF ATINPQOPTS:ATIDFLTRN is not NONE and any of the following is true:
		• MSISDN was found but no Entity found in RTDB
		• MSISDN was not found in RTDB (This applies only when ATINPTYPE=ALWAYS. For ATINPTYPE=ANY, this results in an RTDB lookup failure.)
		• Entity was found with type SP (If IGM is ON or S-Port is enabled, and entity data is RN/PT=0, it is considered to be of type SP, not RN.)
		THEN ATIDFLTRN is used in place of Entity. The vlr-number is encoded as ATIDFLTRN + incoming MSISDN.
		IF ATINPQOPTS:ATIDFLTRN is NONE,
		THEN the vlr-number is encoded as incoming MSISDN in the response.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	RNSP	If Entity was found during NPDB lookup and Entity type was either SP or RN, encode vlr-number as the found entity ID. Otherwise, if ATINPQOPTS:ATIDFLTRN is not NONE and any of the following conditions are met, the vlr-number is encoded as ATIDFLTRN: • MSISDN was found, but Entity was not found in RTDB. • MSISDN was not found in RTDB. This applies only when ATINPTYPE=ALWAYS. For ATINPTYPE=ANY, this results in a lookup failure. • Entity of type other than SP or RN was found. In all other cases, vlr-number is encoded as the incoming MSISDN in the ATI ACK response.
	RNSPDLMASD	The vlr-number is encloded as RN/SP + ATIDLM (if not NONE) + ASD (if available from RTDB lookup). RN/SP is encoded as described in the option ATIACKRN = RNSP, except for the MSISDN encoding if RN/SP not found. If ATIDLM is not NONE and ASD digits are available, DLM is included even if RN/SP does not have any digits (resulting in DLM+ASD). If the formatting results in no digits or only DLM digits, the vlr-number is encoded with only MSISDN in the response.
	RNSPDLMGRN	The vlr-number is encoded as RN/SP + ATIDLM (if not NONE) + GRN (if available from RTDB lookup). RN/SP is encoded as described in the option ATIACKRN = RNSP, except for the MSISDN encoding if RN/SP is not found. If ATIDLM is not NONE and GRN digits are available, DLM is included even if RN/SP does not have any digits (resulting in DLM+GRN). If the formatting results in no digits or only DLM digits, the vlr-number is encoded with only MSISDN in the response.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	RNSPMSISDN	This is the default value.
		If Entity was found during RTDB lookup and Entity type was SP or RN, encode vlr-number as the found Entity type + incoming MSISDN.
		ELSE IF ATINPQOPTS:ATIDFLTRN is not NONE and any of the following is true:
		• MSISDN was found, but Entity was not found in RTDB.
		• MSISDN was not found in RTDB. This applies only when ATINPTYPE=ALWAYS. For ATINPTYPE=ANY, this results in a lookup failure.
		• Entity of type other than SP or RN was found.
		THEN vlr-number is encoded as ATIDFLTRN.
		IF ATINPQOPTS:ATIDFLTRN is NONE,
		THEN vlr-number is encoded as incoming MSISDN in the response.
	SRFIMSI	The vlr-number is encoded as SRFIMSI is configured in the Entity data.
		If SRFIMSI was not found (for example: MSISDN not found in RTDB, MSISDN found but no Entity found, or SP/RN Entity found but SRFIMSI not configured), then the vlr-number is encoded as the incoming MSISDN.
		SRFIMSI digits configured with only Entity type RN or SP are used to encode vlr-number.
	SRFIMSIDLMASD	The vlr-number is encoded as SRFIMSI + ATIDLM (if not NONE) + ASD (if supported and available from RTDB lookup). SRFIMSI is encoded as described in the option ATIACKVLRNUM = SRFIMSI.
		If ATIDLM is not NONE and ASD digits are available, DLM is included even if SRFIMSI does not have any digits (resulting in DLM+ASD).
		If the formatting results in no digits or only DLM digits, the vlr-number is encoded with only MSISDN in the response.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
	SRFIMSIDLMGRN	The vlr-number is encoded as SRFIMSI + ATIDLM (if not NONE) + GRN (if available from RTDB lookup). SRFIMSI is encoded as described in the option ATIACKVLRNUM= SRFIMSI.
		If ATIDLM is not NONE and GRN digits are available, DLM is included even if SRFIMSI does not have any digits (resulting in DLM+GRN).
		If the formatting results in no digits or only DLM digits, the vlr-number is encoded with only MSISDN in the response.
ATIDFLTRN - Default Routing Number used in encoding outgoing formats in the ATI ACK response in cases where an RN is not returned from an RTDB lookup	NONE HEX (1-15 digits)	This option can be set to NONE at any time. The default value is NONE. The specific encoding is described further in other option value descriptions.
ATIDLM - specifies whether delimiter digits or no delimiter is to be used in encoding outbound digits in ATI ACK response	NONE HEX (1-15 digits)	This option can be set to NONE at any time by the user. The default value is NONE.
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 for a description of determination of success. This specifically excludes the case when MSISDN is not found in RTDB.
	ALWAYS	The lookup is always considered to be successful whether or not MSISDN is found in RTDB match.
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	This is the default value. The SRFIMSI or Entity ID is used without modification in the ATIACKRN format specified.
	Decimal (1-15)	Example: If the SRFIMSIDLMASD format is specified, ENTITYLEN = 5, SRFIMSI from Entity = 1234567890 (10 digits), ASD = 123, and DLM = 55, then a maximum of 5 digits is used from SRFIMSI to encode the format as 12345 + 55 + 123. If ENTITYLEN = NONE, then all ten digits from SRFIMSI would be used. The same applies to formats that encode an Entity ID.

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
OFF - Disables or turns off a comma-separated list of feature options	ATISUPP LOCINFO	This value specifies that Location Information request is not processed by the ATINP subsystem if the ATINP feature is turned on. This is the default value for ATISUPPLOCINFO.
ON - Enables or turns on a comma-separated list of feature options	ATISUPP LOCINFO	This value specifies that Location Information request is processed by the ATINP subsystem if the ATINP feature is turned on.
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 is considered to be International. No conditioning is performed on the MSISDN before RTDB lookup.
	NAT	The NAI of the incoming MSISDN digits is considered to be National. The MSISDN is conditioned to international format before RTDB lookup by pre-pending the provisioned STPOPTS default country code (DEFCC) parameter value. 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	This is the default value. The NAI field of the MSISDN parameter determines whether number conditioning is required before RTDB lookup. If NAI is INTL (0x01) or Network Specific Number (0x3), then the number is considered to be International and no conditioning is performed before RTDB lookup. If NAI is not considered INTL, it is considered to be National. The STPOPTS default country code (DEFCC) value is pre-pended to the MSISDN to condition it to international format before RTDB lookup.
SPORTTYPE - indicates the Service Portability processing that is requested for ATI queries for own-network subscribers; can be provisioned when the Service Portability feature is enabled but not turned on; impacts protocol processing only if the Service Portability feature is turned on.	NONE	This is the default value. No Service Portability processing is requested.
	GSM	Service Portability is requested for ATI queries for own-network GSM subscribers (Entity = SP).
	IS41	Service Portability is requested for ATI queries for own-network IS41 subscribers (Entity = RN, PT = 0).
	ALL	GSM and IS41 Service Portability is requested for own-network subscribers (Entity = SP or Entity = RN, PT = 0).

Table 2-2   (Cont.) ATINP Options

Option	Value	Action in the STP
VLRNUMLEN - indicates the maximum number of digits that can be encoded as vlr-number in ATI ACK, as defined by ATIACKVLRNUM	Decimal (1-40)	The default value is 40. Example: If ATIACKVLRNUM = RNSPMSISDN format is specified, VLRNUMLEN = 12, MSISDN is 1234567890, entity RN from RTDB lookup was 13579, then the vlr-number digits would be 135791234567890. With VLRNUMLEN = 12, the vlr- number digits in the Location Information field of response message are encoded as 135791234567.

> **Note:**
>
> If the Service Portability feature is enabled or the IGM feature is turned on, and RTDB lookup results in Entity = RN and PT=0, then the Entity is considered to be SP.

If the RTDB lookup matched on odd number of digits, then the MSISDN is encoded with the match in the RTDB without the trailing 0.

2.4 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 MNP Requested Info or Location Information. If message contains both requests (MNP Requested Info and Location Information), then MNP Requested Info is processed.

    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 (Service Indicator = 3) are forwarded to Service Module cards for processing.

    Response messages and UIMs (see ATINPQ Subsystem UIMs) 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 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 ATINP Configuration Options.

- 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 than 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 2-3.

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 ATINP Configuration Options.

> **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 ATINP Configuration Options for option descriptions and response formats.

Table 2-3   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.		

2.5 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 includes Number Portability Status. Routing Number digits, MSISDN digits, and IMSI digits can be included, and ASD and GRN data can be used, depending on RTDB lookup results and ATINP configuration option values. ATINP Configuration Options 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. The ATIACKRN option values determine the data from the RTDB lookup that is used in the outgoing RN. (See ATINP Configuration Options.)

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. The following formats consider Additional Subscriber Data (ASD) digits for encoding the outgoing RN parameter:

- ASD+DLM+RNSP
- RNSP+DLM+ASD
- SRFIMSI+DLM+ASD
- ASD+DLM+SRFIMSI

Generic Routing Number (GRN) digits included in an Entity can be used in formatting the outgoing RN. The Generic Routing Number can be used in identifying GSM or IS41 own-network subscribers for Service Portability, or for identifying members of ROPs (CNL clusters). The following formats consider Generic Routing Number (GRN) digits for encoding the outgoing RN parameter:

- GRN+DLM+RNSP
- RNSP+DLM+GRN
- SRFIMSI+DLM+GRN
- GRN+DLM+SRFIMSI

> **Note:**
>
> If the RTDB Entity type is RN with PT=0 and either the IGM feature is On or the Service Portability feature is enabled, the subscriber is considered to be an own-network IS41 subscriber, and the Entity type is treated as SP. See the ATIACKRN=RN configuration option description in ATINP Configuration Options.

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.

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.

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.

- GRN - If an Entity was found during RTDB lookup and **GRN** (Generic Routing Number) was provisioned in the EPAP Entity, then IMSI digits are encoded as the GRN. If GRN is not available, the IMSI parameter will not be encoded in the response message.

The ASD format considers ASD digits for encoding the outgoing IMSI parameter.

The Generic Routing Number can be used in identifying GSM or IS41 own-network subscribers for Service Portability, or for identifying members of ROPs (CNL clusters). The GRN format considers GRN digits for encoding the outgoing IMSI parameter.

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, Generic Routing Number found in the EPAP Entity, or a combination of MSISDN, ASD or GRN, and digits delimiter.

The following formats consider ASD digits for encoding the outgoing MSISDN parameter:

- ASD

- ASD+DLM+MSISDN

Generic Routing Number (GRN) digits included in an Entity can be used in formatting the outgoing MSISDN. The Generic Routing Number can be used in identifying GSM or IS41 own-network subscribers for Service Portability, or for identifying members of ROPs (CNL clusters). The following formats consider GRN digits for encoding the outgoing MSISDN parameter:

- GRN

- GRN+DLM+MSISDN

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 2-4   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:
	  – 0 (NOT KNOWN TO BE PORTED)
	  – 1 (OWN NUMBER PORTED OUT)
	  – 2 (FOREIGN NUMBER PORTED TO FOREIGN NETWORK)
	  – 36 (NOT IDENTIFIED TO BE PORTED)
	  – 0xFF (none - NO STATUS)
	• MSISDN and Entity found in RTDB with Entity type = RN, PT = 0,S-Port is not enabled,and**IGM** feature is OFF.
	• MSISDN and Entity found in RTDB with Entity type = RN, and PT=0xFF (none - NO STATUS) or PT=36 (Not identified to be ported).
	Note: This says that if a routing number was not found in RTDB (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 RTDB with Entity type=RN and PT=1 (OWN NUMBER PORTED OUT)
Foreign Number Ported To Foreign Network (2)	MSISDN and Entity found in RTDB with Entity type=RN and PT=2 (FOREIGN NUMBER PORTED TO FOREIGN NETWORK)

Table 2-4   (Cont.) Encoded Number Portability Status value

Encoded Number Portability Status value	Criterion
Own Number Not Ported Out (4)	• MSISDN and Entity found in RTDB 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 RTDB with no Entity and PT=Migrated (5) • MSISDN found in RTDB with no Entity but PT=Prepaid (3, 4, 6-35). • MSISDN and Entity found in RTDB with Entity type=RN, PT=0, andS-Port is enabledor IGM feature is turned ON (migrated subscriber is considered own subscriber). • MSISDN and Entity found in RTDB 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.

2.6 ATINP Error Response MSU Encoding

The EAGLE 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*.

2.7 Hardware Requirements

EPAP-related features that perform an RTDB lookup require Service Module cards (E5-SM4G, E5-SM8G-B, or SLIC cards) running the SCCPHC application. The EAGLE can be equipped with up to 32 (31+1) Service Module cards.

Features that do not perform an RTDB lookup require Service Module cards only for GTT processing that might be performed for the feature. These features can coexist in systems with EPAP, but do not require an EPAP connection.

2.8 MPS/EPAP Platform

Oracle provides the Multi-Purpose Server (MPS) platform as a subsystem of the Oracle Communications EAGLE. The MPS provides support for EPAP-related features that perform Real Time Database (RTDB) lookups.

The MPS is composed of hardware and software components that interact to create a secure and reliable platform. For details about the MPS hardware, refer to *Application B Card Hardware and Installation Guide*. The MPS provides the means of connecting the customer provisioning application with the EAGLE and accepts the customer number portability data, while accommodating numbers of varying lengths.

The Oracle Communications EAGLE Application Processor (EPAP) is software that runs on the MPS hardware platform. EPAP collects and organizes customer provisioning data, and forwards the data to the EAGLE Service Module cards. For detailed information about EPAP, refer to *Administration Guide* for EPAP.

In this manual, Service Module card refers to an E5-SM4G, E5-SM8G-B, or SLIC card unless a specific card is required. For more information about the supported cards, refer to *Hardware Reference*.

3

EAGLE ATINP Commands

This chapter contains brief descriptions of the EAGLE ommands that are used for the configuration of the ATI Number Portability Query (ATINP) feature.

3.1 EAGLE Commands

This chapter describes EAGLE commands used for the configuration of the ATI Number Portability Query (ATINP) feature.

Refer to *Commands User's Guide* for complete command descriptions including parameter names, valid parameter values, examples, and dependencies.

Table 3-1   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 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, and options for Service Portability	chg/rtrv-atinpqopts
Local Subsystem Activation	alw/inh-map-ss

enable-ctrl-feat / chg-ctrl-feat / rtrv-ctrl-feat

These commands are used to enable, turn on, and display the on/off status of the ATINP feature and the Service Portability feature.

chg-stpopts / rtrv-stpopts

The STP Options commands are used to provision system options for the EAGLE. The options are used to control system-level processing. Features can check the option values to determine what processing to apply.

The Default Country Code (`defcc`) and DSM checksum audit (dsmaud) parameters are supported for ATINP.

chg/dlt/rtrv-ss-appl

The Local Subsystem Application 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.

ent-srvsel / dlt-srvsel / chg-srvsel / rtrv-srvsel

The service selector commands are used to provision and display service selector information for the atinp service.

chg-atinpqopts / rtrv-atinpqopts

The ATINP Options commands are used to provision the configuration options for the ATINP feature. The options control number portability and Service Portability processing for ATI messages and response message formatting.

The ATINP Options 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 inclusion and formatting of the Location Information field 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

- Specify Service Portability processing that can be performed for ATI messages

alw / inh-map-ss

The `alw-map-ss` and `inh-map-ss` commands allow and inhibit (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.

4

ATINP Configuration

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

4.1 Introduction

The ATINP feature is configured on the EAGLE and on the EPAP. This chapter describes prerequisites and procedures for the EAGLE configuration only. The EPAP configuration is covered in the *Administration Guide* for EPAP. This chapter also includes procedures for configuration of the Service Portability feature for use with ATINP, and for provisioning options to allow the use of the GRN for ROP information.

ATINP Configuration Procedure lists the steps for enabling and turning on the ATINP feature and the Service Portability feature, and for the provisioning required for the features. Each step contains a link or reference to information and procedures to use to complete the step. Feature provisioning can be performed after the features are enabled and before the features are turned on. Refer to *Commands User's Guide* for complete descriptions of the commands used in these procedures.

The ATINP feature and other related features are optional and you must be entitled to use them in your system. If you are not sure whether you are entitled to use a specific feature, contact your Oracle Sales or Account Representative.

> **✎ Note:**
>
> For an in-service environment, contact My Oracle Support (MOS) before continuing to configure the ATINP feature. For an environment that is not yet in-service, continue with the configuration.

4.1.1 EPAP Entity Provisioning

Oracle recommends that EPAP entity (**SP** or **RN**) administration not be performed until after the Point Code and/or Subsystem Number has been entered into the EAGLE MAP table.

- EPAP-administered entity data can become out-of-sync with the EAGLE MAP table when the creation of Point Codes and/or Subsystem Numbers in the MAP table is performed after EPAP database administration.

- If this mismatch is discovered in real-time operations, a UIM is sent to the EAGLE maintenance terminal. (Example UIMs: `SCCP did not route - DPC not in MAP tbl`, `SCCP did not route - SS not in MAP tbl`.)

4.1.2 System Prerequisites

Before any feature that is described in this manual can be enabled, the prerequisites listed in Table 4-1 are required in the system.

Table 4-1   System Prerequisites

Prerequisite	Verification and Provisioning
The system serial number must be correct and locked. For new installations, the system is shipped with an unlocked serial number. The serial number can be changed if necessary and must be locked after the system is on-site. For systems that are being upgraded, the serial number is usually already verified and locked.	**Note**: The serial number cannot be changed after it is entered and locked in the system. Locate the serial number for the system on a label affixed to the control shelf (1100). Enter the `rtrv-serial-num` command to display the serial number and its locked status. Verify that the displayed serial number is correct for the system. If no serial number is displayed, enter the `ent-serial-num` command (without the lock parameter) to provision the serial number that appears on the control shelf label. Enter the `rtrv-serial-num` command and verify that the serial number was entered correctly. Enter the `ent-serial-num` command with the `lock=yes` parameter to lock the serial number in the system.
A sufficient number of Service Module cards must be equipped.	Enter the `rept-stat-card:appl=vsccp` command to list the Service Module cards in the system. If more cards or cards of a different type are needed, refer to the procedures in *Database Administration - GTT User's Guide* to add or remove Service Module cards.
The GTT feature must be on in the system. Some features require an additional GTT-related feature such as EGTT. See the specific feature prerequisites in this section.	Enter the `rtrv-feat` command to display the GTT feature status. If the GTT feature is on, the gtt=on entry appears in the output. If the `gtt=off` entry appears in the output, use the procedures in *Database Administration - GTT User's Guide* to turn on and provision the GTT feature and any other GTT-related features and functions that will be used in the system.

4.1.3 ATINP Feature Prerequisites

Before the ATINP feature can be enabled, the following prerequisites are required in the system:

Table 4-2   ATINP Feature Prerequisite

Prerequisite	Verification and Provisioning
The ANSIGFLEX system option cannot be set to Yes.	Enter the `rtrv-stpopts` command. Verify that the ANSIGFLEX entry does not appear in the command output or that the ANSI GFLEX entry shows a value of No.

Table 4-2   (Cont.) ATINP Feature Prerequisite

Prerequisite	Verification and Provisioning
The LNP feature cannot be on in the system.	Enter the `rtrv-ctrl-feat` command.
	If the LNP feature is on, shown with a quantity greater than zero for the `LNP ported TNs` entry in the command output, the feature described in this manual cannot be enabled.

4.2 ATINP Configuration Procedure

The EAGLE configuration of the ATINP feature consists of the following steps. The steps contain links and references to detailed procedures and information needed to complete each step.

1. Verify, and provision if needed, the system prerequisites. See System Prerequisites.

2. Verify, and provision if needed, the feature prerequisites. See ATINP Feature Prerequisites.

3. Enable the ATINP feature, set system STP options, and turn on the ATINP feature. See Enabling ATINP, Setting STP Options, and Turning On ATINP.

4. Enable the Service Portability feature, if it will be used with ATINP. See Enabling the Service Portability Feature.

5. Change the self identification of the EAGLE node to include true point codes and ATINP capability point codes. See Provisioning True Point Codes and Capability Point Codes and refer to the procedures in *Database Administration - SS7 User's Guide*.

6. Refer to the procedures in *Database Administration - GTT User's Guide* to provision the following items:

    •   Translation types and mappings

    •   Mated Application table entries for the ATINP feature that contain the EAGLE true point codes, the ATINP capability point codes, and the ATINPQ subsystem number. Only solitary and dominant loadsharing are supported.

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

    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:

    a. ANSI

    b. ITU-N

    c. ITU-N Spare

    d. ITU-I

    e. ITU-I Spare

7. Provision state and subsystem number for the ATINPQ local subsystem application. See Adding the ATINPQ Local Subsystem Application.

8. Provision the service selector mechanism to route MSUs to the ATINPQ subsystem. See Adding an ATINP Service Selector.
The ATINP service is `atinp`.

   The Translation Type and Subsystem Number are the values assigned for the ATINP local subsystem when the MAP table entries were defined. See Step 4 in this procedure.

   ATINP supports ANSI, ITU-I, and ITU-N Global Title Indicators; ITU-N24 is not supported.

   The Nature of Address Indicator and Numbering Plan are required when the GTI value is 4, and not allowed when the GTI value is 2.

   ATINP does not support the Service Nature of Address or the Service Numbering Plan.

9. Provision ATINP options, including options for Service Portability and GRN data processing if required. See Provisioning the ATINP Options.

10. Activate the ATINP local subsystem. See Activating the ATINPQ Local Subsystem.

11. Turn on the Service Portability feature, if it will be used with ATINP. See Turning On the Service Portability Feature.

12. Configure the Measurements Platform feature or the E5-OAM Integrated Measurements feature if measurements are to be collected for ATINPQ.
Refer to the procedures in *Database Administration - System Management User's Guide* for configuring the Measurements Platform feature, the E5-OAM Integrated Measurements feature, and the EAGLE OA&M IP Security feature in the EAGLE. OAM-based measurements reports are not available for ATINPQ.

4.3 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.

- The ATINP feature must be enabled using the ATINP feature part number 893022101 and a Feature Access Key.

   > **Note:**
   >
   > Controlled features are optional and you must be entitled to use them in your system. If you are not sure whether you are entitled to use a specific feature, contact your Oracle Sales or Account Representative.

   When the ATINP feature is enabled, it is permanently enabled. The ATINP feature cannot be temporarily enabled.

   > **Note:**
   >
   > 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 option 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.

  In the `rtrv-stpopts` command output, the `defcc` parameter is displayed with value NONE when the ATINP feature is enabled.

- 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 ATINP feature is enabled and turned on, the ATINP feature can be turned off again.

  When 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.

  - The `dsmaud` parameter is displayed with value off when the ATINP feature is turned on.

1. 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 (FAK) is provided by Oracle. If you do not have the controlled feature part number or the Feature Access Key for the feature, contact your Oracle 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        ----
   ;
   ```

2. Verify that the `defcc` STP option parameter value is not NONE. Enter the `rtrv-stpopts` command.

   - If the value is not NONE, continue with 3.

   - If the `defcc` parameter value is NONE, use the `chg-stpopts` command to provision a new value. Then continue with 3.

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

3. Turn on the ATINP feature. Enter 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 09-06-29 16:40:40 EST  EAGLE5 41.1.0
   The following features have been permanently enabled:
   Feature Name              Partnum    Status  Quantity
   HC-MIM SLK Capacity       893012707  on            64
   ATINP                     893022101  on          ----
   ;
   ```

4. 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.
   ```

4.4 Enabling the Service Portability Feature

If Service Portability can be applied to the messages processed by a feature described in this guide, use this procedure to enable the Service Portability feature in the EAGLE.

The Service Portability feature must be enabled using the feature part number 893034301 and a feature access key.

> **Note:**
>
> Controlled features are optional and you must be entitled to use them in your system. If you are not sure whether you are entitled to use a specific feature, contact your Oracle Sales or Account Representative.

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

Provisioning of S-Port options can be done after the feature is enabled and before the feature is turned on.

After the S-Port feature has been enabled and database provisioning is complete, the S-Port feature status must be set to on (the feature must be "turned on") before S-Port processing will occur.

1. Display the status of the controlled features that are controlled with Feature Access Keys (FAKs). 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 09-06-29 16:40:40 EST  EAGLE5 41.1.0
   The following features have been permanently enabled:
   Feature Name              Partnum    Status  Quantity
   HC-MIM SLK Capacity       893012707  on            64
   ;
   ```

   If the Service Portability entry appears in the `rtrv-ctrl-feat` output, performing this procedure is not necessary.

2. Enable the S-Port feature, by entering the `enable-ctrl-feat` command.

   `enable-ctrl-feat:partnum=893034301:fak=<feature access key>`
   When the feature is enabled, the Service Portability entry appears in the output of the `rtrv-ctrl-feat` command.

   ```
   rlghncxa03w 09-06-29 16:40:40 EST  EAGLE5 41.1.0
   The following features have been permanently enabled:
   Feature Name              Partnum    Status  Quantity
   HC-MIM SLK Capacity       893012707  on            64
   Service Portability       893034301  off         ----
   ;
   ```

3. 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.
   ```

4.5 Provisioning True Point Codes and Capability Point Codes

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

For the ATINPQ subsystem, the EAGLE 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.

This procedure explains how to provision EAGLE true point codes and ATINP capability point codes.

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 09-06-29 16:40:40 EST  EAGLE 41.1.0
    The following features have been permanently enabled:
    Feature Name            Partnum    Status  Quantity
    HC-MIM SLK Capacity     893012701  on            64
    ATINP                   893022101  on          ----
;
```

- If the feature entry appears in the command output, and the feature status is on, continue with 3.

- 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 3.

3. Change the true point codes and capability point codes as needed, using the `chg-sid` command.

   Refer to the procedures in *Database Administration - SS7 User's Guide* for changing the Self-Identification of the EAGLE. The system might need to be initialized for the point code changes to take effect. This must be done carefully to minimize traffic loss.

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.
```

4.6 Provisioning the ATINPQ Local Subsystem

The following procedures in this section are used to add or remove a local subsystem application:

- Adding the ATINPQ Local Subsystem Application
- Removing a Local Subsystem Application

See the procedures in Changing the State of a Subsystem Application to take the subsystem application online or offline.

> **Note:**
>
> The EAGLE supports the operation of two or more local subsystems for **EPAP-related features** in the system at one time. For example, the local subsystems for INP and EIR can coexist in the system.

4.6.1 Adding the ATINPQ Local Subsystem Application

This procedure is used to define the ATINPQ subsystem application. The subsystem application can be taken online when it is defined or later in the configuration process (see Changing the State of a Subsystem Application).

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

Table 4-3   ATINPQ Local Subsystem Prerequisites

Prerequisite	Verification
The ATINP feature must be enabled and turned on	Enter the `rtrv-ctrl-feat` command.
	If the ATINP entry with Status of `on` does not appear in the output, see the Enabling ATINP, Setting STP Options, and Turning On ATINP procedure.
The application specified by the `appl` parameter (`atinpq`) cannot already be in the database.	Enter the `rtrv-ss-appl` command.
	If the ATINPQ entry appears in the output, this procedure cannot be performed.

Table 4-3   (Cont.) ATINPQ Local Subsystem Prerequisites

Prerequisite	Verification
EAGLE true point codes and ATINP capability point codes must be defined, and entered in the Mated Application table with a subsystem number to be used for the ATINPQ subsystem application.	Only one subsystem number for the application can be defined, and must be used for all point code types assigned to the local subsystem.
	Enter the `rtrv-sid` command, and verify that the true and capability point codes needed for the feature are correct. If changes are required, see Provisioning True Point Codes and Capability Point Codes
	Enter the `rtrv-map` command, and verify that the MAP table entries are correct for the ATINPQ local subsystem. If changes are required, refer to the procedures in *Database Administration - GTT User's Guide* for provisioning solitary and dominant mated applications.

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. 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
   ```

2. Verify the changes with 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)
   ;
   ```

3. 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.
   ```

4.6.2 Removing a 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 local subsystem application in the database, by entering the `rtrv-ss-appl` command.

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

   If the subsystem is out of service , shown by an entry containing OOS-MT-DSBLD for the subsystem in the `rept-stat-sccp` output, go to 5.

3. Place the local subsystem application out of service. Enter the `inh-map-ss` command and specify the subsystem number displayed in 1.

   ```
   inh-map-ss:ssn=11
   ```

   ```
   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 local subsystem is out of service (OOS-MT-DSBLD), by entering the `rept-stat-sccp` command. If the local subsystem is not out of service, return to 3 and enter the `inh-map-ss` command with the `force=yes` parameter specified.

5. Remove the local subsystem application from the database, by entering the `dlt-ss-appl` command.

   ```
   dlt-ss-appl:appl=<subsystem>
   ```

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.
   ```

4.7 Provisioning the ATINP Service Selector

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

4.7.1 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 09-06-29 16:40:40 EST  EAGLE5 41.1.0
   The following features have been permanently enabled:
   Feature Name              Partnum     Status  Quantity
   HC-MIM SLK Capacity       893012707   on            64
   ATINP                     893024401   on          ----
   ;
   ```

   - If the ATINP feature is enabled and turned on, continue with 2.

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

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 41.1.0

   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 3.

```
rlghncxa03w 08-06-28 14:42:38 GMT  EAGLE 41.1.0

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.
```

4.7.2 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 2.

   `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.
```

4.7.3 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 to remove the existing service selector. Then use the procedure in Adding an ATINP Service Selector 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 09-06-29 16:40:40 EST  EAGLE 41.1.0
The following features have been permanently enabled:
Feature Name            Partnum    Status  Quantity
HC-MIM SLK Capacity     893012707  on            64
ATINP                   893024401  on          ----
```

;

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

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=n
one: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.

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 3.

   ```
   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.
   ```

4.8 Provisioning the ATINP Options

Refer to ATINP Configuration Options in this manual and to the `chg-atinpqopts` command description in *Commands User's Guide* for parameter names, valid parameter values, examples, and dependencies.

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 09-06-29 16:40:40 EST  EAGLE 41.1.0
       The following features have been permanently enabled:
       Feature Name              Partnum     Status  Quantity
   ```

```
    HC-MIM SLK Capacity        893012707  on              64
    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 to enable the ATINP feature. Then continue with 3.

- If the ATINP feature is enabled, continue with 3.

2. If the Service Portability feature will be used with ATINP, verify that the Service Portability entry appears in the output in 1.

    - If the Service Portability entry appears in the output, continue with 3.

    - If the Service Portability entry does not appear in the output, go to Enabling the Service Portability Feature to enable the feature. Then continue with 3.

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

4. Change the ATINP options to the required settings, by entering the `chg-atinpqopts` command with at least one of the ATINP option parameters specified. If Service Portability will be used with ATINP, change the ATINP options that apply to Service Portability to the required settings.

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

5. Verify the changes by entering the `rtrv-atinpqopts` command.

6. If the ATINP feature was not turned on (status is `off` in the output in 1), go to Enabling ATINP, Setting STP Options, and Turning On ATINP to turn on the feature.

7. 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.
```

4.9 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 explain how to take a local subsystem online and offline.

Table 4-4   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.
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.

4.10 Turning On the Service Portability Feature

This procedure is used to turn on the Service Portability feature in the EAGLE, using the feature part number 893034301.

Before the Service Portability (S-Port) feature can be turned on, the feature must be enabled in the EAGLE.

Provisioning of S-Port options can be done after the feature is enabled and before the feature is turned on.

After the S-Port feature has been enabled and database provisioning is complete, the Service Portability feature status must be set to on (the feature must be "turned on"). MSUs will not be processed by the Service Portability feature until the feature is turned on.

After the Service Portability feature is enabled and turned on, it can be turned off again. Service Portability processing can occur only when the Service Portability feature is on and a feature that uses S-Port is on.

1. Display the status of the controlled features that are controlled with Feature Access Keys (FAKs). Enter the `rtrv-ctrl-feat` command. The output lists the enabled features in the system and shows the on/off status for each feature.

   • If the entry for the Service Portability feature appears in the `rtrv-ctrl-feat` output with status `on`, performing this procedure is not necessary.

   • If the status of the Service Portability feature in the output is off, continue with 2.

2. Turn on the S-Port feature, by entering the `chg-ctrl-feat` command.

   `chg-ctrl-feat:partnum=893034301:status=on`
   When the feature is turned on, the feature status changes to `on` in the `rtrv-ctrl-feat` command output.

```
   rlghncxa03w 09-08-29 16:40:40 EST  EAGLE5 41.1.0
   The following features have been permanently enabled:
   Feature Name              Partnum    Status  Quantity
   HC-MIM SLK Capacity       893012707  on            64
   ATINP                     893022101  on          ----
   Service Portability       893034301  on          ----
;
```

3. 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.
```

4.11 Turning Off the Service Portability Feature

Before the Service Portability (S-Port) feature can be turned on and off, the feature must be enabled in the EAGLE.

This procedure is used to turn off the Service Portability feature, using its feature part number 8930343001.

> **Note:**
>
> MSUs will not be processed by a feature when the feature is turned off in the system.

1. Display the status of the controlled features that are controlled with Feature Access Keys (FAKs). 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 09-06-29 16:40:40 EST  EAGLE5 41.1.0
The following features have been permanently enabled:
Feature Name              Partnum     Status  Quantity
HC-MIM SLK Capacity       893012707   on            64
TIF Number Portability    893018901   on          ----
Service Portability       893034301   on          ----
;
```

If the entry for the Service Portability feature appears in the `rtrv-ctrl-feat` output with status `off`, performing this procedure is not necessary.

If the status of the Service Portability feature in the output is `on`, continue with 2.

2. Turn off the S-Port feature, by entering the `chg-ctrl-feat` command.

`chg-ctrl-feat:partnum=<893034301>:status=off`
When the feature is turned off, the feature status changes to `off` in the `rtrv-ctrl-feat` command output.

```
rlghncxa03w 09-05-29 16:40:40 EST  EAGLE5 41.1.0
The following features have been permanently enabled:
Feature Name              Partnum     Status  Quantity
HC-MIM SLK Capacity       893012707   on            64
TIF Number Portability    893018901   on          ----
Service Portability       893034301   off         ----
;
```

3. 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.
```

4.12 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 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 sends SBR/SSPs. A UAM is generated, indicating that the subsystem is PROHIBITED.

When the EAGLE 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 will not reply to the SOR message.

4.12.1 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.

3. Place the subsystem out of service. Specify the subsystem number displayed in the output in 1.

   `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.

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.
```

4.12.2 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.

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.
    ```

ORACLE

5

ATINP Measurements

This chapter describes the measurements that can be collected and generated for the ATINP feature.

5.1 ATINP Measurements

The EAGLE **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 EAGLE Measurements subsystem supports the collection and retrieval of measurements related to the ATINP feature and the ATINPQ local subsystem. The ATINP measurements can be collected with either of the following collection methods:

- The Measurements Platform feature enabled and the Measurements Platform collection option on
- The E5-OAM Integrated Measurements feature enabled and on and the E5-OAM Integrated Measurements collection option on

OAM-based (UI) measurements are not available for ATINP.

Refer to *Measurements Reference* for descriptions of collection methods, measurements, and measurements reports.

Refer to *Commands User's Guide* for descriptions of the commands used to enable and turn on features, turn on measurements collection options, and schedule and generate measurements reports.

Refer to the procedures in *Database Administration - System Management User's Guide* for configuring the Measurements Platform feature or the EAGLE Integrated Measurements feature and the EAGLE OA&M IP Security feature in the EAGLE.

The Per System totals and Per SSP totals shown in Table 5-1 are collected for ATINP. The totals are reported in the Hourly Maintenance Measurements (MTCHATINP) report and Daily Maintenance Measurements (MTCDATINP) report.

> **Note:**
>
> If an MSU is received with CdPA Rt-on-GT, EAGLE replaces the OPC with its PC as a part of the GTT process. If the CgPA is Rt-on-GT and no CgPA PC is present, it is not possible to determine the originating SSP until GTT has been performed on the CgPA during the encode function. If a decode problem with the query is encountered, then processing will be aborted and Per-SSP measurements will not be updated. GTT of the CgPA will not be attempted on a suspect message. Normal UIM generation will occur (see ATINPQ Subsystem UIMs).

Table 5-1   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.
	Note: MSUs resulting in U-Abort and P-Abort messages typically are not successfully decoded to identify them as ATI messages. ATINPQRCV will not be incremented for these MSUs.
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.)
	Note: MSUs resulting in U-Abort and P-Abort messages typically are not successfully decoded to identify them as ATI messages. ATINPQERR will not be incremented for these MSUs.

6
Maintenance

This chapter describes commands and reports that can be used for ATINP maintenance, including status reporting and problem identification.

6.1 ATINPQ Subsystem Alarms

This section contains a list of EAGLE Unsolicited Alarm Messages (UAMs) that support the ATINPQ local subsystem. All ATINPQ-related UAMs are generated to the APSS Output Group.

Refer to *Unsolicited Alarm and Information Messages Reference* for descriptions and corrective procedures for EAGLE-related alarms.

Refer to *Alarms and Maintenance Guide* for EPAP for the descriptions and corrective procedures associated with MPS-related alarms.

Table 6-1   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

6.2 ATINPQ Subsystem UIMs

This section contains a list of EAGLE Unsolicited Information Messages (UIMs) that support the ATINPQ local subsystem.

Refer to *Unsolicited Alarm and Information Messages Reference* for a complete description of all UIM text and formats.

> **✎ Note:**
>
> If both a decode and an encode error occur during ATINP processing, precedence is given to the decode error and only one UIM will be generated.

Table 6-2 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.	
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 Location Information, 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 fit 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, MSISDN, and vlr-number fields (ATINPQOPTS: ATIACKRN, ATIACKMSISDN, ATIACKVLRNUM options), digits in incoming ATI NP query, and the result of RTDB lookup.
1426	S-Port: Missing GRN for srvc prtd subs	Service Portability required use of RTDB GRN for encoding response; however GRN was not provisioned.	Verify EPAP provisioning for the subscriber.

6.3 Maintenance Commands

The following commands can be used for maintenance when an EPAP-related feature is on.

Refer to *Commands User's Guide* for complete descriptions of the commands, including parameters, valid parameter values, rules for using the commands, and output examples.

Table 6-3   Maintenance Commands

Command	Description
rept-stat-sys	Reports the status of system entities, including cards. The output includes the number of Service Module cards that are in service (IS-NR) and how many are in another state (IS-ANR, OOS-MT, OOS-MT-DSBLD).
rept-stat-sccp	Reports operating status of services and subsystems, CPU usage, and Service Module card status. When the `loc` parameter is specified, the command displays detailed card traffic statistics, including cards that are denied SCCP service. See the section in this manual that describes the use of the `rept-stat-sccp` command.
rept-stat-mps	Displays the overall status of the EPAP application running on the MPS (multi-purpose server). Command output for the various reports of this command include overall MPS alarm status and card status, and status for a specific Service Module card when a feature is on.
rept-stat-trbl	Includes a summary of any trouble notifications (**UAM**s) for local subsystems, cards, and linksets. The severity of each alarm is indicated in the output report.
rept-stat-alm	Displays the alarm counts and totals for local subsystems and Service Module card/EPAP IP links.
rept-stat-db	Displays the status information for the EAGLE databases. This includes the level information for each Service Module card, and for the active and standby EPAP RTDB. The command reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birth dates and levels. It shows the status of each PDB and RTDB when an EPAP-related feature is enabled.
rtrv-tbl capacity	Retrieves table use capacity summary information. For each table listed, the number of table entry elements in use and the total allowed number of table elements is presented, along with a percent (%) full value. Information is shown for some tables only if the feature that uses the table is enabled.
inh-card/alw-card	The `inh-card` command is used to change the operating state of the card from In-Service Normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD). A craftsperson then can test the card or physically remove it from the shelf. The `alw-card` command is used to change the card from OOS-MT-DSBLD (Out-of-Service Maintenance-Disabled) to IS-NR (In-Service Normal) if card loading is successful.
inh-alm/unhb-alm	Used to allow and inhibit reporting of alarms for a given device, including the Service Module card ports. The commands allow both Port A and Port B to be specified. Inhibited alarms will not generate UAMs or cause alarm indicators to be turned on. All `rept-stat-xxx` commands continue to display the alarms with an indication that the device has its alarms inhibited.

Table 6-3   (Cont.) Maintenance Commands

Command	Description
rtrv-data-rtdb	Retrieves Entity data, DN data, IMEI data, IMSI data, TN data, NPANXX data, and LRN data from the RTDB on an active Service Module card.
	If the `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.

6.3.1 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.

6.4 EAGLE Debug Commands

Commands User's Guide contains descriptions of debug commands used in assessing and modifying system status and operation. Most of the debug commands are used only under the direction of Oracle 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 traps MSUs that meet the specified tracing criteria, which are the DN and ENTITYID parameters when the ATINP feature is enabled.

6.5 Status Reporting and Problem Identification

EAGLE commands can be used to obtain status and statistics for the EAGLE system, the EPAP systems, system devices including Service Module cards, EPAP-related features, local subsystems, and SCCP services.

Refer to *Commands User's Guide* for complete descriptions of the commands, including parameters and valid values, rules for using the commands correctly, and output examples.

Refer to *Unsolicited Alarm and Information Messages Reference* for descriptions and recovery procedures for UAMs and UIMs.

Refer to *Administration Guide* for EPAP for descriptions of EPAP functions and operation.

Refer to *Alarms and Maintenance Guide* for descriptions and recovery procedures for EPAP alarms.

Refer to the appropriate feature User's Guide for information about the functions and operation of EPAP-related features.

Table 6-4   Status Reporting for EPAP-Related Features

Reports, Status, and Statistics	Command
EAGLE	
Maintenance Status Report - indicates whether Maintenance, Routing, and SCCP Baselines have been established.	`rept-stat-sys`
Alarms and operating state for system devices, including Service Module ("SCCP") cards.	`rept-stat-sys`
Unsolicited Alarm Messages (UAMs) and Unsolicited Information Messages (UIMs)	`rept-stat-alm` `rept-stat-trbl`
EPAP/MPS (from the EAGLE)	
EPAP code version and operating state for each EPAP.	`rept-stat-mps`
MPS hexadecimal alarm strings for the active and standby EPAPs.	`rept-stat-mps`
Operating state and alarm status of equipped Service Module cards and their DSM ports and IP connections.	`rept-stat-mps` `rept-stat-mps:loc=<Service Module card location>`
Amount of memory used by the RTDB on the specified card, as a percent of available Service Module card memory.	`rept-stat-mps:loc=<Service Module card location>`
EPAP Provisioning Database (PDB), EPAP Real Time Database (RTDB), and Service Module card RTDB status information - Coherent, birthdate (date and time of creation), and exception (condition when a problem was detected).	`rept-stat-db` `rept-stat-db:db=mps`
Service Module Cards, **EPAP-Related Features, Services, Local Subsystems**	
Status of the Service Module cards, and the services executing on the cards for EPAP-related features that are turned on. Includes Service Report, Subsystem Report, and Alarm Status; Total Service Statistics.	`rept-stat-sccp`
Operating state and alarm status of equipped Service Module cards and their DSM ports and IP connections; EPAP-related feature status per card.	`rept-stat-mps:loc=<Service Module card location>`
Alarms and operating state for Service Module ("SCCP") cards.	`rept-stat-sys` `rept-stat-mps`
Any cards that are denied SCCP service.	`rept-stat-sccp`
Detailed view of the status of SCCP services provided by the specified Service Module card. Includes Card Alarm Status, Card Service Statistics	`rept-stat-sccp:loc=<Service Module card location>`
General SCCP traffic performance for Service Module cards. Message rates for TVG performance.	`rept-stat-sccp:mode=perf`
Statistics for EPAP-related feature local subsystems - Subsystem Report	`rept-stat-sccp`
Statistics for EPAP-related features	`rept-stat-sccp`

6.5.1 EPAP Status and Alarm Reporting

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

EPAP Maintenance Blocks

The EPAP forwards all status and error messages to the Service Module cards in maintenance blocks. Maintenance blocks are asynchronously sent whenever the EPAP has something to report. The status information that is displayed when a `rept-stat-mps` command is issued includes information that came from the maintenance blocks.

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

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

- Status of EPAP A - actual states are active, standby, and down (inoperative). Maintenance blocks include a field for this information so that it can be available for the output of the `rept-stat-mps` command.

- Status of EPAP B - actual states are active, standby, and down (inoperative). Maintenance blocks include a field for this information so that it can be available for the output of the `rept-stat-mps` command.

- Identification of Active EPAP - a field to identify the active EPAP.

- Congestion Indicator - an indicator showing provisioning link congestion. The link between the EPAPs and the external source of provisioning data can become congested in high-provisioning traffic situations. When this occurs and subsequently as the congestion clears, the EPAP sends maintenance blocks to the Service Module card.

- Alarm Conditions - an error code field. If the EPAP needs to report an alarm condition, it puts an appropriate UAM identifier in this field.

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

DSM Status Requests and DSM Status Messages

When the EPAP needs to know the status of a Service Module card, the EPAP sends a DSM Status Request to all Service Module cards, and each Service Module card returns its status to the EPAP.

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

- The Service Module card is booted.

- The Service Module card receives a DSM Status Request message from the EPAP.

- The Service Module card determines that it needs to download the entire RTDB; for example, the Service Module card determines that the RTDB needs to be downloaded because it is totally corrupted, or a user requests that the RTDB be reloaded. The Service Module card sends a Full Download Request message to the EPAP

- The Service Module card starts receiving RTDB downloads or updates. When a Service Module card starts downloading the RTDB or accepting updates, the Service Module card sends a DSM Status Message informing the EPAP of the first record received. This helps the EPAP keep track of downloads in progress.

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

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

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