Tekelec EAGLE® 5

Feature Manual - V-Flex™

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Chapter 1

Introduction

Topics:

V-Flex is an EAGLE 5 ISS feature that allows operators to customized voice mail routing based on subscriber information and call status. With the introduction of advanced services such as video and multimedia voice mail and the implementation of a tiered voice mail service structure, operators can deploy a few advanced voice mail servers for premium customers, while maintaining standard platforms to service the majority of basic voice mail subscribers.

Introduction

V-Flex is an EAGLE 5 ISS feature that allows operators to customized voice mail routing based on subscriber information and call status. With the introduction of advanced services such as video and multimedia voice mail and the implementation of a tiered voice mail service structure, operators can deploy a few advanced voice mail servers for premium customers, while maintaining standard platforms to service the majority of basic voice mail subscribers.

Range-based voice mail routing schemes route calls to all available voice mail server centers (VMSCs) in an equal, load-sharing scheme. Subscriber numbers are grouped into ranges and are routed to the VMSC associated with a particular number range. This routing scheme does not make it possible to assign a subscriber to a particular VMSC on an individual basis.

V-Flex provides operators with the ability to associate individual subscriber numbers (DN or MSISDN) to a specific voice mail server in a centralized database. V-Flex determines which VMSC the voice mail call should be routed to for a specific subscriber. This allows the operator to make specific subscriber-to-VMSC assignments, making the most efficient use of the VMSC platforms that are deployed.

In addition, V-Flex also provides a flexible routing scheme with DN/MSISDN-VMSC assignment controlled by a central application. This means that mobile switching centers (MSCs) with the V-Flex feature would not need to maintain separate number ranges, each with a VMSC assignment. Consequently, subscriber re-assignment and platform maintenance is greatly simplified.

V-Flex is deployed as a local subsystem on the EAGLE 5 ISS platform. Queries from MSCs are routed directly to the EAGLE 5 ISS V-Flex node, where the subscriber DN/MSISDN-VMSC mappings and call decision criteria are provisioned and maintained in the system OAM. Upon receipt of the query, V-Flex uses mapping tables and call decision criteria to determine a specific voice mail routing number, which the MSC uses to route the call.

V-Flex supports two different query types:

- ITU/ETSI INAP IDP query
- 3GPP CAMEL (CAP) IDP query

V-Flex Functions

V-Flex provides the following functions:

- Flexible number mapping to provide a logical link between a subscriber (MSISDN/DN) and a VMSC
- Support for up to 8 DNs per subscriber
- Support for individual and range entries
- Up to 120 million subscriber numbers, scalable in increments of 500,000
- Up to 50,000 MSISDN range entries
- Database support for variable-length numbers from 1 to 15 digits
- Number normalization feature to store numbers in international format and automatically translate national numbers to international numbers before searching the database, preventing duplicate number storage

V-Flex Considerations

The GTT feature must be ON before the V-Flex feature can be enabled.

V-Flex and North American LNP are mutually exclusive in an EAGLE 5 ISS node.

Scope and Audience

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

Manual Organization

This document is organized into the following chapters:

- *Introduction* contains general information about the V-Flex documentation, the organization of this manual, and how to get technical assistance.
- *Feature Description* provides a functional description of the V-Flex feature, including network perspectives, assumptions and limitations, a database overview, Service Module card provisioning and reloading, and V-Flex user interface overview.
- *EAGLE 5 ISS V-Flex Commands* describes the commands that can be used for V-Flex feature configuration functions.
- *V-Flex Configuration*provides procedures for configuring the V-Flex feature for use in the Eagle 5 ISS.
- *V-Flex Measurements* describes V-Flex-related measurements, measurements reports, and methods of collection.
- *Maintenance* describes V-Flex-related UAMs and UIMs; commands that can be used for maintenance functions; and status and alarm reporting for the EAGLE 5 ISS, EPAP, Service Module cards, services, and the local subsystem.

Documentation Admonishments

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

Table 1: Admonishments

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

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

Customer Care Center

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

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

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

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

Tekelec - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

  Phone:

  1-888-FOR-TKLC or 1-888-367-8552 (toll-free, within continental USA and Canada)

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

  TAC Regional Support Office Hours:

  8:00 a.m. through 5:00 p.m. (GMT minus 5 hours), Monday through Friday, excluding holidays

- **Caribbean and Latin America (CALA)**

  Phone:

  USA access code +1-800-658-5454, then 1-888-FOR-TKLC or 1-888-367-8552 (toll-free)

  TAC Regional Support Office Hours (except Brazil):

  10:00 a.m. through 7:00 p.m. (GMT minus 6 hours), Monday through Friday, excluding holidays

  - **Argentina**

    Phone:

0-800-555-5246 (toll-free)

- **Brazil**

  Phone:

  0-800-891-4341 (toll-free)

  TAC Regional Support Office Hours:

  8:30 a.m. through 6:30 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays
- **Chile**

  Phone:

  1230-020-555-5468
- **Colombia**

  Phone:

  01-800-912-0537
- **Dominican Republic**

  Phone:

  1-888-367-8552
- **Mexico**

  Phone:

  001-888-367-8552
- **Peru**

  Phone:

  0800-53-087
- **Puerto Rico**

  Phone:

  1-888-367-8552 (1-888-FOR-TKLC)
- **Venezuela**

  Phone:

  0800-176-6497

- **Europe, Middle East, and Africa**

  Regional Office Hours:

  8:30 a.m. through 5:00 p.m. (GMT), Monday through Friday, excluding holidays

  - **Signaling**

    Phone:

    +44 1784 467 804 (within UK)
  - **Software Solutions**

    Phone:

+33 3 89 33 54 00

- **Asia**
  - **India**

    Phone:

    +91 124 436 8552 or +91 124 436 8553

    TAC Regional Support Office Hours:

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  - **Singapore**

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    +65 6796 2288

    TAC Regional Support Office Hours:

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Emergency Response

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

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

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

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

Related Publications

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

Documentation Availability, Packaging, and Updates

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

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

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

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

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

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

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

Locate Product Documentation on the Customer Support Site

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

1. Log into the *Tekelec Customer Support* site.

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

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

Chapter 2

Feature Description

Topics:

This chapter describes how V-Flex permits routing of calls to voice mail systems with specific capabilities based on subscriber and call context information.

V-Flex Feature Overview

V-Flex permits routing of calls to voice mail systems with specific capabilities based on subscriber and call context information. The scenario for a voice mail call to an MSC supported by an Eagle with the V-Flex feature turned on is:

1. MSC receives an IAM for a call being routed to a VMS
2. MSC is programmed to generate an IDP to the EAGLE 5 ISS (instead of directly to a VMS)
3. Eagle 5 ISS, using subscriber information and call context information from the IAM:
   - Analyzes the information provided in the IDP
   - Performs appropriate database searches
   - Generates a CONNECT message to the MSC with routing information
4. MSC connects to the correct VMS based on routing information

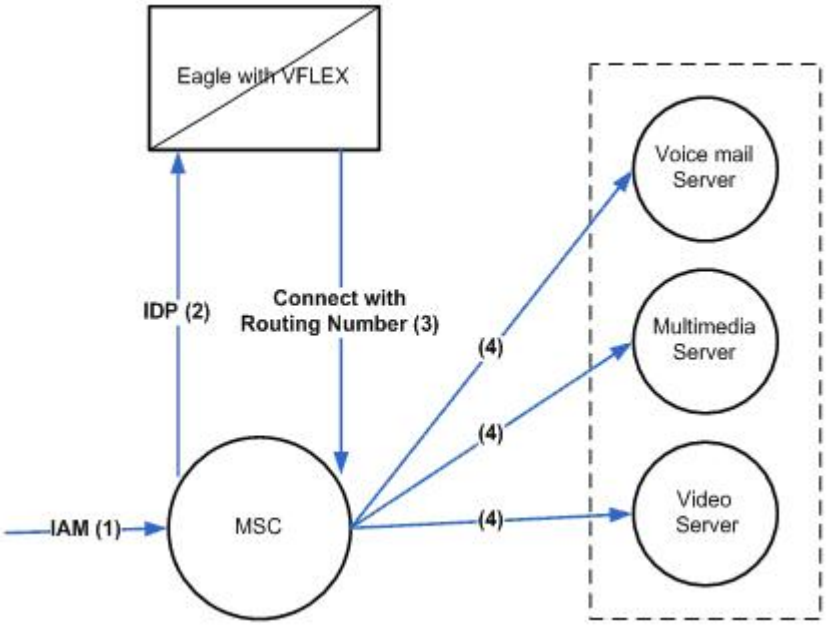

Figure 1: Call Scenario with V-Flex Feature

When the V-Flex service is triggered, V-Flex must determine three things for the transaction to be successful:

- The MSISDN of the subscriber whose voice mail is being accessed
- The VMS ID assigned to that subscriber (MSISDN)
- The Voice Mail Routing Number of the VMS associated with the MSISDN of the subscriber

Determining the MSISDN

The first step is to determine where to find the MSISDN of the subscriber whose voice mail is being accessed.

A valid MSISDN is defined as :

- An MSISDN found in the IDP query
- An MSISDN correctly encoded in the IDP query
- An MSISDN found either as a DN or within DN Block in the RTDB
- An MSISDN or DN Block that has an associated VMS ID or GRN entity

Note: An invalid MSISDN can still be routed using a default routing number provisioned in the Call Decision Table (for an MSISDN "not found" that matches other parameters).

How the MSISDN is determined is dependent on the type of VM call that is made.Voice mail calls can be made in two ways:

- Redirected call to a VMS by the MSC
- Direct call to VMS using standard VMS number used by the MSC

When a call is redirected (indicated by the RDI parameter in the IDP), the MSISDN is identified by one of the following:

- Check for MSISDN in Re-Directing Number (RDN)
- If there is no MSISDN in RDN, get MSISDN from Original Called Number (OCN)

For a direct VMS call, the MSISDN is identified by checking for a VM prefix in the INAP CalledPartyNumber or the CAP CalledPartyBCDNumber resulting in one of the following options:

- If there is a match on the VM prefix and there are additional digits in the CdPN/CdPBCDN, then get MSISDN from CdPN/CdPBCDN following VM prefix digits
- If there is a match on the VM prefix and there are no additional digits in the CdPN/CdPBCDN, then get MSISDN from INAP/CAP CgPN
- If there is no match on the VM prefix in CdPN/CdPBCDN, get MSISDN from INAP/CAP CgPN

Determining the VMS ID

The second step is to find the VMS ID assigned to the subscriber (MSISDN). For this, V-Flex extracts the MSISDN from the appropriate parameter and uses it to search the Eagle Real-time Database (RTDB) to find the VMS ID assigned to that subscriber. A match may be found on a specific DN, or within a DN Block.

Determining the VMRN

The third step is to determine the VMRN. The VMRN is determined based on the following call conditions (combination of parameters in the Call Decision Table):

Voice Mail Number or Voice Mail Prefix (from the INAP/CAP CdPN or CdPBCDN parameter)

For redirect by the MSC, the Voice Mail Number is used.

For a direct dial by the subscriber, the Voice Mail Prefix is used if it is available (VMPrefix + MSISDN in the INAP CdPN). When the VMPrefix is not available, the CdPN is used.

Different voice mail numbers correspond to different call scenarios and can be used to determine which VMS routing number should be used.

Redirection Indicator (INAP/CAP RDI parameter)

Indicates whether the call has been redirected (redirection signifies a voice mail deposit). If the call has not been redirected, the call is either a voice mail retrieval or a direct dialed VM deposit (as determined by the INAP/CAP CdPN).

Bearer Capabilities (INAP/CAP)

Determines the type of mail – for example voice, video, multimedia, etc.

Note: Bearer Capabilities is a set of up to 32 values (0-31) configured by the network provider.

MSISDN found or not found in the EPAP RTDB

Indicates authorized versus unauthorized retrieval.

Based on the parameter values in the Call Decision Table, V-Flex determines the appropriate VMRN and returns it in a connect response to the MSC. The MSC uses the VMRN supplied by V-Flex to route the Voice Mail call.

V-Flex Protocol

The EAGLE 5 ISS supports the V-Flex capability point code type and a local subsystem that can have a mated application, and a concerned point code group assigned to it . All point code types except ITUN-24 are supported in the MAP table. The V-Flex subsystem cannot be set to Load Shared mode (as end nodes do not perform load sharing), but can be set to Dominant or Solitary mode.

Multiple Local Subsystems

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

Messages for Local Subsystems

The message arrives on the V-Flex subsystem on *rt-on-ssn* or *rt-on-gt*. If the message arrives *rt-on-ssn*, it must contain either the EAGLE 5 ISS true point code or the V-Flex capability point code in the DPC field of the message, and EAGLE 5 ISS V-Flex Subsystem number in the Called Party Subsystem field of the message. If V-Flex queries has the EAGLE 5 ISS capability point code for the DPC, then the EAGLE 5 ISS processes the message, but is not able to divert this message in the event of subsystem failure.

If a rt-on-gt message arrives at the EAGLE 5 ISS, it must either contain a CdPA address that translates to the V-Flex subsystem or match SCCP Service Selectors that have been provisioned to select V-Flex. These messages also should contain one of EAGLE 5 ISS capability point codes in the DPC field. The EAGLE 5 ISS also processes the message if it has the EAGLE 5 ISS's true point code for the DPC, but it is not able to divert these messages in the event of subsystem failure.

If the V-Flex local subsystem is offline and the mated subsystem is available, the routing indicator is used to determine whether to reroute:

- If the message arrived route-on-ssn, the message is not rerouted to the mate. In this case, EAGLE 5 ISS is acting as an end node, and end nodes do not reroute. If the return on error option is set, the EAGLE 5 ISS generates a UDTS, otherwise it will discard the message.
- If the message arrived on route-on-gt, the message is rerouted to the mated subsystem. In this case, EAGLE 5 ISS is acting as both STP and SCP, and STPs do reroute messages.

MTP and SCCP Management to Support V-Flex

If the V-Flex subsystem is offline, the EAGLE 5 ISS sends SSPs that causes the *rt-on-ssn* message to be diverted to the mate subsystem. These do not cause the *rt-on-gt* messages to be diverted. In order to make other nodes divert *rt-on-gt* traffic to the mate, the EAGLE 5 ISS will send response method TFPs to the APC of the message, when messages arrive *rt-on-gt* for one of the V-Flex Capability Point Codes and the result of translation is the EAGLE 5 ISS V-Flex subsystem. This TFP should cause the APC to divert traffic to the mate. If a message arrives *rt-on-gt* for the EAGLE 5 ISS True Point Code, the EAGLE 5 ISS will not generate a TFP. Therefore, nodes that send *rt-on-gt* traffic to the EAGLE 5 ISS should use a V-Flex capability point code, not the EAGLE 5 ISS True Point Code.

If the EAGLE 5 ISS receives an RSP (Route Set Test Message - Prohibited) for a V-Flex capability point code, and the V-Flex subsystem is offline, the EAGLE 5 ISS does not reply. If the EAGLE 5 ISS receives an RSR (Route Set Test Message - Restricted) for V-Flex capability point code, and the V-Flex subsystem is offline, the EAGLE 5 ISS replies with a TFP concerning the capability point code. When the V-Flex subsystem is online, RSRT replies to both RSRs and RSPs for the V-Flex capability point code with a TFA.

Hardware Requirements

EPAP-related features that perform an RTDB lookup require Service Module cards (DSM cards, E5-SM4G cards, or E5-SM8G-B cards) running the VSCCP application. The EAGLE 5 ISS 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.

MPS/EPAP Platform

Tekelec provides the Multi-Purpose Server (MPS) platform as a subsystem of the EAGLE 5 ISS. 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 *Tekelec 1200 Application Server Hardware Manual*. The MPS provides the means of connecting the customer provisioning application with the EAGLE 5 ISS and accepts the customer number portability data, while accommodating numbers of varying lengths.

The EAGLE Provisioning Application Processor (EPAP) is software that runs on the MPS hardware platform. It collects and organizes customer provisioning data, and forwards the data to the EAGLE 5 ISS Service Module cards. *Figure 2: MPS/EPAP Platform Architecture* shows the overall system architecture from customer provisioning through the MPS subsystem to the EAGLE 5 ISS Service Module card databases.

In this manual, Service Module card refers to a DSM card, an E5-SM4G card, or an E5-SM8G-B card unless a specific card is required. For more information about the supported cards, refer to *EAGLE 5 ISS Hardware Manual*.

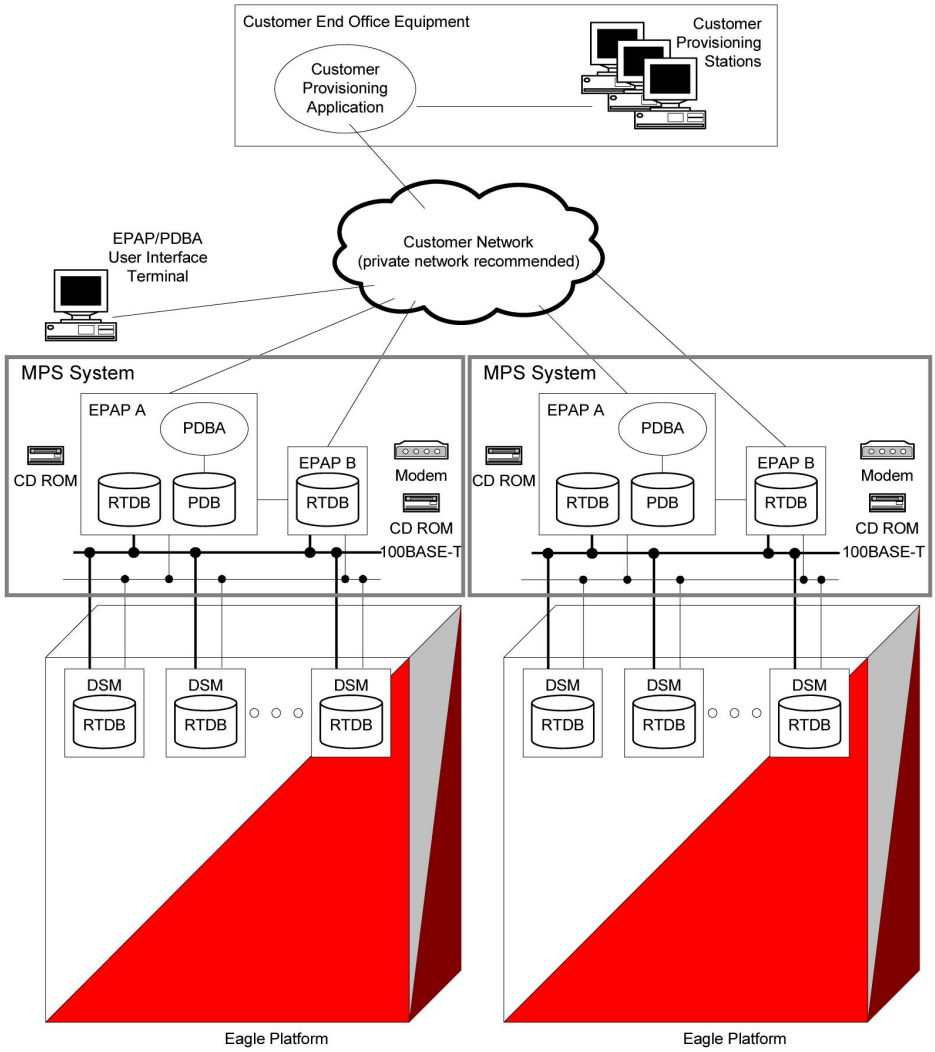

Figure 2: MPS/EPAP Platform Architecture

Design Overview and System Layout

Figure 2: MPS/EPAP Platform Architecture identifies the tasks, databases and interfaces which constitute the overall system architecture. The system consists of two mated MPS servers. Each MPS contains two EPAP platforms - EPAP A and EPAP B with each containing a Real Time Database (RTDB) , Provisioning Database (PDB), servers, optical media, modems, and network switches when using a T1200 AS system. Each MPS and its associated EPAPs are an *EPAP system*; the EPAP system and the mated EAGLE 5 ISS are the *mated EPAP system*. Each EPAP system is a T1200 AS system with a total of four Ethernet interfaces: one from each EPAP to the 100BASE-T Ethernet and one from each EPAP to either a 10BASE-T or a 100BASE-T Ethernet. See *Table 2: Service Module Card Provisioning and Reload Settings* for the link speed.

On the EAGLE 5 ISS, a set of Service Module cards, which hold the RTDB, is part of the STP. Two high-speed Ethernet links connect the Service Module cards and the EPAPs. One of the links is a 100BASE-T Ethernet bus, and the other is either a 10BASE-T or a 100BASE-T Ethernet bus. See *Table 2: Service Module Card Provisioning and Reload Settings* for the link speed.

The RTDB is provisioned and maintained through the EPAPs. EPAP A and EPAP B act as the active EPAP and the standby EPAP. One link serves as the active link, and the other link as the standby link. Only one EPAP and one link are active at a time. The database is provisioned through the active link by the active EPAP; the other EPAP provides redundancy.

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

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

The major modules on the EPAP are:

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

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

Functional Overview

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

The RTDB on the EPAP contains a coherent, current copy of the subscriber database. If the current copy of the RTDB on the Service Module cards becomes *out-of-sync* because of missed provisioning or card rebooting, the EPAP Service Module card provisioning module sends database information through the provisioning link to the Service Module cards. The Service Module cards are reprovisioned with current subscriber information.

EPAP/PDBA Overview

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

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

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

The EPAP platform performs the following:

- Maintains an exact copy of the real time database (RTDB) on the EPAP

- Distributes the subscription database to the Service Module cards
- Maintains a redundant copy of the RTDB database

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

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

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

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

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

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

Each EPAP server maintains a copy of the Real Time Database (RTDB) in order to provision the EAGLE 5 ISS Service Module cards. The EPAP server must comply with the hardware requirements in the *Tekelec 1200 Application Server Hardware Manual*. *Figure 2: MPS/EPAP Platform Architecture* illustrates the EPAP architecture contained in the MPS subsystem.

Each EPAP has a dedicated optical media drive. One EPAP per EAGLE 5 ISS platform has a modem capable of supporting remote diagnostics, configuration, and maintenance. These remote operations are performed through EPAP login sessions and are accessible across the customer network as well as through a direct terminal connection to the EPAP using an RS232 connection. Refer to *Tekelec 1200 Application Server Hardware Manual* for details about the hardware devices and network connections.

Subscriber Data Provisioning

Figure 3: Subscriber Data Provisioning Architecture (High Level) shows a high-level view of the subscriber data provisioning architecture. Only those parts of the EAGLE 5 ISS platform that are relevant to subscriber data provisioning are shown. This section defines requirements for the Provisioning Database Interface (PDBI) between the EPAP and the operator's provisioning system (OPS). Provisioning clients connect to the EPAPs using the PDBI. This interface contains commands that allow all of the provisioning and retrieval of subscription data. The PDBI is used for real-time provisioning of subscriber and network entity data only. Refer to *Provisioning Database Interface Manual* for more details.

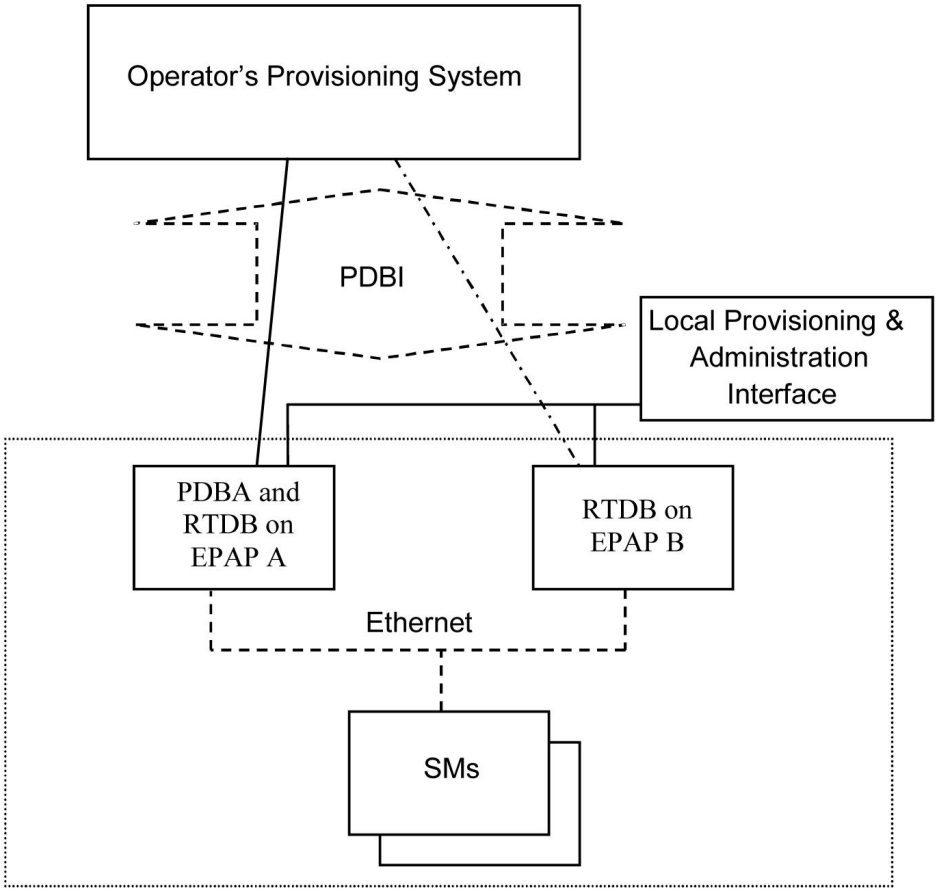

Figure 3: Subscriber Data Provisioning Architecture (High Level)

A pair of active/standby EPAP servers provides the interface between the Real Time Database (RTDB) of the EAGLE 5 ISS Service Module cards and the OPS. EPAP A is equipped with both the PDB (Provisioning Database) and the RTDB, and EPAP B has only the RTDB. An EPAP with only the RTDB must be updated by the EPAP that is equpped with the PDB.

For more information about the EPAP, refer to *EPAP Administration Manual*. For more information about the MPS hardware, refer to *Tekelec 1200 Application Server Hardware Manual* .

Distributed Administrative Architecture

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

Databases requiring high update and retrieval rates, such as the EPAP RTDB, are populated using redundant Ethernet connections to Service Module cards from an EPAP MPS platform.

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

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

The EPAP architecture contains a local provisioning terminal and a modem for remote access, as well as other functions. A backup device can be used to back up or restore the provisioning database. The local provisioning terminal is used to manually repair the standby EPAP RTDB or to turn the subscriber database audit on or off. For additional information, refer to *Tekelec 1200 Application Server Hardware Manual* and the *EPAP Administration Manual*.

EPAP (EAGLE Provisioning Application Processor)

As shown in *Figure 2: MPS/EPAP Platform Architecture*, a single MPS system contains two EAGLE Provisioning Application Processor (EPAP) servers. At any given time, only one EPAP actively communicates with the Service Module cards on the EAGLE 5 ISS. The other EPAP server is in standby mode. In addition, two MPS systems can be deployed in a mated pair configuration.

The primary purpose of the EPAP system is to maintain the Real Time Database (RTDB) and Provisioning Database (PDB), and to download copies of the RTDB to the Service Module cards.

The PDB on the active EPAP receives subscription data from the customer network through the Provisioning Database Interface (PDBI), the external source of provisioning information. The Provisioning Database Application(PDBA) continually updates the PDB of the active EPAP. The PDB uses MySQL database software. After an update is applied to the active PDB, the data is sent to the RTDBs on the active and standby EPAPs.

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

A mated pair configuration has two mated MPS Systems, as shown in *Figure 2: MPS/EPAP Platform Architecture*. The PDB on the active EPAP automatically updates the PDB on the mate platform. The PDB on the mate platform then updates RTDBs on its EPAPs, which in turn update the RTDBs on the associated Service Module cards.

Provisioning of the EAGLE 5 ISS Service Module cards is performed through two interfaces using two different sets of commands. Provisioning is accomplished by the STP updates from EAGLE 5 ISS terminals and by updates from the customer's external provisioning system. This system of dual provisioning is illustrated in *Figure 4: Database Administrative Architecture*.

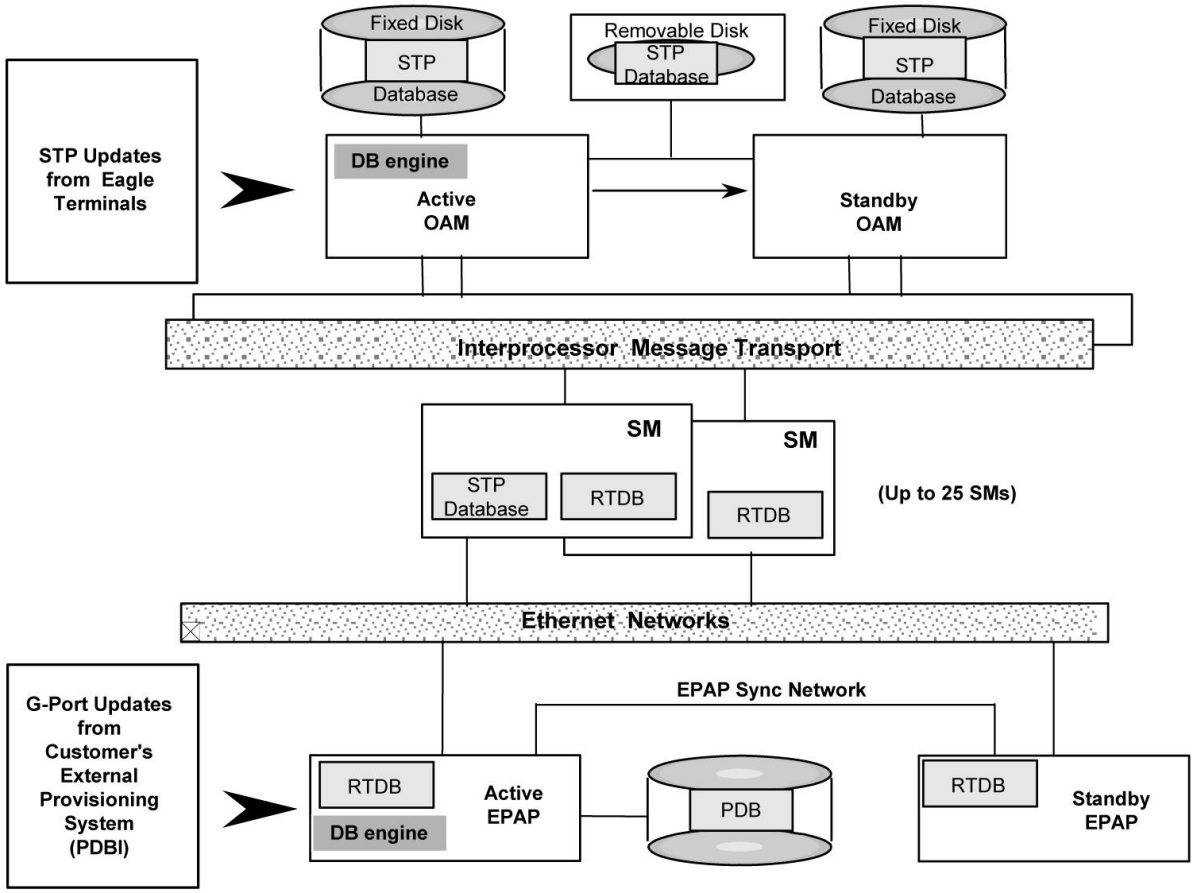

Figure 4: Database Administrative Architecture

Service Module Cards

Up to 32 cards (31+1) Service Module cards can be provisioned with one or more EPAP-related features enabled and EPAP running on a T1200 AS.

EPAP-related features require that all Service Module cards contain 4 GB of memory. *Figure 4: Database Administrative Architecture* illustrates each Service Module card having two Ethernet links, the main DSM network on the 100BASE-T link and the backup DSM network . See *Table 2: Service Module Card Provisioning and Reload Settings* for the link speed. The Service Module cards run the VSCCP software application.

The Service Module card Ethernet ports are linked to the EPAP system to receive the downloaded Real Time Database (RTDB). Multiple Service Module cards provide a means of load balancing in high-traffic situations. The RTDB on the Service Module card is in a format that facilitates rapid lookups.

Though the Service Module card copies of the RTDB are intended to be identical, the various databases may not be identical at all times for the following reasons:

- When a Service Module card is initialized, the card downloads the current copy of the database from the EPAP. While that card is being loaded, it cannot receive new updates that have arrived at the EPAP since reload began.

- Card databases can become out-of-sync with the EPAP RTDB when the EPAP receives updates from its provisioning source, but it has not yet sent the updates down to the Service Module cards. Updates are applied to the Provisioning Database (PDB) as they are received.

Two possible scenarios contribute to a condition where a Service Module card may not have enough memory to hold the entire database:

- The database is downloaded successfully to the Service Module card, but subsequent updates eventually increase the size of the database beyond the capacity of the Service Module card memory. In this situation, it is desirable for EPAP-related features to continue processing transactions, even though the database might not be up-to-date.
- When a Service Module card is booted and it is determined then that the card does not have enough memory for the entire database, the database is not loaded on that card. Each Service Module card is responsible for recognizing and reporting its out-of-memory conditions by means of alarms.

Overview of EPAP to Service Module Card Communications

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

- UDP - sending Service Module card status messages

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

- IP - reporting EPAP maintenance data

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

- IP Multicast - downloading GSM database

  Because of the large size of the database and the need to download it quickly on up to 32 Service Module cards, EPAP-related features use a technique known as IP multicasting. This technique is based on Reliable Multicast Transport Protocol-II (RMTP-II), a product of Globalcast Communications. IP multicasting downloads the RTDB and database updates to all of the Service Module cards simultaneously.

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

Service Module Card Provisioning and Reload

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

Table 2: Service Module Card Provisioning and Reload Settings

RMTP Channel	T1200 running only DSM cards	T1200 running any combination of E5-SM4G and E5-SM8G-B cards	T1200 running DSM cards with any combination of E5-SM4G and E5-SM8G-B cards
EPAP A, Link A (on the main DSM network)	100BASE-T	100BASE-T	100BASE-T
EPAP A, Link B (on the backup DSM network)	10BASE-T	100BASE-T	10BASE-T
EPAP B, Link A (on the main DSM network)	100BASE-T	100BASE-T	100BASE-T
EPAP B, Link B (on the backup DSM network)	10BASE-T	100BASE-T	10BASE-T
Note: Full duplex mode is supported only when running any combination of E5-SM4G and E5-SM8G-B cards on the T1200. In all other cases, half duplex mode is supported.			

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

The Service Module cards perform the following:

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

Service Module Card Reload Model

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

EPAP Continuous Reload

It is important to understand how the EPAP handles reloading of multiple Service Module cards from different starting points. Reload begins when the first Service Module card requires it. Records are read sequentially from the Real Time Database (RTDB) from an arbitrary starting point, wrapping back to the beginning. If another Service Module card requires reloading at this time, it uses the existing

record stream and notifies the Service Module card provisioning task of the first record it read. This continues until all Service Module cards are satisfied.

Service Module Card Database Levels and Reloading

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

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

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

EPAP Status and Error Reporting via 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 maintenance blocks eventually update EPAP Device Control Blocks (DCBs) located on the EAGLE 5 ISS. The DCBs provide the status information that is received when a `rept-stat-mps` command is issued.

Network Connections

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

- *Customer Provisioning Network*
- *EPAP Sync Network*
- *DSM Networks*
- *Dial-Up PPP Network*

The following discussion is an overview of these private networks. It expands on the networks in the architecture diagram shown in *Figure 5: Customer Provisioning Network*. For details about configuring these networks, refer to *EPAP Administration Manual*.

Customer Provisioning Network

The customer network carries the following traffic:

- Customer queries and responses to the PDB via the PDBI from the customer provisioning network

- Updates between PDBs of a mated EAGLE 5 ISS pair
- Updates between a PDB on one EAGLE 5 ISS and RTDBs on a mated EAGLE 5 ISS
- PDBA import/export (file transfer) traffic
- Traffic from a PDBA reloading from its mate
- EPAP and PDBA user interface traffic.

A typical customer network is shown in *Figure 5: Customer Provisioning Network*.

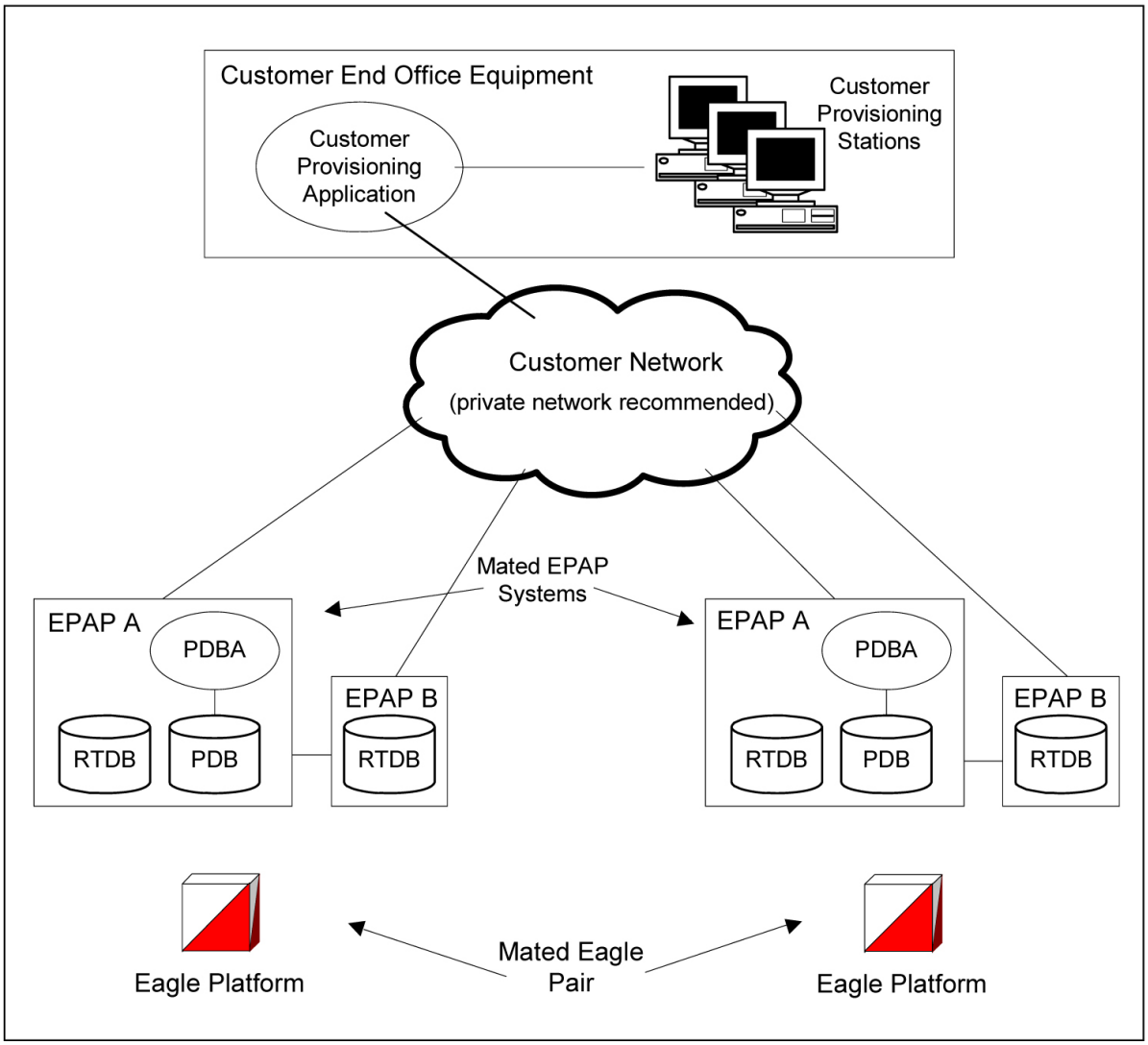

Figure 5: Customer Provisioning Network

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

EPAP Sync Network

The EPAP sync network carries RTDB and maintenance application traffic between active and standby EPAP servers on an MPS system. It synchronizes the contents of the RTDBs of both EPAP A and B. The EPAP Sync network is a single Ethernet connection between EPAP A and EPAP B running at 100BASE-T, as shown in *Figure 6: EPAP Sync Network*. The T1200 EPAP Sync network is truncated with the EPAP backup DSM connection and communicates through the switch.

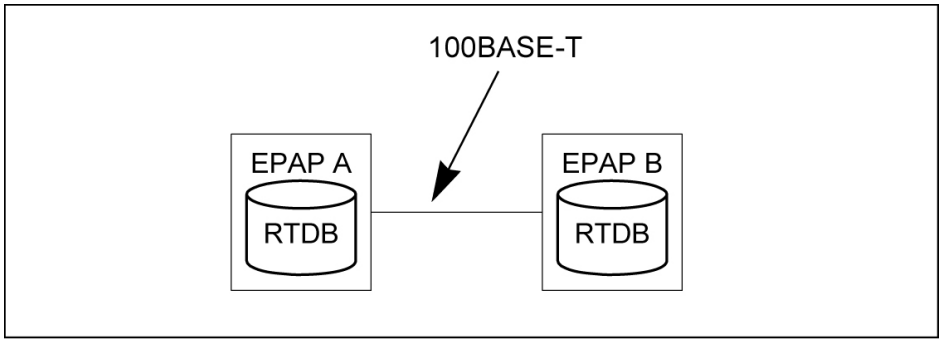

Figure 6: EPAP Sync Network

DSM Networks

The DSM networks are shown in *Figure 7: DSM Networks*. They carry provisioning data from the active EPAP RTDB to the Service Module cards. They also carry reload and maintenance traffic to the Service Module cards.

The DSM networks consist of two Ethernet networks: the main DSM network running at 100BASE-T, and the backup DSM network running at either 10BASE-T or 100Base-T. See *Table 3: EPAP IP Addresses in the DSM Network* for the link speed. Both Ethernet networks connect EPAP A and EPAP B with every Service Module card on a single EAGLE 5 ISS platform.

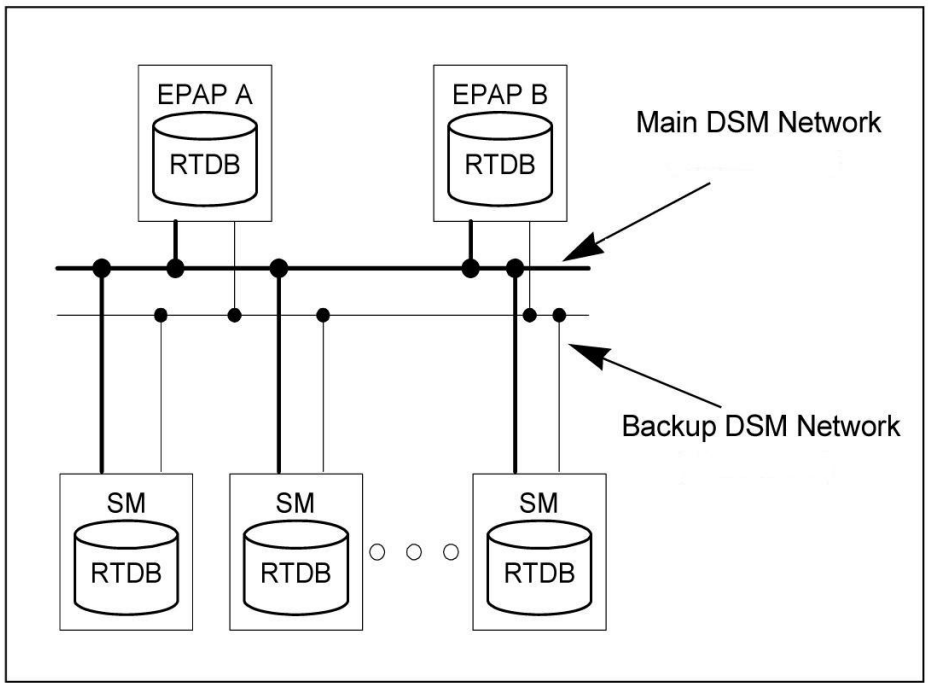

Figure 7: DSM Networks

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

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

The first and second octets of the EPAP network addresses for this network are 192.168. (The first two octets for private class C networks are defined in RFC 1918.)

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

The fourth octet of the address is specified as follows:

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

Table 3: EPAP IP Addresses in the DSM Network summarizes the contents of each octet.

Table 3: EPAP IP Addresses in the DSM Network

Octet	Value
1	*192*
2	*168*
3	One customer-provisioned value for DSM network A and another for DSM network B

Octet	Value
4	*100* for EPAP A and *200* for EPAP B

Dial-Up PPP Network

The dial-up PPP network allows multiple user-interface sessions to be established with the EPAP. The network connects a remote EPAP/PDBA user interface terminal with the EPAP in the EAGLE 5 ISS's MPS subsystem. The dial-up PPP network is illustrated in *Figure 8: Dial-Up PPP Network*.

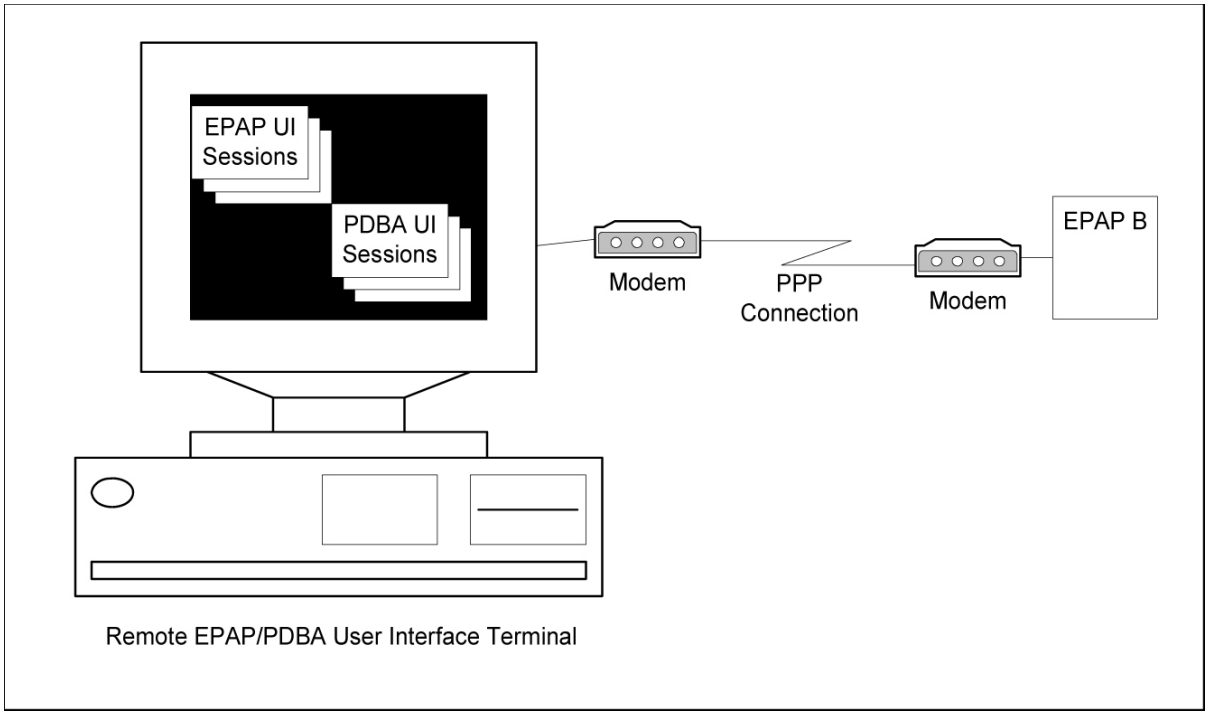

Figure 8: Dial-Up PPP Network

Chapter 3

EAGLE 5 ISS V-Flex Commands

Topics:

This chapter describes the EAGLE 5 ISS commands that can be used for the configuration of the Voice Mail Router (V-Flex) feature.

EAGLE 5 ISS Commands

This chapter describes the EAGLE 5 ISS commands that are used for the configuration of the Voice Mail Router (V-Flex) feature.

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

Table 4: Commands used for V-Flex

Type	Commands
System Serial Number	ent/rtrv-serial-num
Card	ent/dlt/rtrv/alw/inh/init/rept-stat-card
Feature Control	enable/chg/rtrv-ctrl-feat
STP Options	chg/rtrv-stpopts
EAGLE 5 ISS STP Self Identification	chg/rtrv-sid
Mated Application (MAP)	chg/dlt/ent/rtrv-map
Subsystem Application	chg/dlt/ent/rtrv-ss-appl
Service Selector	chg/dlt/ent/rtrv-srvsel
HOMERN Entries	ent/dlt/rtrv-homern
V-Flex Options	ent/chg/dlt/rtrv-vflx-cd chg/rtrv-vflx-opts ent/chg/dlt/rtrv-vflx-rn ent/chg/dlt/rtrv-vflx-vmsid
Local Subsystem Activation	alw/inh-map-ss

EAGLE 5 ISS Feature Control Commands

The GTT feature must be turned on in the system before the V-Flex feature can be enabled.

The `chg/rtrv-feat` commands are used to turn on and display the on/off status of features, such as GTT, that are controlled with feature bits.

- `chg-feat` - Change Feature

  The `chg-feat` command is used to set the bit in the system to indicate the status of `on` for a feature that is controlled with a bit – to turn on the feature. After the feature is turned on, it cannot be turned off.
  :gtt=on - Turns on the GTT feature.

- `rtrv-feat` - Retrieve Feature

The `rtrv-feat` command is used to display the status (on or off) of features that are controlled with feature bits. This command has no parameters.

When a feature is enabled using the `enable-ctrl-feat` command with the feature part number and feature access key, it is recognized by the system. Other actions might be needed to make the feature fully operational, such as turning the feature on, installing hardware, and database provisioning.

The V-Flex feature must be enabled using the V-Flex feature part number 893016701 and a feature access key. The feature access key is based on the V-Flex feature part number and the serial number of the system, making the feature access key site-specific.

Some features can be enabled with a temporary feature access key for a limited trial of the feature. The V-Flex feature cannot be enabled using a temporary feature access key.

After the feature is enabled, the feature must be turned on by using the `chg-ctrl-feat` command to set the feature status to on. The V-Flex feature is a Permanently On feature. The feature cannot be turned off after it is turned on.

The `enable/chg/rtrv-ctrl-feat` commands are used to enable, turn on, and display the status of features that are controlled by feature access keys.

- `enable-ctrl-feat` – Enable Control Feature

  The `enable-ctrl-feat` command uses the following parameters to permanently enable the V-Flex feature:

  :partnum - The Tekelec-issued part number for the V-Flex feature, 893016701.

  :fak - The feature access key contains 13 alphanumeric characters and is not case sensitive.

- `chg-ctrl-feat` – Change Control Feature

  The `chg-ctrl-feat` command is used to turn on the V-Flex feature. After the V-Flex feature is turned on, it is permanently on; it cannot be turned off.

  The `chg-ctrl-feat` command uses the following parameters to turn on the V-Flex feature:

  :partnum - The Tekelec-issued part number of the V-Flex feature, 893016701.

  :status=on - Sets the status of the enabled V-Flex feature to on.

- `rtrv-ctrl-feat` – Retrieve Control

  The `rtrv-ctrl-feat` command displays the status (on or off) of the enabled features in the system. After the V-Flex feature is enabled, the VFLEX entry in the command output shows the status as off. After the V-Flex feature is turned on, the VFLEX entry in the command output shows the status as on.

  The command can be entered with no parameters to list all enabled features, or with one of the following parameters:

  :partnum - Specify the part number 893016701 to display the status only for the V-Flex feature.

  :enable - Specify the value perm to display the status of all permanently enabled features in the system.

```
The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on            64
    Large System # Links      893005910  on          2000
    Routesets                 893006401  on          6000
    EAGLE5 Product            893007101  off         ----
```

```
EAGLE Product              893007201  off         ----
Network Security Enhance   893009101  off         ----
VFLEX                      893012301  on          ----
EAGLE OA&M IP Security     893400001  off         ----
SCCP Conversion            893012001  on          ----
```

EAGLE 5 ISS Service Selector Commands

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

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

- The `ent-srvsel` command specifies the applicable service selectors to define a V-Flex DSM service entry.

  The ssn=* parameter is supported for the V-Flex subsystem. The snp and snai parameters are not needed in V-Flex service selectors.

  The gti/gtii/gtin value can be either 2 or 4.

  If the gti/gtii/gtin value is 2, the np, nai, npv, or naiv parameters cannot be specified with the `ent-srvsel` command.

  If either the npv or naiv parameters are specified in the `ent-srvsel` command, then both parameters must be specified and neither the np and nai parameters can be specified.
- The `chg-srvsel` command specifies the applicable selectors to change an existing V-Flex service entry.
- The `dlt-srvsel` command specifies the applicable selectors to delete an existing service entry.

  Either the np and nai, or npv and naiv parameters can be specified with the `dlt-srvsel` command only if the gti/gtii/gtin value for the service selector being removed is 4. If the gti/gtii/gtin value of service selector being removed is 2, only the gti/gtii/gtin, tt, and ssn parameters can be specified with the `dlt-srvsel` command.

  If either the np or nai parameters are specified with the `dlt-srvsel` command, then both parameters must be specified with the `dlt-srvsel` command and neither the npv and naiv parameters can be specified with the `dlt-srvsel` command.

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

  Note: If the service selector being removed does not show values for the npv and naiv parameters, and you want to use these parameters with the dlt-srvsel command, refer to the command description in the *Commands Manual* for the npv and naiv values that correspond to the np and naiv values shown for the service selector being removed.
- The `rtrv-srvsel` command displays a list of provisioned service selector combinations. All output is sorted first by service, then by global title domain (ANSI first, followed by ITU), GTI, translation type, numbering plan, and the nature of address indicator. The output can be filtered by specifying various optional parameters.

Because of the large number of service selectors that can be in the database, the `rtrv-srvsel` command can be entered with the num and force parameters. The num parameter specifies the maximum number of entries to display. The force parameter must be specified to display more than 50 entries. This prevents trying to display extremely large numbers of entries, which could take hours.

EAGLE 5 ISS V-Flex Options Commands

The `chg/rtrv-vflx-opts` commands define and display V-Flex options in the system. The options are used to condition the DN in an incoming MSU.

- `chg-vflx-opts` - Change V-Flex Options

  The `chg-vflx-opts` command uses the following parameter to provision the data in the VFLXOPTS table:

Table 5: `chg-vflx-opts` Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
dra	Optional	rn, rndn, ccrndn	Destination Routing Address (DRA)
dranai	Optional	sub, unknown, natl, intl, ntwk	Nature Of Address Indicator for DRA
dranaiv	Optional	0-127	Nature Of Address Indicator Value for DRA
dranp	Optional	e164, x121, f69	Numbering Plan for DRA
dranpv	Optional	0-7	Numbering Plan Value for DRA
nequeryonly	Optional	off, on	Search Call Decision table after RTDB lookup
netype	Optional	vmsid, sprn, grn	Network Entity Type used for RTDB lookup

- `rtrv-vflx-opts` - Retrieve V-Flex Options

  The `rtrv-vflx-opts` command displays the V-Flex options setting that are provisioned in the VFLXOPTS table.

EAGLE 5 ISS HOMERN Prefix Commands

The `ent/dlt/rtrv-homern` commands define, delete, and display home routing number prefixes in the HOMERN table.

- `ent-homern` - Enter Home Routing Number Prefix

The `ent-homern` command is used to enter up to 100 home routing number prefixes for the operating network into the HOMERN table.
:rn - Home routing number prefix (1-15 digits)

- `dlt-homern` - Delete Home Routing Number Prefix

  The `dlt-homern` command removes a home routing number prefix from the HOMERN table.
  :rn – Home routing number prefix (1-15 digits)

- `rtrv-homern` - Retrieve Home Routing Number Prefix

  The `rtrv-homern` command displays the list of home routing number prefixes that belong to the operation network. The command has no parameters.

EAGLE 5 ISS Voice Mail Prefix Commands

The `ent/chg/dlt/rtrv-csl` commands are used to enter, change, delete, and display Voice Mail prefix entries for V-Flex. The common screening list entries tailor certain types of common screening information to specific features.

- `ent-csl` - Enter Common Screening List

  The `ent-homern` command is used to enter up to 100 home routing number prefixes for the operating network into the HOMERN table.
  The `ent-csl` command is used to enter a Voice Mail prefix digit string; the string is specified in the following parameter:
  :ds - Specify 1-15 hexadecimal digits for the prefix
  The V-Flex feature is identified in the command by one of the following parameters:
  :feature - Specify the feature name as it appears in the `rtrv-ctrl-feat` command output when the feature is enabled (:feature=”VFLEX”).
  :pn - Specify the V-Flex feature part number 893016701
  The Common Screening List must be specified when the feature uses more than one screeening list. V-Flex uses only the vmpfx list.
  :list - Specify the name of the Common Screening List associated with the feature (:list=vmpfx).

- `chg-csl` - Change Common Screening List

  The `chg-csl` command is used to change a Voice Mail prefix digit string; the new string is specified in the following parameter:
  :ds - Specify 1-15 hexadecimal digits for the prefix
  The V-Flex feature is identified in the command by one of the following parameters:
  :feature - Specify the feature name as it appears in the `rtrv-ctrl-feat` command output when the feature is enabled (:feature=”VFLEX”)
  :pn - Specify the V-Flex feature part number 893016701
  The Common Screening List must be specified when the feature uses more than one screeening list. V-Flex uses only the vmpfx list.
  :list - Specify the name of the Common Screening List associated with the feature (:list=vmpfx).

- `dlt-csl` - Delete Common Screening List

The `dlt-csl` command is used to delete a Voice Mail prefix digit string; the string is specified in the following parameter:

:ds – Specify 1-15 hexadecimal digits for the prefix

The V-Flex feature is identified in the command by one of the following parameters:

:feature - Specify the feature name as it appears in the `rtrv-ctrl-feat` command output when the feature is enabled (:feature="VFLEX")

:pn - Specify the V-Flex feature part number 893016701

The Common Screening List must be specified when the feature uses more than one screeening list. V-Flex uses only the vmpfx list.

:list - Specify the name of the Common Screening List associated with the feature (:list=vmpfx).

- `rtrv-csl` - Retrieve Common Screening List

  The `rtrv-csl` command is used to display the provisioned Voice Mail prefix entries. The V-Flex feature is identified in the command by one of the following parameters:

  :feature - Specify the feature name as it appears in the `rtrv-ctrl-feat` command output when the feature is enabled (:feature="VFLEX")

  :pn - Specify the V-Flex feature part number 893016701

EAGLE 5 ISS Voice Mail Routing Number Commands

The `chg/dlt/ent/rtrv-vflx-rn` commands are used to define and display voice mail routing numbers and routing number names, and to view the associated reference count.

- `chg-vflx-rn` - Change Voice Mail Routing Number

  The `chg-vflx-rn` command uses the following parameters:

  :rnname - Routing number name associated with a voice mail routing number

  :nrn - New Voice Mail Routing Number associated with a routing number name

  :nrnname - New Routing Number Name

- `dlt-vflx-rn` - Delete Voice Mail Routing Number

  A routing number (name) cannot be deleted if its associated reference count is greater than zero. (Use the `rtrv-vflx-rn` command to display the reference count.)

  The dlt-vflx-rn command uses the following parameter:

  :rnname - Routing number name associated with a voice mail routing number

- `ent-vflx-rn` - Enter Voice Mail Routing Number

  The ent-vflx-rn command uses the following parameters to associate voice mail routing numbers with routing number names.

  :rn - Voice Mail Routing Number

  :rnname - Voice Mail Routing Number Name

- `rtrv-vflx-rn` - Retrieve Voice Mail Routing Number

  The `rtrv-vflx-rn` command displays voice mail routing numbers and routing number names, and the associated reference count.

When the command is entered with no parameters, all provisioned voice mail routing number information is displayed.

The following parameters can be used to display information for a specific routing number or routing number name, with or without the reference count:

:refcnt - Display (yes) or do not display (no) the reference count

:rn - Voice Mail Routing Number

:rnname - Voice Mail Routing Number Name

EAGLE 5 ISS Voice Mail Server ID Commands

The `ent/chg/dlt/rtrv-vflx-vmsid` commands are used to enter, change, delete, and display Voice Mail Server IDs for V-Flex.

- `ent-vflx-vmsid` - Enter Voice Mail Server ID

  The `ent-vflx-vmsid` command is used to define a Voice Mail Server ID and associate up to 10 voice mail routing number names with that VMSID. The default VMSID comprises a special default set of routing numbers used when a query is received with either an invalid MSISDN or with a MSISDN that is not found in the RTDB.

  The following command parameters specify the new VMSID and the routing number name associated with each specified voice mail routing number index:

  :id - Specify 1-15 hexadecimal digits for the ID, or dflt to specify the default VMSID

  :idx0 through :idx9 - Specify the new routing number name for the specified voice mail routing number index.

- `chg-vflx-vmsid` - Change Voice Mail Server ID

  The `chg-vflx-vmsid` command is used to change one or more voice mail routing numbers that are associated with a VMSID.

  The following command parameters specify the VMSID and the new routing number name associated with each voice mail routing number index:

  :id - Specify 1-15 hexadecimal digits for the ID, or dflt to specify the default VMSID

  :idx0 through :idx9 - Specify the routing number name for the specified voice mail routing number index.

- `dlt-vflx-vmsid` - Delete Voice Mail Server ID

  The `dlt-vflx-vmsid` command with the following parameter is used to delete a Voice Mail Server ID from the VMSID table:

  :id - Specify 1-15 hexadecimal digits for the ID

- `rtrv-vflx-vmsid` - Retrieve Voice Mail Server ID

  The `rtrv-vflx-vmsid` command is used to display the provisioned V-Flex VMSIDs and the routing number name associated with each voice mail routing number index.

  When the command is entered with no parameters, all VMSIDs are displayed. The following parameters are used to display one VMSID, or all entries referring to the specified routing number name:

  :id - Specify 1-15 hexadecimal digits for the ID, or dflt to specify the default VMSID

  :rnname - Specify a routing number name that is associated with the specified VMSID

EAGLE 5 ISS Call Decision Entry Commands

The `ent/chg/dlt/rtrv-vflx-cd` commands are used to enter, change, delete, and display call decision entries for the V-Flex feature.

- `ent-vflx-cd` - Change V-Flex Call Decision Entry

  The `ent-vflx-cd` command is used to define the call decision criteria that are used to create a voice mail routing number.

  The command uses the following parameters to define the call decision entry:

  :bcap - INAP/CAP bearer capabilities; numerical values that are used to indicate the type of mail that is used by the call, such as voice, video, or multimedia. The user assigns meanings to the numbers; V-Flex does not place any interpretation on the values. The value none can be specified to indicate that there is no BCAP information in the entry.

  :cdn - The call decision name for the new call decision entry

  :dnstat - Dialed number status, to indicate whether the MSISDN is found in the EPAP RTDB, is not found in the RTDB, or does not matter.

  :rnidx - The routing number index to be associated with the generated voice mail routing number.

  :rdi - Call redirection indicator (redirected or not redirected)

  :vmdig - The voice mail number or voice mail prefix digits to associate with the specified call decision entry name. If the call is redirected (the rdi=redir parameter is specified), then the value specified for the vmidg parameter represents a voice mail number. If the call is not redirected (the rdi=dir parameter is specified), then the value specified for the vmidg parameter represents a set of voice mail digits.

- `chg-vflx-cd` - Change V-Flex Call Decision Entry

  The `chg-vflx-cd` command is used to change an existing V-Flex call decision entry. The command uses the following parameters to change the call decision entry name, a routing number index associated with the call decision entry, or a voice mail number or voice mail prefix digits that are associated with a call decision entry:

  :cdn - An existing call decision entry name

  :ncdn - The new name for the specified call decision entry

  :nrnidx - The new routing number index to be associated with the specified call decision entry name

  :nvmdig - The new voice mail number or voice mail prefix digits to associate with the specified call decision entry name

- `dlt-vflx-cd` - Delete V-Flex Call Decision Entry

  The `dlt-vflx-cd` command with the cdn parameter is used to remove an existing V-Flex call decision entry from the Call Decision table.

  :cdn – An existing call decision entry name

- `rtrv-vflx-cd` - Retrieve V-Flex Call Decision Entry

  The `rtrv-vflx-cd` command is used to display the provisioned V-Flex call decision entries. When the command is entered with no parameters, all call decision entries are displayed. The following parameters are used to display one call decision entry, or all call decision entries that are associated with the specified voice mail number or voice mail prefix digits.

  :cdn - Call decision name; name of a call decision entry

:vmdig - Voice mail number or voice mail prefix digits

Chapter 4

V-Flex Configuration

Topics:

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

Introduction

The V-Flex feature is configured on the EAGLE 5 ISS and on the EPAP. This chapter describes prerequisites and procedures for the EAGLE 5 ISS configuration only. The EPAP configuration is covered in the *EPAP Administration Manual*.

V-Flex Configuration Procedure lists the steps for enabling and turning on the V-Flex feature, and for the provisioning required for the feature. Each step contains a link or reference to information and procedures to use to complete the step.

The V-Flex feature is optional and must be purchased from Tekelec before it can be used in your system. If you are not sure whether you have purchased the feature, contact your Tekelec Sales or Account Representative.

EPAP Entity Provisioning

It is recommended that EPAP entity (SP or RN) administration not be done until after the point code and/or subsystem number has been entered into the EAGLE 5 ISS MAP table.

- EPAP-administered entity data can possibly become out-of-sync with the EAGLE 5 ISS 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 (such as `SCCP did not route - DPC not in MAP tbl` or `SCCP did not route - SS not in MAP tbl`) is sent to the EAGLE 5 ISS maintenance terminal.

System Prerequisites

Before any feature that is described in this manual can be enabled, the prerequisites listed in *Table 6: System Prerequisites* are required in the system.

Table 6: 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

Prerequisite	Verification and Provisioning
	`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. Some features require only E5-SM4G cards and cannot use DSM cards. See specific feature prerequisites, if any, in this section. Refer to the *Dimensioning Guide for EPAP Advanced DB Features* for information on the dimensioning rules and the database capacity requirements for EPAP-related features.	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 the *Database Administration Manual - GTT* to add Service Module cards or remove DSM 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 the *Database Administration Manual - GTT* to turn on and provision the GTT feature and any other GTT-related features and functions that will be used in the system.

V-Flex Feature Prerequisites

Before the V-Flex feature can be enabled, the following prerequisites are required in the system:

Table 7: V-Flex 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.
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

Prerequisite	Verification and Provisioning
	in the command output, features described in this manual cannot be enabled.

V-Flex Configuration Procedure

The EAGLE 5 ISS configuration of the V-Flex 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 *V-Flex Feature Prerequisites*.
3. Enable the V-Flex feature, set system STP options, and turn on the V-Flex feature. See *Enabling V-Flex, Setting STP Options, and Turning On V-Flex*.
4. Refer to the procedures in the *Database Administration Manual - SS7*.to change the self identification of the EAGLE 5 ISS node to include true point codes and V-Flex capability point codes.

   Messages for the V-Flex local subsystem can arrive Rt-on-SSN or Rt-on-GT. All MSUs must contain the EAGLE 5 ISS true or secondary point code or the V-Flex capability point code in the DPC field of the message.

   For the V-Flex subsystem, the EAGLE 5 ISS supports ANSI, ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare capability point code types. including group codes. ITU-N24 capability point codes are not supported.
5. Refer to the procedures in the *Database Administration Manual - Global Title Translation* to provision the following items

   - Translation types and mappings
   - Mated Application (MAP) table entries for the V-Flex feature that contain the EAGLE 5 ISS true point codes, the V-Flex capability point codes, and the V-Flex subsystem number. Only solitary and dominant loadsharing are supported.

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

   1. ANSI
   2. ITU-N
   3. ITU-N Spare
   4. ITU-I
   5. ITU-I Spare
6. Provision state and subsystem number for the V-Flex local subsystem application. See *Adding the V-Flex Subsystem Application*.
7. Provision final GTT routing to an EAGLE 5 ISS PC and the V-Flex local subsystem.

GTT routing information must be provisioned properly in GTT tables, using a command like the following command. Refer to the procedures in the *Database Administration Manual - Global Title Translation*.

```
ENT-GTT:TYPE=<TT Type>:GTA=<gta>:EGTA=<egta>:XLAT=DPCSSN:RI=SSN:PC=<EAGLE 5 ISS
 True or Secondary Point Code>:SSN=<V-Flex SSN>
```

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

If the local V-Flex subsystem is online, then it does not matter if the DPC is a CPC or TSPC. The query will be redirected to the local subsystem and processed. Any response MSU will use the TSPC assigned to the destination node as the OPC.

If the local V-Flex subsystem is offline and the mated subsystem is available, the EAGLE 5 ISS will reroute the message to the mated subsystem. In this case, the EAGLE 5 ISS is acting as both STP and SCP, and STPs do reroute messages. If a message arrives Rt-on-GT for the EAGLE 5 ISS TSPC, the EAGLE 5 ISS cannot generate a TFP. The EAGLE 5 ISS will be forced to handle and reroute these messages, instead of forcing the adjacent node to route to the mate. Therefore, nodes that send Rt-on-GT traffic to the EAGLE 5 ISS should use one of the V-Flex CPCs, not the EAGLE 5 ISS TSPC.

See *Activating the V-Flex Subsystem*.

Note: Direct DPC/SSN routing to the EAGLE 5 ISS PC and the V-Flex local subsystem (SSN) is handled on the network card. No provisioning is required.

Rt-on-SSN MSUs should contain EAGLE® 5 ISS's V-Flex Subsystem number in the Called Party Subsystem field of the message.

If the V-Flex local subsystem is online, then it does not matter whether the DPC is capability point code (CPC), or true or secondary point code (TSPC). The message will be processed by the local subsystem. Any required response MSU will use the TSPC assigned to the destination node as the OPC.

If the local V-Flex subsystem is offline and the mated subsystem is available, the EAGLE 5 ISS will not reroute the message to the mate. In this case, the EAGLE 5 ISS is acting as an end node, and end nodes do not reroute. If possible, the EAGLE 5 ISS will generate network management messages to force the network to transition traffic to the mate.

Because the EAGLE 5 ISS cannot generate an SSP when a message arrives Rt-on-SSN for the EAGLE 5 ISS CPC, it is preferred that nodes sending Rt-on-SSN traffic use one of the EAGLE 5 ISS TSPCs.

8. Provision the service selector mechanism to route MSUs to the V-Flex subsystem. See *Adding a V-Flex Service Selector*.

   The V-Flex service is vflex.

   The Translation Type and Subsystem Number are the values assigned for the V-Flex local subsystem when the MAP table entries were defined. See Step 5 in this procedure.

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

   The Nature of Address Indicator (NAI or NAIV) and Numbering Plan (NP or NPV) are required when the GTI value is 4, and not allowed when the GTI value is 2.

   V-Flex does not support the Service Nature of Address (SNAI) or the Service Numbering Plan (SNP).

9. Provision V-Flex options. See *Provisioning the V-Flex Options*.
10. Provision Home Routing Number (HOMERN) prefix entries. See *Provisioning HOMERN Entries*.
11. Provision Voice Mail screening prefix entries. See *Provisioning Voice Mail Prefix Entries*.
12. Provision Voice Mail routing numbers (VM RN) . See *Provisioning Voice Mail Routing Numbers*.
13. Provision Voice Mail Server ID (VMSID) entries. See *Provisioning Voice Mail Server ID Entries*.
14. Provision Call Decision entries. See *Provisioning Call Decision Table Entries*.
15. Activate the V-Flex local subsystem. See *Activating the V-Flex Subsystem*.
16. Configure the Measurements Platform if measurements are to be collected for V-Flex.

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

    The EAGLE 5 ISS can collect daily and hourly measurements for the V-Flex local subsystem. V-Flex measurements are collected only by the EAGLE 5 ISS Measurements Platform. UI measurements reports are not available for V-Flex.

Enabling V-Flex, Setting STP Options, and Turning On V-Flex

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

The V-Flex feature must be enabled using the V-Flex feature part number 893016701 and a feature access key.

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

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

When the V-Flex feature is enabled, it is permanently enabled. The V-Flex feature cannot be temporarily enabled. After the V-Flex feature is enabled and turned on, the V-Flex feature cannot be turned off.

When the V-Flex feature has been enabled, the STP options for the default country code and the default network destination code must be changed from NONE to appropriate values for V-Flex. The `chg-stpopts` and `rtrv-stpopts` commands support the defcc, defndc and dsmaud parameters for the V-Flex feature.

The default country code (defcc) parameter and default network destination code (defndc) parameter can be provisioned for V-Flex after the V-Flex feature is enabled. The defcc and defndc parameter values must be changed from NONE to appropriated values before the V-Flex feature can be turned on in the system.

In the `rtrv-stpopts` command output:

- The defcc and defndc parameters are displayed with value NONE when the V-Flex feature is enabled
- The dsmaud parameter is displayed with value OFF when the V-Flex feature is turned on

After the V-Flex feature has been enabled and the STP options are set, the V-Flex feature status must be set to on (the feature must be "turned on"). Database provisioning for V-Flex can be done after the feature is turned on.

After the feature is turned on:

- The defcc and defndc parameter values cannot be set to NONE.
- The DSM audit running state (dsmaud) parameter of the `chg-stpopts` command can be provisioned for V-Flex

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

```
    rlghncxa03w 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 `rtrv-ctrl-feat` output shows a LNP ported TNs quantity entry, this procedure cannot be performed.

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

2. Verify the defcc and defndc STP option parameter values. Enter the `rtrv-stpopts` command..

   - If the parameter values are not NONE, continue with *Step 3*.
   - If the parameter values are NONE, use the `chg-stpopts` command to change the values. Then continue with *Step 3*

3. Enable the V-Flex feature, by entering the `enable-ctrl-feat` command.
   `enable-ctrl-feat:partnum=893016701:fak=<feature access key>`

   Note: The feature access key is provided by Tekelec when the feature is purchased. If you do not have the controlled feature part number or the feature access key for a feature, contact your Tekelec Sales Representative or Account Representative.

   When the feature is enabled, the VFLEX 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
    VFLEX                     893016701  off         ----
;
```

4. Turn on the V-Flex feature, by entering the `chg-ctrl-feat` command.
   `chg-ctrl-feat:partnum=893016701: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
    VFLEX                     893016701  on          ----
;
```

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

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

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

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

Provisioning V-Flex as a Local Subsystem

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

- *Adding the V-Flex 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 5 ISS supports the operation of two or more local subsystems for EPAP-related features in the system at one time. For example, V-Flex and ATINP can coexist in the system.

Adding the V-Flex Subsystem Application

This procedure is used to define the V-Flex (Voice Mail Router) subsystem application.The subsystem can be placed online when it is added or later in the configuration process (see *Changing the State of a Subsystem Application*).

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

Table 8: V-Flex Subsystem Application Prerequisites

Prerequisite	Verification
The V-Flex feature must be enabled and turned on.	Enter the `rtrv-ctrl-feat` command. If the VFLEX entry with Status of `on` does not appear in the output, see the *Enabling V-Flex, Setting STP Options, and Turning On V-Flex* procedure.
The application specified by the appl parameter (vflex) cannot already be in the database.	Enter the `rtrv-ss-appl` command. If the VFLEX entry appears in the output, this procedure cannot be performed.
EAGLE 5 ISS true point codes and V-Flex capability point codes must be defined, and entered in the Mated Application table with a	Only one subsystem number for the application can be defined, and must be used for all point code types assigned to the local subsystem..

Prerequisite	Verification
subsystem number to be used for the V-Flex subsystem application.	Enter the `rtrv-sid` command, and verify that the true and capability point codes needed for the feature are correct. If changes are required, refer to the procedures in the *Database Administration Manual - SS7*. Enter the `rtrv-map` command, and verify that the MAP table entries are correct for the V-Flex local subsystem. If changes are required, refer to the procedures in the *Database Administration Manual – Global Title Translation* for provisioning solitary and dominant mated applications.

The examples in this procedure use the subsystem number 100 for the V-Flex application and set the V-Flex application status to `online`.

1. Add the V-Flex 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=vflex:ssn=100:stat=online
   ```

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

   ```
       tekelecstp 07-07-25 08:02:22 EST  EAGLE 37.6.0
       APPL   SSN  STAT
       VFLEX  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.
   ```

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 *Step 5*.

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

Provisioning the V-Flex Service Selector

The procedures in this section describe how to add, change, and remove a service selector. The information is indicated that is specific to the V-Flex feature.

The commands that are used in these procedures are described briefly in *"EAGLE 5 ISS Service Selector Commands"* on page 3-8, and in complete detail in the *Commands Manual*.

Adding a V-Flex Service Selector

This procedure is used to add a service selector for the V-Flex feature.

The V-Flex feature must be enabled and turned on before a V-Flex service selector can be added.

1. Verify that the V-Flex feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command. If the V-Flex feature is enabled and turned on, the status of the VFLEX 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
```

```
    VFLEX                     893016701  on          ----
;
```

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

2. Display any existing V-Flex service selectors in the database, by entering the `rtrv-srvsel:serv=vflex` command.
3. Add new V-Flex service selectors, using the `ent-srvsel` command. For example, enter commands like these:

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

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

4. Verify the changes by entering the `rtrv-srvsel` command with the parameters and values used in *Step 3*.
5. Back up the changes using the `chg-db:action=backup:dest=fixed` command.

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

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

Removing a Service Selector

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

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

These parameters can also be used to limit the amount of information displayed with the `rtrv-srvsel` command.

test

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

   ```
   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  ---   ---    vflex
   ```

```
    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=vflex:tt=35:ssn=100:gtin=4:np=e214:nai=natl`

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

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

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

```
    rlghncxa03w 07-06-28 14:42:38 GMT  EAGLE 37.6.0


    GTIN  TT   NP       NAI   SSN  SNP   SNAI   SERV

    No SRV Selector found in range
;
```

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

```
    tekelecstp 07-08-28 16:35:22 EST  EAGLE 37.6.0
    GTII  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
    No SRV Selector found in range
;
```

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

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

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

Changing an Existing Service Selector to a V-Flex Service Selector

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

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

:nserv

New DSM service type, VFLEX

:nsnp

A V-Flex 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

A V-Flex 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 V-Flex service selector, use the the procedure in *Removing a Service Selector* to remove the existing service selector. Then use the procedure in *Adding a V-Flex Service Selector* to add the new V-Flex 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 07-06-28 14:42:38 GMT  EAGLE 37.6.0


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
```

```
;
```

If the `rtrv-srvsel` output shows V-Flex service selectors, go to *Step 3*.

2. Verify that the V-Flex feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command. If the V-Flex feature is enabled and turned on, the status of the VFLEX 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
    VFLEX                     893016701  on          ----
;
```

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

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

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

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

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

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

```
    rlghncxa03w 07-06-28 14:42:38 GMT  EAGLE 37.6.0


    GTIN  TT   NP       NAI   SSN  SNP   SNAI   SERV

    4     4    e214     natl  34   ---   ---    vflex


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

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

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

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

Provisioning the V-Flex Options

The V-Flex options indicate the contents and required processing of types of information in the MSU.

- The destination routing address (dra) can contain the Routing Number (RN), the Routing Number + Dialed Number (RN + DN), or the Country Code + Routing Number + Dialed Number (CC + DN + RN).
- The Nature of Address Indicator can be specified as a mnemonic (dranai) or an explicit value to indicate a subscriber number, a national significant number, an international number, a network specific number, or an unknown type of number.
- The Numbering Plan can be specified as a mnemonic (dranp) or an explicit value (dranpv) to indicate an ISDN/telephony numbering plan, a data numbering plan, or a telex numbering plan.
- If the Network Query Only option is set to on, the Call Decision table is searched after RTDB lookup, for the specified network entity type: a Voice Mail Server ID (VMSID), a signaling point routing number (SP), or a generic routing number (GRN - the Routing Number provided by the RTDB lookup).

The V-Flex feature must be turned on before this procedure can be completed. See *Enabling V-Flex, Setting STP Options, and Turning On V-Flex*.

1. Verify that the V-Flex feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command. If the V-Flex feature is enabled and turned on, the status of the VFLEX 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
    VFLEX                     893016701  on          ----
;
```

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

2. Display the status of the V-Flex options, using the `rtrv-vflx-opts` command.
3. Change the V-Flex options to the desired settings, by entering the `chg-vflx-opts` command with at least one of the V-Flex option parameters specified. The netqueryonly and netype parameters must be specified together in the command if the Network Query Only option is used.

```
chg-vflx-opts:dranai=<nai>:dranp=<np>:dra=<dra>
```

4. Verify the changes, by entering the `rtrv-vflx-opts` command.
5. 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.
```

Provisioning HOMERN Entries

The `ent-homern` command is used to provision the prefix RNs in the HOMERN table.

The matching RN is removed in the incoming message as part of the conditioning process.

Any deleted HomeRN digits are omitted from the DN digits encoded in a Connect:DRA parameter.

After HomeRN deletion, the MSISDN with MSISDN_NAI in subscriber format is converted to international format by prepending the STPOPTS defcc value and the STPOPTS defndc value.

After HomeRN deletion, the MSISDN with MSISDN_NAI in national format is converted to international format by prepending the STPOPTS defcc value.

1. Display the HOMERN table entries, by entering the `rtrv-homern` command.
2. Enter the home routing number prefixes that will be used for V-Flex. Use the following command for each prefix:
   `ent-homern:rn=<routing number>`
3. Verify the changes by entering the `rtrv-homern` command.
4. 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.
```

Provisioning Voice Mail Prefix Entries

A list of up to 100 Voice Mail prefixes can be provisioned, that can be searched against incoming CdPN digits to determine if a direct-dial VM deposit is required.

1. Verify that the V-Flex feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command. If the V-Flex feature is enabled and turned on, the status of the VFLEX 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
   VFLEX                     893016701  on          ----
;
```

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

2. Display the Common Screening List table entries, by entering the `rtrv-csl` command.
3. Enter the Voice Mail prefix digit strings that will be used for V-Flex. Enter the following for each prefix:
   `ent-csl:feature="VFLEX":dn=<digit string>`

4. Verify the changes by entering the `rtrv-csl:feature="VFLEX"` command.
5. 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.
```

Provisioning Voice Mail Routing Numbers

Each VM Routing Number is 1-15 hexadecimal digits and has a VM Routing Number Name. A VM Routing Number Name can be assigned to each of 10 VMRN indices associated with a VMSID. See *Provisioning Voice Mail Server ID Entries*.

For each VM Routing Number, a reference count is maintained in the database. When a VMSID entry refers to a VM RN entry, the reference count of that VM Routing Number is incremented by 1 in the database. When a VM RN reference to a VMSID entry is removed, the reference count is decremented by 1 in the database. A VM RN entry can be deleted only when the reference count is zero for that VM RN.

1. Verify that the V-Flex feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command. If the V-Flex feature is enabled and turned on, the status of the VFLEX 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
    VFLEX                     893016701  on         ----
;
```

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

2. Display the voice mail routing numbers, by entering the `rtrv-vflx-rn` command.
3. Enter the Voice Mail routing numbers that will be used for V-Flex. Enter the following for each routing number:
   `ent-vflx-id:rnname=<RN Name>:rn=<Routing Number digits>`
4. Verify the changes by entering the `rtrv-vflx-rn` command.
5. 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.
```

Provisioning Voice Mail Server ID Entries

Up to 10 Voice Mail Routing Number Names (VM RN Names) in the VFLXVID table provide a correlation between the VMSIDs associated to the subscribers from the EPAP, and a list of call-related VMRN indexes and VM Routing numbers to be used by the EAGLE 5 ISS in the IDP response being sent to the MSC. Up to 1000 VMSIDs can be provisioned, including the default VMSID.

Each VM RN name is assigned to a Routing Number Index (0-9). The Routing Number Indexes are used in the Call Decision entries to identify a Routing Number associated with a VMSID.

Note: It is up to the user to interpret what each index means. V-Flex does not interpret the indexes in any way.

V-Flex VMSIDs are provisioned on EAGLE 5 ISS independently of the VMSIDs that are provisioned in the EPAP database. The EAGLE 5 ISS does not verify whether a particular EAGLE 5 ISS VMSID is already provisioned in the EPAP database. A default VMSID can be provisioned in the VFLXVID table:

- If no specific MSISDN is found for a particular IDP
- If a specific MSISDN is found with no VMSID
- If a specific MSISDN is found with a VMSID in the RTDB, but there is no matching VMSID provisioned in the VFLXVID table.
- If a VMRN index match is found in the Call Decision Table, but there is no corresponding VMRN index provisioned in specific MSISDN's VMSID.

For each Routing Number, a reference count is maintained in the database. Whenever a VMSID entry refers to a Routing Number, the reference count of that RN will be incremented by 1 in the database. Whenever a VMSID reference to a Routing Number is removed, the reference count of that RN will be decremented by 1 in the database. A Routing Number can be deleted only when the reference count is zero for that Routing Number.

1. Verify that the V-Flex feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command. If the V-Flex feature is enabled and turned on, the status of the VFLEX 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
   VFLEX                    893016701  on          ----
;
```

   - If the V-Flex feature is not enabled or turned on, go to *Enabling V-Flex, Setting STP Options, and Turning On V-Flex* to enable and turn on the V-Flex feature. Go to *Step 2*.
   - If the V-Flex feature is enabled and turned on, go to *Step 2*.

2. Display the Voice Mail Server IDs, by entering the `rtrv-vflx-vmsid` command.
3. Enter the Voice Mail routing numbers that will be used for V-Flex. For each VMSID, enter the `ent-vflx-vmsid` command and specify the routing numbers that wil be used for the VMSID.
4. Verify the changes by entering the `rtrv-vflx-vmsid` command.
5. 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.
```

Provisioning Call Decision Table Entries

A maximum of 4,950 Call Decision entries can be provisioned in the VFLXCD table. The key in each table entry is:

- Voice Mail Number/Voice Mail Prefix (1-15 hexadecimal digits)
- INAP/CAP Redirection Indicator (redirected, not redirected)
- INAP/CAP Bearer Capability
- MSISDN/RN status indicator in the database (Found, Not Found, Does not matter -*)

Each Call Decision table entry also contains a VM Routing Number Index (0-9). The VM RN index is used in the VMSID for a specific MSISDN, or in the default VMSID if a specific VMSID is not provisioned.

1. Verify that the V-Flex feature is enabled and turned on, by entering the `rtrv-ctrl-feat` command. If the V-Flex feature is enabled and turned on, the status of the VFLEX 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
   VFLEX                     893016701  on          ----
   ;
   ```

   - If the V-Flex feature is not enabled or turned on, go to *Enabling V-Flex, Setting STP Options, and Turning On V-Flex* to enable and turn on the V-Flex feature. Go to *Step 2*.
   - If the V-Flex feature is enabled and turned on, go to *Step 2*.

2. Display the Call Decision entries, by entering the `rtrv-vflx-cd` command.
3. Enter the Call Decision entries that will be used for V-Flex. Enter the `ent-vflx-cd` command for each Call Decision entry:
4. Verify the changes by entering the `rtrv-vflx-cd` command.
5. Back up the changes, using the `chg-db:action=backup:dest=fixed` command.

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

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

Activating the V-Flex Subsystem

The procedure in this section explains how to activate the V-Flex subsystem.

V-Flex operates as a local subsystem in the EAGLE 5 ISS.

When all configuration is complete for the V-Flex feature, the V-Flex 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:appl=` command can be used to specify the value online or the value offline to control the persistent setting for the local subsystem. The `rtrv-ss-appl` command always 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. The `inh-map-ss` command does not necessarily force a state change, because it can fail if the mate does not send 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 9: Subsystem Allow/Inhibit

Command\ Subsystem State	Offline	Online
`alw-map-ss`	Command is rejected.	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=vflex :nstat=online`	Command is rejected, because the subsystem must be online to be in the allowed state.	Changes local subsystem database status to online.
`chg-ss-appl:appl=vflex :nstat=offline`	Command is rejected because the subsystem must be inhibited to go offline.	Changes local subsystem database status to offline.

1. Display the status of the V-Flex subsystem application, by entering the `rtrv-ss-appl` command.

```
    tekelecstp 07-07-25 08:02:22 EST  EAGLE 37.6.0
    APPL   SSN  STAT
    VFLEX  11   offline

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

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

```
    integrat40 00-05-24 10:37:22 EST  EAGLE5 37.6.0
    Allow map subsystem command sent to all SCCP cards.
    Command Completed.
;
```

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

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

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

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

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

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

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

When the `inh-map-ss` command is entered for the subsystem, a coordinated shutdown is attempted. If the coordinated shutdown fails, a UIM is output indicating 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 Tcoord timer (30 seconds). If SCMG receives an SOG message from the mated subsystem before the Tcoord 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 Tcoord expires, then the inhibit request is denied and a UIM is generated.

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

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

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

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

Taking the Subsystem Application Offline

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

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

```
    tekelecstp 07-07-25 08:02:22 EST  EAGLE 37.6.0
    APPL   SSN  STAT
    VFLEX  11   online

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

   If the V-Flex subsystem 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 *Step 1*.

   `inh-map-ss:ssn=100`

```
    rlghncxa03w 09-05-28 14:42:38 GMT EAGLE 41.0.0
    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.
6. Verify the changes by entering the `rtrv-ss-appl` command.

```
    tekelecstp 07-07-25 08:02:22 EST  EAGLE 37.6.0
    APPL   SSN  STAT
    VFLEX  11   offline

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

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

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

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

Taking the Subsystem Application Online

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

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

```
    tekelecstp 07-07-25 08:02:22 EST  EAGLE 37.6.0
    APPL   SSN  STAT
    VFLEX  11   offline

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

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

```
    tekelecstp 07-07-25 08:02:22 EST  EAGLE 37.6.0
    APPL   SSN  STAT
    VFLEX  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.
```

Adding a Service Module Card

This procedure is used to add Service Module cards to the database to support GTT-related features and EPAP-related features.

EPAP-related features require Service Module cards running the VSCCP application. The following cards can be used as Service Module cards running the VSCCP application in the system:

- DSM 4G – a Service Module card with 4 gigabytes of memory and supports Group Ticket Voucher (TVG) and Message Flow Control (MFC)
- E5-SM4G - a Service Module card with 4 gigabytes of memory and supports TVG and MFC
- E5-SM8G-B - a Service Module card with 8 gigabytes of memory and supports only MFC

The system can contain a maximum of 32 (31+1) Service Module cards for EPAP-related features with EPAP running on a T1200 AS:

- The following Warning appears when more than 25 Service Module cards have been provisioned in the system and the `enable-ctrl-feat` command is entered to enable the first EPAP-related feature in the system:

```
Warning: The Eagle must be connected to an EPAP T1200 or higher
```

- The following Caution appears when the `ent-card` commend is entered to add the 26th Service Module card to the database and any EPAP-related feature is enabled in the system:

```
CAUTION: Please ensure EPAP Application Server is running on
         hardware supporting 32 SCCP cards e.g.: T1200.
         Re-enter command within 30 seconds to confirm change.
```

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

A Service Module card occupies two card slots. A Service Module card can be inserted in only an odd/even numbered pair of empty card slots of an EAGLE 5 ISS shelf. The even-numbered card slot to the right of the odd-numbered slot where the Service Module card is to be inserted must be empty. A Service Module card cannot be inserted in slots 09 and 10 because slots 09 and 10 of each shelf contain HMUX cards, HIPR cards, or HIPR2 cards. The Service Module card is connected to the network through the odd-numbered card slot connector.

Note: Service Module cards can be inserted only in slots 01, 03, 05, 07, and 11 of the control shelf (1100).

Table 10: Service Module Card Locations

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

Prerequisites

Before a Service Module card can be added, the prerequisites in *Table 11: System Prerequisites for Adding a Service Module Card* must be present in the system.

Table 11: System Prerequisites for Adding a Service Module Card

Prerequisite	Verification and Actions
The shelf to which the card is to be added must already be provisioned in the database.	Enter the `rtrv-shlf` command. If the shelf is not in the database, refer to the procedure for adding a shelf in *Database Administration Manual – System Management*.
The odd/even slots in which the card will be inserted must not have a card already assigned in the database.	Enter the `rtrv-card` command. If a slot has a card assigned to it, use the dlt-card command to remove the card from the database. Refer to the `dlt-card` command description in *Commands Manual*.

Prerequisite	Verification and Actions
The GTT feature must be on.	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 Manual - GTT* to turn on and provision the GTT feature and any other GTT-related features and functions that will be used in the system.
To add more than 25 Service Module cards to the database, the EPAP connected to the EAGLE 5 ISS must be running on a T1200 AS.	Use visual inspection or contact the for assistance to determine the EPAP hardware type.

Before an E5-SM4G Service Module card can be added, the prerequisite in *Table 12: Prerequisite for Adding an E5-SM4G Service Module Card* must be present in the system.

Table 12: Prerequisite for Adding an E5-SM4G Service Module Card

Prerequisite	Verification and Actions
Slots 09 and 10 in the shelf to which the E5-SM4G card will be added must contain either HIPR cards or HIPR2 cards.	Enter the `rept-stat-gpl:gpl=hipr` command and the `rept-stat-gpl:gpl=hipr2` command to list the installed HIPR cards and HIPR2 cards in the system. If the shelf does not contain HIPR cards or HIPR2 cards, refer to procedures in *Installation Manual - EAGLE 5 ISS* to install HIPR cards or HIPR2 cards in the shelf.

Before an E5-SM8G-B Service Module card can be added, the prerequisites in *Table 13: Prerequisites for Adding an E5-SM8G-B Service Module Card* must be present in the system.

Table 13: Prerequisites for Adding an E5-SM8G-B Service Module Card

Prerequisite	Verification and Actions
Slots 09 and 10 in the shelf to which the E5-SM8G-B card will be added must contain either HIPR cards or HIPR2 cards.	Enter the `rept-stat-gpl:gpl=hipr` command and the `rept-stat-gpl:gpl=hipr2` command to list the installed HIPR cards and HIPR2 cards in the system. If the shelf does not contain HIPR cards or HIPR2 cards, refer to procedures in *Installation Manual - EAGLE 5 ISS* to install HIPR cards or HIPR2 cards in the shelf.

Prerequisite	Verification and Actions
Fan trays must be installed.	If fan trays are not installed, refer to *Installation Manual - EAGLE 5 ISS* for the fan installation procedure.
The Cooling Fan feature (FAN) must be on.	Enter the `rtrv-feat` command to display the status of the Cooling Fan feature (FAN). If `FAN = off` in the `rtrv-feat` output, refer to procedures in *Database Administration Manual - System Management* to turn on the Cooling Fan feature (FAN).
The Message Flow Control (MFC) option must be on.	Enter the `rtrv-stpopts` command to display the status of the Message Flow Control (MFC) option. Refer to procedures in *Database Administration Manual - System Management* to turn on the Message Flow Control (MFC) option.

Refer to *Commands Manual* for complete descriptions of the commands used in this procedure. The complete descriptions include valid parameter values and output examples.

1. Display the cards in the system by entering the `rtrv-card` command. Odd-even pairs of card locations that do not contain cards (are not listed in the output) and do not contain HMUX, HIPR, or HIPR2 cards can be used for Service Module cards.

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

;
```

2. Verify that the Service Module card to be added has been physically installed in the correct card location and the required cabling is installed to connect the card to the EPAP.

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

3. Perform this step only if the card being added will be the 26th Service Module card in the system.

   If the card is NOT the 26th Service Module card, continue to *Step 4*.

Note: The same `ent-card` command must be entered twice within 30 seconds to complete the provisioning of the card.

a) Enter the `ent-card` command the first time for the 26th card.

```
ent-card:loc=<card location>:type=dsm:appl=vsccp
```

When the command executes the first time and any EPAP-related feature is enabled, the following caution appears :

```
CAUTION: Please ensure EPAP Application Server is running on
         hardware supporting 32 SCCP cards e.g.: T1200.
         Re-enter command within 30 seconds to confirm change.
```

b) Enter the `ent-card` command a second time for the 26th card to complete the provisioning of the card.

c) Go to *Step 5*.

4. Add the Service Module card to the database, using the `ent-card` command.
```
ent-card:loc=<card location>:type=dsm:appl=vsccp
```

5. For an E5-SM4G or E5-SM8G-B card, verify the temperature threshold settings by performing the "Changing the High-Capacity Card Temperature Alarm Thresholds" procedure in *Database Administration Manual - SS7*.

6. Verify the change by entering the `rtrv-card` command with the card location specified.
```
rtrv-card:loc=<card location>
```

```
   rlghncxa03w 08-03-15 16:34:56 EST  EAGLE 39.2.0
   CARD   TYPE      APPL      LSET NAME     LINK SLC LSET NAME     LINK SLC
   1301   DSM       VSCCP     ------------  A    --  ------------  B
;
```

7. Display the current IP link parameters associated with the Service Module card in the database by entering the `rtrv-ip-lnk` command.

```
RLGHNCXA03W 09-08-24 21:14:37 GMT EAGLE 41.0.0
LOC PORT IPADDR   SUBMASK    DUPLEX  SPEED  MACTYPE  AUTO  MCAST
1107 A   -------  --------   HALF    10     DIX      NO    NO
1107 B   -------  --------   HALF    10     DIX      NO    NO
```

8. Enter the IP address and other parameter values associated with the Service Module card in the database using the `chg-ip-lnk` command.

For example, enter:

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

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

where:

:loc

Card location or slot number of the Service Module card in the EAGLE 5 ISS

:port

Ethernet interface Port ID - the physical interface of the Service Module card

:ipaddr

IP address for the specified port. This is a TCP/IP address expressed in standard dot notation. IP addresses consist of the network number of the system and the unique host number.

:submask

Subnet mask of the IP interface in the form of an IP address with a restricted range of values

:duplex

Mode of operation of the interface

:speed

Interface bandwidth in megabits per second. The speed is either 100 Mbps for main Service Module network or 10 Mbps for backup Service Module network.

:mactype

Media Access Control Type of the interface. Specify `dix` for the Digital/Inter/Xerox *de facto* standard for Ethernet 2.

:mcast

Multicast Control to enable or disable multicast support for the interface. This parameter value must be `yes` to establish the connection from the Service Module card to the MPS system.

9. Verify the IP address and other parameter values associated with the Service Module card in the database by entering the `rtrv-ip-lnk` command.

```
RLGHNCXA03W 09-08-24 21:14:37 GMT EAGLE 41.0.0
LOC  PORT IPADDR        SUBMASK       DUPLEX SPEED MACTYPE AUTO MCAST
1107 A    192.168.122.1 255.255.255.0 HALF   100   DIX     NO   YES
1107 B    192.168.123.1 255.255.255.0 HALF   10    DIX     NO   YES
```

10. Display the current IP host information in the database by entering the `rtrv-ip-host` command.

```
RLGHNCXA03W 09-08-24 21:17:37 GMT EAGLE 41.0.0
IPADDR          HOST
192.1.1.32      KC_HLR2
192.1.1.50      DN_MSC1
192.1.1.52      DN_MSC2
```

11. Add the host name and IP address for each VSCCP link, using the `ent-ip-host` command.

Command examples:

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

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

where:

:host

Host name. Each VSCCP link must be specified separately.

:ipaddr

IP network address for each EPAP. The first three octets of the IP address must be the same as MPS A and B ports, respectively. The fourth octet identifies the Service Module card and must have a a unique octet identifier for the card IP address.

12. Verify the new IP host information in the database by entering the `rtrv-ip-host` command.

```
RLGHNCXA03W 09-08-24 21:19:37 GMT EAGLE 41.0.0
IPADDR          HOST
192.1.1.32      KC_HLR2
192.1.1.50      DN_MSC1
192.1.1.52      DN_MSC2
192.168.122.1   VSCCP_1107_A
192.168.123.1   VSCCP_1107_B
```

13. Enter local domain and IP router address for the Service Module card, using the `chg-ip-card` command.

    Note: Most customer private networks do not require setting up a default router for the Service Module card. If your network configuration requires a default router to connect the Service Module card communication to the EPAP, then only one default router is assignable to each Service Module card. Assign the default router address to each Service Module card as shown in this step.

    For example:

    ```
    chg-ip-card:defrouter=192.168.122.250:domain=nc.tekelec.com:loc=<card location>
    ```

    where:

    :defrouter

    Default router IP address. This is a TCP/IP address expressed in standard dot notation. IP addresses consist of the network number of the system and the unique host number.

    :domain

    Domain name of domain server

    :loc

    Card location or slot number of the Service Module card in the EAGLE 5 ISS

14. Verify the new TCP/IP parameters associated with the Service Module card in the database by entering the `rtrv-ip-card` command.

```
RLGHNCXA03W 09-08-24 21:21:37 GMT EAGLE 41.0.0
   LOC 1107
     SRCHORDR  LOCAL
     DNSA      -----------
     DNSB      -----------
     DEFROUTER 192.168.122.250
     DOMAIN    NC.TEKELEC.COM
```

15. Allow the Service Module card that was added to operate in the system, using the `alw-card` command.

    ```
    alw-card:loc=<card location>
    ```

16. Verify the In-Service-Normal (IS-NR) status of the Service Module card, using the `rept-stat-card` command.
17. Test the presence of the EPAP hosts on the network using the `pass` command with the ping parameter. This command is invoked with a destination that is either a hostname or IP address.

    Command examples:

    ```
    pass:loc=1107:cmd="ping 192.168.122.100".
    ```

    ```
    pass:loc=1107:cmd="ping 192.168.122.200".
    ```

```
pass:loc=1107:cmd="ping 192.168.123.100".
pass:loc=1107:cmd="ping 192.168.123.200".
```

where:

:loc

Card location or slot number in the EAGLE 5 ISS

:cmd

Command string passed to Service Module card for processing

After successful completion of each command, the system response is similar to the following output:

```
rlghncxa03w 09-08-24 08:30:44 GMT EAGLE 41.0.0
pass: loc=1107: cmd="ping 192.168.122.100"
Command entered at terminal #1.
;
rlghncxa03w 09-08-24 08:30:44 GMT EAGLE 41.0.0
PASS: Command sent to card
;
rlghncxa03w 09-08-24 08:30:44 GMT EAGLE 41.0.0
PING command in progress
;
rlghncxa03w 09-08-24 08:30:46 GMT EAGLE 41.0.0
PING 192.168.122.100: 56 data bytes
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=0.time=5. ms
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=1.time=0. ms
64 bytes from tekral.nc.tekelec.com (192.168.122.100):icmp_seq=2.time=0. ms
----192.168.100.3 PING Statistics----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms) min/avg/max = 0/1/5
PING command complete
```

If the `pass` commands with the `ping` parameter are not successful, verify the correct connection of the hardware cabling and repeat this step. If the command fails again, contact *Customer Care Center*.

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

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

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

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

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

Activating the E5-SM4G Throughput Capacity Feature

The E5-SM4G Throughput Capacity feature quantities are used to increase the processing capacity of the E5-SM4G card, the E5-SM8G-B card, and the system SCCP traffic for an EAGLE 5 ISS that contains

E5-SM4G or E5-SM8G-B cards only. DSM Service Module cards are not affected. The achievable TPS maximums are shown in *Table 14: Maximum E5-SM4G, E5-SM8G-B, and System TPS Capacity*.

Table 14: Maximum E5-SM4G, E5-SM8G-B, and System TPS Capacity

Feature Quantity Part Number	Maximum TPS Capacity per E5-SM4G Card	Maximum TPS Capacity per E5-SM8G -B Card	Maximum System TPS Capacity
893019101 - Feature Quantity 5000	3125	3125	96,875 TPS with one or more EPAP-related features and 31+1 cards with EPAP running on T1200 AS
	5000	5000	• 150,000 TPS with no EPAP-related or ELAP-related feature traffic and 31+1 cards • 120,000 TPS with G-Flex and the ANSIGFLEX STP option and 24+1 cards • 155,00 TPS with G-Flex and the ANSIGFLEX STP option and 31+1 cards with EPAP running on T1200 AS • 40,000 TPS with ELAP and 8+1 cards • 85,000 TPS with ELAP and 17+1 cards
893019102 - Feature Quantity 6800	6800	6800	• 210,800 TPS with no EPAP-related or ELAP-related feature traffic and 31+1 cards • 210,800 TPS with one or more EPAP-related features and 31+1 cards with EPAP running on T1200 AS • 54,400 TPS with ELAP and 8+1 cards • 115,600 TPS with ELAP and 17+1 cards
893019103 - Feature Quantity 10000	6800	10000	For E5-SM4G: • 210,800 TPS with no EPAP-related or ELAP-related feature traffic and 31+1 cards • 210,800 TPS with one or more EPAP-related features and 31+1

Feature Quantity Part Number	Maximum TPS Capacity per E5-SM4G Card	Maximum TPS Capacity per E5-SM8G -B Card	Maximum System TPS Capacity
			cards with EPAP running on T1200 AS • 54,400 TPS with ELAP and 8+1 cards • 115,600 TPS with ELAP and 17+1 cards For E5-SM8G-B: • 310,000 TPS with no EPAP-related or ELAP-related feature traffic and 31+1 cards • 310,000 TPS with one or more EPAP-related features and 31+1 cards with EPAP running on T1200 AS • 80,000 TPS with ELAP and 8+1 cards • 170,000 TPS with ELAP and 17+1 cards

An E5-SM4G Throughput Capacity quantity feature must be enabled using an E5-SM4G Throughput Capacity feature part number (893019101, 893019102, or 893019102) and a feature access key.

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

Note: The E5-SM4G Throughput Capacity quantity feature must be purchased to receive the feature access key used to enable the feature. Contact your Tekelec Sales Representative or Account Representative before beginning this procedure if you have purchased the E5-SM4G Throughput Capacity quantity feature, but do not have the feature access key. A temporary feature access key is not available for this feature.

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

System Prerequisites

Before the E5-SM4G Throughput Capacity feature can be enabled, the prerequisites listed in *Table 15: System Prerequisites* are required in the system.

Table 15: System Prerequisites

Prerequisite	Verification and Provisioning
For new installations, the system serial number must be verified and locked.	Enter the `rtrv-serial-num` command to display the serial number and its lock status.

Prerequisite	Verification and Provisioning
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 has already been verified and locked.	Verify that the displayed serial number is correct for the system. The serial number is shown on a label affixed to the control shelf (shelf 1100). If no serial number is displayed, or if the displayed serial number is not locked, refer to the `ent-serial-num` command description in *Commands Manual* for instructions to enter and lock the serial number.
The GTT feature must on in the system.	Enter the `rtrv-feat` command. 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 Manual – Global Title Translation* to turn on and provision the GTT feature and any related features and functions.

E5-SM4G Throughput Capacity Feature Prerequisite

Before the E5-SM4G Throughput Capacity feature can be enabled, the prerequisite shown in *Table 16: E5-SM4G Throughput Capacity Feature Prerequisite* is required in the system.

Table 16: E5-SM4G Throughput Capacity Feature Prerequisite

Prerequisite	Verification and Provisioning
E5-SM4G cards or E5-SM8G-B cards running the VSCCP application must be equipped. The required number of cards depends on the desired total system TPS to be achieved by the cards. See *Table 14: Maximum E5-SM4G, E5-SM8G-B, and System TPS Capacity*.	Enter the `rept-stat-gpl:gpl=sccphc` command to list the E5-SM4G cards and E5-SM8G-B cards in the system. If the number of cards is not sufficient, use the procedure in *Adding a Service Module Card* to add E5-SM4G cards or E5-SM8G-B cards.

The following procedure explains how to enable an E5-SM4G Throughput Capacity quantity feature.

Note: After a quantity feature has been enabled, a feature for a higher quantity can be enabled; a feature for a lower quantity cannot be enabled. Quantity features are automatically turned on when they are enabled.

Refer to *Commands Manual* for complete descriptions of the commands used in this procedure, including parameter names, valid parameter values, rules for using the commands, and output examples.

1. Display the status of the features that are controlled by feature access keys. Enter the `rtrv-ctrl-feat` command.

```
rlghncxa03w 09-07-29 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
```

```
    E5-SM4G Throughput Cap    893019101  on          5000
;
```

- If the `rtrv-ctrl-feat` output shows that the correct E5-SM4G Throughput Capacity quantity feature is enabled and its status is on, no further action is necessary.
- If no E5-SM4G Throughput Capacity feature quantity is enabled or a higher quantity needs to be enabled, continue with *Step 2*.

2. Enable the E5-SM4G Throughput Capacity quantity feature by entering the `enable-ctrl-feat` command with the correct part number and FAK for the desired quantity.
3. Verify the status of the E5-SM4G Throughput Capacity quantity feature by entering the `rtrv-ctrl-feat` command with the feature part number that was enabled (893033501, 893019102, or 893019103) in *Step 2*.
   `rtrv-ctrl-feat:partnum=893019102`

```
    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
    E5-SM4G Throughput Cap    893019102  on          6800
;
```

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.
```

Configuring the Measurements Platform

The EAGLE 5 ISS can collect daily and hourly measurements for the V-Flex service. V-Flex measurements are collected only by the EAGLE 5 ISS Measurements Platform. UI measurements reports are not available for V-Flex.

See *V-Flex Measurements* in this manual and refer to the *Measurements* manual for information about measurements for V-Flex.

Refer to the procedures in the *Database Administration Manual - System Management* for configuring the Measurements Platform feature in the EAGLE 5 ISS.

Chapter 5

V-Flex Measurements

Topics:

This chapter describes the measurements that can be collected and generated for the V-Flex feature.

V-Flex Measurements

The EAGLE 5 ISS Measurements subsystem supports the collection and retrieval of measurements related to the Voice Mail Routere (V-Flex) feature . The V-Flex 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 V-Flex.

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

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

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

There are five measurement registers specifically for the V-Flex feature (see *Table 17: Pegs for Per System V-Flex Measurements* and *Table 18: Pegs for Per SSP V-Flex Measurements*). The registers are reported in two new V-Flex reports (VFLX_SYS and VFLX_SSP) that have been added to the Hourly Maintenance Measurements (MTCH) report and Daily Maintenance Measurements (MTCD) report.

The data for these registers originates in the Service Module cards. The FTP interface to the customer's network transfers the V-Flex MTCH and V-Flex MTCD reports to a customer FTP server. Following collection, scheduled reports are automatically generated and transferred to the customer's FTP server.

Refer to the procedure in the *Database Administration Manual - System Management* for configuring the Measurements Platform feature in the EAGLE 5 ISS.

When the V-Flex feature is on, the MCP application collects V-Flex measurements data each hour following the hour boundary (0000, 0100, 0200, etc.). The collected data is retained in the appropriate data store. The retention period for hourly V-Flex measurements data is 24 hours. The V-Flex measurements data collected each hour is aggregated into a daily sum total that is reported in the MTCD report. The retention period for daily V-Flex measurements data is 7 days.

Existing FTP file server reports are overwritten by subsequent requests that produce the identical file name.

Reports can be generated on demand. The `rept-ftp-meas` command is used to generate and FTP transfer reports on demand. Refer to the *Commands Manual* for descriptions of the commands that are used for V-Flex measurements.

Table 17: Pegs for Per System V-Flex Measurements

Event Name	Description	Type	Unit
VFIDPQRCV	Total number of IDP queries received for the V-Flex service.	System	Peg count

Event Name	Description	Type	Unit
VFCNCTRSP	Total number of IDP Connect responses sent by the V-Flex service.	System	Peg count
VFERRRSP	Total number of IDP queries received that resulted in TCAP Error response from the V-Flex service.	System	Peg count

Table 18: Pegs for Per SSP V-Flex Measurements

Event Name	Description	Type	Unit
VFVMSISDN	Total number of IDP queries received for the V-Flex service with a valid MSISDN and known OPC.	Per-SSP	Peg count
VFIMSISDN	Total number of IDP queries received for the V-Flex service with a invalid MSISDN and known OPC.	Per-SSP	Peg count

Chapter 6

Maintenance

Topics:

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

V-Flex Alarms

Table 19: V-Flex UAMs lists the alarms (UAMs) that are used to support the V-Flex subsystem. All V-Flex-related UAMs are output to the Maintenance Output Group.

Refer to the *Unsolicited Alarm and Information Messages* manual for information and corrective procedures for EAGLE 5 ISS-related alarms. Refer to the *EPAP Alarms on T1200 Platform* manual or the *T1200 Integrated Application Platform Maintenance Manual* for information and corrective procedures for MPS-related alarms.

Table 19: V-Flex UAMs

UAM	Severity	Message Text
0551	Critical	VFLEX Subsystem is not available
0552	Critical	VFLEX Subsystem is disabled
0553	Minor	VFLEX Subsystem normal, card(s) abnormal
0554	None	VFLEX Subsystem is available
0555	None	VFLEX Subsystem is removed

V-Flex UIMs

Table 20: V-Flex UIMs lists the UIMs that are used for the V-Flex feature.The *Unsolicited Alarm and Information Messages* manual contains a complete description of all UIM text and formats.

Table 20: V-Flex UIMs

UIM	Text	Description	Action
1286	LSS: Invalid INAP/CAMEL digits length	The local subsystem received an INAP message in which the Called Party Number parameter length is invalid.	None
1291	LSS: No INAP/CAP CalledPartyNumber param	The local subsystem received an INAP message that does not contain an Called Party Number parameter.	None

UIM	Text	Description	Action
1378	Inh VFLX SS request already outstanding	A second attempt to inhibit the V-Flex subsystem has been made while the first is still being processed.	None - the second attempt will be ignored
1379	Failure Inhibiting VFLEX SS	The attempted inhibit of the V-Flex subsystem failed. A response SOG was not received from the mate.	No action necessary.
1380	VFLEX: No RN digits provisioned	The digits in the VMS at the requested VMRN index were not provisioned.	The provisioning information for the VMS ID accessed via the MSU information should be verified.
1381	VFLEX: CD entry not found	The call decision table entry matching the incoming MSU criteria is not found.	Call decision tree provisioning should be updated.
1382	LSS: Too many digits for DRA parameter	Too many digits (>31) in the DRA parameter to encode.	Decrease the number of RN digits or modify the querying node to send fewer digits in DN.

Maintenance Commands

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

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

Table 21: 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 (UAMs) for local subsystems, cards, and linksets. The severity of each alarm is indicated in the output report.

Command	Description
rept-stat-alm	Displays the alarm counts and totals for local subsystems and Service Mocule card/EPAP IP links.
rept-stat-db	Displays the status information for the EAGLE 5 ISS databases. This includes the level information for each Service Module card, and for the active and standby EPAP 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.
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.

rept-stat-sccp

This command reports V-Flex Subsystem operating status, CPU usage related to V-Flex, and Service Module card status. The loc parameter displays detailed card traffic statistics.

EAGLE 5 ISS Debug Commands

Chapter 6 of the *Commands Manual* contains descriptions of commands that can be used in assessing and modifying system status and operation. The debug commands are used only under the direction of Tekelec support personnel.

The `ent-trace` command can be used to trace MSUs sent to Service Module cards running the VSCCP application. The DN and ENTITYID parameters are supported when the V-Flex feature is turned on.

Status Reporting and Problem Identification

EAGLE 5 ISS commands can be used to obtain status and statistics for the EAGLE 5 ISS system, the EPAP systems, system devices including Service Module cards, EPAP-related features, local subsystems, and SCCP services.

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

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

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

Refer to the *EPAP Alarms on the T1200 Platform* manual for descriptions and recovery procedures for EPAP alarms.

Refer to the appropriate *Feature Manual* for information about the functions and operation of EPAP-related features.

Table 22: Status Reporting for EPAP-Related Features

Reports, Status, and Statistics	Command
EAGLE 5 ISS	
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 5 ISS)	

Reports, Status, and Statistics	Command
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>`

Reports, Status, and Statistics	Command
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`

EPAP Status and Alarm Reporting

Because EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 ISS 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, it 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 craftsperson 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, it 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.

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

Glossary

A

APC	Adjacent Point Code The point code that identifies a node adjacent to the EAGLE 5 ISS. This term is used in link sets and routes.

D

DCB	Device Control Block
DSM	Database Service Module. The DSM provides large capacity SCCP/database functionality. The DSM is an application card that supports network specific functions such as EAGLE Provisioning Application Processor (EPAP), Global System for Mobile Communications (GSM), EAGLE Local Number Portability (ELAP), and interface to Local Service Management System (LSMS).

E

EPAP	EAGLE Provisioning Application Processor
EPAP-related features	Features that require EPAP connection and use the Real Time Database (RTDB) for lookup of subscriber information. • ANSI Number Portability Query (AINPQ) • ANSI-41 AnalyzedInformation Query – no EPAP/ELAP (ANSI41 AIQ) • Anytime Interrogation Number Portability (ATI Number Portability, ATINP) • AINPQ, INP, G-Port SRI Query for Prepaid, GSM MAP SRI

E

Redirect, IGM, and ATINP Support for ROP

- A-Port Circular Route Prevention (A-Port CRP)
- Equipment Identity Register (EIR)
- G-Flex C7 Relay (G-Flex)
- G-Flex MAP Layer Routing (G-Flex MLR)
- G-Port SRI Query for Prepaid
- GSM MAP SRI Redirect to Serving HLR (GSM MAP SRI Redirect)
- GSM Number Portability (G-Port)
- IDP A-Party Blacklist
- IDP A-Party Routing
- IDP Relay Additional Subscriber Data (IDPR ASD)
- IDP Relay Generic Routing Number (IDPR GRN)
- IDP Service Key Routing (IDP SK Routing)
- IDP Screening for Prepaid
- INAP-based Number Portability (INP)
- Info Analyzed Relay Additional Subscriber Data (IAR ASD)
- Info Analyzed Relay Base (IAR Base)
- Info Analyzed Relay Generic Routing Number (IAR GRN)
- Info Analyzed Relay Number Portability (IAR NP)
- INP Circular Route Prevention (INP CRP)
- IS41 Mobile Number Portability (A-Port)
- IS41 GSM Migration (IGM)
- MNP Circular Route Prevention (MNPCRP)
- MO-based GSM SMS NP
- MO-based IS41 SMS NP
- MO SMS Generic Routing Number (MO SMS GRN)

E

- MO- SMS B-Party Routing
- MO SMS IS41-to-GSM Migration
- MT-based GSM SMS NP
- MT-based GSM MMS NP
- MT-based IS41 SMS NP
- MTP Routed Messages for SCCP Applications (MTP Msgs for SCCP Apps)
- MTP Routed Gateway Screening Stop Action (MTPRTD GWS Stop Action)
- Portability Check for MO SMS
- Prepaid IDP Query Relay (IDP Relay, IDPR)
- Prepaid SMS Intercept Phase 1 (PPSMS)
- Service Portability (S-Port)
- S-Port Subscriber Differentiation
- Triggerless ISUP Framework Additional Subscriber Data (TIF ASD)
- Triggerless ISUP Framework Generic Routing Number (TIF GRN)
- Triggerless ISUP Number Portability (TIF NP)
- Triggerless ISUP Framework Number Substitution (TIF NS)
- Triggerless ISUP Framework SCS Forwarding (TIF SCS Forwarding)
- Triggerless ISUP Framework Simple Number Substitution (TIF SNS)
- Voice Mail Router (V-Flex)

F

FTP — File Transfer Protocol

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

G

G

GSM	Global System for Mobile Communications
GTT	Global Title Translation A feature of the signaling connection control part (SCCP) of the SS7 protocol that the EAGLE 5 ISS uses to determine which service database to send the query message when an MSU enters the EAGLE 5 ISS and more information is needed to route the MSU. These service databases also verify calling card numbers and credit card numbers. The service databases are identified in the SS7 network by a point code and a subsystem number.

I

IAM	Initial Address Message
IDP	Initial Detection Point
INAP	Intelligent Network Application Part
IP	Internet Protocol IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.
ISDN	Integrated Services Digital Network

I

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

L

Link	Signaling Link Signaling Link Carries signaling within a Link Set using a specific Association. A Link can belong to only one Link Set and one Association. There is generally one Link per Association in a Link Set.

M

MAP	Mobile Application Part
MCP	Measurement Collection Processor This application is used by the MCPM card for the Measurements Platform feature.
MFC	Message Flow Control
MPS	Multi-Purpose Server The Multi-Purpose Server provides database/reload functionality and a variety of high capacity/high speed offboard database functions for

M

	applications. The MPS resides in the General Purpose Frame. Messages Per Second A measure of a message processor's performance capacity. A message is any Diameter message (Request or Answer) which is received and processed by a message processor.
MSC	Mobile Switching Center
MSISDN	Mobile Station International Subscriber Directory Number The MSISDN is the network specific subscriber number of a mobile communications subscriber. This is normally the phone number that is used to reach the subscriber.
MSU	Message Signal Unit The SS7 message that is sent between signaling points in the SS7 network with the necessary information to get the message to its destination and allow the signaling points in the network to set up either a voice or data connection between themselves. The message contains the following information: • The forward and backward sequence numbers assigned to the message which indicate the position of the message in the traffic stream in relation to the other messages. • The length indicator which indicates the number of bytes the message contains. • The type of message and the priority of the message in the signaling information octet of the message.

M

- The routing information for the message, shown in the routing label of the message, with the identification of the node that sent message (originating point code), the identification of the node receiving the message (destination point code), and the signaling link selector which the EAGLE 5 ISS uses to pick which link set and signaling link to use to route the message.

O

OAM	Operations, Administration, and Maintenance The application that operates the Maintenance and Administration Subsystem which controls the operation of many Tekelec products.
OPS	Operator Provisioning System

P

PDB	Provisioning Database
PDBA	Provisioning Database Application There are two Provisioning Database Applications (PDBAs), one in EPAP A on each EAGLE 5 ISS. They follow an Active/Standby model. These processes are responsible for updating and maintaining the Provisioning Database (PDB).
PDBI	Provisioning Database Interface The interface consists of the definition of provisioning messages only. The customer must write a client application that uses the PDBI request/response messages to communicate with the PDBA.

P

PPP	Point-to-Point Protocol

R

RFC	Request for Comment RFCs are standards-track documents, which are official specifications of the Internet protocol suite defined by the Internet Engineering Task Force (IETF) and its steering group the IESG.
RMTP	Reliable Multicast Transport Protocol
RN	Routing Number
RSP	Remote Signaling Point Represents an SS7 network node (point code) that signaling must be sent to. An RSP has an SS7 domain (ANSI, ITUI, ITUN), a point code, and an optional Adjacent Server Group. Remote Signaling Point A logical element that represents a unique point code within a particular SS7 domain with which the SS7 application's Local Signaling Point interacts.
RSR	Reset Request Route Set Test – Restricted message
RTDB	Real Time Database

S

SCMG	SCCP Management SCMG manages the status of subsystems and SCCP-capable

S

	signaling points (SPs). It maintains the status of remote SCCP SPs and that of local subsystems.
Service Module card	DSM, E5-SM4G, or E5-SM8G-B card that contains the Real Time Database (RTDB) downloaded from an EPAP or ELAP system.
SOR	Support of Optimal Routing System Out of Service Request
SP	Signaling Point A set of signaling equipment represented by a unique point code within an SS7 domain.
STP	Signal Transfer Point The STP is a special high-speed switch for signaling messages in SS7 networks. The STP routes core INAP communication between the Service Switching Point (SSP) and the Service Control Point (SCP) over the network.

T

TCP	Transfer Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TFA	TransFer Allowed (Msg)
TFP	TransFer Prohibited (Msg) A procedure included in the signaling route management (functionality) used to inform a

T

	signaling point of the unavailability of a signaling route.
True Point Code	The point code defining a destination in the Destination Point Code table.
TVG	Group Ticket Voucher

U

UAM	Unsolicited Alarm Message A message sent to a user interface whenever there is a fault that is service-affecting or when a previous problem is corrected. Each message has a trouble code and text associated with the trouble condition.
UDP	User Datagram Protocol
UIM	Unsolicited Information Message A message sent to a user interface whenever there is a fault that is not service-affecting or when a previous problem is corrected. Each message has a trouble code and text associated with the trouble condition.

V

V-Flex	Voicemail Flexible Routing An advanced database application based on the industry proven EAGLE 5 ISS. Deployed as a local subsystem on the EAGLE platform, V-Flex centralizes voicemail routing.
VMS	Voice Mail Server

V

	Virtual Memory System A multi-user, multiprocessing virtual memory-based operating system designed for use in time sharing, batch processing, real time and transaction processing.
VSCCP	VxWorks Signaling Connection Control Part The application used by the Service Module card to support EPAP-related features and LNP features. If an EPAP-related or LNP feature is not turned on, and a Service Module card is present, the VSCCP application processes normal GTT traffic.