

Tekelec EAGLE[®] 5 Integrated Signaling System

Feature Manual - V-Flex[™]

910-5108-001 Revision D

August 2008



**Copyright 2008 Tekelec
All Rights Reserved.
Printed in U.S.A.**

Notice

Information in this documentation is subject to change without notice. Unauthorized use, copying, or translation of this documentation can result in civil or criminal penalties.

Any export of Tekelec products is subject to the export controls of the United States and the other countries where Tekelec has operations.

No part of this documentation may be reproduced, translated, or transmitted in any form or by any means, electronic or mechanical, including photocopying or recording, for any purpose without the express written permission of an authorized representative of Tekelec.

Other product names used herein are for identification purposes only, and may be trademarks of their respective companies.

RoHS 5/6 - As of July 1, 2006, all products that comprise new installations shipped to European Union member countries will comply with the EU Directive 2002/95/EC "RoHS" (Restriction of Hazardous Substances). The exemption for lead-based solder described in the Annex will be exercised. RoHS 5/6 compliant components will have unique part numbers as reflected in the associated hardware and installation manuals.

WEEE - All products shipped to European Union member countries comply with the EU Directive 2002/96/EC, Waste Electronic and Electrical Equipment. All components that are WEEE compliant will be appropriately marked. For more information regarding Tekelec's WEEE program, contact your sales representative.

Trademarks

The Tekelec logo, EAGLE, G-Flex, G-Port, IP7, IP7 Edge, and IP7 Secure Gateway are registered trademarks of Tekelec. TekServer, A-Port, and V-FLEX are trademarks of Tekelec. All other trademarks are the property of their respective owners.

Patents

This product is covered by one or more of the following U.S. and foreign patents:

U.S. Patent Numbers:

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

Foreign Patent Numbers:

EP1062792; EP1308054; EP1247378; EP1303994; EP1252788; EP1161819; EP1177660; EP1169829; EP1135905; EP1364520; EP1192758; EP1240772; EP1173969; CA2352246

Ordering Information

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

Table of Contents

Chapter 1. Introduction	1-1
Introduction	1-1
Flexible Voice mail Routing	1-1
V-Flex Benefits	1-2
V-Flex Functions	1-2
V-Flex Considerations	1-3
Scope and Audience	1-3
Manual Organization	1-3
Related Publications	1-3
Documentation Availability, Packaging, and Updates	1-4
Documentation Admonishments	1-4
Customer Care Center	1-5
Emergency Response	1-5
Locate Product Documentation on the Customer Support Site	1-6
Customer Assistance	1-6
Chapter 2. Feature Description	2-1
V-Flex Feature Overview	2-1
Determining the MSISDN	2-2
Determining the VMS ID	2-3
Determining the VMRN	2-3
V-Flex Tables	2-4
Call Decision Table	2-4
VMS ID Table	2-5
V-Flex Routing Number Table	2-6
V-Flex Options Table	2-6
Common Screening List (CSL) Table	2-7
STP Options (STPOPTS) Table	2-7
Home RN Table	2-8
Mated Application (MAP) Table	2-9
STP Site Identification Table	2-9
Service Selector Table	2-10
Subsystem Application Table	2-11
V-Flex Protocol	2-11
Messages for Local Subsystems	2-11
MPS/EPAP Platform	2-12
Design Overview and System Layout	2-13
Functional Overview	2-14
EPAP/PDBA Overview	2-14

Subscriber Data Provisioning	2-15
EPAP (EAGLE Provisioning Application Processor)	2-17
Service Module Cards	2-18
Network Connections	2-21
Serviceability Hints	2-26
Chapter 3. EAGLE 5 ISS V-Flex Commands	3-1
Introduction	3-2
EAGLE 5 ISS Commands for V-Flex	3-2
EAGLE 5 ISS Card Commands	3-2
EAGLE 5 ISS Serial Number Commands	3-4
EAGLE 5 ISS System Options Commands	3-4
EAGLE 5 ISS Feature Control Commands	3-4
EAGLE 5 ISS Self ID and Capability Point Code Commands	3-6
EAGLE 5 ISS Mate Application Commands	3-7
EAGLE 5 ISS Subsystem Application Commands	3-7
EAGLE 5 ISS Service Selector Commands	3-8
EAGLE 5 ISS V-Flex Options Commands	3-10
EAGLE 5 ISS HOMERN Prefix Commands	3-11
EAGLE 5 ISS Voice Mail Prefix Commands	3-11
EAGLE 5 ISS Voice Mail Routing Number Commands	3-13
EAGLE 5 ISS Voice Mail Server ID Commands	3-14
EAGLE 5 ISS Call Decision Entry Commands	3-14
EAGLE 5 ISS Local Subsystem Activation Commands	3-16
Maintenance Commands for V-Flex	3-16
rept-stat-sys	3-17
rept-stat-sccp	3-17
rept-stat-mps	3-19
rept-stat-trbl	3-20
rept-stat-alm	3-20
rept-stat-db	3-20
rtrv-tbl-capacity	3-21
inh-card / alw-card	3-21
inh-alm / unhb-alm	3-22
rtrv-data-rtdb	3-22
Measurements Commands for V-Flex	3-22
rept-ftp-meas	3-22
rept-stat-meas	3-22
EAGLE 5 ISS Debug Commands	3-23
Chapter 4. V-Flex Configuration	4-1
Introduction	4-1
Provisioning Service Module Cards	4-2
Adding a Service Module	4-3
Removing a TSM Card	4-5
Enabling V-Flex, Setting STP Options, and Turning On V-Flex	4-6
Provisioning True Point Code and Capability Point Code	4-9
Provisioning a Mated Application using True Point Code	4-10

Provisioning V-Flex as a Local Subsystem	4-11
Adding the V-Flex Subsystem Application	4-11
Removing the V-Flex Subsystem Application	4-13
Routing MSUs to Support V-Flex Subsystem	4-15
Provisioning the V-Flex Service Selector	4-16
Adding a V-Flex Service Selector	4-16
Removing a Service Selector	4-17
Changing an Existing Service Selector to a V-Flex Service Selector	4-19
Provisioning the V-Flex Options	4-21
Provisioning HOMERN Entries	4-22
Provisioning Voice Mail Prefix Entries	4-23
Provisioning Voice Mail Routing Numbers	4-24
Provisioning Voice Mail Server ID Entries	4-25
Provisioning Call Decision Table Entries	4-26
Activating the V-Flex Subsystem	4-27
Changing the State of a Subsystem Application	4-29
Taking the Subsystem Application Offline	4-30
Taking the Subsystem Application Online	4-33
Activating the E5-SM4G Throughput Capacity Feature	4-34
Configuring the Measurements Platform for V-Flex	4-37
Chapter 5. Maintenance and Measurements	5-1
Hardware Requirements	5-1
EPAP Status and Alarms	5-2
EPAP Maintenance Blocks	5-2
Service Module Card Status Requests	5-2
V-Flex Alarms	5-3
DSM-EPAP Link	5-4
MPS (EPAP) Alarms	5-5
Card Related MPS Alarms	5-6
V-Flex Subsystem Alarms	5-9
Migration System Status Reports	5-10
System Status Reporting	5-10
MPS Status Reporting	5-10
Service Module Memory Capacity Status Reporting	5-10
Loading Mode Support Status Reporting	5-11
Code and Application Data Loading	5-11
Service Module Code Loading	5-11
EPAP Application Data Loading	5-11
State Transitions during Start-Up	5-13
V-Flex UIMs	5-16
V-Flex Measurements	5-18
Glossary	Glossary-1
Index	Index-1

List of Figures

- Figure 2-1.** Call Scenario with V-Flex Feature..... 2-2
- Figure 2-2.** MPS/EPAP Platform Architecture..... 2-13
- Figure 2-3.** Subscriber Data Provisioning Architecture (High Level)..... 2-16
- Figure 2-4.** Database Administrative Architecture..... 2-18
- Figure 2-5.** Customer Provisioning Network..... 2-23
- Figure 2-6.** EPAP Sync Network..... 2-24
- Figure 2-7.** DSM Networks..... 2-24
- Figure 2-8.** Dial-Up PPP Network..... 2-26
- Figure 5-1.** Obit Message for Abort of Card Loading..... 5-13
- Figure 5-2.** V-Flex Not Enabled, Service Module Running in TSM Emulation..... 5-14
- Figure 5-3.** V-Flex Enabled, Normal Operating Sequence..... 5-14
- Figure 5-4.** V-Flex Enabled, but Service Module Not Connected to EPAP..... 5-14
- Figure 5-5.** V-Flex Enabled, but Service Module card memory Insufficient for Database..... 5-14
- Figure 5-6.** V-Flex Enabled, but Database Exceeds Service Module card memory..... 5-15
- Figure 5-7.** V-Flex Not Enabled at First, but then Activated on Service Module..... 5-15
- Figure 5-8.** V-Flex Activation Unsuccessful due to Insufficient Database..... 5-15

List of Tables

Table 1-1. Admonishments.....	1-4
Table 2-1. EPAP IP Addresses in the DSM Network.....	2-25
Table 3-1. EAGLE 5 ISS Commands Used for V-Flex.....	3-2
Table 3-2. ent-srvsel Parameters - Class = DATABASE.....	3-9
Table 3-3. chg-srvsel Parameters - Class = DATABASE.....	3-9
Table 3-4. dlt-srvsel Parameters - Class = DATABASE.....	3-10
Table 3-5. rtrv-srvsel Parameters - Class = DATABASE.....	3-10
Table 3-6. chg-vflx-opts Parameters - Class = DATABASE.....	3-11
Table 4-1. Service Module Card Locations.....	4-3
Table 4-2. Subsystem Allow/Inhibit.....	4-28
Table 5-1. V-Flex UAMs.....	5-3
Table 5-2. V-Flex UIMs.....	5-16
Table 5-3. Pegs for Per System V-Flex Measurements.....	5-19
Table 5-4. Pegs for Per SSP V-Flex Measurements.....	5-19

Introduction

Introduction	1-1
Flexible Voice mail Routing	1-1
V-Flex Benefits	1-2
V-Flex Functions	1-2
V-Flex Considerations	1-3
Scope and Audience	1-3
Manual Organization	1-3
Related Publications	1-3
Documentation Availability, Packaging, and Updates	1-4
Documentation Admonishments	1-4
Customer Care Center	1-5
Emergency Response	1-5
Locate Product Documentation on the Customer Support Site	1-6
Customer Assistance	1-6

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.

Flexible Voice mail Routing

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 an advanced database application. Deployed as a local subsystem on the EAGLE 5 ISS platform, V-Flex centralizes voice mail routing. 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 Benefits

- Easy deployment of premium voice mail services
- Maximized resource utilization - V-Flex centralizes voice mail routing, performing load balancing across multiple VMSCs as well as alleviating the need for MSCs to maintain number range tables. The core routing solution allows the most efficient use of network resources and simplifies provisioning and maintenance.
- Scalability - Tekelec is the industry leader in providing advanced database applications, such as V-Flex, providing high capacity, superior throughput and scalability up to 96 million subscriber numbers per node.
- Simplified provisioning - Easy-to-use interface simplifies operator provisioning of subscriber VMSC mapping and call decision criteria. Provisioning is non-service affecting and can be done in real time.

V-Flex Functions

V-Flex provides the following functions:

- Flexible number mapping provides a logical link between a subscriber (MSISDN/DN) and a VMSC
- Supports up to eight DN's per subscriber
- Support for individual and range entries
- Up to 96 million subscriber numbers, scalable in increments of 500,000
- Up to 50,000 MSISDN range entries
- Variable-length database supports numbers from 1 to 15 digits
- Number normalization feature stores numbers in international format and automatically translates national numbers to international numbers before searching the database, preventing duplicate number storage
- Centralized routing data for simplified provisioning and maintenance
- Flexible network deployment – can be deployed as a standalone solution or integrated with the EAGLE 5 ISS signal transfer point (STP) function, and/or other EAGLE 5 ISS platform applications
- Scalable from 850 to 75,000 transactions per second (TPS)
- Real-time memory-based database with less than 75 millisecond processing delay
- Automatic provisioning synchronization – database changes are sent to one node and automatically replicated to other V-Flex nodes
- High-provisioning transaction rate – over 25 database updates per second
- 99.99999% availability for mated pair deployments
- Supports two different query types:

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

V-Flex Considerations

- GTT must be ON before the V-Flex feature can be enabled
- The V-Flex feature cannot be enabled on an EAGLE 5 ISS with TSM cards installed
- TSM cards cannot be added to an EAGLE 5 ISS with V-Flex enabled

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:

- [Chapter 1 Introduction](#) , contains general information about the V-Flex documentation, the organization of this manual, and how to get technical assistance.
- [Chapter 2 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.
- [Chapter 3 EAGLE 5 ISS V-Flex Commands](#) , describes the new or updated commands that support the V-Flex feature. It provides some sample reports and explanations of appropriate command usage.
- [Chapter 4 V-Flex Configuration](#) , describes Eagle 5 ISS provisioning for the V-Flex feature.
- [Chapter 5 Maintenance and Measurements](#) , describes maintenance and measurements in detail, including EPAP status and alarms, hardware verification messages, V-Flex system status reports and commands, code and application data loading, and alarms.

Related Publications

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

Documentation Availability, Packaging, and Updates

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

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

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

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 as a set or individually. Exceptions to printed documentation are:

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




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

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

Documentation Admonishments

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

Table 1-1. Admonishments

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

Customer Care Center

The Tekelec Customer Care Center offers a point of contact for product and service support through highly trained engineers or service personnel. The Tekelec Customer Care Center is available 24 hours a day, 7 days a week at the following locations:

- Tekelec, USA
Phone:
+1 888 367 8552 (US and Canada only)
+1 919 460 2150 (international)
Email: *support@tekelec.com*
- Tekelec, Europe
Phone: +44 1784 467804
Email: *ecsc@tekelec.com*

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

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

Emergency Response

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

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

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

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

Locate Product Documentation on the Customer Support Site

To view or download product documentation, log into the Tekelec Customer Support site at:

<https://support.tekelec.com/index.asp>

1. Log in with your user name and password. (Click on **Need an Account?** if you need to register).
2. Select **EAGLE** from the Product Support menu.
3. Select the release number from the Release menu.
4. Locate the Notices section to view the latest Feature Notice.
5. Locate the Manuals section to view all manuals applicable to this release.

The documentation is listed in alphabetical order by the manual name. Only the first three manuals display. Click **more...** to see the remaining manuals.

6. Locate the latest revision of the manual name.

Confirm the release number and last available revision.

Select the 936-xxxx-x01 part number to download the complete documentation set with all linked files.

NOTE: The electronic file for this part number is quite large.

7. To view a manual, double-click the manual name.
8. To download a manual, right-click and select **Save Target As**.

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

Customer Assistance

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

Feature Description

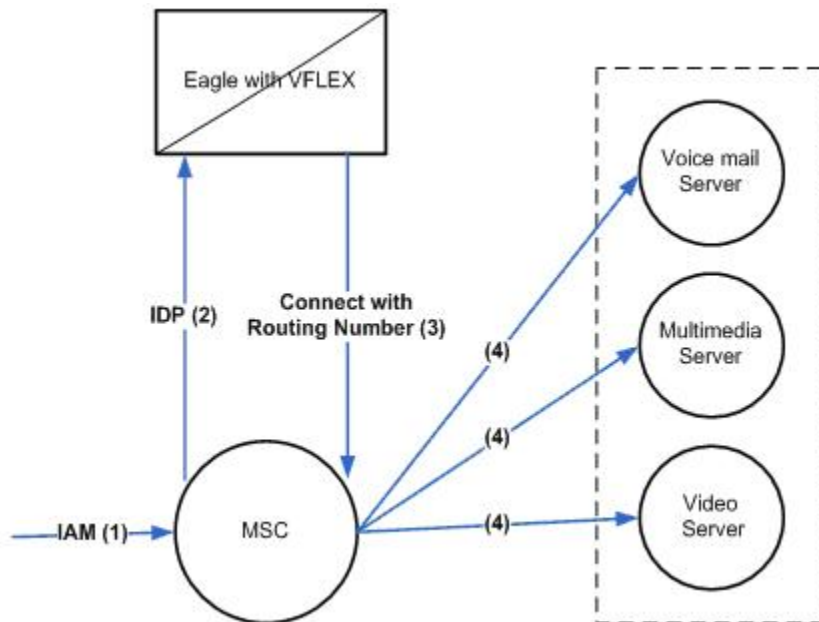
V-Flex Feature Overview	2-1
Determining the MSISDN	2-2
Determining the VMS ID	2-3
Determining the VMRN	2-3
V-Flex Tables	2-4
Call Decision Table	2-4
VMS ID Table	2-5
V-Flex Routing Number Table	2-6
V-Flex Options Table	2-6
Common Screening List (CSL) Table	2-7
STP Options (STPOPTS) Table	2-7
Home RN Table	2-8
Mated Application (MAP) Table	2-9
STP Site Identification Table	2-9
Service Selector Table	2-10
Subsystem Application Table	2-11
V-Flex Protocol	2-11
Messages for Local Subsystems	2-11
MPS/EPAP Platform	2-12
Design Overview and System Layout	2-13
Functional Overview	2-14
EPAP/PDBA Overview	2-14
Subscriber Data Provisioning	2-15
EPAP (EAGLE Provisioning Application Processor)	2-17
Service Module Cards	2-18
Network Connections	2-21
Serviceability Hints	2-26

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 enabled 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 2-1. 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

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

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 Tables

The following tables are required in the Eagle 5 ISS for the implementation of the V-Flex Voice Mail Router (V-Flex) feature:

- Call Decision table
- VMS ID table
- RN table
- V-Flex Options table
- Common Screening List (CSL) table
- STP Options table
- Home RN table
- Service Selector table
- Subsystem Application table
- Mated Application (MAP) table
- STP Site Identification table
- Service Selector (SRV SELECTOR) table
- Subsystem Application (SS-APPL) table

Call Decision Table

The main purpose of the Call Decision table is to determine the Routing Number Index. The Routing Number Index is combined with the VMS ID in the VMS ID table to determine the VMRN (needed by the MSC to route the call).

Enter the **rtrv-vflx-cd** command to view the Call Decision table:

```
tk1c1081301 07-08-08 11:26:18 EST EAGLE5 37.6.0

RDI      DN Status   BCAP   VM Number/Prefix  VMRN Index  CD Name
---      -
DIR      NFND        0      333                6            kp5
DIR      FND         0      1234567            7            kp6
DIR      FND         0      5551234            2            kp9
DIR      FND         0      123456789          2            kp10
DIR      FND         8      316537771234      5            kp15
DIR      FND         9      333                3            kp33
DIR      FND         9      5551234            2            kp16
DIR      FND         17     316537771234      7            kp20
DIR      FND         24     316537771234      6            kp19
DIR      FND         NONE   333                9            kp8
DIR      FND         NONE   316538881234      7            kp31
REDIR    NFND        9      333                4            kp3
REDIR    FND         9      316538881234      5            kp21
REDIR    FND         NONE   316535551234      7            kp35
```

VFLEX Call Decision table is (14 of 4950) 1% full.

The values shown in the Call Decision table are:

RDI	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 IDP query).
DN Status	Indicates whether MSISDN is found, not found, or does not matter (*).
BCAP (Bearer Capabilities)	Determines the type of mail – including voice, video, and multimedia.
VM Number	For redirect by the MSC, the Voice Mail Number is used.
VM Prefix	For a direct dial by the subscriber, the Voice Mail Prefix is used if it is available (VMPrefix + MSISDN in the IDP query). When the VMPrefix is not available, the CdPN is used.
VMRN Index	The Routing Number Index is used by the VM --> VMRN table to determine the VMRN needed by the MSC to route the call.
CD Name	The unique name given to a CD table entry (for retrieval, change, or deletion).

VMS ID Table

The main purpose of the VMS ID table is to determine the VMRN.

Enter the **rtrv-vflx-vmsid** command to view the VMS ID table.

```
tklc1081301 07-08-08 11:26:11 EST EAGLE5 37.6.0
```

VMS ID	-----	IDX0	-----	IDX1	-----	IDX2	-----	IDX3	-----	IDX4	-----
ff0001	-----	pfxaaa	-----	pfxbbb	-----	pfxcdd	-----	pfxeef	-----		-----
		IDX5	-----	IDX6	-----	IDX7	-----	IDX8	-----	IDX9	-----
		NONE	-----	pfxggg	-----	pfxhhh	-----	pfxiii	-----	pfxjjj	-----
VMS ID	-----	IDX0	-----	IDX1	-----	IDX2	-----	IDX3	-----	IDX4	-----
ff0002	-----	pfxbbb	-----	pfxcdd	-----	pfxeef	-----	pfxfff	-----		-----
		IDX5	-----	IDX6	-----	IDX7	-----	IDX8	-----	IDX9	-----
		pfxggg	-----	pfxhhh	-----	pfxiii	-----	pfxjjj	-----	pfxkkk	-----
VMS ID	-----	IDX0	-----	IDX1	-----	IDX2	-----	IDX3	-----	IDX4	-----
ff0003	-----	pfxaaa	-----	pfxcdd	-----	pfxeef	-----	pfxfff	-----		-----
		IDX5	-----	IDX6	-----	IDX7	-----	IDX8	-----	IDX9	-----
		pfxggg	-----	pfxhhh	-----	pfxiii	-----	pfxjjj	-----	pfxkkk	-----
VMS ID	-----	IDX0	-----	IDX1	-----	IDX2	-----	IDX3	-----	IDX4	-----
ff0004	-----	pfxddd	-----	pfxeef	-----	pfxfff	-----	pfxggg	-----	pfxhhh	-----
		IDX5	-----	IDX6	-----	IDX7	-----	IDX8	-----	IDX9	-----
		pfxiii	-----	pfxjjj	-----	pfxkkk	-----	pfxaaa	-----	pfxbbb	-----
VMS ID	-----	IDX0	-----	IDX1	-----	IDX2	-----	IDX3	-----	IDX4	-----
ff0005	-----	pfxeef	-----	pfxfff	-----	pfxggg	-----	pfxhhh	-----	pfxiii	-----
		IDX5	-----	IDX6	-----	IDX7	-----	IDX8	-----	IDX9	-----
		pfxjjj	-----	pfxkkk	-----	pfxaaa	-----	pfxbbb	-----	pfxcdd	-----

VMS ID	IDX0	IDX1	IDX2	IDX3	IDX4
----- DFLT	----- pfxfff	----- pfxggg	----- pfxhhh	----- pfxiii	----- pfxjjj
	----- pfxkkk	----- NONE	----- NONE	----- NONE	----- NONE

VFLEX VMSID table is (6 of 1000) 1% full.

The values shown in the VSM ID table are:

VMS ID	ID for a Voice Mail Server that can be assigned to a MSISDN
VMRN Index	Value derived from the Call Decision table (combines with VMS ID to determine VMRN for the VM call)
VMRN	Hexadecimal number that the MSC uses to route the VM call to the correct VM server

V-Flex Routing Number Table

Enter the **rtrv-vflx-rn** command to view the V-Flex Routing Number table.

```
tklc1081301 07-08-08 11:26:04 EST EAGLE5 37.6.0
```

RN Name	Routing Number
----- pfxaaa	----- 55555
pfxbbb	67676767
pfxccc	88888888
pfxddd	2323232323
pfxeee	454545454545
pfxfff	4354657687
pfxggg	787878787878
pfxhhh	4455667788999
pfxiii	11112222333
pfxjjj	668833559911
pfxkkk	655443231212166

VFLEX Routing Number table is (11 of 10000) 1% full.

```
tekelecstp 06-06-29 15:07:01 EST EAGLE 37.6.0
```

RN Name	Routing Number	Ref Count
----- rn02	----- 123456789abc	----- 3

VFLEX Routing Number table is (2 of 10000) 1% full.

The values shown in the V-Flex Routing Number table are:

RN Name	Voice Mail Routing Number Name
Routing Number	Voice Mail Routing Number digits
Ref Count	Number of VMSID table entries that are referring to an RN entry

V-Flex Options Table

The V-Flex Options table defines how the TCAP of the connect response message is formulated. If DRA = RN, only the VFLEX-RN is present in the connect response. If DRA=RNDN, the response is VFLEX-RN + CdPN/CdPBCDN. If DRA=CCRNDN, the response is CountryCode + VFLEX-RN + CdPN/CdPBCDN (except the case where the CdPN/CdPBCDN was only a VM prefix. In that case, Country Code is omitted).

NOTE: The CountryCode may come from either DefCC or from GSMOPTS:CC list. There is a multiple CC feature that allows additional CCs to be identified.

Enter the **rtrv-vflx-opts** command to view the V-Flex Options table.

```
Command Accepted - Processing

tklcl081301 07-08-08 11:26:28 EST EAGLE5 37.0.0-58.20.0
rtrv-vflx-opts
Command entered at terminal #3.
;

tklcl081301 07-08-08 11:26:28 EST EAGLE5 37.0.0-58.20.0

VFLEX OPTIONS
-----
DRANP      = E164
DRANAI     = INTL
DRA        = RNDN
NEQUERYONLY = OFF
NETYPE     = VMSID
;
```

Common Screening List (CSL) Table

The CSL table defines Voice mail prefix values that can be present in a VFLEX IDP query (sent directly to voice mail and not redirected by the MSC). This prefix can be appended to the called party number of the query if it is present. If the prefix is present, it is removed from the called party number and the remaining digits are treated as the MSISDN for RTDB database lookup. The prefix is used in the VFLEX-CD table to determine the correct VM-RN to return in the response.

Enter the **rtrv-csl** command to view the CSL Feature Control table.

```
Command Accepted - Processing

tklcl081301 07-08-08 11:25:54 EST EAGLE5 37.0.0-58.20.0
rtrv-csl
Command entered at terminal #3.
;

tklcl081301 07-08-08 11:25:54 EST EAGLE5 37.0.0-58.20.0

VFLEX
VM Prefix List
DS
-----
333
123456

VM Prefix List table is (2 of 100) 2% full
;
```

STP Options (STPOPTS) Table

The only two parameters used in the STPOPTS table for the V-Flex feature are **DEFCC** and **DEFNDC**. These parameters are used for number conditioning of the MSISDN. If the MSISDN NP=NAT, the **DEFCC** is prefixed to the MSISDN digits for conditioning the MSISDN to E164 format. If the MSISDN NP=SUB, the **DEFCC** and the **DEFNDC** are prefixed to the MSISDN digits for conditioning the MSISDN to E164 format.

Enter the **rtrv-stpopts** command to view the STPOPTS table.

```
> rtrv-stpopts

Command Accepted - Processing

tklcl081301 07-09-09 22:25:50 EDT EAGLE5 37.6.0-58.20.41
rtrv-stpopts
Command entered at terminal #4.
;

tklcl081301 07-09-09 22:25:50 EDT EAGLE5 37.6.0-58.20.41
STP OPTIONS
-----
MTPT31CTL          1
MTPLTI             yes
MTPLTCTDPCQ        3
MTPLTST            10000
MTPDPCQ            2000
TFATFRPR           1000
MTPLPRST           yes
MTPT10ALT          30000
UIMRD              no
SLSCNV             off
CRITALMINH         no
DISPACTALMS        no
NPCFMTI            03-08-03-00
GSMDFLT            pass
GSMDECERR           pass
DEFCC              31
DEFNDC             653
DSMAUD             ccc
RPTLNPMRSS         yes
RANDSLS            all
GR2878RGLBL       no
RSTRDEV            off
ANSIGFLEX          no
HSCLKSRC           rs422
HSCLKLL            longhaul
;

```

Home RN Table

The IDP Query could arrive at EAGLE 5 ISS with a HOMERN prefixed to the MSISDN. If there is a match in the HOMERN table, the HOMERN is removed and the remaining digits are treated as the MSISDN for the database lookup.

Enter the **rtrv-homern** command to view the Home RN table.

```
> rtrv-homern

Command Accepted - Processing

tklcl081301 07-09-09 22:19:24 EDT EAGLE5 37.6.0-58.20.41
rtrv-homern
Command entered at terminal #4.
;

tklcl081301 07-09-09 22:19:24 EDT EAGLE5 37.6.0-58.20.41
RN
-----
aa00001
aa00002
bb00001
bb00002
cc00001
cc00002

```



```
ff00001
ff00002
ff00003
ff00004
ff00005
ff00006
ff00007
ff00008
ff00009
ff00010
```

```
HOMERN table is (16 of 100) 100% full
```

```
;
```

Mated Application (MAP) Table

The MAP table contains the information that defines mated application relationships in the system. The information is used in the routing of SCCP management SSP/SSA messages. Enter the **rtrv-map** command to display the MAP table contents.

```
tekelecstp 06-09-27 11:50:22 EST EAGLE 36.0.0
PCA          MATE PCA          SSN RC MUL SRM MRC GRP NAME SSO
003-003-003          10 10 SHR NO NO ----- ON
          003-003-005      20 10 SHR YES YES ----- OFF
003-003-003          10 10 COM NO NO ----- ON
          003-003-006      20 10 COM YES YES ----- OFF
          003-003-005      20 20 COM YES YES ----- OFF
003-003-003          10 10 COM NO NO ----- ON
          003-003-004      20 10 COM NO NO ----- ON
          003-003-005      20 40 COM YES YES ----- OFF
          003-003-006      30 50 COM YES YES ----- OFF
          003-003-007      30 50 COM YES YES ----- OFF
003-003-003          10 10 SOL --- --- ----- ON
003-003-003          10 10 SHR NO NO ----- ON
          003-003-004      20 10 SHR NO NO ----- ON
```

```
;
```

The values shown in the MAP table are:

- PC/PCA/PCI/PCN/PCN24 The point code of the SCP where the primary application resides
- MATE PC/PCA/PCI/PCN/PCN24 The point code of the SCP where the mate application resides
- SSN The applications subsystem number
- RC The relative cost of the point code/subsystem
- MUL Multiplicity mode (Solitary or Dominant for V-Flex)
- SRM Specifies whether subsystem routing messages are transmitted
- MRC Specifies whether message routing under congestion is on (**YES**) or off (**NO**)
- GRP NAME The name of a group of point codes (the broadcast list group name) that should be notified of the subsystem status
- SSO Subsystem Status (**ON**=prohibited or **OFF**=allowed) for PC/SSN MAP entries

STP Site Identification Table

The STP Site Identification table contains the characteristics that identify the system – true point codes, capability point codes, and the CLI code.

Enter the **rtrv-sid:cpctype=vflex** command to display the STP true point codes and the provisioned V-Flex capability point codes.

```
tekelecstp 07-08-22 15:07:48 EST EAGLE 37.6.0

PCA          PCI          PCN          CLLI          PCTYPE
001-001-001  2-002-2        01234       tekelecstp   ANSI

CPCA (VFLEX)
004-004-004

CPCI (VFLEX)
5-012-0

CPCN (VFLEX)
12345

;
```

The values shown in the STP Self Identification table are:

- PCA/PCI/PCN The true point code of the STP
- CPCA/CPCI/CPCN (type) The capability point code used by the SS7 protocol to identify a group of functionally related STPs in the signaling network. The TYPE is **VFLEX** for V-Flex capability point codes.
- PCTYPE The type of ANSI point code:

ANSI - follows one set of rules

OTHER - follows a less restricted set of rules for point code format

Service Selector Table

The Service Selector table lists the provisioned service selector combinations.

Enter the **rtrv-srsel:serv=vflex** command to display the provisioned V-Flex service selectors.

```
tekelecstp 07-08-28 16:35:22 EST EAGLE 37.6.0

GTII  TT  NP      NAI  NPV  NAIV  SSN  SNP  SNAI  SERV
4     1   e164   intl ---   3    ---   ---   vflex
4     2   e164   intl ---   *    ---   ---   vflex

GTIN  TT  NP      NAI  NPV  NAIV  SSN  SNP  SNAI  SERV
4     4   e164   natl ---   4    ---   ---   vflex

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

;
```

The values shown in the Service Selector table are:

- GTI/GTIA/GTII/GTIN/GTIN24 Global title indicator
- TT Translation type
- NP Numbering plan
- NAI Nature of address indicator
- NPV Numbering plan value
- NAIV Nature of address indicator value
- SNP Service numbering plan
- SNAI Service nature of address indicator
- SERV DSM service

Subsystem Application Table

The Subsystem Application (SS-APPL) table contains the application type, subsystem number, and application status.

Enter the **rtrv-ss-appl** command to display the application type (**APPL**), subsystem number (**SSN**), and application status (**STAT**) for the V-Flex subsystem application.

```
rlghncxa03w 03-03-17 16:02:05 EST EAGLE 31.3.0
APPL  SSN  STAT
LNP   15  online

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

V-Flex Protocol

The EAGLE 5 ISS supports the V-Flex capability point code type and an additional local subsystem that is entered into the MAP table. Like other entries in the MAP table, this subsystem can have a mate subsystem, and a concerned point code group assigned to it. This subsystem is administered using MAP commands (*ent-map*, *chg-map*, *dlt-map*). All point code types (except ITUN-24) are supported in the MAP commands. The V-Flex subsystem cannot be set to Load Shared mode (as end nodes do not perform load sharing), but is set to Dominant or Solitary mode. The EAGLE 5 ISS has the restriction that only one local subsystem and capability point code type can be provisioned at any instant.

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's true point code or the V-Flex capability point code in the DPC field of the message, and EAGLE 5 ISS's V-Flex Subsystem number in the Called Party Subsystem field of the message. If V-Flex queries has the EAGLE 5 ISS's 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's 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 local V-Flex 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 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's 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's 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 one of V-Flex Capability Point Codes, not the EAGLE 5 ISS's 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 V-Flex is online, RSRT replies to both RSRs and RSPs for V-Flex Capability Point Code with a TFA.

MPS/EPAP Platform

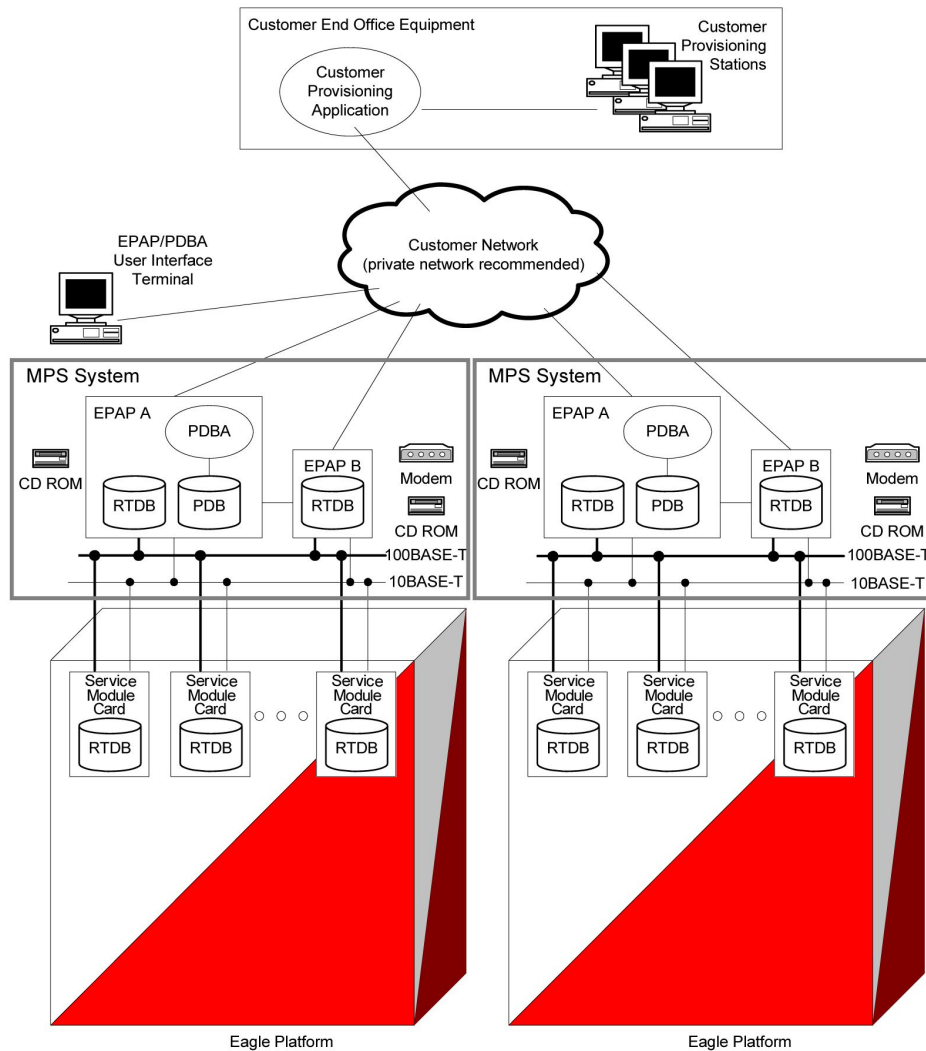
Tekelec provides the MPS (Multi-Purpose Server) platform as a subsystem of the EAGLE 5 ISS. The MPS provides support for the AINPQ, A-Port, EIR , G-Flex, G-Port, IGM, V-Flex, and INP features.

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

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

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

Figure 2-2. MPS/EPAP Platform Architecture



Design Overview and System Layout

Figure 2-2 illustrates the overall system architecture and identifies the different tasks, databases and interfaces involved. The system consists of two mated MPS servers. Each MPS contains two EPAP platforms, EPAP A and EPAP B, each containing a RealTime Database (RTDB), a Provisioning Database (PDB), servers, optical media, modems, and network hubs. Each MPS and its EPAPs may be thought of as an ‘EPAP system’; the EPAP system and the mated EAGLE 5 ISS is referred to as the ‘mated EPAP system’. Each EPAP system is a T1000 AS system with a total of four Ethernet interfaces: one from each EPAP to the 100Base-T Ethernet and one from each EPAP to the 10Base-T Ethernet.

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

The RTDB database is provisioned and maintained through the EPAPs. EPAP A and EPAP B act as the active EPAP and the standby EPAP. One link serves as the active link, and the other as the standby link. At any given

time, there is only one active EPAP and one active link. The database is provisioned through the active link by the active EPAP; the other EPAP provides redundancy.

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

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

The major modules on the EPAP are:

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

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

Functional Overview

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

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

EPAP/PDBA Overview

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

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

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

The EPAP platform performs the following:

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

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

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

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

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

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

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

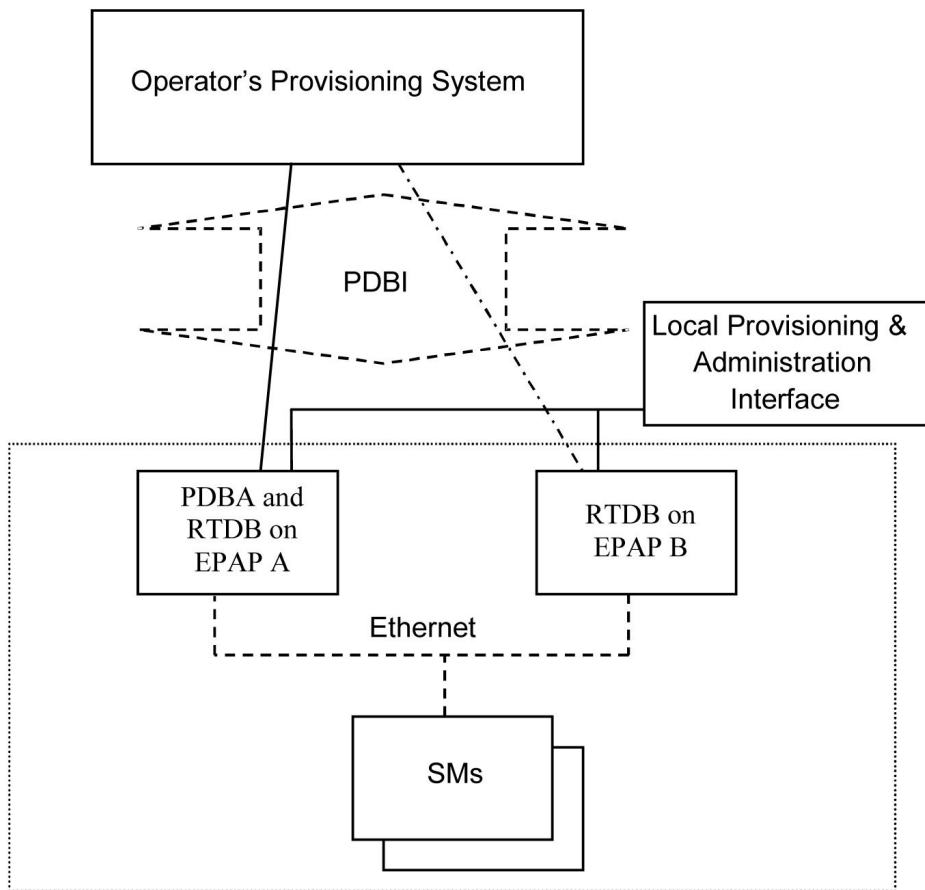
- Variety of hardware components and vendors
- Availability of third party communication and database tools
- Standard communication protocols
- Availability of personnel with related experience

Each EPAP server maintains a copy of the Real Time Database (RTDB) in order to provision the EAGLE 5 ISS Service Module cards. The EPAP server must comply with the hardware requirements in the *MPS Hardware Manual*. [Figure 2-2](#) illustrates the EPAP architecture contained in the MPS subsystem.

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

Subscriber Data Provisioning

[Figure 2-3](#) shows the current high-level view of the subscriber data provisioning architecture. Only those parts of the EAGLE 5 ISS platform that are relevant to subscriber data provisioning are shown. This section defines requirements for the Provisioning Database Interface (PDBI) between the EPAP and the operator's provisioning system (OPS). Provisioning clients connect to the EPAPs via the PDBI. This interface contains commands that allow all of the provisioning and retrieving of subscription data. The PDBI is used for real-time provisioning of subscriber and network entity data only. Refer to the *Provisioning Database Interface Manual* for more details.

Figure 2-3. 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 just the RTDB. An EPAP with just the RTDB must be updated by the EPAP that has the PDB.

For more information about the EPAP, refer to the *EPAP Administration Manual*. For more information about the MPS hardware, refer to the .

Distributed Administrative Architecture

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

In general, EAGLE 5 ISS database updates are sent via an EAGLE 5 ISS terminal across an RS232 serial port to the active OAM (Operation Administration and Maintenance). The active OAM commits the update to TDM fixed disk and then sends the update control information to the standby OAM and to the rest of the network cards. When all databases are updated, the active OAM responds with a *Command Completed* indication to the user terminal. EAGLE 5 ISS database updates are generally considered to be EAGLE 5 ISS link, linkset, route, destination, mated application, gateway screening, and global title types of information.

Databases requiring high update and retrieval rates, (compared to the rates provided by the OAM) are not administered via EAGLE 5 ISS terminals. These databases, such as the EPAP RTDB, are populated using redundant Ethernet connections to Service Module cards from an EPAP MPS platform.

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

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

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

EPAP (EAGLE Provisioning Application Processor)

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

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

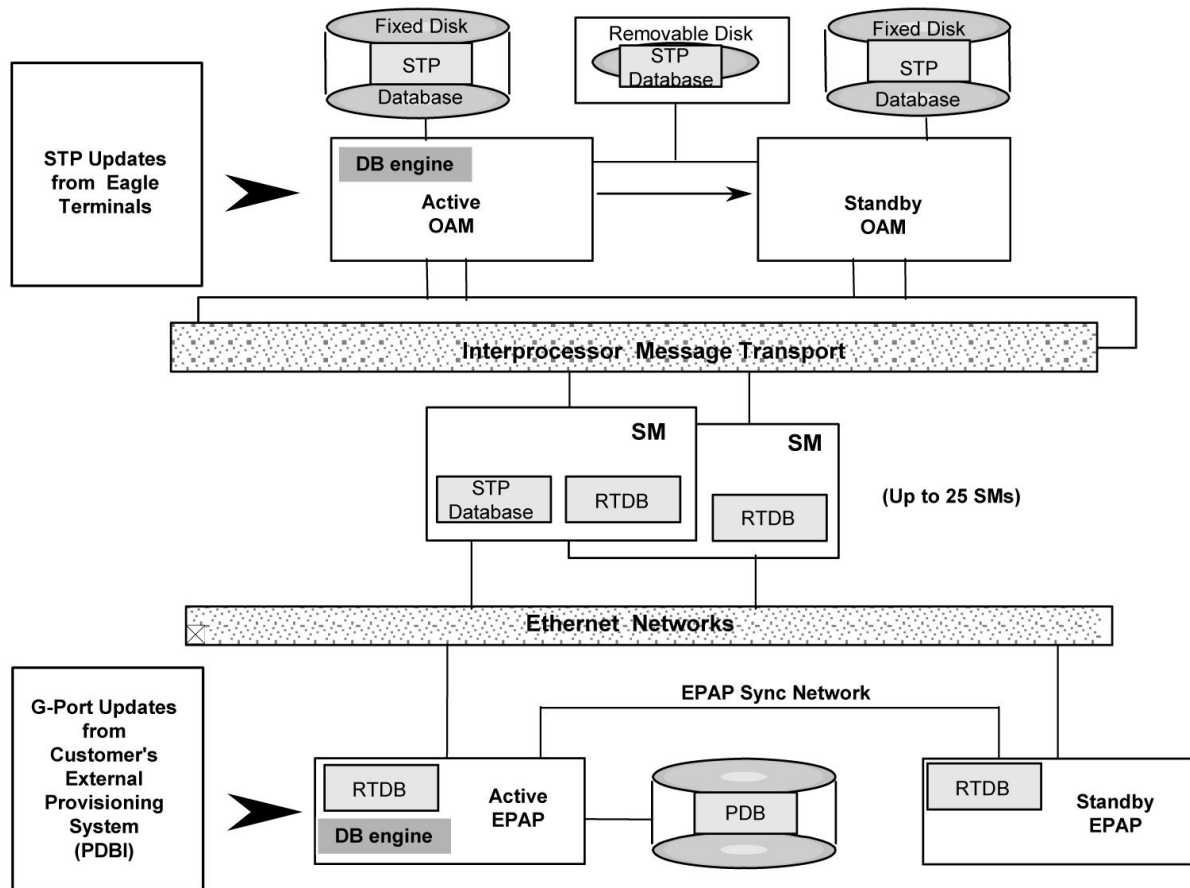
The PDB on the active EPAP receives subscription data from the customer network through the PDBI, the external source of provisioning information. The PDBA continually updates the active EPAP's PDB. The PDB uses MySQL database software. Once an update is applied to the active PDB, it is sent to the RTDBs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

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

In a mated-pair configuration, there are two mated MPS Systems, as shown in [Figure 2-2](#). The PDB on the active EPAP automatically updates the PDB on the mate platform. The PDB on the mate platform then updates its EPAP RTDBs, which in turn update the RTDBs on the associated Service Module cards.

Provisioning of the EAGLE 5 ISS's Service Module cards is performed through two interfaces, using two different sets of commands. Provisioning is accomplished by the STP updates from EAGLE 5 ISS terminals and by updates from the customer's external provisioning system. This system of dual provisioning is illustrated in [Figure 2-4](#).

Figure 2-4. Database Administrative Architecture



Service Module Cards

From 1 to 25 Service Module cards can be provisioned with the V-Flex feature enabled. The V-Flex feature requires that all Service Module cards contain 4 GB of memory. [Figure 2-4](#) illustrates each Service Module card having two Ethernet links, the main Service Module network on the 100BASE-T link and the backup Service Module network on the 10BASE-T link.

The extra memory holds a copy of the RTDB. The Service Module Ethernet ports are linked to the EPAP systems to receive the downloaded RTDBs. The Service Module cards run a version of the SCCP software application that has been ported to the VxWorks operating system. To differentiate the Service Module-VxWorks-SCCP application from the SCCP that runs on Translation Services Module (TSM) cards, the Service Module version is named 'VSCCP'.

Multiple Service Module cards provide a means of load balancing in high-traffic situations. The Service Module card database is in a format that facilitates rapid lookups. Each Service Module card contains an identical database. Furthermore, all Service Module V-Flex subscriber databases are identical to the RTDB maintained by the EPAPs.

However, the various databases may not be identical at all times for several reasons. First of all, when a Service Module card is initialized, it downloads the current copy of the database from the EPAP. While that card is being loaded, it cannot receive new updates that have arrived at the EPAP since reload began. Another condition that can result in databases being out-of-sync occurs when the EPAP receives updates from its provisioning source,

but it has not yet sent them down to the Service Module cards. Updates are applied to the Provisioning Database (PDB) as they are received.

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

The other case occurs when a Service Module card is booted. If it is determined then that the card does not have enough memory for the entire database, the database is not loaded on that card. Each Service Module card is responsible for recognizing and reporting its out-of-memory conditions by means of alarms.

Overview of EPAP to Service Module Card Communications

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

- UDP - sending Service Module card status messages

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

- IP - reporting EPAP maintenance data

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

- IP Multicast - downloading GSM database

Because of the large size of the database and the need to download it quickly on up to 25 Service Module cards, V-Flex uses a technique known as IP multicasting. This technique is based on Reliable Multicast Transport Protocol-II (RMTP-II), a product of Globalcast Communications. IP multicasting downloads the RTDB and database updates to all of the Service Module cards simultaneously.

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

Service Module Card Provisioning and Reload

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

- EPAP A, Link A (on the main DSM network, 100BASE-T)

- EPAP A, Link B (on the backup DSM network, 10BASE-T)
- EPAP B, Link A (on the main DSM network, 100BASE-T)
- EPAP B, Link B (on the backup DSM network, 10BASE-T)

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

The Service Module cards do the following:

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

Service Module Card Reload Model

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

EPAP Continuous Reload

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

Service Module Card Database Levels and Reloading

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

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

- **Stage 1 loading:** The database is being copied record for record from the golden RTDB in the EPAP to the Service Module card RTDB. The database is incoherent during stage 1 loading.
- **Incremental update:** The database is receiving all of the updates missed during stage 1 loading or some other reason (e.g., network outage, processor limitation, lost communication, etc.). The database is coherent, but back-level during incremental update.
- **Current:** The database is receiving current updates from the Service Module card provisioning task.

- **Coherent:** The database is at a whole database level, that is, not currently updating records belonging to a database level.

Service Module Card Reload Requirements

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

The upload process is divided into two stages:

1. Sequentially send the initial database records.
2. Send any updates missed since the beginning of the first stage.

The Service Module card reload stream uses a separate RMTP channel from the provisioning and incremental update streams. This allows Service Module card multicast hardware to filter out the high volume of reload traffic for Service Module cards that do not require it.

Service Module cards do the following:

- Detect the need for stage 1 loading and send a status message to the EPAP.
- Identify the first record that the Service Module card was able to read in the above status message if a record stream is already in progress.
- Handle the record stream regardless of the starting point (that is, records starting with the middle record of the middle table).
- Expect tables to be sent in a particular order and therefore detect any gap in the record stream.
- Send a status message if a gap is detected. Stage 1 loading is essentially reset to the last update received.
- Handle wrapping from the last record from the last table to the first record of the first table of the last update received.
- Know when they have received all the required records to proceed to stage 2 loading.
- Send a status message when stage 1 loading is complete, indicating the database level at the beginning of stage 1.
- Detect when the master RTDB crosses a memory boundary during stage 1 loading; the card automatically reboots and then auto-inhibits.

EPAP Status and Error Reporting via Maintenance Blocks

The EPAPs forward all status and error messages to the 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 2-5](#) . (For details about configuring these networks, refer to the *EPAP Administration Manual*.)

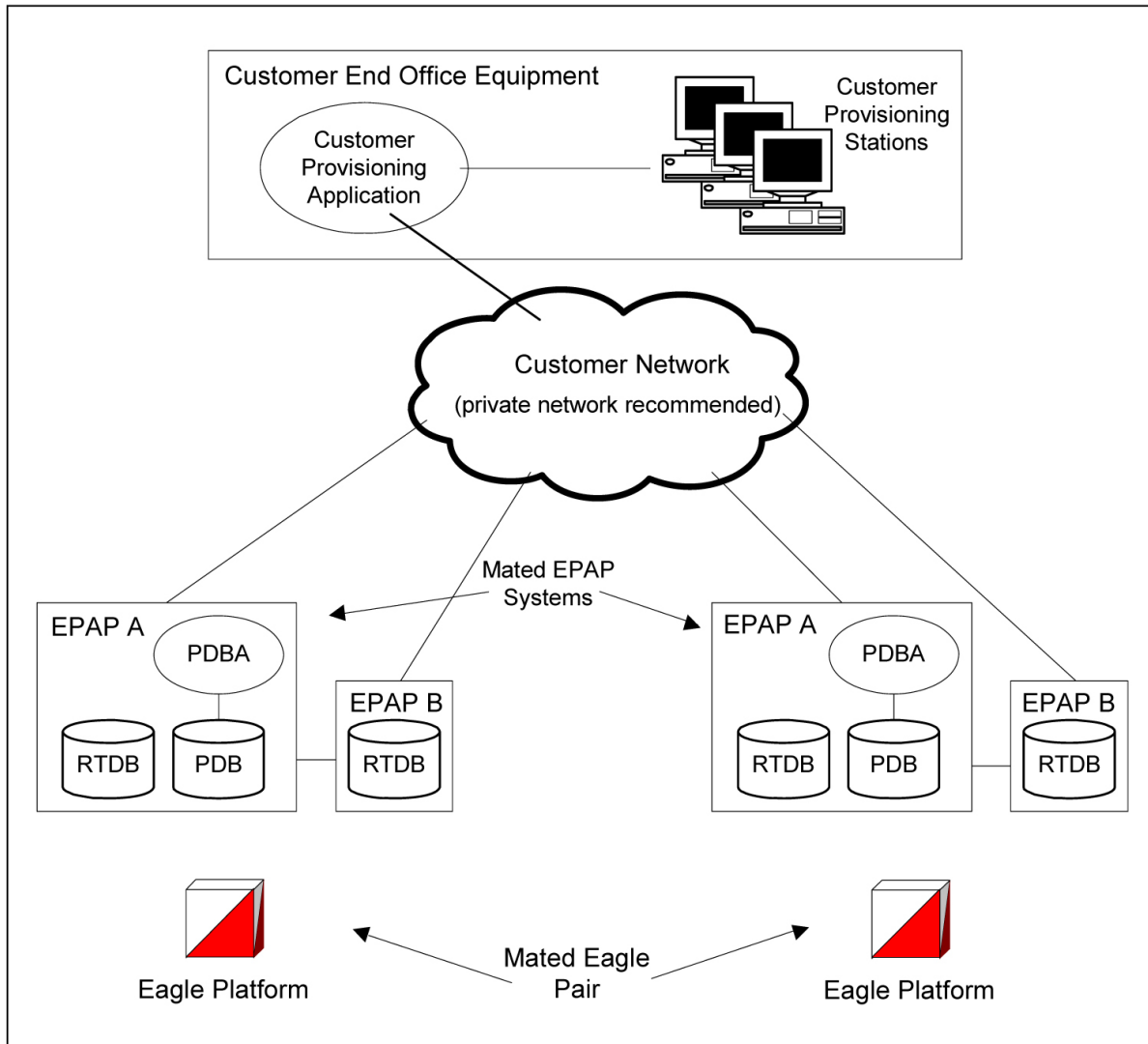
Customer Provisioning Network

The customer network carries the following traffic:

- Customer queries and responses to the PDB via the PDBI from the customer provisioning network
- Updates between PDBs of a mated EAGLE 5 ISS pair
- Updates between a PDB on one EAGLE 5 ISS and RTDBs on a mated EAGLE 5 ISS
- PDBA import/export (file transfer) traffic
- Traffic from a PDBA reloading from its mate
- EPAP and PDBA user interface traffic.

A typical customer network is shown in [Figure 2-5](#) .

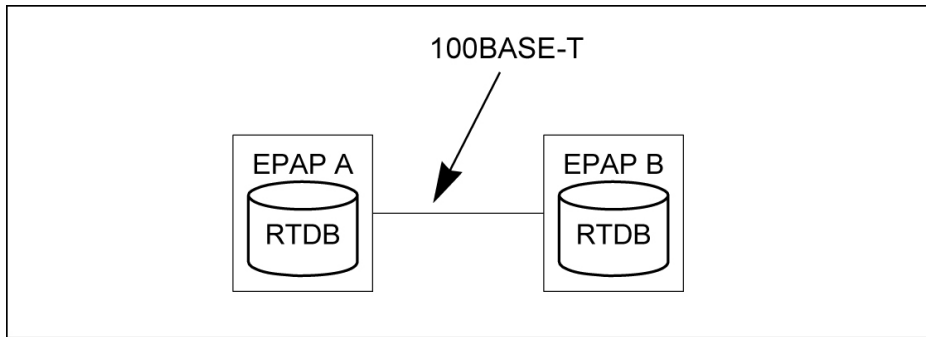
Figure 2-5. Customer Provisioning Network



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

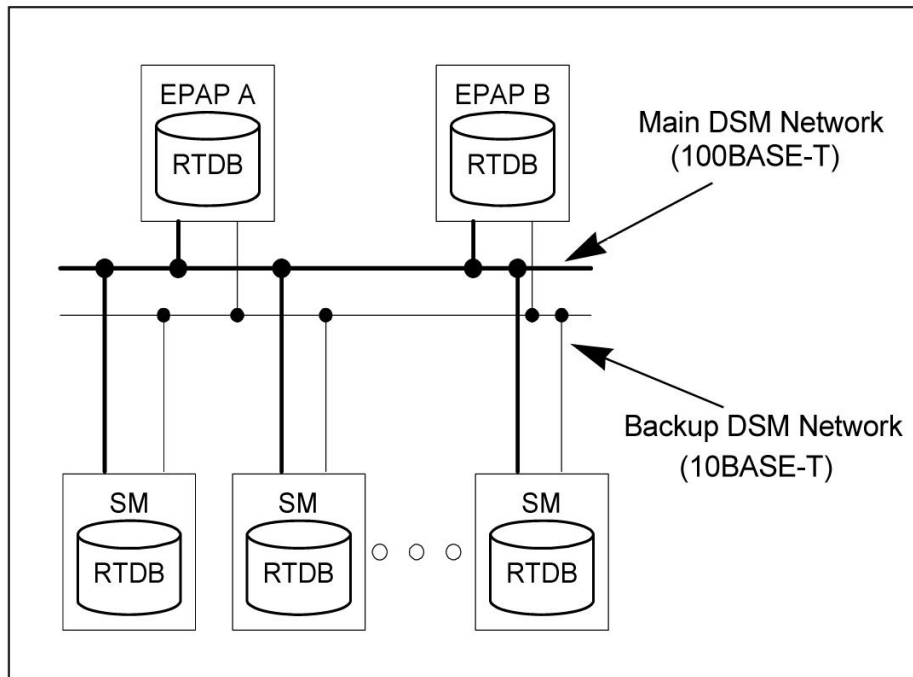
The EPAP sync network carries RTDB and maintenance application traffic between active and standby EPAP servers on an MPS system. It synchronizes the contents of the RTDBs of both EPAP A and B. The EPAP Sync network is a single Ethernet connection between EPAP A and EPAP B running at 100BASE-T, as shown in [Figure 2-6](#).

Figure 2-6. EPAP Sync Network

DSM Networks

The DSM networks are shown in [Figure 2-7](#). They carry provisioning data from the active EPAP RTDB to the Service Module cards. They also carry reload and maintenance traffic to the Service Module cards.

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

Figure 2-7. 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.

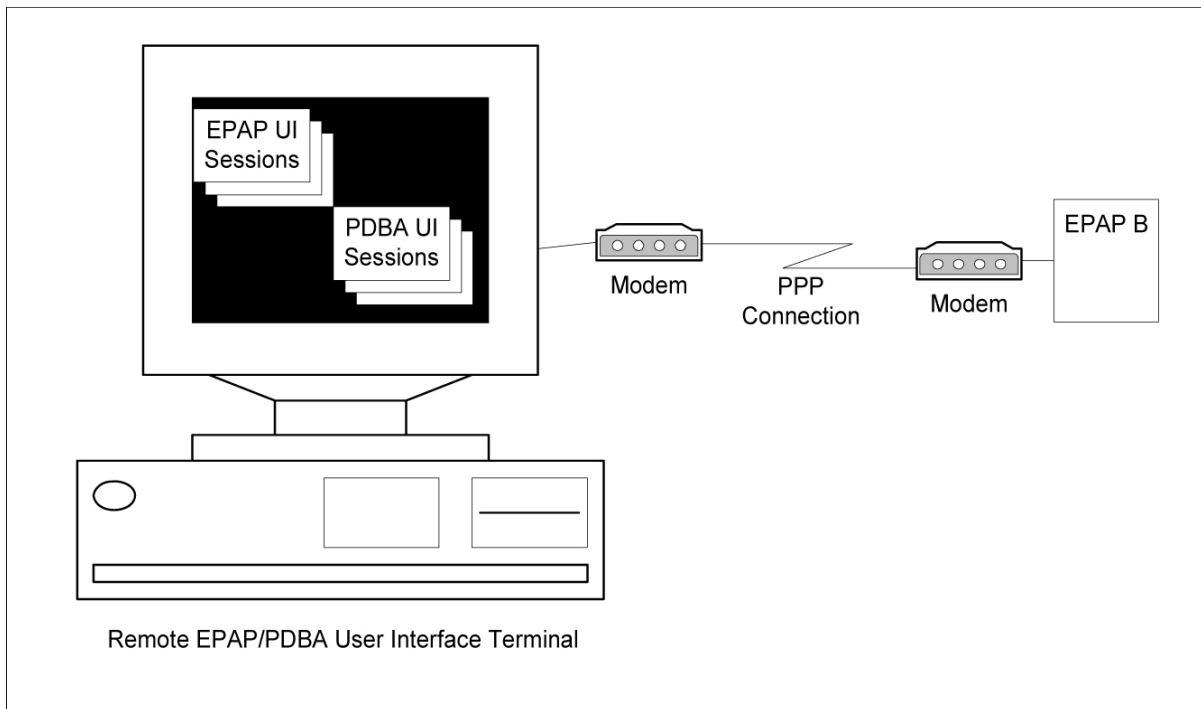
[Table 2-1](#) summarizes the contents of each octet.

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

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

Dial-Up PPP Network

The dial-up PPP network allows multiple user-interface sessions to be established with the EPAP. The network connects a remote EPAP/PDBA user interface terminal with the EPAP in the EAGLE 5 ISS's MPS subsystem. The dial-up PPP network is illustrated in [Figure 2-8](#) .

Figure 2-8. Dial-Up PPP Network

Serviceability Hints

The following hints are offered to aid in the serviceability of V-Flex databases:

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

Mated Application Considerations

An EPAP-administered entity data can possibly become out-of-sync with the EAGLE 5 ISS mated application table because the creation of entity point codes (and/or subsystem numbers) in the mated application table is not performed at database administration time.

If this mismatch is discovered in real-time operations, a UIM message (such as “SCCP did not route - DPC not in MAP tbl” or “SCCP did not route - SS not in MAP tbl”) is sent to the EAGLE 5 ISS maintenance terminal. This message means the MSU was discarded.

For this reason, it is recommended that the entity (SP or RN) not be administered until the entity point code (and/or subsystem number) has been entered into the EAGLE 5 ISS mated application (MAP) table.

Entity Point Codes and Routes

Verification that an entity point code exists in the route table and has a route is not performed at database administration time. Therefore, it is possible for the EPAP entity data to be out-of-sync with the EAGLE 5 ISS route table.

If an out-of-sync condition is discovered during real-time operation, a UIM is sent to the EAGLE 5 ISS maintenance terminal, indicating one of these conditions:

- Destination point code is not in the route table.
- Destination point code exists in the route table but is not assigned a route.
- Destination point code exists in the route table and has been assigned a route, but it is out of service.

EAGLE 5 ISS V-Flex Commands

Introduction	3-2
EAGLE 5 ISS Commands for V-Flex	3-2
EAGLE 5 ISS Card Commands	3-2
EAGLE 5 ISS Serial Number Commands	3-4
EAGLE 5 ISS System Options Commands	3-4
EAGLE 5 ISS Feature Control Commands	3-4
EAGLE 5 ISS Self ID and Capability Point Code Commands	3-6
EAGLE 5 ISS Mate Application Commands	3-7
EAGLE 5 ISS Subsystem Application Commands	3-7
EAGLE 5 ISS Service Selector Commands	3-8
EAGLE 5 ISS V-Flex Options Commands	3-10
EAGLE 5 ISS HOMERN Prefix Commands	3-11
EAGLE 5 ISS Voice Mail Prefix Commands	3-11
EAGLE 5 ISS Voice Mail Routing Number Commands	3-13
EAGLE 5 ISS Voice Mail Server ID Commands	3-14
EAGLE 5 ISS Call Decision Entry Commands	3-14
EAGLE 5 ISS Local Subsystem Activation Commands	3-16
Maintenance Commands for V-Flex	3-16
rept-stat-sys	3-17
rept-stat-sccp	3-17
rept-stat-mps	3-19
rept-stat-trbl	3-20
rept-stat-alm	3-20
rept-stat-db	3-20
rtrv-tbl-capacity	3-21
inh-card / alw-card	3-21
inh-alm / unhb-alm	3-22
rtrv-data-rtdb	3-22
Measurements Commands for V-Flex	3-22
rept-ftp-meas	3-22
rept-stat-meas	3-22
EAGLE 5 ISS Debug Commands	3-23

Introduction

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

EAGLE 5 ISS Commands for V-Flex

This chapter contains a brief description of the command functions that are used for V-Flex.

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

The EAGLE 5 ISS commands that are used for V-Flex feature configuration, maintenance, and measurements are listed in [Table 3-1](#).

Table 3-1. EAGLE 5 ISS Commands Used for V-Flex

EAGLE 5 ISS Commands for V-Flex Feature			
alw-card	dlt-card	ent-ss-appl	rtrv-feat
alw-map-ss	dlt-csl	ent-trace	rtrv-homern
chg-csl	dlt-homern	ent-vflx-cd	rtrv-map
chg-ctrl-feat	dlt-map	ent-vflx-rn	rtrv-measopts
chg-feat	dlt-srvsel	ent-vflx-vmsid	rtrv-serial-num
chg-map	dlt-ss-appl	inh-map-ss	rtrv-sid
chg-measopts	dlt-vflx-cd	inh-card	rtrv-srvsel
chg-sid	dlt-vflx-rn	rept-ftp-meas	rtrv-ss-appl
chg-srvsel	dlt-vflx-vmsid	rept-stat-db	rtrv-stpopts
chg-ss-appl	enable-ctrl-feat	rept-stat-meas	rtrv-tbl-capacity
chg-stpopts	ent-card	rept-stat-mps	rtrv-vflx-cd
chg-th-alm	ent-csl	rept-stat-sccp	rtrv-vflx-opts
chg-vflx-cd	ent-homern	rept-stat-sys	rtrv-vflx-rn
chg-vflx-opts	ent-map	rtrv-csl	rtrv-vflx-vmsid
chg-vflx-rn	ent-serial-num	rtrv-ctrl-feat	
chg-vflx-vmsid	ent-srvsel	rtrv-data-rtdb	

EAGLE 5 ISS Card Commands

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

- **ent-card** - Enter Card

The **ent-card** command is used to add Service Module cards to the database, using the following parameters:

:loc - The location of the Service Module card being added to the database. Service Module cards are dual-slot cards. The card must be installed in an odd-even pair of slots. The odd-numbered slot is specified in the loc parameter value.

:type - The type of card being added to the database. The value of this parameter is **dsm**.

:appl - The application to be loaded on the card. The value of this parameter is **vsccp**.

:force - Allow a LIM card to be added to the database even if there are not enough Service Module cards to support the number of LIM cards in the system. Do not specify this parameter when configuring Service Module cards.

- **dlt-card** - Delete Card

The V-Flex feature uses only Service Module cards running the VSCCP application. Any TSM cards that are running the SCCP application must be removed from the system before the V-Flex feature can be enabled.

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

The **dlt-card** command uses the **loc** parameter:

:loc - The location of the Service Module card being removed from the database. The odd-numbered slot for the dual-slot Service Module card is specified in the **loc** parameter value.

- **rtrv-card** - Retrieve Card

The **rtrv-card** command is used to display information about the cards that are provisioned in the database. When the command is entered with no parameters, all cards that are provisioned in the database are listed.

The **rtrv-card** command can be entered with the following parameter to display information about a specific Service Module card:

:loc - The location of a specific Service Module card. The odd-numbered slot for the dual-slot Service Module card is specified in the **loc** parameter value.

- **alw-card** - Allow Card

The **alw-card** command is used to cause a Service Module card to begin operation in the system. The card status is changed from OOS-MT-DSBLD (Out-of-Service-Maintenance-Disabled) to IS-NR (In-Service-Normal) if the GPL loading is successful.

When the command is entered with the **loc** parameter, the approved version of the VSCCP GPL is loaded on the card.

:loc - The location of the Service Module card. The odd-numbered slot for the dual-slot Service Module card must be specified in the **loc** parameter value.

- **inh-card** - Inhibit Card

The **inh-card** command is used to cause a Service Module card to stop operation in the system. When the card status has changed from in-service normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD), the Service Module card can be physically removed from the shelf.

:loc - The location of the Service Module card. The odd-numbered slot for the dual-slot Service Module card must be specified in the **loc** parameter value.

:force - This parameter must be specified to inhibit the last card that is supporting an SCCP subsystem or MPS-to-Service Module connection.

EAGLE 5 ISS Serial Number Commands

Before the V-Flex feature can be enabled, the database must contain a valid and locked serial number for the EAGLE 5 ISS. The system is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked after the system is on-site.

The **ent/rtrv-serial-num** commands are used to enter, lock, and display the status of the system serial number.

- **ent-serial-num** - Enter Serial Number

The serial number must be entered once without the lock parameter, and entered again with the lock parameter.

The **ent-serial-num** command uses these parameters:

:serial - The serial number assigned to the system. The serial number is not case sensitive.

:lock - This parameter has only one value, yes, which locks the serial number. After the serial number is locked, it cannot be changed.

- **rtrv-serial-num** - Retrieve Serial Number

The **rtrv-serial-num** command displays the system serial number and its lock status. The command has no parameters.

EAGLE 5 ISS System Options Commands

The **chg/rtrv-stpopts** commands are used to change and report on the values of one or more of the STP node level processing option indicators maintained in database tables. System default values for the options are assigned initially at STP installation time. The values can be updated using the **chg-stpopts** command.

- **chg-stpopts** - Change STP Options

The **chg-stpopts** command is used to define all STP-specific system options in the database.

Before the V-Flex feature can be turned on, the values for the default country code (**defcc**) and default network destination code (**defndc**) parameter values must be changed from **none** to the appropriate values for the system that is using V-Flex.

After the V-Flex feature is on, the **defcc** and **defndc** parameter values cannot be changed to none.

The DSM checksum audit (**dsmaud**) parameter is supported for V-Flex.

- **rtrv-stpopts** - Retrieve STP Options

The **rtrv-stpopts** command displays the settings of the provisioned STP options in the database. The command has no parameters.

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
IPGWx Signaling TPS	893012805	on	2000
ISUP Normalization	893000201	on	----
Command Class Management	893005801	on	----
Prepaid SMS Intercept Ph1	893006701	on	----
Intermed GTT Load Sharing	893006901	on	----
G-Port Circ Route Prevent	893007001	on	----
XGTT Table Expansion	893006101	on	400000
XMAP Table Expansion	893007710	on	3000
Large System # Links	893005910	on	2000
Routesets	893006401	on	6000
EAGLE5 Product	893007101	off	----
EAGLE Product	893007201	off	----
IP7 Product	893007301	off	----
Network Security Enhance	893009101	off	----
HC-MIM SLK Capacity	893011801	on	64
VFLEX	893012301	on	----
EAGLE OA&M IP Security	893400001	off	----
SCCP Conversion	893012001	on	----

EAGLE 5 ISS Self ID and Capability Point Code Commands

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

- **chg-sid** - Change Self Identification

The **chg-sid** command is used to define the self-identification point codes of the system. The command also defines the common language location identifier (CLLI), which identifies the system in terms of its physical location.

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

The **chg-sid** command uses the following parameters:

- :cpctype** - Specify the **vflex** parameter value to allow defining V-Flex capability point codes.
- :pc/pca/pci/pcn/pcn24** - Used to define the ANSI, ITU-I, ITU-N, ITU-I spare, ITU-N spare, and ITU-N24 true point codes for the system. (An ITU-N true point code and an ITU-N24 true point code cannot be defined at the same time in the system.)
- :cpc/cpca/cpci/cpcn** - Used to define the ANSI, ITU-I, ITU-N, ITU-I spare, and ITU-N spare capability point codes for V-Flex.
- :clli** - Used to define the system common language location identifier.

- **rtrv-sid** - Retrieve Self Identification

The **rtrv-sid** command displays the true and capability point codes and CLLI that are defined in the system.

The command can be entered with no parameters to display all defined true and capability point codes, or with one of the following parameters to display information for a specific point code or CPC type:

:cpctype - Specify the **vflex** parameter value to display V-Flex capability point codes.

:pc/pca/pci/pcn/pcn24 - Used to display the ANSI, ITU-I, ITU-N, ITU-I spare, ITU-N spare, or ITU-N24 true point codes for the system.

:cpc/cpca/cpci/cpcn - Used to display the ANSI, ITU-I, ITU-N, ITU-I spare, or ITU-N spare capability point codes for V-Flex.

EAGLE 5 ISS Mate Application Commands

V-Flex exists as a local SCCP subsystem on the EAGLE 5 ISS, with a subsystem number assigned to it.

Local subsystems must be entered into the MAP table. Like other entries in the MAP table, this subsystem can have a mate subsystem and a concerned point code group assigned to it.

Unlike other entries in the MAP table, this subsystem cannot be set to Load Shared mode (as end nodes do not perform load sharing), but can be set only to Dominant or Solitary mode.

The **ent/chg/dlt/rtrv-map** commands are used to provision a true point code and a subsystem number for the V-Flex subsystem.

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

- **ent-map** - Enter Mate Application

The **ent-map** command is used to enter into the MAP table the mated application relationship information maintained by the system. This information is used to support the routing of SCCP management SSP/SSA messages.

:ssn - Defines the V-Flex subsystem number.

- **chg-map** - Change Mate Application

The **chg-map** command is used to change the MAP table information for the V-Flex local subsystem.

:ssn - The V-Flex subsystem number.

- **dlt-map** - Delete Mate Application

The **dlt-map** command is used to delete the MAP table information for the V-Flex local subsystem.

- **rtrv-map** - Retrieve Mate Application

The **rtrv-map** command displays the mated application relationship information maintained by the system in the MAP table.

EAGLE 5 ISS Subsystem Application Commands

The **chg/dlt/rtrv-ss-appl** commands are used to define or delete the local subsystem application, and change and display the local subsystem application status in the database.

- **ent-ss-appl** - Change Subsystem Application

The **ent-ss-appl** command uses the following parameters to reserve a subsystem number for a subsystem application and set the application status to online or offline:

:appl - The application type (**vflex**).

:ssn - The subsystem number.

:stat - The new application status.

- **chg-ss-appl** - Change Subsystem Application

The **chg-ss-appl** command changes the status for the specified application to either offline or online.

:appl - The application type (**vflex**).

:nstat - The new application status.

- **dlt-ss-appl** - Change Subsystem Application

The **dlt-ss-appl** command removes the specified application from the database.

:appl - The application type (**vflex**).

- **rtrv-ss-appl** - Retrieve Subsystem Application

The **rtrv-ss-appl** command displays the application type, subsystem number, and status for all provisioned local subsystem applications. The command has no parameters.

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.

- **ent-srvsel** - Enter Service Selector

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 the **gti/gtii/gtin** value is **4**, either the **np** and **nai** or the **npv** and **naiv** parameters must 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.

If either the **np** or **nai** parameters are specified in the **ent-srvsel** command, then both parameters must be specified, and neither the **npv** and **naiv** parameters can be specified.

Table 3-2. ent-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
GTI, GTII, GTIN	Mandatory	2, 4	Global Title Indicator
SSN	Mandatory	0-255 *	Subsystem number
TT	Mandatory	0-255	Translation Type
SERV	Mandatory	eir, gflex, gport, inpq, inpmr, mnpsms, smsmr, idps, idpr, mnp, vflex	GSM service
NAI	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
NAIV	Optional	0-127	NAI Value
NP	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
NPV	Optional	0-15	Numbering Plan Value

- **chg-srvsel** - Change Service Selector

The **chg-srvsel** command specifies the applicable selectors to change an existing V-Flex service entry.

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

Parameter	Optional/ Mandatory	Range	Description
GTI, GTII, GTIN	Mandatory	2, 4	Global Title Indicator
NSERV	Mandatory	eir, gflex, gport, inpq, inpmr, mnpsms, smsmr, idps, idpr, mnp, vflex	New GSM service
SSN	Mandatory	0-255*	Subsystem number
TT	Mandatory	0-255	Translation Type
NAI	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
NAIV	Optional	0-127	NAI Value
NP	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
NPV	Optional	0-15	Numbering Plan Value

- **dlt-srvsel** - Delete Service Selector

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, 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 the correspond to the npv and naiv values shown 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 the correspond to the **np** and **naiv** values shown for the service selector being removed.

Table 3-4. dlt-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
GTI, GTIL, GTIN	Mandatory	2, 4	Global Title Indicator
TT	Mandatory	0-255	Translation Type
SSN	Mandatory	0-255*	Subsystem number
NAI	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
NAIV	Optional	0-127	NAI Value
NP	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
NPV	Optional	0-15	Numbering Plan Value

- **rtrv-srvsel** - Retrieve Service Selector command

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.

Table 3-5. rtrv-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
GTI, GTIL, GTIN	Optional	2, 4	Global Title Indicator
NAI	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
NAIV	Optional	0-127	NAI Value
NP	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
NPV	Optional	0-15	Numbering Plan Value
SERV	Optional	eir, gflex, gport, inpq, inpmr, mnpsms, smsmr, idps, idpr, mnp, vflex	GSM service
SSN	Mandatory	0-255*	Subsystem number
TT	Optional	0-255	Translation Type
NUM	Optional	0-992	Number of entries to display
FORCE	Optional	yes, no	Display more than 50 entries

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 3-6. chg-vflx-opts Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
dra	Optional	rn, rndn, ccrndn	Destination Routing Address (DRA)
dranaï	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-cs1** 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-cs1** - 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-cs1** 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 screening list. V-Flex uses only the **vmpfx** list.

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

- **chg-cs1** - Change Common Screening List

The **chg-cs1** 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 screening list. V-Flex uses only the **vmpfx** list.

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

- **dlt-cs1** - Delete Common Screening List

The **dlt-cs1** 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 screening list. V-Flex uses only the **vmpfx** list.

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

- **rtrv-cs1** - Retrieve Common Screening List

The **rtrv-cs1** 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

:rname - 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)

:vmidg - 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

:nvmidg - 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

EAGLE 5 ISS Local Subsystem Activation Commands

The **alw-map-ss** command activates a mated application subsystem.

The **inh-map-ss** command shuts down (inhibits) a mated application subsystem. The specified subsystem attempts a coordinated shutdown. If the coordinated shutdown fails, a UIM is issued indicating the shutdown failed. If the **force** parameter is specified, the subsystem is forced to shut down, and a coordinated shutdown is not performed.

- **alw-map-ss** - Allow Mated Application Subsystem

The **alw-map-ss** command allows a mated application subsystem to become operational in the system.

:ssn - Subsystem number for the mated application subsystem

- **inh-map-ss** - Retrieve Mated Subsystem Application

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

The **inh-map-ss** command stops the operation of a mated application subsystem.

:ssn - Subsystem number for the local subsystem

:force - Specify yes to force the shutdown of the mated application subsystem

Maintenance Commands for V-Flex

This section provides a description of the commands used for maintenance when the V-Flex feature is on.

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

Commands described here include:

- [rept-stat-sys](#)
- [rept-stat-sccp](#)
- [rept-stat-mps](#)
- [rept-stat-trbl](#)
- [rept-stat-alm](#)
- [rept-stat-db](#)
- [rtrv-tbl-capacity](#)
- [inh-card / alw-card](#)
- [inh-alm / unhb-alm](#)
- [rtrv-data-rtdb](#)

rept-stat-sys

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

```
eagle10605 07-07-25 02:32:46 EST EAGLE 37.6.0
MAINTENANCE STATUS REPORT
Maintenance Baseline established.
Routing Baseline established.
SCCP Baseline established.
ALARMS:      CRIT=      9 MAJR=      10  MINR=  3 INH=  2
OAM 1113     IS-NR      Active INH=  0
OAM 1115     IS-NR      Standby INH=  0
LIM   CARD IS-NR=  3  Other=  0 INH=  0
X25   CARD IS-NR=  0  Other=  0 INH=  0
SCCP   CARD IS-NR=  3  Other=  0 INH=  0
GLS   CARD IS-NR=  0  Other=  0 INH=  0
SLAN   CARD IS-NR=  0  Other=  0 INH=  0
VXWLAN CARD IS-NR=  0  Other=  0 INH=  0
EMDC   CARD IS-NR=  0  Other=  0 INH=  0
SS7IPGW CARD IS-NR=  0  Other=  0 INH=  0
IPGWI   CARD IS-NR=  0  Other=  0 INH=  0
IPLIM   CARD IS-NR=  0  Other=  0 INH=  0
IPLIMI  CARD IS-NR=  0  Other=  0 INH=  0
HMUX   CARD IS-NR=  0  Other=  0 INH=  0
HIPR    IS-NR=  2  Other=  0 INH=  0
IMT     IS-NR=  2  Other=  0
SLK     IS-NR=  0  Other=  6 INH=  0
DLK     IS-NR=  0  Other=  0 INH=  0
LINK SET  IS-NR=  0  Other=  4 INH=  0
NDC IP LK  IS-NR=  4  Other=  0 INH=  0
DSM IP LK  IS-NR=  0  Other=  0 INH=  0
MCPM   CARD IS-NR=  0  Other=  0 INH=  0
EROUTE  CARD IS-NR=  0  Other=  0 INH=  0
CLOCK   IS-NR=  2  Other=  0 INH=  0
HS CLOCK IS-NR=  2  Other=  0 INH=  0
MCPM IP LK IS-NR=  2  Other=  0 INH=  0
APPLSOCK IS-NR=  0  Other=  0 INH=  0
SCTP ASSOC IS-NR=  0  Other=  0 INH=  0
APPL SERVER IS-NR=  0  Other=  0 INH=  0
SS7 DPC  IS-NR=  0  Other=  6 INH=  0
X25 DPC  IS-NR=  0  Other=  0 INH=  0
CLUST DPC IS-NR=  0  Other=  1 INH=  0
RTX     IS-NR=  2  Other=  1 INH=  0
XLIST DPC IS-NR=  0  Other=  0
DPC SS   Actv =  0  Other=  0
SEAS SS  IS-NR=  0  Other=  2
SEAS X25 IS-NR=  0  Other=  2 INH=  0
LSMS SS  IS-NR=  0  Other=  2
LSMS Conn IS-NR=  0  Other=  2 INH=  0
TERMINAL IS-NR=  2  Other=  14 INH=  0
MPS     IS-NR=  2  Other=  0
SECURITY SS IS-NR=  1  Other=  0
EIR SS  IS-NR=  1  Other=  0
RTD SS  IS-NR=  0  Other=  1
VFLEX SS IS-NR=  1  Other=  0
;
```

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. Refer to the *Commands Manual* for a complete description of this command.

```

tklcl1170501 07-08-18 10:16:24 EST EAGLE5 37.6.0
SCCP SUBSYSTEM REPORT IS-NR      Active      -----
  SCCP ALARM STATUS = No Alarms
VFLEX SUBSYSTEM REPORT IS-NR      Active      -----
  VFLEX: SSN STATUS = Allowed      MATE SSN STATUS = -----
  VFLEX ALARM STATUS = No Alarms
GFLEX SERVICE REPORT IS-NR        Active      -----
  GFLEX ALARM STATUS = No Alarms
GPORT SERVICE REPORT IS-NR        Active      -----
  GPORT ALARM STATUS = No Alarms

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

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

SCCP Service Average MSU Capacity = 71% Average CPU Capacity = 32%

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

TOTAL SERVICE STATISTICS:

SERVICE	SUCCESS	ERRORS	FAIL RATIO	REROUTE\ WARNINGS	FORWARD TO GTT	TOTAL
GTT:	3510	15	0%	-	-	3525
GFLEX:	100043	0	0%	0	0	100043
GPORT:	312203	0	0%	15	1879	314097
VFLEX:	23157	0	0%	-	-	23157

Command Completed.

;

rept-stat-mps

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

Overall status:

```

rlghncxa03w 07-09-07 11:27:34 EST EAGLE 37.6.0
          VERSION      PST          SST          AST
EPAP A    027-015-000  IS-NR      Active      -----
CRITICAL PLATFORM    ALARM DATA = No Alarms
MAJOR     PLATFORM    ALARM DATA = No Alarms
MINOR     PLATFORM    ALARM DATA = No Alarms
CRITICAL APPLICATION ALARM DATA = No Alarms
MAJOR     APPLICATION ALARM DATA = No Alarms
MINOR     APPLICATION ALARM DATA = No Alarms
          ALARM STATUS = No Alarms

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

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

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

```

Status for a specific card:

```

Integrat40 07-09-07 11:37:24 EST EAGLE5 37.6.0
CARD  VERSION      TYPE      PST          SST          AST
1205  -----      DSM       OOS-MT-DSBLD Manual      -----
      DSM PORT A          OOS-MT      Unavail     -----
          ALARM STATUS      = ** 0084 IP Connection Unavailable
      DSM PORT B          OOS-MT      Unavail     -----
          ALARM STATUS      = ** 0084 IP Connection Unavailable

      GSM STAT            = -----
      VFLEX STAT         = -----
      CARD ALARM STATUS  = No Alarms.
      DSM MEMORY USAGE   = 0%
Command Completed.
;

```

rept-stat-trbl

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

```
rlghncxa03w 07-02-03 09:50:17 EST EAGLE5 37.6.0
SEQN UAM AL DEVICE ELEMENT TROUBLE TEXT
0002.0143 * CARD 1113 EOAM System release GPL(s) not approved
3661.0048 * TERMINAL 1 Terminal failed
3674.0155 * DLK 1107,A STPLAN STPLAN connection unavailable
3677.0312 * DPC 001-115-001 DPC is restricted
3678.0002 * GPL SYSTEM BPCM Card is not running approved GPL
3683.0176 * SECULOG 1116 Stdby security log -- upload required
3684.0013 ** CARD 1305 SS7IPGW Card is isolated from the system
3688.0236 ** SLK 1203,A lslg2 REPT-LKF: not aligned
3692.0318 ** LSN e5e6 REPT-LKSTO: link set prohibited
3697.0539 ** ENET 1305,A Ethernet Interface Down
3698.0539 ** ENET 1305,B Ethernet Interface Down
3699.0539 ** ENET 1307,B Ethernet Interface Down
3700.0536 * IP7 assoc1234567890 IP Connection Excess Retransmits
0915.0541 *C RTD SYSTEM MSU cksum error threshold exceeded

0915.0541 *C RTD SYSTEM MSU cksum error threshold exceeded
Command Completed.
```

rept-stat-alm

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

```
rlghncxa03w 07-05-27 15:00:53 EST EAGLE 37.6.0
ALARM TRANSFER= LMC
ALARM MODE CRIT= AUDIBLE MAJR= SILENT MINR= AUDIBLE
ALARM FRAME 1 CRIT= 7 MAJR= 0 MINR= 10
ALARM FRAME 2 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME 3 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME 4 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME 5 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME 6 CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME OAP CRIT= 0 MAJR= 0 MINR= 0
ALARM FRAME GPF CRIT= 0 MAJR= 0 MINR= 0
PERM. INH. ALARMS CRIT= 2 MAJR= 0 MINR= 0
TEMP. INH. ALARMS CRIT= 3 MAJR= 0 MINR= 0
TIMED. INH. ALARMS CRIT= 0 MAJR= 0 MINR= 0
ACTIVE ALARMS CRIT= 2 MAJR= 0 MINR= 10
TOTAL ALARMS CRIT= 7 MAJR= 0 MINR= 10

Command Completed.
```

rept-stat-db

This command displays the status information for the EAGLE 5 ISS databases. This includes the level information for each Service Module card, and for the active and standby EPAP databases. It reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birth dates and levels. It shows the status of the PDB and RTDB databases when the V-Flex feature key is on. For a complete description of this command, refer to the *Commands Manual*.

```
tekelecstp 07-08-29 08:55:54 NZST EAGLE 37.6.0
rept-stat-db:display=all:db=mps
Command entered at terminal #4.
EPAP A ( ACTV )
C BIRTHDATE LEVEL EXCEPTION
```



```

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

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

EAGLE RTDB REPORT
CARD/APPL  LOC  C BIRTHDATE          LEVEL          EXCEPTION  IN-SRVC
-----
VS CCP     1201 Y 07-08-29 08:20:04 12345 - 10d 23h 21m
VS CCP     1203 Y 07-08-29 08:20:04 12345 - 10d 23h 21m
VS CCP     1105 Y 07-08-29 08:20:04 12345 - 5d 3h 1m
;

```

rtrv-tbl-capacity

The **rtrv-tbl-capacity** command retrieves table use capacity summary information. For each table listed, the number of table entry elements in use and the total allowed number of table elements is presented, along with a percent (%) full value. Information is shown for the V-Flex Call Decision (VFLXCD), Routing Number (VFLXRN), and VMSID (VFLXVID) tables if the V-Flex feature is enabled.

```

tk1c1090701 07-05-24 14:22:01 EST EAGLE 37.6.0

DSTN table is ( 5940 of 6000) 99% full
XLIST table is ( 0 of 500) 0% full
X25-DSTN table is ( 0 of 1024) 0% full
SPC table is ( 4 of 40) 10% full
LS table is ( 738 of 1024) 72% full
SLK table is ( 360 of 2000) 18% full
X25-SLK table is ( 0 of 256) 0% full
IP-LNK table is ( 6 of 512) 1% full
MAP table is ( 336 of 1024) 33% full
GTA table is ( 269999 of 269999) 100% full
SSNSELID table is ( 0 of 10000) 0% full
SCRSET table is ( 40 of 255) 16% full
RTEKEY table is ( 0 of 1000) 0% full
APPLSOCK table is ( 0 of 4000) 0% full
AS table is ( 0 of 250) 0% full
MRN table is ( 768 of 5988) 13% full
SCCP SRV table is ( 12 of 96) 13% full
VFLXRN table is ( 1 of 10000) 1% full
VFLXCD table is ( 1 of 4950) 1% full
VFLXVID table is ( 1 of 1000) 1% full
;

```

inh-card / alw-card

The **inh-card** command is used to change the 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 Service Module card or physically remove it from the shelf.

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

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

inh-alm / unhb-alm

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

rtrv-data-rtdb

This command retrieves 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 data is retrieved on the active Service Module card that has the lowest IMT address. The RTDB status on the active Service Module card can be coherent or incoherent.

Measurements Commands for V-Flex

This section provides a description of the commands used for measurements for the V-Flex feature.

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

Commands described here include:

- [rept-ftp-meas](#)
- [rept-stat-meas](#)

rept-ftp-meas

This command initiates on-demand generation and FTP transfer of a measurements report from the MCPM to the customer FTP server. The **rept-ftp-meas** accepts a V-Flex entity type. The combination of this entity type and a report type determines which on-demand V-Flex report is generated. There are only two report types that are accepted with the V-Flex entity type: MTCH and MTCD. The V-Flex entity type is valid only when the V-Flex feature is on. Refer to the *Commands Manual* for a complete description of this command.

NOTE: The ability to schedule the automatic generation and FTP of V-FLEX daily and hourly measurement reports is not available in the EAGLE 5 ISS release 39.0.

rept-stat-meas

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

```

                PST           SST           AST
MEAS SS        OOS-MT       Fault       -----
ALARM STATUS = ** 0516 MEAS degraded with card out of service

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

CARD 1107 ALARM STATUS = No Alarms
CARD 1109 ALARM STATUS = Card is isolated from the system
    
```

```
Command Completed.  
;
```

EAGLE 5 ISS Debug Commands

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.

V-Flex Configuration

Introduction	4-1
Provisioning Service Module Cards	4-2
Adding a Service Module	4-3
Removing a TSM Card	4-5
Enabling V-Flex, Setting STP Options, and Turning On V-Flex	4-6
Provisioning True Point Code and Capability Point Code	4-9
Provisioning a Mated Application using True Point Code	4-10
Provisioning V-Flex as a Local Subsystem	4-11
Adding the V-Flex Subsystem Application	4-11
Removing the V-Flex Subsystem Application	4-13
Routing MSUs to Support V-Flex Subsystem	4-15
Provisioning the V-Flex Service Selector	4-16
Adding a V-Flex Service Selector	4-16
Removing a Service Selector	4-17
Changing an Existing Service Selector to a V-Flex Service Selector	4-19
Provisioning the V-Flex Options	4-21
Provisioning HOMERN Entries	4-22
Provisioning Voice Mail Prefix Entries	4-23
Provisioning Voice Mail Routing Numbers	4-24
Provisioning Voice Mail Server ID Entries	4-25
Provisioning Call Decision Table Entries	4-26
Activating the V-Flex Subsystem	4-27
Changing the State of a Subsystem Application	4-29
Taking the Subsystem Application Offline	4-30
Taking the Subsystem Application Online	4-33
Activating the E5-SM4G Throughput Capacity Feature	4-34
Configuring the Measurements Platform for V-Flex	4-37

Introduction

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*.



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



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

The EAGLE 5 ISS configuration of the V-Flex feature consists of the following tasks:

- Verify that the EAGLE 5 ISS contains only Service Module cards or E5-SM4G cards, or both, running the VSCCP application. See [Adding a Service Module](#) and [Removing a TSM Card](#) .
- 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](#) .
- Change the self identification of the EAGLE 5 ISS node to include ITU-I and ITU-N true point codes and V-Flex capability point codes. To provision true point codes and V-Flex capability point codes, see [Provisioning True Point Code and Capability Point Code](#) and refer to the procedures in the *Database Administration Manual - SS7*.
- Provision mated applications for the V-Flex feature that contain the EAGLE 5 ISS ITU-I and ITU-N true point codes, the V-Flex capability point codes, and the V-Flex subsystem number. To provision mated applications, refer to the procedures in the *Database Administration Manual - Global Title Translation*.
- Provision the V-Flex local subsystem number. To configure the V-Flex subsystem application number, see [Adding the V-Flex Subsystem Application](#) .
- Provision the service selector mechanism to route MSUs to the V-Flex subsystem. To configure the V-Flex service selectors, see [Adding a V-Flex Service Selector](#) .
- Provision V-Flex options. See [Provisioning the V-Flex Options](#) .
- Provision home routing number prefix (HOMERN) entries. See [Provisioning HOMERN Entries](#) .
- Provision Voice Mail screening prefix entries. See [Provisioning Voice Mail Prefix Entries](#) .
- Provision Voice Mail routing numbers (VM RN) . See [Provisioning Voice Mail Routing Numbers](#) .
- Provision Voice Mail Server ID (VMSID) entries. See [Provisioning Voice Mail Server ID Entries](#) .
- Provision Call Decision entries. See [Provisioning Call Decision Table Entries](#) .
- Activate the V-Flex local subsystem. See [Activating the V-Flex Subsystem](#) .
- Configure the Measurements Platform if measurements are to be collected for V-Flex. See [Configuring the Measurements Platform for V-Flex](#) .

Provisioning Service Module Cards

The V-Flex feature requires “Service Module cards” running the VSCCP application.

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

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

TSM cards running the SCCP application cannot be used with the V-Flex feature. If any cards running the SCCP application are present in the system, they must be replaced by Service Module cards. Contact your Customer Care Center before replacing any cards that are running the SCCP application.

This section contains procedures for adding Service Module cards to the system and removing TSM cards from the system.

Adding a Service Module

This procedure uses the **ent-card** command to add Service Module cards to the database, to support the Global Title Translation feature, the Enhanced Global Title Translation feature, and the V-Flex feature.



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

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

Table 4-1. Service Module Card Locations

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

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

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

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

NOTE: See [EAGLE 5 ISS Commands for V-Flex](#) for brief descriptions of the commands that are used in these procedures to configure the V-Flex feature. Refer to the Commands Manual for complete descriptions of the commands that are used in this procedure. The complete descriptions include all valid parameter values and output examples.

Procedure

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

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

- If the GTT feature is on, shown by the entry **GTT = on** in the **rtrv-feat** command output, go to [Step 3](#).

- If the GTT feature is off, shown by the entry **GTT = off** in the **rtrv-feat** command output, continue with [Step 2](#) .

NOTE: The GTT feature must be purchased before turning it on. If you are not sure whether you have purchased the GTT feature, contact your Tekelec Sales Representative or Account Representative.

After the Global Title Translation (GTT) feature has been turned on with the **chg-feat command, it cannot be turned off.**

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

```
rlghncxa03w 03-03-15 16:34:56 EST EAGLE 37.6.0
CARD   TYPE      APPL      LSET NAME   LINK SLC LSET NAME   LINK SLC
1201   LIMDS0      SS7ANSI   LS1         A    0    LS1         B
1102   DSM         VSCCP    -----    A    --    -----    B    --
1113   GPSM        OAM
1114   TDM-A
1115   GPSM        OAM
1116   TDM-B
1117   MDAL
```

;

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

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

- If the shelf contains HIPR cards, continue with [Step 4](#) .
- If the shelf does not contain HIPR cards, refer to the Installation Manual - EAGLE 5 ISS to install HIPR cards in the shelf. Continue with [Step 4](#) .

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

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



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

5. Add the Service Module card to the database, using the **ent-card** command.

```
ent-card:loc=1301:type=dsm:appl=vsccp
```

NOTE: Verify the temperature threshold settings for an E5-SM4G card by performing the “Changing the High-Capacity Card Temperature Alarm Thresholds” procedure in the *Database Administration Manual - SS7*.

6. Verify the temperature threshold settings for an E5-SM4G card by performing the “Changing the High-Capacity Card Temperature Alarm Thresholds” procedure in the *Database Administration Manual - SS7*.
7. Verify the changes by entering the **rtrv-card** command with the card location specified.

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

```
rlghncxa03w 03-03-15 16:34:56 EST EAGLE 37.6.0
CARD   TYPE      APPL      LSET NAME   LINK SLC LSET NAME   LINK SLC
```



```

1102 DSM VSCCP ----- A -- ----- B
;

```

- 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.

```

- Repeat this procedure for each Service Module card that needs to be added to the system.
- If TSM cards need to be removed from the system, go to [Removing a TSM Card](#).

Removing a TSM Card

This procedure uses the **dlt-card** command to remove TSM cards from the database. A card cannot be removed if it does not exist in the database.



CAUTION: If the TSM card is the last card in service, removing this card from the database will cause global title translation traffic to be lost.

The TSM card is shown in the database with the entries TSM in the TYPE field and SCCP in the APPL field of the of the **rtrv-card** command output.

The examples in this procedure are used to remove the TSM card in card location 1204.

Procedure

- Display the TSM cards in the system, by entering the **rtrv-card** command.

```

rlghncxa03w 03-03-15 16:34:56 EST EAGLE 37.6.0
CARD  TYPE      APPL      LSET NAME      LINK SLC LSET NAME      LINK SLC
1201  TSM          SCCP      LS1            A    0    LS1            B
1102  DSM          VSCCP      ----- A    -- ----- B    --
1113  GPSM          OAM
1114  TDM-A
1115  GPSM          OAM
1116  TDM-B
1117  MDAL
;

```

- Remove a TSM card from service (inhibit the card), by entering the **inh-card** command and specifying the card location. If the TSM card to be inhibited is the only TSM card in service, the **force=yes** parameter must also be specified. The cards that are in service are shown by the entry **IS-NR** in the **PST** field in the output in [Step 1](#).

```
inh-card:loc=1201
```

```

rlghncxa03w 03-03-15 16:34:56 EST EAGLE 37.6.0
Card has been inhibited.

```

When the card is successfully inhibited, physically removed from the shelf.

- Delete the TSM card from the database, by entering the **dlt-card** command.

```
dlt-card:loc=1201
```

- Verify the changes, using the **rtrv-card** command that specifies the card that was removed in [Step 2](#).

```
rtrv-card:loc=1201
```

E2144 Cmd Rej: Location invalid for hardware configuration

5. Repeat this procedure for each TSM card that needs to be removed from the system.
6. Back up the changes using the **chg-db:action=backup:dest=fixed** command. These messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

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

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 the feature access key.

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

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



CAUTION: 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.

Before the V-Flex feature can be enabled, the following conditions must exist in the system:

- The V-Flex feature requires Service Module cards running the VSCCP application to be configured in the system. If there are no Service Module cards present in the EAGLE 5 ISS, they must be added before the V-Flex feature can be enabled and turned on. See [Adding a Service Module](#) .



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

Any TSM cards running the SCCP application must be deleted from the database and physically removed from the system. See [Removing a TSM Card](#) .

- The database must contain a valid and locked serial number for the EAGLE 5 ISS. The system is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked after the system is on-site.
- The GTT feature must be turned on.

After the 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 V-Flex feature cannot be enabled when the **ansigflex** parameter is enabled.

The default country code (**defcc**) parameter, 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 Service Module audit running state (**dsmaud**) parameter of the **chg-stpopts** command can be provisioned for V-Flex

CHG-STPOPTS:DEFCC=<cc>:DEFNDC=<ndc>:Service ModuleAUD=ON

Procedure

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

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

- If the GTT feature is on, shown by the entry **GTT = on** in the **rtrv-feat** command output in step 1, go to [Step 3](#) .
- If the GTT feature is off, shown by the entry **GTT = off** in the **rtrv-feat** command output in step 1, continue with [Step 2](#) .

NOTE: The GTT feature must be purchased before turning it on. If you are not sure whether you have purchased the GTT feature, contact your Tekelec Sales Representative or Account Representative.

After the Global Title Translation (GTT) feature has been turned on with the chg-feat command, it cannot be turned off.

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

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

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

```
rlghncxa03w 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum   Status   Quantity
IPGWx Signaling TPS   893012805 on       2000
VFLEX                 893016701 on       ----
E5-SM4G Throughput Cap 893019101 on       ----
```

;

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

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

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

```
rlghncxa03w 03-03-15 16:34:56 EST EAGLE 37.6.0
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  GPMSM       OAM
1114  TDM-A
1115  GPMSM       OAM
1116  TDM-B
1117  MDAL
```

;

If Service Module cards are not shown in the output of the **rtrv-card** command, go to the [Adding a Service Module](#) and add the necessary Service Module cards, making sure that the Service Module cards meet the requirements.

If the **rtrv-card** output shows TSM cards running the SCCP application, these cards must be removed after the Service Module cards are added to the database. TSM cards are shown with the entries **TSM** in the **TYPE** field and **SCCP** in the **APPL** field. Go to the [Removing a TSM Card](#) and remove all TSM cards running the SCCP application from the database.

5. Verify that the system serial number is correct and locked. Enter the **rtrv-serial-num** command to display the system serial number and the lock status.
 - If the serial number is correct and locked, continue with [Step 7](#).
 - If the serial number shown in the output is not correct, enter the correct serial number into the database, using the **ent-serial-num** command without the **lock** parameter. Enter the **rtrv-serial-num** command again to verify that the correct serial number is entered.

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

```
rtrv-serial-num
```

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

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

6. Verify that the **defcc** and **defndc** STP option parameter values are not **none**. Enter the **rtrv-stpopts** command. If the parameter values are **none**, change the values. Then continue with [Step 7](#).
7. 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 (the fak parameter) is provided by Tekelec. If you do not have the controlled feature part number or the feature access key for the V-Flex 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 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
```

```

Feature Name      Partnum  Status  Quantity
IPGWx Signaling TPS  893012805  on      2000
VFLEX            893016701  off     ----
E5-SM4G Throughput Cap  893019101  on      ----

```

```
;
```

- 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 07-08-29 16:40:40 EST  EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name      Partnum  Status  Quantity
IPGWx Signaling TPS  893012805  on      2000
VFLEX            893016701  on      ----
E5-SM4G Throughput Cap  893019101  on      ----

```

```
;
```

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

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

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

```

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

```

Provisioning True Point Code and Capability Point Code

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.

This procedure explains how to provision EAGLE 5 ISS true point codes and V-Flex capability point codes.

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

```

tekelecstp 07-08-22 15:07:48 EST  EAGLE 37.6.0

PCA          PCI          PCN          CLLI          PCTYPE
-----          -----          ----          tekelecstp    ANSI

```

```
;
```

- Verify that the V-Flex feature is enabled and turned on, by entering the **rtrv-ctrl-feat** command.

```

rlghncxa03w 07-08-29 16:40:40 EST  EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name      Partnum  Status  Quantity
IPGWx Signaling TPS  893012805  on      2000
VFLEX            893016701  on      ----
E5-SM4G Throughput Cap  893019101  on      ----

```

```
;
```

- If the VFLEX entry appears in the command output, and the feature status is on, continue with [Step 3](#).

- If the VFLEX entry does not appear in the command output or if the feature status in the VFLEX entry is off, go to [Enabling V-Flex, Setting STP Options, and Turning On V-Flex](#) to enable and turn on the V-Flex feature. Continue with [Step 3](#) .
3. Change the ANSI, ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare true point codes and V-Flex capability point codes, using the **chg-sid** command. (ITU-N24 point codes are not valid for V-Flex.)
 4. Verify the changes with the **rtrv-sid** command.

```
tekelecstp 07-08-22 15:07:48 EST EAGLE 37.6.0

      PCA          PCI          PCN          CLLI          PCTYPE
      001-001-001  2-002-2    01234      tekelecstp   ANSI

      CPCA (VFLEX)
      004-004-004

      CPCI (VFLEX)
      5-012-0

      CPCN (VFLEX)
      12345

;
```

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

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

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

Provisioning a Mated Application using True Point Code

V-Flex exists as a local SCCP subsystem on the EAGLE 5 ISS, with a subsystem number assigned to it.

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

- The EAGLE 5 ISS ANSI, ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare true point codes must be defined in the system. See [Provisioning True Point Code and Capability Point Code](#) .
- The EAGLE 5 ISS ANSI, ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare true point codes and a subsystem number must be entered into the Mated Application table.

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

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

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

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

If multiple point code types for 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

Provisioning V-Flex as a Local Subsystem

The following procedures in this section are used to add, remove, or change a subsystem application. Only one subsystem application can be defined. The application must be unique.

- [Adding the V-Flex Subsystem Application](#)
- [Removing the V-Flex Subsystem Application](#)
- [Changing the State of a Subsystem Application](#)

Adding the V-Flex Subsystem Application

This procedure is used to reserve a subsystem number for the V-Flex (Voice Mail Router) application, and to place the V-Flex application either on-line or offline.

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

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

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

The examples in this procedure reserve the subsystem number 100 for the V-Flex application and set the V-Flex application status to on-line.

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, the VFLEX entry shows a status of **on**.

```
rlghncxa03w 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum   Status   Quantity
IPGWx Signaling TPS   893012805 on        2000
HC-MIM SLK Capacity   893012707 on         64
VFLEX                 893016701 on         ----
E5-SM4G Throughput Cap 893019101 on         ----
;
```

- If the V-Flex feature is not enabled or turned on, go to the procedure in [Enabling V-Flex, Setting STP Options, and Turning On V-Flex](#) .

Return to this procedure and continue with [Step 2](#) .

- If the V-Flex feature is enabled and turned on, continue with [Step 2](#) .
2. Verify that EAGLE 5 ISS true point codes are defined in the system. Enter the **rtrv-sid** command. The EAGLE 5 ISS true point codes are shown in the **PCA**, **PCI**, and **PCN** fields of the **rtrv-sid** output.

```
tekelecstp 07-08-22 15:07:48 EST EAGLE 37.6.0

PCA          PCI          PCN          CLLI          PCTYPE
001-001-001  2-002-2      01234       tekelecstp   ANSI

CPCA (VFLEX)
004-004-004

CPCI (VFLEX)
5-012-0

CPCN (VFLEX)
12345

;
```

If the **rtrv-sid** output does not show entries in the **PCA**, **PCI** or **PCN** fields, or if the true point code values need to be changed, See [Provisioning True Point Code and Capability Point Code](#) and the “*Changing the Self-Identification of the System*” procedure in the *Database Administration Manual - SS7* to add the correct point code values.

Continue with [Step 3](#) .

3. Verify that the EAGLE 5 ISS true point codes (from [Step 2](#)) and a subsystem number that can be used for V-Flex are available in the MAP table. Enter the **rtrv-map** command.
If EAGLE 5 ISS true point codes and V-Flex subsystem number are not shown in the **rtrv-map** output, go to the “*Provisioning a Mated Application*” procedure in the *Database Administration Manual – Global Title Translation* and add the EAGLE 5 ISS true point codes and a subsystem to a mated application..
4. Verify that the V-Flex application is not already defined in the database. Enter the **rtrv-ss-appl** command. The VFLEX entry should not appear in the output.

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

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

;
```

5. 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
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  online

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

;
```

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

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


Removing the V-Flex Subsystem Application

This procedure is used to remove a subsystem application from the database. The EAGLE 5 ISS can contain only one subsystem application.

If the V-Flex subsystem application is defined and must be removed, use the procedure in this section.

If another subsystem application is already defined, it must be removed before the V-Flex application can be entered. To remove the INP, EIR, or LNP subsystem, do not perform the procedure in this section. Perform the procedures in the *Feature Manual - INP*, *Feature Manual - EIR*, or *Database Administration Manual - LNP*.

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 V-Flex application in the database, 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)
```

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

```
tklc1170501 07-08-18 10:16:24 EST EAGLE5 37.6.0
SCCP SUBSYSTEM REPORT IS-NR Active -----
SCCP ALARM STATUS = No Alarms
VFLEX SUBSYSTEM REPORT IS-NR Active -----
VFLEX: SSN STATUS = Allowed MATE SSN STATUS = -----
VFLEX ALARM STATUS = No Alarms
GFLEX SERVICE REPORT IS-NR Active -----
GFLEX ALARM STATUS = No Alarms
GPORT SERVICE REPORT IS-NR Active -----
GPORT ALARM STATUS = No Alarms

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

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

```

1107 126-030-000 IS-NR Active ----- 55% 26%
-----
SCCP Service Average MSU Capacity = 71% Average CPU Capacity = 32%

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

```

TOTAL SERVICE STATISTICS:

SERVICE SUCCESS ERRORS RATIO FAIL REROUTE\ FORWARD TOTAL
GTT: 3510 15 0% - - - 3525
GFLEX: 100043 0 0% 0 0 100043
GPORT: 312203 0 0% 15 1879 314097
VFLEX: 23157 0 0% - - 23157
    
```

Command Completed.

NOTE: If the V-Flex subsystem is out of service, shown by the entry VFLEX SUBSYSTEM REPORT OOS-MT-DSBLD in the rept-stat-sccp output in Step 3 , skip Step 4 and Step 5 , and go to Step 6 .

- Place the V-Flex subsystem application out of service. Enter the **inh-map-ss** command and specify the V-Flex subsystem number displayed in [Step 1](#) .

inh-map-ss:ssn=100

```

rlghncxa03w 03-06-28 14:42:38 GMT EAGLE 37.6.0
Inhibit map subsystem command sent to all TSM cards running the SCCP application.
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 the subsystem is inhibited.

```

rlghncxa03w 03-06-28 14:42:38 GMT EAGLE 37.6.0
Inhibit map subsystem command sent to all TSM cards running the SCCP application.
Command Completed.
    
```

- Verify that the V-Flex subsystem is out of service (OOS-MT-DSBLD), by entering the **rept-stat-sccp** command. If the V-Flex subsystem is not out of service, return to [Step 3](#) and enter the **inh-map-ss** command with the **force=yes** parameter specified.

```

e1030701 06-09-18 02:44:41 EST EAGLE 36.0.0
SCCP SUBSYSTEM REPORT IS-NR Active -----
SCCP ALARM STATUS = No Alarms
VFLEX SUBSYSTEM REPORT OOS-MT_DSBLD Inhibited -----
VFLEX: SSN STATUS = Inhibited MATE SSN STATUS = -----
VFLEX ALARM STATUS = *C 0529 Service is disabled

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

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

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

TOTAL SERVICE STATISTICS:

SERVICE SUCCESS ERRORS RATIO FAIL REROUTE\ FORWARD TOTAL
    
```

SERVICE	SUCCESS	ERRORS	RATIO	WARNINGS	TO GTT	TOTAL
GTT:	0	0	0%	-	-	0
VFLEX	0	0	0%	0	0	0

Command Completed.

- Remove the V-Flex subsystem application from the database, by entering the **dlt-ss-appl** command.
dlt-ss-appl:appl=vflex
- Verify the changes by entering the **rtrv-ss-appl** command. No application entries should appear in the output.

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

```
SS-APPL TABLE IS 25% FULL (1 OF 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.
```

Routing MSUs to Support V-Flex Subsystem

V-Flex allows global title information to resolve to the V-Flex local subsystem, so that route-on-global title (rt-on-gt) messages can be forwarded to the local subsystem.

Provisioning is required to accomplish the following tasks:

- Provision V-Flex as a service. See [Provisioning the V-Flex Service Selector](#) .
- Direct DPC/SSN routing to the EAGLE 5 ISS PC and the V-Flex local subsystem
This 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.

- Final GTT routing to an EAGLE 5 ISS PC and the V-Flex local subsystem
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](#) .

This 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>
```

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 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum  Status  Quantity
IPGWx Signaling TPS   893012805 on      2000
HC-MIM SLK Capacity   893012707 on      64
VFLEX                 893016701 on      ----
E5-SM4G Throughput Cap 893019101 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.

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

GTTI TT NP NAI SSN SNP SNAI SERV
4 1 e164 intl 3 --- --- vflex
```

```
4      2      e164      intl *      ---      ---      vflex
```

```
GTIN  TT  NP      NAI  SSN  SNP  SNAI  SERV
```

```
4      4      e164      natl 4      ---      ---      vflex
```

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

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](#).

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

GTII  TT  NP      NAI  SSN  SNP  SNAI  SERV
4      1      e164      intl 3      ---      ---      vflex
4      2      e164      intl *      ---      ---      vflex
```

```
GTIN  TT  NP      NAI  SSN  SNP  SNAI  SERV
4      4      e164      natl 4      ---      ---      vflex
4      35     e214      natl 100     ---      ---      vflex
2      57     ---      ---  75      ---      ---      vflex
```

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

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

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

Removing a Service Selector

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

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.

```
r1ghncxa03w 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	mnp sms
4	2	e164	intl	*	---	---	vflex
GTIN	TT	NP	NAI	SSN	SNP	SNAI	SERV
4	4	e214	natl	34	e164	intl	gflex

```
4      9      e214      nat1 --- e164 intl  gflex
```

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

```
;
```

NOTE: If the `rtrv-srvsel` output in [Step 1](#) shows V-Flex service selectors, skip [Step 2](#) and go to [Step 3](#).

- 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 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum  Status  Quantity
IPGWx Signaling TPS   893012805 on      2000
HC-MIM SLK Capacity   893012707 on      64
VFLEX                 893016701 on      ----
E5-SM4G Throughput Cap 893019101 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 3](#).
- If the V-Flex feature is enabled and turned on, go to [Step 3](#).

- Change the service selector, using the `chg-srvsel` command.

```
chg-
```

```
srvsel:gtin=4:tt=4:np=e214:nai=nat1: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*.

- 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=nat1: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   nat1  34   ---  ---   vflex
```

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


- ;
- 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, the routing number + dialed number, or the country code + routing number + dialed number.
- 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, a signaling point routing number, or a generic routing number (the routing number provided by the RTDB lookup).

The default value for this parameter is **off**.

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](#) .

- 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 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum  Status  Quantity
IPGWx Signaling TPS   893012805 on      2000
HC-MIM SLK Capacity   893012707 on       64
VFLEX                  893016701 on      ----
E5-SM4G Throughput Cap 893019101 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](#) .

- Display the status of the V-Flex options, using the **rtrv-vflx-opts** command.

```
tekelecstp 07-05-04 07:53:46 EST EAGLE 37.6.0

VFLEX OPTIONS
-----
DRANPV      = 0
DRANAIV     = 0
DRA         = RN
```

```

NEQUERYONLY = OFF
NETYPE       = VMSID
;

```

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.

```

tekelecstp 07-05-04 07:53:46 EST EAGLE 37.6.0

VFLEX OPTIONS
-----
DRANPV      = 0
DRANAIV     = 0
DRA         = RNDN
NEQUERYONLY = OFF
NETYPE      = VMSID
;

```

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, MSISDN with MSISDN_NAI in subscriber format are converted to international format by prepending the STPOPTS **defcc** value and the STPOPTS **:defndc** value.

After HomeRN deletion, MSISDN with MSISDN_NAI in national format shall be converted to international format by prepending 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.

```

rlghncxa03w 03-03-28 08:50:12 EST EAGLE 31.3.0
RN
-----
216780909087654
76345098
abc
abc1234
c10234567
cabade

```

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

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 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum    Status    Quantity
IPGWx Signaling TPS   893012805  on       2000
HC-MIM SLK Capacity   893012707  on        64
VFLEX                 893016701  on        ---
E5-SM4G Throughput Cap 893019101  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 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.

```
tekelecstp 07-08-23 17:30:17 EST EAGLE 37.6.0
VFLEX
VM Prefix List
DS
-----
12
123
12345
123456789abcdef
VM Prefix List table is (4 of 100) 4% full
;
```

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](#) on page 4-41.

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 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum    Status    Quantity
IPGWx Signaling TPS   893012805 on         2000
HC-MIM SLK Capacity   893012707 on          64
VFLEX                 893016701 on          ---
E5-SM4G Throughput Cap 893019101 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 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-RN:RNNAME=<RN Name>:RN=<Routing Number digits>

4. Verify the changes by entering the **rtrv-vflx-rn** command.

```
tekelecstp 07-06-29 15:07:01 EST EAGLE 37.6.0
RN Name Routing Number
-----
rn01 123456789abcd01
rn02 123456789abcd02
rn03 123456789abcd03
rn04 123456789abcd04
rn05 123456789abcd05
rn06 123456789abcd06
rn07 123456789abcd07
rn08 123456789abcd08
rn09 123456789abcd09
rn10 123456789abcd0A
rn11 123456789abcd0B
rn12 123456789abcd0C
rn13 123456789abcd0D
rn14 123456789abcd0E
rn15 123456789abcd0F
. .
. .
. .
. .
rn10000 1000000000abcdef
VFLEX Routing Number table is (10000 of 10000) 100% full.
;
```

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 indices 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 Indices 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 indices 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 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum  Status  Quantity
IPGWx Signaling TPS   893012805 on      2000
HC-MIM SLK Capacity   893012707 on       64
VFLEX                 893016701 on      ----
E5-SM4G Throughput Cap 893019101 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. Enter the following for each VMSID:

ENT-VFLX-VMSID:ID=<VMSID>:IDX0=<RN Name>:IDX1=<RN Name>:IDX2=<RN Name>:IDX3=<RN Name>:IDX4=<RN Name>:IDX5=<RN Name>:IDX6=<RN Name>:IDX7=<RN Name>:IDX8=<RN Name>:IDX9=<RN Name>

- Verify the changes by entering the **rtrv-vflx-vmsid** command.

```
rlghncxa03w 07-02-07 11:11:28 EST EAGLE 37.6.0

VMS ID          IDX0          IDX1          IDX2          IDX3          IDX4          IDX5
-----
123456789abcdef RN0000000    RN0000001    RN0000002    RN0000003    RN0000004    RN0000005

          IDX6          IDX7          IDX8          IDX9
          -----
          RN0000006    RN0000007    RN0000008    RN0000009

VMS ID          IDX0          IDX1          IDX2          IDX3          IDX4          IDX5
-----
123456789012abc RN0000010    RN0000011    RN0000012    RN0000013    RN0000014    RN0000015

          IDX6          IDX7          IDX8          IDX9
          -----
          RN0000016    RN0000017    RN0000018    RN0000019

VMS ID          IDX0          IDX1          IDX2          IDX3          IDX4          IDX5
-----
a23456789012abc RN0000020    RN0000021    RN0000022    RN0000023    RN0000024    RN0000025

          IDX6          IDX7          IDX8          IDX9
          -----
          RN0000026    RN0000027    RN0000028    RN0000029

VFLEX VMSID table is (3 of 1000) 1% full.
```

- 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 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum    Status    Quantity
IPGWx Signaling TPS   893012805 on         2000
HC-MIM SLK Capacity   893012707 on          64
VFLEX                  893016701 on          ----
E5-SM4G Throughput Cap 893019101 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 following for each entry:
ent-vflx-cd:dnstat=<dn status>:rdi=<rdi>:bcap=<bcap>:vmdig=<vm digits>:rnidx=<rn index>:cdn=<call decision entry name>
4. Verify the changes by entering the **rtrv-vflx-cd** command.

```
tekelecstp 07-08-01 09:36:55 EST EAGLE 37.6.0
```

RDI	DN Status	BCAP	VM Number/Prefix	VMRN Index	CD Name
---	-----	---	-----	-----	-----
DIR	NFND	0	1	9	c100
DIR	NFND	0	12	9	c101
DIR	NFND	0	123	9	c102
DIR	NFND	0	1234	9	c103
DIR	FND	0	1	9	c200
DIR	*	1	123	9	c201
DIR	*	2	2345678	9	c203
DIR	*	3	456789a	9	c204
DIR	*	4	56789ab	9	c205
REDIR	*	1	123456789abcdef	9	c202

```
VFLEX Call Decision table is (10 of 4950) 1% full.
```

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 be 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 4-2. 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 TSM cards running the SCCP application.
Command Completed.
;
```

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

```
tklc1170501 07-08-18 10:16:24 EST EAGLE5 37.6.0
SCCP SUBSYSTEM REPORT IS-NR Active -----
SCCP ALARM STATUS = No Alarms
VFLEX SUBSYSTEM REPORT IS-NR Active -----
VFLEX: SSN STATUS = Allowed MATE SSN STATUS = -----
VFLEX ALARM STATUS = No Alarms
GFLEX SERVICE REPORT IS-NR Active -----
GFLEX ALARM STATUS = No Alarms
GPORT SERVICE REPORT IS-NR Active -----
GPORT ALARM STATUS = No Alarms
```



```

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

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

SCCP Service Average MSU Capacity = 71% Average CPU Capacity = 32%

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

TOTAL SERVICE STATISTICS:

SERVICE	SUCCESS	ERRORS	FAIL RATIO	REROUTE\ WARNINGS	FORWARD TO GTT	TOTAL
GTT:	3510	15	0%	-	-	3525
GFLEX:	100043	0	0%	0	-	100043
GPORT:	312203	0	0%	15	1879	314097
VFLEX:	23157	0	0%	-	-	23157

Command Completed.

;

Changing the State of a Subsystem Application

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

The online/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.

```
tklcl1170501 07-08-18 10:16:24 EST EAGLE5 37.6.0
SCCP SUBSYSTEM REPORT IS-NR Active -----
SCCP ALARM STATUS = No Alarms
VFLEX SUBSYSTEM REPORT IS-NR Active -----
VFLEX: SSN STATUS = Allowed MATE SSN STATUS = -----
VFLEX ALARM STATUS = No Alarms
GFLEX SERVICE REPORT IS-NR Active -----
GFLEX ALARM STATUS = No Alarms
GPORT SERVICE REPORT IS-NR Active -----
GPORT ALARM STATUS = No Alarms

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

```

System TPS Alarm Threshold      17000 TPS ( 80% System N SCCP Capacity)

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

```

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

```

TOTAL SERVICE STATISTICS:

SERVICE  SUCCESS  ERRORS  FAIL  REROUTE\  FORWARD  TOTAL
          3510    15     0%    WARNINGS  TO GTT
GTT:
GFLEX:  100043  0     0%    0
GPORT:  312203  0     0%    15    1879  314097
VFLEX:  23157   0     0%    -     -    23157
    
```

Command Completed.

- Place the subsystem out of service. Specify the subsystem number displayed in the output in [Step 1](#).

inh-map-ss:ssn=100

```

rlghncxa03w 03-06-28 14:42:38 GMT EAGLE 37.6.0
Inhibit map subsystem command sent to all TSM cards running the SCCP application.
Command Completed.
    
```

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

```

tklcl1170501 07-08-18 10:16:24 EST EAGLE5 37.6.0
SCCP SUBSYSTEM REPORT IS-NR    Active   -----
  SCCP ALARM STATUS = No Alarms
VFLEX SUBSYSTEM REPORT OOS-MT-DSBLD Active   -----
  VFLEX: SSN STATUS = Inhibited MATE SSN STATUS = -----
  VFLEX ALARM STATUS = No Alarms
GFLEX SERVICE REPORT IS-NR    Active   -----
  GFLEX ALARM STATUS = No Alarms
GPORT SERVICE REPORT IS-NR    Active   -----
  GPORT ALARM STATUS = No Alarms

SCCP Cards Configured=25      Cards IS-NR=25
System Daily Peak SCCP Load  15639 TPS 06-09-18 06:14:24
    
```

```
System Overall Peak SCCP Load      21062 TPS 06-09-15 14:24:38
System Total SCCP Capacity         21250 TPS (21250 max SCCP Capacity)
System SCCP Capacity Calc. Method (N)
System TPS Alarm Threshold         17000 TPS ( 80% System N SCCP Capacity)
```

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

 SCCP Service Average MSU Capacity = 71% Average CPU Capacity = 32%

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

TOTAL SERVICE STATISTICS:

SERVICE	SUCCESS	ERRORS	FAIL RATIO	REROUTE\ WARNINGS	FORWARD TO GTT	TOTAL
GTT:	3510	15	0%	-	-	3525
GFLEX:	100043	0	0%	0	0	100043
GPORT:	312203	0	0%	15	1879	314097
VFLEX:	23157	0	0%	-	-	23157

Command Completed.

- Take the subsystem offline. Enter the **chg-ss-appl** command with the **nstat=offline** parameter.

chg-ss-appl:appl=vflex:nstat=offline

- 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)

- 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.

```
tklc1170501 07-08-18 10:16:24 EST EAGLE5 37.6.0
SCCP SUBSYSTEM REPORT IS-NR Active -----
SCCP ALARM STATUS = No Alarms
VFLEX SUBSYSTEM REPORT OOS-MT-DSBLD Active -----
VFLEX: SSN STATUS = Inhibited MATE SSN STATUS = -----
VFLEX ALARM STATUS = No Alarms
GFLEX SERVICE REPORT IS-NR Active -----
GFLEX ALARM STATUS = No Alarms
GPORT SERVICE REPORT IS-NR Active -----
GPORT ALARM STATUS = No Alarms

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

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

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

```
TOTAL SERVICE STATISTICS:
```

SERVICE	SUCCESS	ERRORS	FAIL RATIO	REROUTE\ WARNINGS	FORWARD TO GTT	TOTAL
GTT:	3510	15	0%	-	-	3525
GFLEX:	100043	0	0%	0	0	100043
GPORT:	312203	0	0%	15	1879	314097
VFLEX:	23157	0	0%	-	-	23157

```
Command Completed.
```

```
;
```

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

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

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.
```

Activating the E5-SM4G Throughput Capacity Feature

The E5-SM4G Throughput Capacity feature provides up to 75,000 transactions per second when the maximum number of E5-SM4G cards are installed in the EAGLE 5 ISS and one or more EPAP-related features (such as V-Flex) are enabled and turned on.

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

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

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

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

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

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



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

- HIPR cards must be installed in card locations 09 and 10 in all shelves that contain E5-SM4G cards.
- Any TSM cards running the SCCP application must be deleted from the database and physically removed from the system. See “Removing a TSM Card” on page 4-8
- The database must contain a valid and locked serial number for the EAGLE 5 ISS. The system is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked after the system is on-site.
- The GTT feature must be turned on.

NOTE: The E5-SM4G Throughput Capacity feature cannot be enabled if the LNP feature is on.

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

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

```
rlghncxa03w 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum   Status   Quantity
IPGWx Signaling TPS   893012805 on        2000
HC-MIM SLK Capacity   893012707 on         64
VFLEX                 893016701 on         ---
E5-SM4G Throughput Cap 893019101 on         ---
;
```

- If the **rtrv-ctrl-feat** output shows that the E5-SM4G Throughput Capacity feature is enabled and its status is on, no further action is necessary.
 - If the feature is enabled, and its status is off, skip [Step 2](#) through [Step 6](#) , and go to step [Step 7](#) .
 - If the **rtrv-ctrl-feat** output shows that the LNP feature is enabled, this procedure cannot be performed. The E5-SM4G Throughput Capacity feature cannot be enabled if the LNP feature is enabled.
 - If the E5-SM4G Throughput Capacity and LNP features are not enabled, continue with [Step 2](#) .
2. Verify that the GTT feature is on. Enter the **rtrv-feat** command. If the GTT feature is on, the **GTT = on** field appears in the command output.

```
rlghncxa03w 04-01-28 11:34:04 EST EAGLE 31.3.0
EAGLE FEATURE LIST

GTT      = on      GWS      = off     NRT      = off
X25G     = off     LAN      = off     CRMD     = off
SEAS     = off     LFS      = off     MTPRS    = off
FAN      = off     DSTN5000 = off     WNP      = off
CNCF     = off     TLNP     = off     SCCPCNV  = off
TCAPCNV  = off     IPISUP   = off     DYNRTK   = off
X252000  = off     PLNP     = off     E5IS     = off
NCR      = off     ITUMTPRS = off     SLSOCB   = off
EGTT     = off     VGGT     = off     MGGT     = off
```

```

MPC          = off      ITUDUPPC = off      GFLEX       = off
MEASPLAT    = off      TSCSYNC  = off      E5IS        = off
;

```

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

- If the GTT feature is on, shown by the entry `GTT = on` in the `rtrv-feat` command output, go to [Step 4](#).
- If the GTT feature is off, shown by the entry `GTT = off` in the `rtrv-feat` command output, continue with [Step 3](#).

NOTE: The GTT feature must be purchased before turning it on. If you are not sure whether you have purchased the GTT feature, contact your Tekelec Sales Representative or Account Representative.

After the Global Title Translation (GTT) feature has been turned on with the `chg-feat` command, it cannot be turned off.

3. Turn the GTT feature on, by entering the following command.

```
chg-feat:gtt=on
```

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

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

```

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

```

- If the required number of E5-SM4G cards (25) are provisioned in the database, continue with [Step 5](#).
 - If the required number of E5-SM4G cards are not provisioned in the database, go to [Adding a Service Module](#) on page 4-5 to add the required number of E5-SM4G cards to the database. Then continue with [Step 5](#).
5. Verify that the system serial number is correct and locked. Enter the `rtrv-serial-num` command to display the system serial number and the lock status.
 - If the serial number is correct and locked, continue with [Step 6](#).
 - If the serial number shown in the output is not correct, enter the correct serial number into the database, using the `ent-serial-num` command without the `lock` parameter. Enter the `rtrv-serial-num` command again to verify that the correct serial number is entered.

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

```
rtrv-serial-num
```


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

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

6. Enable the E5-SM4G Throughput Capacity feature with the permanent key by entering the **enable-ctrl-feat** command.

```
enable-ctrl-feat:partnum=893019101:fak=<E5-SM4G Throughput Capacity feature access key>
```

The values for the feature access key (the **fak** parameter) are provided by Tekelec. If you do not have the feature access key for the E5-SM4G Throughput Capacity feature, contact your Tekelec Sales Representative or Account Representative.

NOTE: If you do not want to turn the E5-SM4G Throughput Capacity feature on at this time, skip [Step 7](#) and go to [Step 8](#).

7. Turn the E5-SM4G Throughput Capacity feature on with the **chg-ctrl-feat** command, specifying the E5-SM4G Throughput Capacity feature part number used in [Step 1](#) and the **status=on** parameter.

```
chg-ctrl-feat:partnum=893019101:status=on
```

After this feature is turned on, it cannot be turned off.

8. Verify the changes by entering the **rtrv-ctrl-feat** command with the E5-SM4G Throughput Capacity feature part number 893019101.

```
rlghncxa03w 07-08-29 16:40:40 EST EAGLE5 37.6.0
The following features have been permanently enabled:
Feature Name          Partnum    Status    Quantity
IPGWx Signaling TPS   893012805  on        2000
HC-MIM SLK Capacity   893012707  on         64
VFLEX                 893016701  on         ---
E5-SM4G Throughput Cap 893019101  on         ---
;
```

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

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

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

Configuring the Measurements Platform for V-Flex

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 for information about measurements for V-Flex.

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

Maintenance and Measurements

Hardware Requirements	5-1
EPAP Status and Alarms	5-2
EPAP Maintenance Blocks	5-2
Service Module Card Status Requests	5-2
V-Flex Alarms	5-3
DSM-EPAP Link	5-4
MPS (EPAP) Alarms	5-5
Card Related MPS Alarms	5-6
V-Flex Subsystem Alarms	5-9
Migration System Status Reports	5-10
System Status Reporting	5-10
MPS Status Reporting	5-10
Service Module Memory Capacity Status Reporting	5-10
Loading Mode Support Status Reporting	5-11
Code and Application Data Loading	5-11
Service Module Code Loading	5-11
EPAP Application Data Loading	5-11
State Transitions during Start-Up	5-13
V-Flex UIMs	5-16
V-Flex Measurements	5-18

Hardware Requirements

The V-Flex feature requires Service Module cards to run the VSCCP application. The EAGLE 5 ISS may be equipped with from 1 to 25 Service Module cards to support V-Flex.



CAUTION: Having a mix of VSCCP (Service Module cards and E5-SM4G cards) and SCCP card types (TSM cards) is not permitted when the V-Flex feature is enabled. Service Module cards and TSM cards running the SCCP application cannot coexist in a system operating the V-Flex feature. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module card database capacity requirements.

The V-Flex feature also requires a T1000 AS based MPS system.

EPAP Status and Alarms

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

EPAP Maintenance Blocks

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

Service Module Card Status Requests

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

Service Module card status Reporting to the EPAP

The sections that follow describe the Service Module status reporting for the EPAP.

Service Module card status Messages – When Sent

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

Service Module card status Messages Fields

The Service Module Status Message provides the following information to the EPAP:

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

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

V-Flex Alarms

All V-Flex related UAMs are output to the Maintenance Output Group. The *Maintenance Manual* contains a complete description of all UAMs. [Table 5-1](#) contains a listing of UAMs used to support the V-Flex feature.

Refer to the *EAGLE 5 ISS Maintenance Manual* for more information and corrective procedures for the EAGLE 5 ISS related alarms. Refer to the *MPS Platform Software and Maintenance Manual* for more information and corrective procedures for the MPS related alarms.

Table 5-1. V-Flex UAMs

UAM	Severity	Message Text	MPS or EAGLE 5 ISS
0013	Major	Card is isolated from system	EAGLE 5 ISS
0084	Major	IP Connection Unavailable	EAGLE 5 ISS

UAM	Severity	Message Text	MPS or EAGLE 5 ISS
0085	None	IP Connection Available	EAGLE 5 ISS
0099	Major	Incompatible HW for provisioned slot	EAGLE 5 ISS
0250	None	MPS available	MPS
0261	Critical	MPS unavailable	MPS
0370	Critical	Critical Platform Failure(s)	MPS
0371	Critical	Critical Application Failure(s)	MPS
0372	Major	Major Platform Failure(s)	MPS
0373	Major	Major Application Failure(s)	MPS
0374	Minor	Minor Platform Failure(s)	MPS
0375	Minor	Minor Application Failure(s)	MPS
0422	Major	Insufficient extended memory	EAGLE 5 ISS
0423	None	Card reload attempted	EAGLE 5 ISS
0441	Major	Incorrect MBD - CPU	EAGLE 5 ISS
0442	Critical	RTDB database capacity is 95% full	EAGLE 5 ISS
0443	Major	RTDB database is corrupted	EAGLE 5 ISS
0444	Minor	RTDB database is inconsistent	EAGLE 5 ISS
0445	None	RTDB database has been corrected	EAGLE 5 ISS
0446	Major	RTDB Database capacity is 80% full	EAGLE 5 ISS
0447	None	RTDB database capacity alarm cleared	EAGLE 5 ISS
0448	Minor	RTDB database is incoherent	EAGLE 5 ISS
0449	Major	RTDB resynchronization in progress	EAGLE 5 ISS
0451	Major	RTDB reload is required	EAGLE 5 ISS
0551	Critical	VFLEX Subsystem is not available	EAGLE 5 ISS
0552	Critical	VFLEX Subsystem is disabled	EAGLE 5 ISS
0553	Minor	VFLEX Subsystem normal, card(s) abnormal	EAGLE 5 ISS
0554	None	VFLEX Subsystem is available	EAGLE 5 ISS
0555	None	VFLEX Subsystem is removed	EAGLE 5 ISS

DSM-EPAP Link

Two alarms are used to indicate the DSM-to-EPAP link status. Refer to the *Signaling Products Maintenance Manual* for more information and corrective procedures for the following alarms.

- **UAM 0084 - IP Connection Unavailable**

This message indicates that an IP application socket is out of service due to a IP link down (Ethernet problem) or due to the Service Module card.

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
** 5676.0084 ** DSM B 1101 IP Connection Unavailable
```

- **UAM 0085 - IP Connection Available**

This message indicates that a previously broken link between the EPAP and Service Module card is now functioning properly.

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
5676.0085 DSM B 1101 IP Connection Available
```

MPS (EPAP) Alarms

The following alarms are output on the EAGLE 5 ISS and include an alarm data string in the output. Refer to the *MPS Platform Software and Maintenance Manual* (except where noted) for more information and corrective procedures for the following MPS related alarms.

- **UAM 0261 - MPS unavailable**

This message indicates that the EAGLE 5 ISS is unable to communicate with the MPS or the MPS has an internal failure. Refer to the *Maintenance Manual* for the corrective action procedure.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
*C 0259.0261 *C MPS B MPS unavailable
```

- **UAM 0370 - Critical Platform Failure (s)**

This message indicates the application running in the MPS server has detected a critical platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'1xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
*C 0259.0370 *C MPS B Critical Platform Failure(s)
ALARM DATA = h'10000000000000008'
```

- **UAM 0371 - Critical Application Failure (s)**

This message indicates the application running in the MPS server has detected a critical application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'2xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
*C 0259.0371 *C MPS B Critical Application Failure(s)
ALARM DATA = h'20000000000000001'
```

- **UAM 0372** - Major Platform Failure (s)

This message indicates the application running in the MPS server has detected a major platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'3xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
** 0259.0372 ** MPS B Major Platform Failure(s)
ALARM DATA = h'3000000000000002'
```

- **UAM 0373** - Major Application Failure (s)

This message indicates the application running in the MPS server has detected a major application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'4xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
** 0259.0373 ** MPS B Major Application Failure(s)
ALARM DATA = h'4000000000000008'
```

- **UAM 0374** - Minor Platform Failure (s)

This message indicates the application running in the MPS server has detected a minor platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'5xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
* 0259.0374 * MPS B Minor Platform Failure(s)
ALARM DATA = h'5000000000000004'
```

- **UAM 0375** - Minor Application Failure (s)

This message indicates the application running in the MPS server has detected a minor application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'6xxxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
station1234 00-09-30 16:28:08 EAGLE 35.0.0
* 0259.0375 * MPS B Minor Application Failure(s)
ALARM DATA = h'6000000000000001'
```

Card Related MPS Alarms

The following alarms are output on the EAGLE 5 ISS. Refer to the *Signaling Products Maintenance Manual* for more information and corrective procedures for the following card related MPS alarms.

- **UAM 0013** - Card is isolated from system

This indicates a card has become isolated and is unable to communicate to other cards in the system. This could be caused by a defective card, a power failure occurred on the card, or the system software has ordered a reset.

This also appears when the card has been manually reset by a command.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
** 0012.0013 ** CARD 1101 SCCP      Card is isolated from the system
    ASSY SN: 102199815a1234
```

- **UAM 0099** - Incompatible HW for provisioned slot

This indicates a DCM or Service Module card does not have an extended memory. This card is automatically inhibited.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
** 0012.0099 ** CARD 1101 VSCCP    Incompatible hardware for provisioned slot
    ASSY SN: 102199815a1234
```

- **UAM 0422** - Insufficient extended memory

At least one SCCP card does not have enough memory for the V-Flex application. Loading of the SCCP card is automatically inhibited.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
** 0012.0422 ** CARD 1108  SCCP      Insufficient extended memory
```

- **UAM 0423** - Card reload attempted

Card loading is no longer inhibited. The once inhibited card is now attempting to load.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
    0012.0423    CARD 1108  SCCP      Card reload attempted
```

- **UAM 0441** - Incorrect main board - CPU

A Service Module card does not have the required hardware configuration for the V-Flex application.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
** 0012.0441 ** CARD 1108  VSCCP      Incorrect MBD - CPU
```

- **UAM 0442** - Insufficient RTDB database capacity

At least one Service Module card does not have at least 1Gb of memory or does not have enough capacity for the RTDB. Loading of the Service Module card is automatically inhibited.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
*C 0012.0442 *C CARD 1108  VSCCP      RTDB database capacity is 95% full
```

- **UAM 0443** - RTDB database is corrupted

A RTDB database is corrupt. The calculated checksum did not match the checksum value stored for one or more records.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
** 0012.0443 ** CARD 1108 VSCCP RTDB database is corrupted
```

- **UAM 0444** - RTDB database is inconsistent

The real time database on one or more Service Module cards is not identical to the current real time database on the active EPAP fixed disks.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
* 0012.0444 * CARD 1108 VSCCP RTDB database is inconsistent
```

- **UAM 0445** - RTDB database has been corrected

This message indicates that a problem with the RTDB has been corrected.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
0012.0445 CARD 1108 VSCCP RTDB database has been corrected
```

- **UAM 0446** - RTDB Database capacity is 80% full

This message is displayed when a Service Module card detects that its daughterboard memory is at least 80% full.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
** 0012.0446 ** CARD 1108 VSCCP RTDB Database capacity is 80% full
```

- **UAM 0447** - RTDB database capacity alarm cleared

This message indicates that a problem with the RTDB memory has been corrected.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
0012.0447 CARD 1108 VSCCP RTDB database capacity alarm cleared
```

- **UAM 0448** - RTDB database is incoherent

This message indicates that the RTDB database download is in-process.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
* 0012.0448 * CARD 1108 VSCCP RTDB database is incoherent
```

- **UAM 0449** - RTDB resynchronization in progress

This message indicates that the MPS database resynchronization is in-process.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
** 0012.0449 ** CARD 1108 VSCCP          RTDB resynchronization in progress
```

- **UAM 0451** - RTDB reload is required

The RTDB database on the Service Module card needs to be reloaded because the resynch log does not contain all of the required updates.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
** 0012.0451 ** CARD 1108 VSCCP          RTDB reload is required
```

V-Flex Subsystem Alarms

The following alarms are output on the EAGLE 5 ISS for the V-Flex subsystem.

- **UAM 0551** - VFLEX Subsystem is not available

Indicates no SCCP cards have a V-Flex status of active. All are OOS or loading.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
*C 0056.0455 *C VFLEX SYSTEM             VFLEX Subsystem is not available
```

- **UAM 0552** - VFLEX Subsystem is disabled

Indicates all IS-NR SCCP cards have a V-Flex status of Offline (with at least 1 card IS-NR). The **inh-map-ss** command has been executed.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
*C 0056.0456 *C VFLEX SYSTEM             VFLEX Subsystem is disabled
```

- **UAM 0553** - VFLX Subsystem normal, card(s) abnormal

1 SCCP card has V-Flex status of Active and there are 1 or more cards with an V-Flex status other than Active.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
* 0056.0457 * VFLX SYSTEM                VFLX Subsystem normal, card(s) abnormal
```

- **UAM 0554** - VFLEX Subsystem is available

All SCCP cards are IS-NR and have an V-Flex status of Active.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
0056.0458 VFLEX SYSTEM                   VFLEX Subsystem is available
```

- **UAM 0555** - VFLEX Subsystem is removed

Indicates the last SCCP card deleted.

Example:

```
station1234 00-04-30 16:28:08 EAGLE 35.0.0
0056.0459   VFLEX SYSTEM           VFLEX Subsystem is removed
```

Migration System Status Reports

Status reporting described here includes the following:

- System status
- V-Flex status
- Service Module memory capacity status
- Loading mode support status

System Status Reporting

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

The **rept-stat-sccp** command supports the Service Module cards running the VSCCP application and reports V-Flex statistics.

MPS Status Reporting

The **rept-stat-mps** command supports MPS system reporting. **rept-stat-mps** concentrates on reporting the status of the provisioning system. See [Maintenance Commands for V-Flex](#) and [Measurements Commands for V-Flex](#) , for more details. V-Flex statistics are placed in the **rept-stat-sccp** command.

Service Module Memory Capacity Status Reporting

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

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

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

Loading Mode Support Status Reporting

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

Code and Application Data Loading

In general, administrative updates can occur while a Service Module card is loading. The Service Module card should also remain in an in-transition state if the STP portion of the database has completed loading and is waiting for the RTDB to download.

Service Module Code Loading

The EAGLE 5 ISS OAM performs code loading of the Service Module card.

EPAP Application Data Loading

The V-Flex feature requires that new TDM-resident data tables be loaded in addition to those currently supported by EAGLE 5 ISS. The GPL and data loading support this additional table loading while maintaining support for loading the existing EAGLE 5 ISS tables.

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

The VSCCP GPL application data loader registers all tables for loading, independent of the V-Flex feature provisioning and main board / applique hardware configuration. As a result, load requests are always identical. During loading, multiple Service Module load requests are combined into a single download, reducing the overall download time. The Service Module card stores or discards RTDB table data based on whether or not it has RTDB-capable hardware for features like G-Port, G-Flex, INP, and EIR.

The OAM, on the other hand, downloads or sets memory boundaries for the V-Flex options, HOMERN, and service selector tables only if the V-Flex feature is provisioned. When the V-Flex feature is not provisioned, the OAM does not attempt to read these tables from disk. Instead, empty tables (i.e., tables without entries) are downloaded. All other tables requested for loading are read from disk and downloaded routinely.

80% Threshold of Support

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

VSCCP Capacity

An insufficient number of Service Module cards that are is-nr or oos-mt-dsbl relative to 80% of the number of provisioned LIMs is called a “failure to provide adequate SCCP capacity.”

Insufficient SCCP Service

It is also possible for LIMs or Service Module cards to be inhibited or to have problems that prevent them from operating normally. If enough Service Module cards are out of service, it may not be possible for the remaining is-nr Service Module cards to service at least 80% of the number of is-nr LIMs. This is called “insufficient SCCP service.” When this occurs, some of the LIMs are denied SCCP service. It is possible to inhibit LIMs to bring the ratio back to 16:1 (or better).

Conditions That Create an Unstable Loading Mode

Current system implementation interrupts and aborts card loading upon execution of an STP database **chg** command. Loading mode support denies the execution of EAGLE 5 ISS database **chg** commands when the system is in an unstable loading mode. An unstable loading mode exists when any of the following conditions are true:

- The system's maintenance baseline has not been established.
- Less than 80% of the number of LIMs provisioned are is-nr or oos-mt-dsbl.
- The number of is-nr and oos-mt-dsbl sccp cards is insufficient to service at least 80% of all provisioned LIMs.
- Insufficient SCCP service occurs when an insufficient number of is-nr Service Module cards are available to service at least 80% of the number of is-nr LIMs.
- LIM cards are being denied SCCP service and any Service Module cards are in an abnormal state (oos-mt, is-anr).

Actions Taken When the System is in an Unstable Loading Mode

- No effect on RTDB downloads or updates.

Unstable loading mode has no impact on RTDB downloads or the stream of RTDB updates.

- **rept-stat-sys** reports unstable loading mode.

When the loading mode is unstable, the **rept-stat-sys** command reports the existence of the unstable loading mode and the specific trigger that caused it.

- No EAGLE 5 ISS database updates allowed.

When in an unstable loading mode, the EAGLE 5 ISS does not accept database updates. When updates are rejected, the reason is given as: E3112 Cmd Rej: Loading Mode unstable due to SCCP service is deficient.

The **inh-card** and **alw-card** commands can be used to alter SCCP service levels to achieve the 80% threshold. This can be repeated for each card until the system is able to supply SCCP services to at least 80% of the is-nr LIMs. The remaining 20% LIM or supporting Service Module cards may remain out of service until the stream of database updates ceases. This stream of updates can be temporarily interrupted to allow the remaining 20% of the system to come in service.

Once an EAGLE 5 ISS database has been loaded, that database can be updated (as long as the system is not in an unstable loading mode). However, if an database update comes in during EAGLE 5 ISS database

loading, the Service Module aborts the current loading, issues a class 01D7 obit, and reboots. [Figure 5-1](#) shows an example.

Figure 5-1. Obit Message for Abort of Card Loading

```

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

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

User Data Dump :

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

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

```

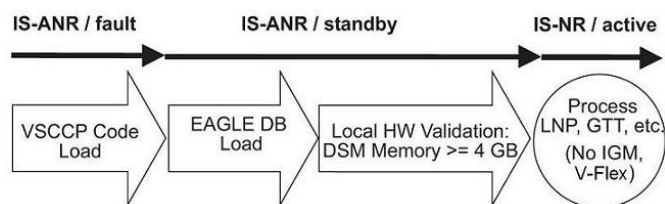
Using the force Option

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

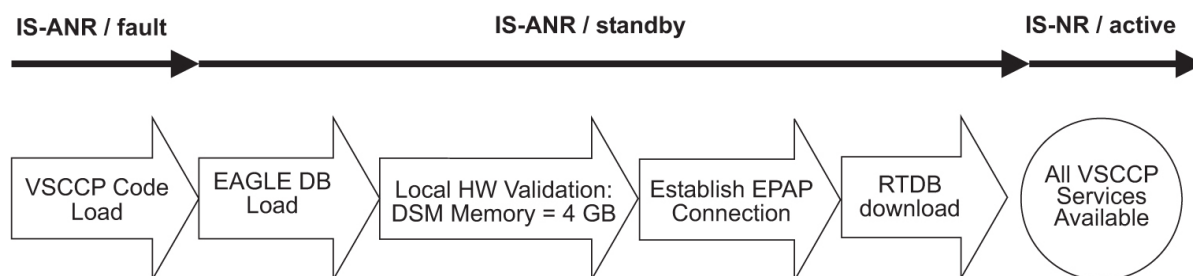
State Transitions during Start-Up

Figures [Figure 5-2](#) through [Figure 5-8](#) show the transitions that a Service Module card goes through as it boots, loads code and data, and runs various VSCCP services. These figures do not illustrate every possible situation, but they do include the most common scenarios involving the V-Flex feature.

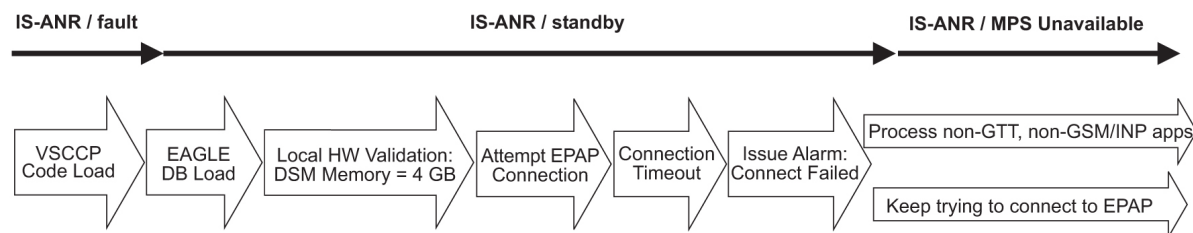
In [Figure 5-2](#), the V-Flex feature is not enabled, and the Service Module card can operate in TSM emulation mode, although it does not provide V-Flex operation.

Figure 5-2. V-Flex Not Enabled, Service Module Running in TSM Emulation

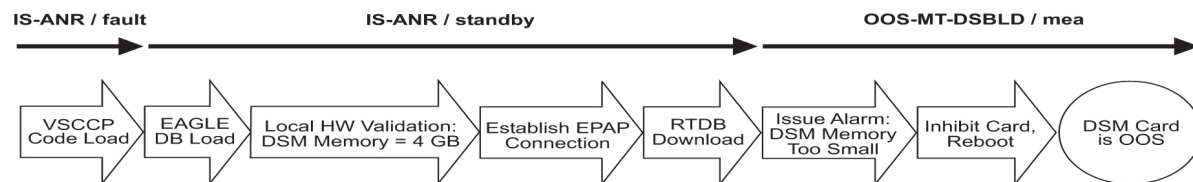
In [Figure 5-3](#), the V-Flex feature is enabled, and the Service Module card memory is 4 GB and is connected to the EPAP. A normal Service Module card operating sequence occurs, providing V-Flex service.

Figure 5-3. V-Flex Enabled, Normal Operating Sequence

In [Figure 5-4](#), the V-Flex feature is enabled, the Service Module card memory is 4 GB, but the Service Module card is unable to connect EPAP; the V-Flex cannot begin operation.

Figure 5-4. V-Flex Enabled, but Service Module Not Connected to EPAP

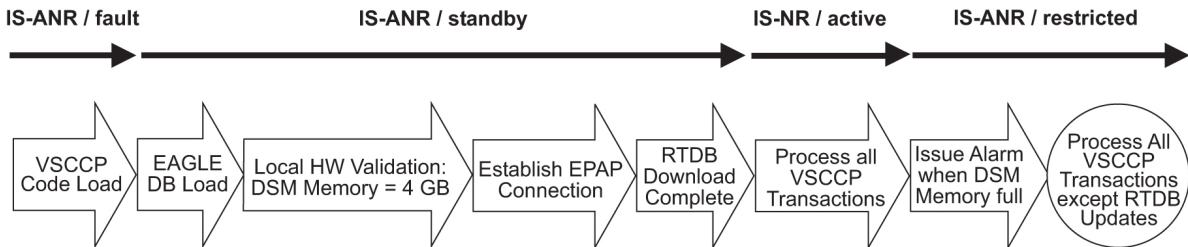
In [Figure 5-5](#), the V-Flex feature is enabled, the Service Module card has the required 4 GB memory and is connected to the EPAP, but the Service Module card is too small for the required database; V-Flex cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module card database capacity requirements.

Figure 5-5. V-Flex Enabled, but Service Module card memory Insufficient for Database

In [Figure 5-6](#), the V-Flex feature is enabled, the Service Module card is connected to the EPAP, but the RTDB grows eventually to exceed the capacity of the Service Module card memory, despite its memory size of 4 GB (an alarm is issued when the Service Module card memory becomes full from the RTDB update). The V-Flex

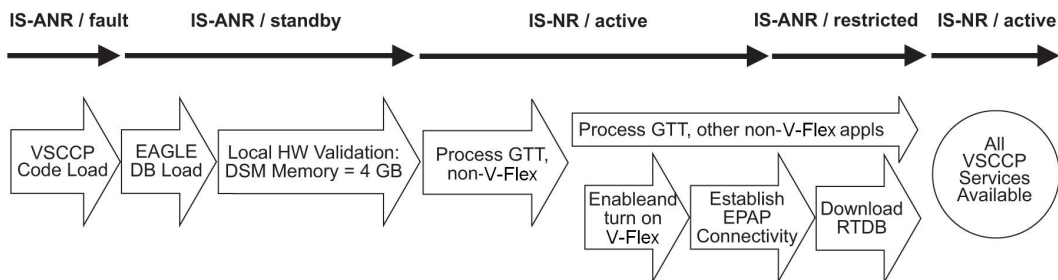
cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module card database capacity requirements.

Figure 5-6. V-Flex Enabled, but Database Exceeds Service Module card memory



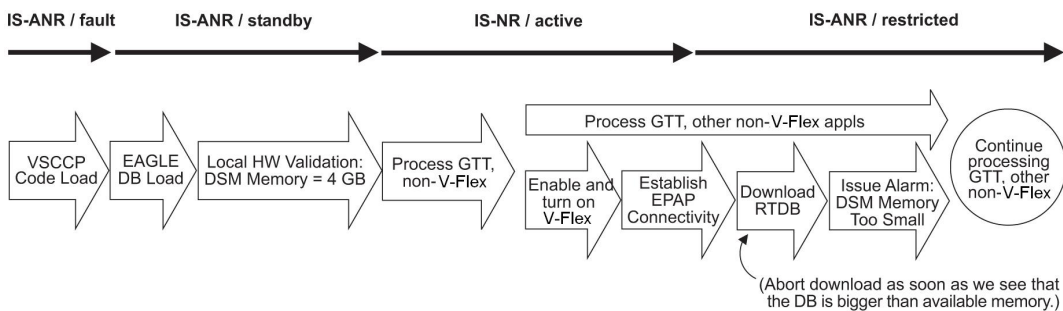
In [Figure 5-7](#), the V-Flex feature is not initially enabled; the Service Module card memory is 4 GB but no EPAP connection; the Service Module card is running other applications when the V-Flex feature is enabled and turned on; the Service Module has sufficient memory to provide V-Flex service.

Figure 5-7. V-Flex Not Enabled at First, but then Activated on Service Module



In [Figure 5-8](#), the V-Flex feature is not initially enabled; the Service Module card memory is 4 GB but no EPAP connection, and is running other applications when the V-Flex feature is turned on. However, the Service Module card memory is insufficient for the needed database, and the cannot provide V-Flex operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the Service Module card database capacity requirements.

Figure 5-8. V-Flex Activation Unsuccessful due to Insufficient Database



V-Flex UIMs

The EAGLE 5 ISS Maintenance Manual contains a complete description of all UIM text and formats. If V-Flex is provisioned, then the following UIMs ([Table 5-2](#)) are used.

Table 5-2. V-Flex UIMs

UIM	Text	Description	Action
1035	SCCP rsp did not route - invalid GTI	The SCCP response did not route due to an invalid GTI	Use a valid GTI in the CGPA part of the query
1036	SCCP rsp did not route - invalid TT	The SCCP response did not route due to an invalid TT	Provision the CGPA TT in the GTT TT table
1037	SCCP rsp did not route - bad Xlation	The SCCP response did not route due to a bad translation	Provision the CGPA GTA address in the GTT database
1038	SCCP rsp did not route - SSP not True PC	The SCCP response did not route due to SSP is not true point code	Use the true point code in the CGPA point code or OPC of the query
1039	SCCP rsp did not route - bad Selectors	The SCCP response did not route due to invalid selectors	Provision the CGPA GTI, TT, NP, and NAI in the EGTT selector table
1040	ITU <-> ANSI translation not supported	This message indicates an invalid translation PC type in attempting to cross the ANSI to ITU domain.	Change the translation PC type to not cross the domain (ANSI <-> ITU), by using the appropriate EPAP commands.
1041	SCCP did not route -no SSN in msg or DB	This message indicates the SCCP message did not route because the SSN was not found in the message or translation data.	Change the message to include the CDPA SSN in the message or provision the SSN in the translation table.
1232	SCCP Encode Failure 2	This message indicates that there is an SCCP encode failure.	Contact the distant end node this message refers to and verify action is being taken to correct the SCCP encode failure problem.
1260	LSS: Unsupported TCAP msg type	The local subsystem received an SCCP message containing an unsupported TCAP (transaction capabilities application portion) message type.	None
1261	LSS: Invalid len in transaction portion	The local subsystem received a TCAP message containing an invalid length in the transaction portion of the message.	None
1262	LSS: Invalid len in dialogue portion	The local subsystem received a TCAP message with an invalid length in the dialogue portion of the message.	None
1263	LSS: Invalid len in component portion	The local subsystem received a TCAP message with an invalid length in the component portion of the message.	None
1264	LSS: No originating transaction ID	The local subsystem received a TCAP message that does not have an originating transaction ID.	None
1265	LSS: Invalid transaction ID len	The local subsystem received a TCAP message containing an invalid transaction ID length.	None
1266	LSS: Dest transaction ID in Begin	The local subsystem received a Begin TCAP message containing a destination transaction ID. (The Begin message should have an originating transaction ID only. A destination transaction ID is	None

UIM	Text	Description	Action
		valid only in Abort, Continue, and End TCAP messages.)	
1267	LSS: No External element	The local subsystem received a TCAP message that does not contain an External element in the dialogue portion of the message.	None
1268	LSS: No External Object Identifier	The local subsystem received a TCAP message that does not contain an Object Identifier element in the External element in the dialogue portion of the message.	None
1269	LSS: Not Structured Dialogue	The local subsystem received a TCAP message with an Object Identifier value in the External element in the dialogue portion that does not indicate a structured dialogue as specified in ITU Q.773.	None
1270	LSS: No External ASN1-Type	The local subsystem received a TCAP message that does not have an ASN1-Type element in the External element in the dialogue portion of the message.	None
1271	LSS: No Dialogue Request	The local subsystem received a TCAP message that does not have a Dialogue Request element in the ASN1-Type element in the dialogue portion of the message.	None
1272	LSS: No Application Context Name	The local subsystem received a TCAP message that does not have an Application Context Name element in the Dialogue Request element in the dialogue portion of the message.	None
1273	LSS: No ACN Object Identifier	The local subsystem received a TCAP message that does not have an Object Identifier element in the Application Context Name element in the dialogue portion of the message.	None
1274	LSS: No component portion	The local subsystem received a TCAP message that does not contain a component portion tag.	None
1275	1275 LSS: First component not an Invoke		
1276	LSS: No Invoke ID	The local subsystem received a TCAP message that does not contain an Invoke ID within the component.	None
1277	LSS: No operation code	The local subsystem received a TCAP message that does not contain an operation code tag within the component.	None
1279	LSS: Unsupported network type	The local subsystem received an SCCP message of an unsupported network type.	None
1280	LSS: Unsupported SCCP msg type	The local subsystem received an SCCP message of an unsupported SCCP message type.	Check translations on the originating switch to determine the trouble
1284	LSS: Unknown SSP PC	The local subsystem received an SCCP message that contained an SSP (Service Switching Point) point code (PC) that is not in the Eagle routing table.	None
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

UIM	Text	Description	Action
1288	LSS: Unsupported operation code	The local subsystem received a TCAP message in which the operation code is unsupported.	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
1293	LSS: Linked ID in query	The local subsystem received an INAP query message containing Linked ID	None
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.

V-Flex Measurements

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

The EAGLE 5 ISS Measurement system supports the collection and retrieval of measurements related to the V-Flex Voice Mail Router (V-Flex) feature. The V-Flex measurement registers are supported only with the Measurements Platform feature enabled and the Measurements Platform option on.

There are five measurement registers specifically for the V-Flex feature (see [Table 5-3](#) and [Table 5-4](#)). 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 IP User Interface (IPUI, Telnet) feature must be on to provide the FTP interface to the customer's network, for the FTP transfer of 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 through the IPUI interface.

Refer to the procedure in the *Database Administration Manual - System Management* for configuring the Measurements Platform and the IPUI 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. See [Measurements Commands for V-Flex](#) and refer to the *Commands Manual* for descriptions of the commands that are used for V-Flex measurements.

Table 5-3. 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
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 5-4. 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

Glossary

A

AINPQ	ANSI-41 INP Query
ANSI	American National Standards Institute
APC	Adjacent Point Code
	Application Processing Chassis
A-Port	ANSI-41 Mobile Number Portability
AS	Application Server

C

CLLI	Common Language Location Identifier
CPU	Central Processing Unit
CSR	Customer Service Request

D

Database	All data that can be administered by the user, including cards, destination point codes, gateway screening tables, global title translation tables, links, LNP services, LNP service providers, location routing numbers, routes, shelves, subsystem applications, and 10 digit telephone numbers.
DB	Database Daughter Board Documentation Bulletin
DCB	Device Control Block
DPC	Destination Point Code The point code of the signaling point to which the MSU is routed. This point code can be adjacent to the EAGLE 5 ISS, but does not have to be.
DSM	Database Service Module.

E

EGTT	Enhanced Global Title Translation
EIR	Equipment Identity Register
EPAP	EAGLE Provisioning Application Processor
EPM	Embedded Platform Module A single-slot card that is similar to the high-capacity blade except that it uses a lower-power CPU and thus does not require external fan trays or extra power.

F

FTP	Feature Test Plan
-----	-------------------

File Transfer Protocol.

G

GB	Gigabyte — 1,073,741,824 bytes
G-Flex	GSM Flexible numbering A feature that allows the operator to flexibly assign individual subscribers to HLRs and route signaling messages, based on subscriber numbering, accordingly.
GPL	Generic Program Load
G-Port	GSM Mobile Number Portability A feature that provides mobile subscribers the ability to change the GSM subscription network within a portability cluster, while retaining their original MSISDN(s).
GSM	Global System for Mobile Communications
GT	Global Title Routing Indicator
GTA	Global Title Address
GTI	Global Title Indicator
GTT	Global Title Translation.

H

HIPR	High-Speed IMT Packet Router
HMUX	High-Speed Multiplexer
HOMERN	Home Network Routing Number Prefix
HW	Hardware

I

IAM	Initial Address Message
ID	Identity, identifier
IDP	Initial Detection Point
IGM	IS41 GSM Migration
INAP	Intelligent Network Application Protocol
INP	INAP-based Number Portability Intelligent Network (IN) Portability
IP	Intelligent Peripheral Internet Protocol
IP7	Tekelec's Internet Protocol to SS7 Interface
ISDN	Integrated Services Digital Network
IS-NR	In Service - Normal
ISDN	Integrated Services Digital Network
ISS	Integrated Signaling System
ITU	International Telecommunications Union
ITU-I	ITU International
ITU-N	ITU National

L

LIM	Link Interface Module
Link	Signaling Link
LNP	Local Number Portability
LSS	Local Subsystem

M

MAP	Mated Application Part Mobile Application Part
MCP	Measurement Collection Processor This application is used by the MCPM card for the Measurements Platform feature.
MCPM	Measurement Collection and Polling Module
MPS	Multi-Purpose Server
MSC	Mobile Switching Center
MSISDN	Mobile Station International Subscriber Directory Number The MSISDN is the number dialed by someone trying to reach the subscriber.
MSU	Message Signaling Unit

N

NAI	Nature of Address Indicator
NP	Number Plan Numbering Plan Number Portability

O

OAM	Operations, Administration, and Maintenance
OPC	Originating Point Code
OPS	Operator Provisioning System

P

PC	Point Code.
PDB	Provisioning Database
PDBA	Provisioning Database Application
PDBI	Provisioning Database Interface
PPP	Point-to-Point Protocol

R

Restricted	The network management state of a route, link set, or signaling link that is not operating properly and cannot carry all of its traffic. This condition only allows the highest priority messages to sent to the database entity first, and if space allows, followed by the other traffic.
------------	---

Traffic that cannot be sent on the restricted database entity must be rerouted or the traffic is discarded.

RFC	Request for Comment
RMTP	Reliable Multicast Transport Protocol
RN	Routing Number
Route	A path to another signaling point.
RSP	Routeset Prohibited Test (Msg)
RSR	Reset Request
RTDB	Real Time Database

S

SCCP	Signaling Connection Control Part
SOR	Support of Optimal Routing System Out of Service Request
SP	Service Provider Signaling Point
SS	Subsystem
SSN	SS7 Subsystem Number Subsystem Number
SSP	Subsystem Prohibited network management message. Subsystem Prohibited SCCP (SCMG) management message. (CER) Service Switching Point (SS7 Network)
STP	Signal Transfer Point

T

TCAP	Transaction Capabilities Application Part
TCP	Transfer-Cluster-Prohibited Transfer Control Protocol Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TDM	Terminal Disk Module. Time Division Multiplexing.
TFA	TransFer Allowed (Msg)
TFP	TransFer Prohibited (Msg)
True Point Code	The point code defining a destination in the Destination Point Code table.
TSM	Translation Services Module
TT	Translation Type.

U

UAM	Unsolicited Alarm Message.
UDP	User Datagram Protocol
UIM	Unsolicited Information Message

V

VMS

Voice Mail Server

VSCCP

VxWorks Signaling Connection Control Part

The application used by the Service Module card to support the G-Flex, G-Port, INP, AINPQ, EIR, A-Port, IGM, V-Flex, and LNP features. If the G-Flex, G-Port, INP, AINPQ, EIR, A-Port, IGM, V-Flex, or LNP feature is not turned on, and a Service Module card is present, the VSCCP GPL processes normal GTT traffic.

Index

100BASE-T Ethernet bus 2-13

10BASE-T Ethernet bus 2-13

A

active/standby EPAP servers 2-16

active 5-2

active EPAP 2-14 , 2-17 , 2-23 , 5-2

active EPAP RTDB process 2-17

admonishments, documentation 1-4

alarm conditions 5-2

alw-card 5-12

C

card loading interrupted or aborted 5-12

Coherent 2-21

congestion 5-2

congestion indicator 5-2

Current 2-20

Customer Care Center 1-6

customer network 2-17

customer's external provisioning system 2-17

D

database

loading complete 5-11

database memory requirements 5-10

database

records 2-14

data from customer network 2-17

DCBs 2-21

destination point code 2-27

device control blocks 2-21

documentation

admonishments 1-4

down 5-2

dual provisioning 2-17

E

EAGLE 5 ISS mated application table 2-26

Eagle Commands for V-Flex Feature 3-2

Eagle Provisioning Application Processor
2-12 , 2-14 , 2-17

EAGLE Provisioning Application Processors
2-16

Eagle Service Module card databases 2-12

ent-card 5-13

entity PC 2-26

entity point codes 2-26

EPAP 'A' 5-2

EPAP 'B' 5-2

EPAP 2-12 , 2-13 , 2-14 , 2-16 , 2-17

EPAP A, Link A 2-19

EPAP A, Link B 2-20

EPAP A 2-16

EPAP architecture 2-17

EPAP automatically updates PDB 2-17

EPAP B, Link A 2-20

EPAP B, Link B 2-20

EPAP B 2-16

EPAP network addresses 2-25

ept-stat-epap 2-21

Ethernet links 2-13

F

force option 5-13

G

Globalcast Communications 2-19

H

high provisioning traffic situations 5-2

high-traffic situations 2-18

I

identify active EPAP 5-2

import/export traffic 2-22

incremental loading 2-20
 Incremental update 2-20
 incremental updates 2-20
 inh-card 5-12 , 5-13
 inhibit LIMs 5-12
 initializing Service Module cards 2-19
 inoperative 5-2
 IP 2-19
 IP link established 5-2
 IP Multicast 2-19

L

LIMs denied SCCP service 5-12
 link congestion 5-2
 load balancing 2-18
 Load Mode Status 5-3
 local provisioning terminal 2-17
 loss of connectivity 2-19

M

maintenance application traffic 2-23
 maintenance blocks 5-2
 mated application table 2-26
 mated EPAP system 2-13
 mated MPS servers 2-13
 mated pair configuration 2-17
 memory requirements 5-10
 modem for remote access 2-17
 MPS 2-16
 MPS platform 2-12
 multi cast updates 2-17
 multiple Service Modules 2-20
 Multi-Purpose Server (MPS) hardware 2-16
 Multi-Purpose Server 2-12
 MySQL 2-17

N

network addresses 2-25

O

OAM provisioning 2-24
 OPS 2-16

out-of-sync 2-26
 out-of-sync condition 2-27
 overlapping database updates 2-17

P

PDB 2-16
 PDBA 2-14 , 2-22
 PDBI 2-15
 platforms 2-13
 primary Service Module card 5-2
 Provisioning Database 2-13 , 2-16 , 2-17
 Provisioning Database Application 2-14
 Provisioning Database Interface 2-15
 provisioning link congestion 5-2
 provisioning Service Module cards 2-17
 provision Service Module cards 2-14
 provision V-Flex 2-14

R

RealTime Database 2-13
 real-time database 2-15
 Realtime Database 2-16
 Reliable Multicast Transport Protocol-II 2-19
 reloading multiple Service Modules 2-20
 rept-stat-epap 5-2 , 5-10
 rept-stat-sccp 5-2 , 5-10
 rept-stat-sys 5-10 , 5-11 , 5-12
 RMTP-II 2-19
 RMTP multicast 2-14
 route table 2-26
 RS232 connection 2-15
 RS232 serial port 2-16
 RTDB 2-16
 RTDB database 2-17
 run VSCCP GPL 5-1

S

send status message 2-20
 Service Module 2-16
 Service Module card polls 2-17
 Service Module card provisioning module 2-14

Service Module cards 2-12 , 5-1
Service Module card status 5-2
Service Module Memory Size 5-3
Service Module-VxWorks-SCCP application
2-18
Stage 1 loading 2-20
standby 5-2
standby EPAP 2-14 , 2-17 , 2-23
STP database updates sent 2-16
subsystem numbers 2-26

T

TCP/IP socket 2-19
TDM fixed disk 2-16
TDM-resident data tables 5-11
transitions of Service Module card 5-13

U

UAMs messages 5-3
UDP 2-19
UIM message 2-26
user interface traffic 2-22

V

V-Flex
capability 2-11
Capability Point Codes 2-12
subsystem 2-11
V-Flex UAMs 5-3
VSCCP 2-18
VSCCP GPL 5-1
VxWorks OS 2-18

