Oracle® Communications
EAGLE V-Flex User's Guide

Release 46.9

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Contents

5   V-Flex Measurements

6   Maintenance

My Oracle Support

My Oracle Support (MOS) is your initial point of contact for any of the following requirements:

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

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

  – A total system failure that results in loss of all transaction processing capability

  – Significant reduction in system capacity or traffic handling capability

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

  – Inability to restart a processor or the system

  – Corruption of system databases that requires service affecting corrective actions

  – Loss of access for maintenance or recovery operations

  – Loss of the system ability to provide any required critical or major trouble notification

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

- **Training Need**
  Oracle University offers training for service providers and enterprises.

A representative at Customer Access Support (CAS) can assist you with MOS registration.

Call the CAS main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at Oracle Support Contacts. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select 2 for New Service Request

2. Select 3 for Hardware, Networking and Solaris Operating System Support

3. Select one of the following options:

   - For Technical issues such as creating a new Service Request (SR), Select 1

   - For Non-technical issues such as registration or assistance with MOS, Select 2

You will be connected to a live agent who can assist you with MOS registration and opening a support ticket.

MOS is available 24 hours a day, 7 days a week, 365 days a year.

What's New in This Guide

There are no updates in this document for Release 46.9.

1
Introduction

V-Flex is an Oracle Communications EAGLE feature that allows operators to customize 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.

1.1 Overview

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

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

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

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

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

V-Flex supports two different query types:

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

V-Flex Functions

V-Flex provides the following functions:

- Flexible number mapping to provide a logical link between a subscriber (MSISDN/DN) and a VMSC

- Support for up to 8 DNs per subscriber

- Support for individual and range entries

- Up to 240 million subscriber numbers, scalable in increments of 500,000

- Up to 50,000 MSISDN range entries

- Database support for variable-length numbers from 1 to 15 digits

- Number normalization feature to store numbers in international format and automatically translate national numbers to international numbers before searching the database, preventing duplicate number storage

V-Flex Considerations

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

V-Flex and North American LNP are mutually exclusive in an EAGLE node, unless the Dual ExAP Configuration feature is enabled.

1.2 Scope and Audience

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

1.3 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

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

Table 1-1   (Cont.) Admonishments

Icon	Description
TOPPLE	Topple: (This icon and text indicate the possibility of *personal injury* and *equipment damage*.)

1.4 Manual Organization

This document is organized into the following chapters:

- Introduction contains general information about the **V-Flex** documentation, the organization of this manual, and how to get technical assistance.

- Feature Description provides a functional description of the V-Flex feature, including network perspectives, assumptions and limitations, a database overview, **Service Module card** provisioning and reloading, and V-Flex user interface overview.

- EAGLE V-Flex Commands describes the commands that can be used for V-Flex feature configuration functions.

- V-Flex Configuration provides procedures for configuring the V-Flex feature for use in the EAGLE.

- V-Flex Measurements describes V-Flex-related measurements, measurements reports, and methods of collection.

- Maintenance describes V-Flex-related UAMs and UIMs; commands that can be used for maintenance functions; and status and alarm reporting for the EAGLE, Oracle Communications EAGLE Application Processor Provisioning (EPAP), Service Module cards, services, and the local subsystem.

1.5 Related Publications

For information about additional publications related to this document, refer to the Oracle Help Center site. See Locate Product Documentation on the Oracle Help Center Site for more information on related product publications.

1.6 Locate Product Documentation on the Oracle Help Center Site

Oracle Communications customer documentation is available on the web at the Oracle Help Center (OHC) site, http://docs.oracle.com. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at http://www.adobe.com.

1. Access the Oracle Help Center site at http://docs.oracle.com.

2. Click `Industries`.

3. Under the Oracle Communications subheading, click the `Oracle Communications documentation` link.

The Communications Documentation page appears. Most products covered by these documentation sets will appear under the headings "Network Session Delivery and Control Infrastructure" or "Platforms."

4. Click on your Product and then the Release Number.

   A list of the entire documentation set for the selected product and release appears.

5. To download a file to your location, right-click the `PDF` link, select `Save target as` (or similar command based on your browser), and save to a local folder.

2

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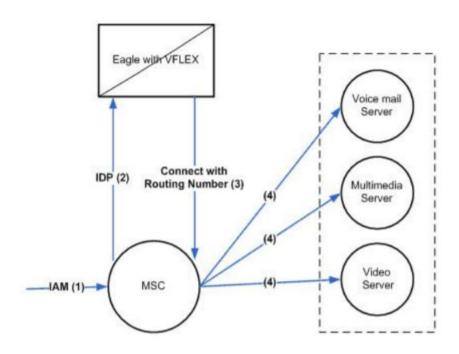
This chapter describes how V-Flex permits routing of calls to voice mail systems with specific capabilities based on subscriber and call context information.

2.1 V-Flex Feature Overview

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

1. MSC receives an **IAM** for a call being routed to a VMS

2. MSC is programmed to generate an IDP to the EAGLE (instead of directly to a **VMS**)

3. EAGLE, 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 Scenarios using v-flex

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

- The MSISDN of the subscriber whose voice mail is being accessed

- The VMS ID assigned to that subscriber (MSISDN)

- The Voice Mail Routing Number of the VMS associated with the MSISDN of the subscriber

Determining the MSISDN

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

A valid MSISDN is defined as :

- An MSISDN found in the IDP query

- An MSISDN correctly encoded in the IDP query

- An MSISDN found either as a DN or within DN Block in the RTDB

- An MSISDN or DN Block that has an associated VMS ID or GRN entity

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

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

- Redirected call to a VMS by the MSC

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

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

- Check for MSISDN in Re-Directing Number (RDN)

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

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

- If there is a match on the VM prefix, get MSISDN from CdPN / CdPBCDN following VM prefix digits

- If there is no match on the VM prefix in CdPN / CdPBCDN, get MSISDN from INAP/CAP CgPN

- 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.

2.2 V-Flex Protocol

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

Multiple Local Subsystems

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

Messages for Local Subsystems

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

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

*   If the message arrived route-on-ssn, the message is not rerouted to the mate. In this case, EAGLE is acting as an end node, and end nodes do not reroute. If the return on error option is set, the EAGLE 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 is acting as both STP and SCP, and STPs do reroute messages.

MTP and SCCP Management to Support V-Flex

If the V-Flex subsystem is offline, the EAGLE 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 will send response method **TFP**s 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 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 **True Point Code**, the EAGLE will not generate a **TFP**. Therefore, nodes that send *rt-on-gt* traffic to the EAGLE should use a V-Flex capability point code, not the EAGLE **True Point Code**.

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

2.3 Hardware Requirements

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

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

2.4 MPS/EPAP Platform

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

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

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

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

3

EAGLE V-Flex Commands

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

3.1 EAGLE Commands

This chapter describes the EAGLE commands used for the configuration of the Voice Mail Router (V-Flex) feature. Refer to *Commands User's Guide* for complete command descriptions including parameter names, valid parameter values, examples, and dependencies.

Table 3-1   Commands used for V-Flex

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

3.1.1 EAGLE Feature Control Commands

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

The `chg-feat` and `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.

> **Note:**
>
> As of Release 46.3, the `fak` parameter is no longer required. This parameter is only used for backward compatibility.

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 Oracle-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 Oracle-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.

3.1.2 EAGLE 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.

- The `ent-srvsel` command specifies the applicable service selectors to define a V-Flex DSM service entry.
  The `ssn=*` parameter is supported for the V-Flex subsystem. The `snp` and `snai` parameters are not needed in V-Flex service selectors.

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

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

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

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

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

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

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

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

- The `rtrv-srvsel` command displays a list of provisioned service selector combinations. All output is sorted first by service, then by global title domain (ANSI first, followed by ITU), GTI, translation type, numbering plan, and the nature of address indicator. The output can be filtered by specifying various optional parameters.
  Because of the large number of service selectors that can be in the database, the `rtrv-srvsel` command can be entered with the `num` and `force` parameters. The `num` parameter specifies the maximum number of entries to display. The `force` parameter must be specified to display more than 50 entries. This prevents trying to display extremely large numbers of entries, which could take hours.

3.1.3 EAGLE V-Flex Options Commands

The `chg-vflx-opts` and `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 3-2 `chg-vflx-opts` Parameters - Class = DATABASE

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

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

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

3.1.4 EAGLE 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.

3.1.5 EAGLE Voice Mail Prefix Commands

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

- `ent-csl` - Enter Common Screening List

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

- `chg-csl` - Change Common Screening List

  The `chg-csl` command is used to change a Voice Mail prefix digit string; the new string is specified in the following parameter:
  `:ds` - Specify 1-15 hexadecimal digits for the prefix
  The V-Flex feature is identified in the command by one of the following parameters:
  `:feature` - Specify the feature name as it appears in the `rtrv-ctrl-feat` command output when the feature is enabled (:feature="VFLEX")
  `:pn` - Specify the V-Flex feature part number 893016701

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

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

- `dlt-csl` - Delete Common Screening List

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

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

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

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

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

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

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

- `rtrv-csl` - Retrieve Common Screening List

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

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

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

3.1.6 EAGLE 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

3.1.7 EAGLE Voice Mail Server ID Commands

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3.1.8 EAGLE Call Decision Entry Commands

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

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

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

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

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

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

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

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

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

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

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

  `:cdn` - An existing call decision entry name

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

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

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

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

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

  `:cdn` – An existing call decision entry name

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

    The `rtrv-vflx-cd` command is used to display the provisioned V-Flex call decision entries.

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

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

    `:vmdig` - Voice mail number or voice mail prefix digits

4

V-Flex Configuration

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

4.1 Introduction

The V-Flex feature is configured on the EAGLE and on the EPAP. This chapter describes prerequisites and procedures for the EAGLE configuration only. The EPAP configuration is covered in *Administration Guide*. Refer to *Commands User's Guide* for complete descriptions of the commands used in the procedures in this chapter.

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

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

4.1.1 EPAP Entity Provisioning

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

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

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

4.1.2 System Prerequisites

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

Table 4-1   System Prerequisites

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

4.1.3 V-Flex Feature Prerequisites

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

Table 4-2   V-Flex Feature Prerequisite

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

Table 4-2 (Cont.) V-Flex Feature Prerequisite

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

4.2 V-Flex Configuration Procedure

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

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

2. Verify, and provision if needed, the feature prerequisites. See V-Flex Feature Prerequisites.

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

4. Refer to the procedures in *Database Administration - SS7 User's Guide* to change the self identification of the EAGLE node to include true point codes and V-Flex capability point codes.

   Messages for the V-Flex local subsystem can arrive Rt-on-SSN or Rt-on-GT. All MSUs must contain the EAGLE 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 supports ANSI, ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare capability point code types. including group codes. ITU-N24 capability point codes are not supported.

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

   - Translation types and mappings

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

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

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

   a. ANSI

   b. ITU-N

   c. ITU-N Spare

   d. ITU-I

    e. ITU-I Spare

6. Provision state and subsystem number for the V-Flex local subsystem application. See Adding the V-Flex Subsystem Application.

7. Provision final GTT routing to an EAGLE PC and the V-Flex local subsystem. GTT routing information must be provisioned properly in GTT tables. Refer to the procedures in *Database Administration - GTT User's Guide*.

Rt-on-GT MSUs can arrive either with SCCP CdPA information that matches an EAGLE service selector, or with a GTA address that has been provisioned to translate to the 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 will reroute the message to the mated subsystem. In this case, the EAGLE is acting as both STP and SCP, and STPs do reroute messages. If a message arrives Rt-on-GT for the EAGLE TSPC, the EAGLE cannot generate a TFP. The EAGLE 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 should use one of the V-Flex CPCs, not the EAGLE TSPC.

See Activating the V-Flex Subsystem.

> ✎ **Note:**
>
> Direct DPC/SSN routing to the EAGLE PC and the V-Flex local subsystem (SSN) is handled on the network card. No provisioning is required.
> Rt-on-SSN MSUs should contain the EAGLE 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 will not reroute the message to the mate. In this case, the EAGLE is acting as an end node, and end nodes do not reroute. If possible, the EAGLE will generate network management messages to force the network to transition traffic to the mate.
>
> Because the EAGLE cannot generate an SSP when a message arrives Rt-on-SSN for the EAGLE CPC, it is preferred that nodes sending Rt-on-SSN traffic use one of the EAGLE TSPCs.

8. Provision the service selector mechanism to route MSUs to the V-Flex subsystem. See Adding a V-Flex Service Selector.
The V-Flex service is `vflex`.

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

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

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

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

9. Provision V-Flex options. See Provisioning the V-Flex Options.

10. Provision Home Routing Number (HOMERN) prefix entries. See Provisioning HOMERN Entries.

11. Provision Voice Mail screening prefix entries. See Provisioning Voice Mail Prefix Entries.

12. Provision Voice Mail routing numbers (VM RN) . See Provisioning Voice Mail Routing Numbers.

13. Provision Voice Mail Server ID (VMSID) entries. See Provisioning Voice Mail Server ID Entries.

14. Provision Call Decision entries. See Provisioning Call Decision Table Entries.

15. Activate the V-Flex local subsystem. See Activating the V-Flex Subsystem.

16. Configure the Measurements Platform if measurements are to be collected for V-Flex.

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

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

4.3 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.

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

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

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

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

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

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

In the `rtrv-stpopts` command output:

- The `defcc` and `defndc` parameters are displayed with value NONE when the V-Flex feature is enabled

- The `dsmaud` parameter is displayed with value OFF when the V-Flex feature is turned on

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

After the feature is turned on:

- The `defcc` and `defndc` parameter values cannot be set to NONE.

- The DSM audit running state (`dsmaud`) parameter of the `chg-stpopts` command can be provisioned for V-Flex

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

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

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

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

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

   • If the parameter values are not NONE, continue with 3.

   • If the parameter values are NONE, use the `chg-stpopts` command to change the values. Then continue with 3

3. Enable the V-Flex feature, by entering the `enable-ctrl-feat` command.

   ```
   enable-ctrl-feat:partnum=893016701:fak=<feature access key>
   ```

   > **Note:**
   >
   > The Feature Access Key is provided when the feature is purchased. If you do not have the controlled feature part number or the Feature Access Key for a feature, contact your Sales Representative or Account Representative.

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

   ```
   rlghncxa03w 09-06-29 16:40:40 EST  EAGLE5 41.1.0
   The following features have been permanently enabled:
   Feature Name              Partnum    Status  Quantity
   HC-MIM SLK Capacity       893012707  on            64
   VFLEX                     893016701  off         ----
   ;
   ```

4. Turn on the V-Flex feature, by entering the `chg-ctrl-feat` command.

   ```
   chg-ctrl-feat:partnum=893016701:status=on
   ```
   When the feature is turned on, the status changes to on in the `rtrv-ctrl-feat` command output.

   ```
   rlghncxa03w 09-06-29 16:40:40 EST  EAGLE5 41.1.0
   The following features have been permanently enabled:
   Feature Name              Partnum    Status  Quantity
   HC-MIM SLK Capacity       893012707  on            64
   VFLEX                     893016701  on          ----
   ;
   ```

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

   ```
   chg-db:action=backup:dest=fixed
   ```
   The following messages appear; the active Maintenance and Administration Subsystem Processor (MASP) appears first.

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

4.4 Provisioning V-Flex as a Local Subsystem

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

- Adding the V-Flex Subsystem Application
- Removing a Local Subsystem Application

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

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

4.4.1 Adding the V-Flex Subsystem Application

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

Before the V-Flex subsystem application can be added to the database, the conditions described in Table 4-3 must exist in the system:

Table 4-3   V-Flex Subsystem Application Prerequisites

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

Table 4-3   (Cont.) V-Flex Subsystem Application Prerequisites

Prerequisite	Verification
EAGLE true point codes and V-Flex capability point codes must be defined, and entered in the Mated Application table with a subsystem number to be used for the V-Flex subsystem application.	Only one subsystem number for the application can be defined, and must be used for all point code types assigned to the local subsystem..
	Enter the `rtrv-sid` command, and verify that the true and capability point codes needed for the feature are correct. If changes are required, refer to the procedures in the *Database Administration - SS7 User's Guide*.
	Enter the `rtrv-map` command, and verify that the MAP table entries are correct for the V-Flex local subsystem. If changes are required, refer to the procedures in the *Database Administration Manual – GTT User's Guide* for provisioning solitary and dominant mated applications.

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

1. Add the V-Flex application and subsystem number, using the `ent-ss-appl` command.

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

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

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

    ```
    tekelecstp 07-07-25 08:02:22 EST  EAGLE 37.6.0
    APPL    SSN   STAT
    VFLEX   100    online

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

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

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

4.4.2 Removing a Local Subsystem Application

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

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

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

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

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

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

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

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

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

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

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

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

6. Verify the changes by entering the `rtrv-ss-appl` command. The deleted entry should not appear in the output.

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

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

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

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

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

4.5 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 used in these procedures are described briefly in EAGLE Service Selector Commands. Refer to *Commands User's Guide* for complete descriptions of the commands used in these procedures.

4.5.1 Adding a V-Flex Service Selector

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

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

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

   ```
       rlghncxa03w 09-06-29 16:40:40 EST  EAGLE5 41.1.0
       The following features have been permanently enabled:
       Feature Name            Partnum    Status  Quantity
       HC-MIM SLK Capacity     893012707  on            64
       VFLEX                   893016701  on          ----
   ;
   ```

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

   • If the V-Flex feature is enabled and turned on, continue with 2.

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

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

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

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

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

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

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

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

4.5.2 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 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.
    ```

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

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

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

:nserv
New DSM service type, `VFLEX`

:nsnp
A V-Flex service selector cannot contain an SNP value; if the service selector being changed contains an SNP value, this value must be changed to `none` with this parameter.

:nsnai
A V-Flex service selector cannot contain an SNAI value; if the service selector being changed contains an SNAI value, this value must be changed to none with this parameter.

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

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

:tt
Translation type

:ssn
Subsystem number

:nai
Nature of address indicator

:naiv
Nature of address indicator value

:np
Numbering plan

:npv
Numbering plan value

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

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



    GTII  TT   NP      NAI  SSN  SNP    SNAI   SERV

    4     1    e214    intl 4    e164   intl   gport

    4     1    e214    intl 5    e164   intl   smsmr

    4     2    e214    intl 5    e164   intl   mnpsms

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

```
GTIN  TT   NP        NAI   SSN  SNP    SNAI   SERV

4     4    e214     natl  34   e164   intl   gflex

4     9    e214     natl  ---  e164   intl   gflex



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

;

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

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

```
rlghncxa03w 09-06-29 16:40:40 EST  EAGLE 41.1.0
The following features have been permanently enabled:
Feature Name            Partnum    Status  Quantity
HC-MIM SLK Capacity     893012707  on            64
VFLEX                   893016701  on          ----
```
;

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

- If the V-Flex feature is enabled and turned on, continue with 3.

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

```
chg-
srvsel:gtin=4:tt=4:np=e214:nai=natl:ssn=34:nsnp=none:nsnai=no
ne: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.

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

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

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



    GTIN  TT  NP       NAI   SSN  SNP   SNAI   SERV

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



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

;
```

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

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

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

4.6 Provisioning the V-Flex Options

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

- The destination routing address (`dra`) can contain the Routing Number (RN), the Routing Number + Dialed Number (RN + DN), or the Country Code + Routing Number + Dialed Number (CC + DN + RN).

- The Nature of Address Indicator can be specified as a mnemonic (`dranai`) or an explicit value to indicate a subscriber number, a national significant number, an international number, a network specific number, or an unknown type of number.

- The Numbering Plan can be specified as a mnemonic (`dranp`) or an explicit value (`dranpv`) to indicate an **ISDN**/telephony numbering plan, a data numbering plan, or a telex numbering plan.

- If the Network Query Only option is set to on, the Call Decision table is searched after **RTDB** lookup, for the specified network entity type: a Voice Mail Server ID (VMSID), a signaling point routing number (SP), or a generic routing number (GRN - the Routing Number provided by the RTDB lookup).

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

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

```
    rlghncxa03w 09-06-29 16:40:40 EST   EAGLE5 41.1.0
    The following features have been permanently enabled:
    Feature Name              Partnum     Status  Quantity
    HC-MIM SLK Capacity       893012707  on             64
    VFLEX                     893016701  on           ----
;
```

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

   • If the V-Flex feature is enabled and turned on, continue with 2.

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

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

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

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

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

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

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

4.7 Provisioning HOMERN Entries

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

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

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

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

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

1. Display the HOMERN table entries, by entering the `rtrv-homern` command.

2. Enter the home routing number prefixes that will be used for V-Flex. Use the following command for each prefix:

   `ent-homern:rn=<routing number>`

3. Verify the changes by entering the `rtrv-homern` command.

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

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

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

4.8 Provisioning Voice Mail Prefix Entries

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

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

```
    rlghncxa03w 09-06-29 16:40:40 EST  EAGLE5 41.1.0
    The following features have been permanently enabled:
    Feature Name             Partnum     Status  Quantity
    HC-MIM SLK Capacity      893012707   on            64
    VFLEX                    893016701   on          ----
;
```

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

   • If the V-Flex feature is enabled and turned on, continue with 2.

2. Display the Common Screening List table entries, by entering the `rtrv-csl` command.

3. Enter the Voice Mail prefix digit strings that will be used for V-Flex. Enter the following for each prefix:

   `ent-csl:feature="VFLEX":dn=<digit string>`

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

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

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

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

4.9 Provisioning Voice Mail Routing Numbers

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

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

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

    ```
    rlghncxa03w 09-06-29 16:40:40 EST  EAGLE5 41.1.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on            64
    VFLEX                     893016701  on          ----
    ;
    ```

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

    • If the V-Flex feature is enabled and turned on, continue with 2.

2. Display the voice mail routing numbers, by entering the `rtrv-vflx-rn` command.

3. Enter the Voice Mail routing numbers that will be used for V-Flex. Enter the following for each routing number:

    `ent-vflx-id:rnname=<RN Name>:rn=<Routing Number digits>`

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

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

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

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

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

4.10 Provisioning Voice Mail Server ID Entries

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

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

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

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

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

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

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

```
    rlghncxa03w 09-06-29 16:40:40 EST  EAGLE5 41.1.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    HC-MIM SLK Capacity       893012707  on            64
    VFLEX                     893016701  on          ----
;
```

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

- If the V-Flex feature is enabled and turned on, go to 2.

2. Display the Voice Mail Server IDs, by entering the `rtrv-vflx-vmsid` command.

3. Enter the Voice Mail routing numbers that will be used for V-Flex. For each VMSID, enter the `ent-vflx-vmsid` command and specify the routing numbers that wil be used for the VMSID.

4. Verify the changes by entering the `rtrv-vflx-vmsid` command.

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

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

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

4.11 Provisioning Call Decision Table Entries

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

- Voice Mail Number/Voice Mail Prefix (1-15 hexadecimal digits)

- INAP/CAP Redirection Indicator (redirected, not redirected)

- INAP/CAP Bearer Capability

- MSISDN/RN status indicator in the database (Found, Not Found, Does not matter -*)

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

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

```
rlghncxa03w 09-06-29 16:40:40 EST  EAGLE5 41.1.0
The following features have been permanently enabled:
Feature Name              Partnum    Status  Quantity
HC-MIM SLK Capacity       893012707  on            64
VFLEX                     893016701  on          ----
;
```

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

- • If the V-Flex feature is enabled and turned on, go to 2.

2. Display the Call Decision entries, by entering the `rtrv-vflx-cd` command.

3. Enter the Call Decision entries that will be used for V-Flex. Enter the `ent-vflx-cd` command for each Call Decision entry:

4. Verify the changes by entering the `rtrv-vflx-cd` command.

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

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

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

4.12 Activating the V-Flex Subsystem

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

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

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

When the local subsystem operating state is Inhibited, the `chg-ss-appl:appl=` command can be used to specify the value `online` or the value `offline` to control the persistent setting for the local subsystem. The `rtrv-ss-appl` command always displays the online or offline provisioned value. When the first Service Module card is loaded, this state tells whether the subsystem should be considered allowed (online) or inhibited (offline). This is a database state. If the command is accepted, then the change is made to the tables and can be read after an `init-sys` command is entered to initialize the system.

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

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

Table 4-4   Subsystem Allow/Inhibit

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

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

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

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

2. Change the V-Flex subsystem to status to online.

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

3. Enter the command to allow the V-Flex subsystem to begin operation.

   `alw-map-ss:ssn=<V-flex ssn>`

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

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

4.13 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.

4.13.1 Taking the Subsystem Application Offline

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

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

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

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

If the V-Flex subsystem is offline, this procedure does not need to be performed.

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

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

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


    rlghncxa03w 09-05-28 14:42:38 GMT EAGLE 41.0.0
    Inhibit map subsystem command sent to all SCCP cards.
    Command Completed.
;
```

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

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

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

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

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

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

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

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

4.13.2 Taking the Subsystem Application Online

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

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

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

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

If the V-Flex subsystem is online, this procedure does not need to be performed.

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

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

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

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

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

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

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

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

4.14 Configuring the Measurements Platform

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

For information about V-Flex measurements, see V-Flex Measurements in this manual and refer to *Measurements Reference*. Refer to the procedures in *Database Administration - System Management User's Guide* for configuring the Measurements Platform feature in the EAGLE.

5

V-Flex Measurements

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

5.1 V-Flex Measurements

The EAGLE Measurements subsystem supports the collection and retrieval of measurements related to the Voice Mail Routere (V-Flex) feature . The V-Flex measurements can be collected with either of the following collection methods:

- The Measurements Platform feature enabled and the Measurements Platform collection option on

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

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

Refer to *Measurements Reference* for descriptions of collection methods, measurements, measurements reports, and detailed measurement usage information.

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

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

The EAGLE 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 collection option on.

There are five measurement registers specifically for the V-Flex feature (see Table 5-1 and Table 5-2). The registers are reported in two new V-Flex reports (VFLX_SYS and VFLX_SSP) that have been added to the Hourly Maintenance Measurements (MTCH) report and Daily Maintenance Measurements (MTCD) report.

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

Refer to the procedure in *Database Administration - System Management User's Guide* for configuring the Measurements Platform feature in the EAGLE.

When the V-Flex feature is on, the **MCP** application collects V-Flex measurements data each hour following the hour boundary (0000, 0100, 0200, etc.). The collected data is retained in the appropriate data store. The retention period for hourly V-Flex measurements data is 24 hours. The V-Flex measurements data collected each hour

is aggregated into a daily sum total that is reported in the MTCD report. The retention period for daily V-Flex measurements data is 7 days.

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

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

Table 5-1   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 5-2   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

6

Maintenance

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

6.1 V-Flex Alarms

Table 6-1 lists the alarms (UAMs) used to support the V-Flex subsystem. All V-Flex-related UAMs are output to the Maintenance Output Group.

Refer to *Unsolicited Alarm and Information Messages Reference* for information and corrective procedures for EAGLE-related alarms. Refer to *Alarms and Maintenance Guide* for EPAP for the descriptions and corrective procedures for MPS-related alarms.

Table 6-1   V-Flex UAMs

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

6.2 V-Flex UIMs

Table 6-2 lists the UIMs that are used for the V-Flex feature. *Unsolicited Alarm and Information Messages Reference* contains a complete description of all **UIM** text and formats.

Table 6-2   V-Flex UIMs

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

Table 6-2   (Cont.) V-Flex UIMs

UIM	Text	Description	Action
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.

6.3 Maintenance Commands

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

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

Table 6-3   Maintenance Commands

Command	Description
rept-stat-sys	Reports the status of system entities, including cards. The output includes the number of Service Module cards that are in service (IS-NR) and how many are in another state (IS-ANR, OOS-MT, OOS-MT-DSBLD).
rept-stat-sccp	Reports operating status of services and subsystems, CPU usage, and Service Module card status. When the `loc` parameter is specified, the command displays detailed card traffic statistics, including cards that are denied SCCP service. See the section in this manual that describes the use of the `rept-stat-sccp` command.
rept-stat-mps	Displays the overall status of the EPAP application running on the MPS (multi-purpose server). Command output for the various reports of this command include overall MPS alarm status and card status, and status for a specific Service Module card when a feature is on.
rept-stat-trbl	Includes a summary of any trouble notifications (**UAM**s) for local subsystems, cards, and linksets. The severity of each alarm is indicated in the output report.
rept-stat-alm	Displays the alarm counts and totals for local subsystems and Service Module card/EPAP IP links.
rept-stat-db	Displays the status information for the EAGLE databases. This includes the level information for each Service Module card, and for the active and standby EPAP RTDB. The command reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birth dates and levels. It shows the status of each PDB and RTDB when an EPAP-related feature is enabled.

Table 6-3   (Cont.) Maintenance Commands

Command	Description
rtrv-tbl capacity	Retrieves table use capacity summary information. For each table listed, the number of table entry elements in use and the total allowed number of table elements is presented, along with a percent (%) full value. Information is shown for some tables only if the feature that uses the table is enabled.
inh-card/alw-card	The `inh-card` command is used to change the operating state of the card from In-Service Normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD). A craftsperson then can test the card or physically remove it from the shelf.
	The `alw-card` command is used to change the card from OOS-MT-DSBLD (Out-of-Service Maintenance-Disabled) to IS-NR (In-Service Normal) if card loading is successful.
inh-alm/unhb-alm	Used to allow and inhibit reporting of alarms for a given device, including the Service Module card ports. The commands allow both Port A and Port B to be specified. Inhibited alarms will not generate UAMs or cause alarm indicators to be turned on. All `rept-stat-xxx` commands continue to display the alarms with an indication that the device has its alarms inhibited.
rtrv-data-rtdb	Retrieves Entity data, DN data, IMEI data, IMSI data, TN data, NPANXX data, and LRN data from the RTDB on an active Service Module card.
	If the `loc` parameter is specified and the target card is an active Service Module card, the RTDB data is retrieved from that card.
	If the `loc` parameter is not specified, the RTDB data is retrieved on the active Service Module card that has the lowest IMT address.
	The RTDB status on the active Service Module card can be coherent or incoherent.

6.3.1 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.

6.4 EAGLE Debug Commands

Commands User's Guide contains descriptions of commands used in assessing and modifying system status and operation. The debug commands are used only under the direction of Oracle support personnel.

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

6.5 Status Reporting and Problem Identification

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

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

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

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

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

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

Table 6-4   Status Reporting for EPAP-Related Features

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

Table 6-4   (Cont.) Status Reporting for EPAP-Related Features

Reports, Status, and Statistics	Command
Operating state and alarm status of equipped Service Module cards and their DSM ports and IP connections; EPAP-related feature status per card.	`rept-stat-mps:loc=<Service Module card location>`

Alarms and operating state for Service Module ("SCCP") cards.	`rept-stat-sys`
	
	`rept-stat-mps`

Any cards that are denied SCCP service.	`rept-stat-sccp`
Detailed view of the status of SCCP services provided by the specified Service Module card. Includes Card Alarm Status, Card Service Statistics	`rept-stat-sccp:loc=<Service Module card location>`
General SCCP traffic performance for Service Module cards. Message rates for TVG performance.	`rept-stat-sccp:mode=perf`
Statistics for EPAP-related feature local subsystems - Subsystem Report	`rept-stat-sccp`
Statistics for EPAP-related features	`rept-stat-sccp`

6.5.1 EPAP Status and Alarm Reporting

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

EPAP Maintenance Blocks

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

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

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

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

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

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

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

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

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

DSM Status Requests and DSM Status Messages

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

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

- The Service Module card is booted.

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

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

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

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

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

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

Index