EAGLE® Provisioning Application Processor (EPAP)

Release 7.0

Feature Notice
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TEKELEC

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U.S. Patent Numbers:

5,008,929, 5,953,404, 6,167,129, 6,324,183, 6,327,350, 6,606,379, 6,639,981, 6,647,113, 6,662,017, 6,735,441, 6,745,041, 6,765,990, 6,795,546, 6,819,932, 6,836,477, 6,839,423, 6,885,872, 6,901,262, 6,914,973, 6,940,866, 6,944,184, 6,954,526, 6,954,794, 6,959,076, 6,965,592, 6,967,956, 6,968,048, 6,970,542

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Table of Contents

Introduction

Feature Notices are distributed to customers with each new release of software.

The *Feature Notice* includes a brief feature overview, lists new hardware required if any, provides the hardware baseline for this release, and explains how to find the *Release Notice* and other customer documentation on the Customer Support Site for the EAGLE Provisioning Application Processor (EPAP) Release 7.0 (see "How to Locate Documentation on the Customer Support Site" on page FN-27).

New Features

EPAP 7.0 introduces the EPAP Provisioning Blacklist feature.

Features from Limited Availability Releases

The following features are included in EPAP 7.0 from Limited Availability releases that were available after the GA Release of EPAP 5.3:

- Automated Database Recovery

- Automatic PDB Backup

- Automatic RTDB Backup

- PDBA Proxy (EPAP Virtual IP Address)

- Update Validation

Compatibility

EPAP 7.0 is fully compatible with EAGLE 5 ISS Release 35.0 and 34.0.4 (which contains the G-Flex update validation support). Table FN-1 identifies the compatibility of EPAP 7.0 with other products.

Table FN-**1.**   Compatibility Matrix - EPAP 7.0

Product	Release	Compatibility
EAGLE	31.6	Partially Compatible
	34.0	Partially Compatible
	34.1	Partially Compatible
	34.2	N/A
	34.3	Partially Compatible
	34.4	Partially Compatible
	35.0	Fully Compatible
LSMS	8.0	N/A
LSMS	8.5	N/A
IMF	N/A	N/A
FTRA	N/A	N/A
Harris	N/A	N/A
SEAS	N/A	N/A
Tekelec 500	N/A	N/A
IDCA	N/A	N/A
ECAP	N/A	N/A

Important Operational Changes

- "Major Platform Alarm Changes" on page FN-18
- "Major Application Alarm" on page FN-18
- "New Major Platform Alarms" on page FN-18
- "Minor Application Alarms" on page FN-19

Feature Overviews

Automated Database Recovery

The Automated Database Recovery feature restores the EPAP system function and facilitates reconciliation of PDB data following a failure of the active PDB with the provisioning being performed to both sides while provisioning replication was not available.

See "Automated Database Recovery" on page FN-3 for more details.

Automatic PDB Backup

The Automatic PDB Backup feature backs up all data stored in the PDB, including G-Port, G-Flex, INP, and EIR data. This feature automates the process of scheduling and creating backup copies of the PDBs at the time, frequency, and to the destination configured by the user. The PDB database backup is created on the EPAP A machine.

See "Automatic PDB/RTDB Backup" on page FN-5 for more details.

Automatic RTDB Backup

The Automatic RTDB Backup feature backs up all data stored in the RTDB database, including G-Port, G-Flex, INP, and EIR data. This feature automates the process of scheduling and creating backup copies of RTDBs at the time, frequency, and to the destination configured by the user. The RTDB database backup is created on the standby EPAP (A or B) machine.

See "Automatic PDB/RTDB Backup" on page FN-5 for more details.

EPAP Provisioning Blacklist

The EPAP Provisioning Blacklist feature helps prevent provisioning of protected E.164 address strings in the EPAP G-Flex database. Provisioning a protected E.164 address string as a DN, DN Block, or IMSI may result in unintended and incorrect routing of messages by the EAGLE 5 ISS DSM. The EPAP Provisioning Blacklist feature allows the user to define a list of address strings that cannot be provisioned as DN, DN Block or IMSI address strings. The E.164 addresses of all HLRs must be provisioned in the provisioning blacklist.

See "EPAP Provisioning Blacklist" on page FN-13 for more details.

PDBA Proxy (EPAP Virtual IP Address)

The PDBA Proxy feature allows G-Flex provisioning to continue without manual intervention when the EPAP-A hosting the active PDB is removed from service.

See "PDBA Proxy" on page FN-14 for more details.

Update Validation

The Update Validation feature provides additional data checks (checksums) before applying updates from the EPAP to the DSMs.

See "EPAP Update Validation" on page FN-17 for more details.

Automatic PDB/RTDB Backup

Description

The Automatic PDB/RTDB Backup feature allows for the scheduling of automated backups of EPAP PDBs and RTDBs. The PDB backup copy is created on the EPAP A server and the RTDB backup copy is created on the standby EPAP server (A or B). A specific destination for the backup copy can be configured at the users discretion.

From the EPAP GUI terminal (Web UI only), the user can access a graphical user interface screen and configure the time, frequency, and destination of the backup copy.

Tekelec recommends that an Automatic PDB/RTDB Backup be performed on a daily (24 hour) basis. Both the PDB and RTDB backups are scheduled together and cannot be scheduled separately. The **Time of the day to Start The Backup** is the time that the RTDB backup starts. The PDB backup automatically starts 1 hour later.

Backups can only be scheduled and created on a provisionable EPAP server pair. An automatic PDB/RTDB backup is not allowed and cannot be scheduled on a non-provisionable EPAP server pair.

Normal provisioning is allowed during the automatic PDB/RTDB backup. This includes provisioning from

- the customer network to the PDB,

- the PDB to the Active EPAP RTDB, and

- the Active EPAP RTDB to the DSM RTDB.

RTDB backups are always created from the standby EPAP RTDB (A or B). The RTDB can resume receiving updates when it is brought back on line.

Disk Space Limitations

This feature supports the retention of three backup copies of the PDB and RTDB databases. However, the disk space in the EPAP free directory may not be sufficient to accommodate the retention of three backup copies on sites with large PDB and RTDB databases. When insufficient disk space exists, a dialog box appears asking the user "`Do you want to delete the old backups`".

- If yes, the new database backup copy is written over the previous version.

- If no, the user must create a directory in a location with sufficient disk space and then specify the location of the backup directory to create the backup copy in.

Automatic PDB/RTDB Backup Screen

This feature adds to the list of EPAP Maintenance menu options, the item "Automatic PDB/RTDB Backup". The scheduled time, frequency, and destination of the backup file can be configured by the user from the Automatic PDB/RTDB Backup screen, see Figure FN-1.

Figure FN-1.   Automatic PDB/RTDB Backup screen.

Most of the input parameters are self explanatory. The following options are configurable by the user:

The frequency of the backup copy can be any of the following increments:

• 12 hours (see Note below)

• 1 Day (daily)

• 2 Days

• 3 Days

• 5 Days

• 7 Days

NOTE: If the 12-hour frequency is selected, the first backup will always be created in the AM. For example, if the Time of the day to start the Backup is selected as 15:00, the first backup will be created at 3:00 AM and then subsequent backups are created in 12-hour intervals.

The Backup Type parameter is the destination for the backup file:

• **Local** - A backup copy of the data is saved to the local disk on the same EPAP server as the PDB/RTDB being backed up.

• **Mate** - A backup copy of the data is created on the local server and then sent via SCP to the mate EPAP server.

• **Remote** - A backup copy of the data file is created on the local EPAP server and then sent via SFTP to a remote server configured by the user. This server may or may not run EPAP software and can be any machine on the network that is running an SFTP daemon or service.

• **None** - No backup is scheduled and cancel all previously scheduled backups. This will not affect a backup that is currently in progress.

NOTE: In the case of mate and remote backup types, a copy of the backup file is first saved to the local drive as a safeguard in the event that a failure occurs during file transfer to the mate or remote locations.

NOTE: If the None backup type is selected, all currently scheduled backups are canceled, and all input parameters on the scheduling screen are disabled except the Schedule Backup button.

Table FN-2 can be used as a guide when scheduling the Automatic PDB/RTDB Backup.

Table FN-2.   Mandatory verses Optional Parameters

Parameter	Automatic PDB/RTDB Backup Type		
	Local	**Mate**	**Remote**
Time of day to start backup	Mandatory	Mandatory	Mandatory
Frequency	Mandatory	Mandatory	Mandatory
File Path	Optional	Optional	Mandatory
Remote Machine IP Address	N/A	N/A	Mandatory
Login Name	N/A	N/A	Mandatory
Password	N/A	N/A	Mandatory
Save the Local copies in the default path	N/A	Optional	Mandatory
Do you want to delete the old backups Note: If you choose Yes, only the last three backup files, including the current one are kept.	Mandatory	Mandatory	N/A

The default file path where subdirectories are created (on the mate and local servers) is /var/TKLC/epap/free/

The default file names that are used to designate the backup files are:

PDB   `pdbBackup_<hostname>_<CurrentTime>_DBBirthdate_<DBBirthdate>`
`_DBLevel_<level>.bkp.tar.gz`

RTDB   `rtdbBackup_<hostname>_<CurrentTime>.tar.gz`

Automatic PDB/RTDB Backups on Remote Servers

The following steps need to be completed <u>before</u> scheduling the automatic PDB/RTDB backup of a remote server:

1. Validate the connection to the remote server.

2. Verify adequate disk space (approximately 17 GB of disk space is required per backup).

3. Verify user name and password.

Semantic Rules

When using the Automatic PDB/RTDB Backup screen to configure the automatic backup, the following semantic rules apply:

*   Enter the **Time of the Day** using a 24 hour format: hh:mm (14:03)

*   **File path** (in remote only) is the absolute path from the root (i.e. /backups/Atlanta_A)

*   Enter **IP Addresses** using the xxx.yyy.zzz.aaa format (192.168.210.111)

*   **Password** entries are displayed using the asterisk character: (*****)

Limitations

The following limitations apply to the Automatic PDB/RTDB Backup feature:

1. Once the backup process starts, it cannot be cancelled.

2. A delay of up to 5 minutes (maximum) can exist between the start time of the backup scheduled by the user and the actual time when the backup starts.

3. It may take as long as 60 seconds for the scrolling alarm to clear after an alarm condition clears.

Backup Failures

There are two kinds of backup failures that can occur:

1. Backup operation failure - A failure that occurs during the creation of backup files on a machine (local or mate) or (EPAP A or B).

2. Backup transfer failure - This is a failure that occurs during the transfer of a backup file to a mate or remote machine.

    NOTE: There are two alarms associated with a backup transfer failure - one for the PDB and one for the RTDB.

Alarms

Two new minor application alarms are associated with this release - one for each database. See "Minor Application Alarms" on page FN-19.

1. PDB Backup Failed - indicates that the automatic backup operation on the PDB has failed.

2. RTDB Backup Failure - indicates that the automatic backup operation on the RTDB has failed.

Error Messages and Log Files

The following error messages are associated with an **unsuccessful completion** of an automatic backup.

- ```
  Automatic backup not completed successfully.
  ```

- ```
  GUI server returned error, cannot start the EPAP
  software.
  ```

- ```
  Unable to connect to GUI server, cannot start the EPAP
  software.
  ```

EPAP Automated Database Recovery

Description

The EPAP Automated Database Recovery (ADR) feature is used to restore the EPAP system function and facilitate the reconciliation of PDB data following the failure of the Active PDBA.

The automated recovery mechanism provided by this feature allows 1 PDBA to become Active when 2 PDBAs think they are active and have updates that have not been replicated to the mate PDBA. The software selects the PDBA that received the most recent update from it's mate to become the Active PDBA (the PDBA that was the Standby most recently will become the Active). No automatic reconciliation is performed because the system has insufficient information to ensure that the correct actions are taken.

In order to return the system to normal functionality, a manual PDB copy from the PDBA the software picked to be Active to the PDBA that is in the replication error (ReplErr) state must be performed. However, provisioning can resume until a maintenance period is available to do this.

This feature uses a replication error list that consists of updates that exist as a result of a failure during the database replication process from the active-to-standby PDB. These updates have not been propagated (reconciled) throughout the system and require manual intervention to ensure the EPAP systems properly process the updates.

Limitations

1. The EPAP ADR feature can be turned on or off. The default setting is off.

2. The EPAP ADR feature must be turned on for both MPS-A boxes of an MPS pair.

3. The EPAP ADR feature requires Standby-homing to be active. If Active-homing is being used by the customer, DSM re-boots may be required if they have taken updates from the Active PDB that are different from what has been replicated to the Standby PDB.

4. Each EPAP can support a minimum of two replication error lists.

Alarms

New or Changed UAMs

No new or changed Unsolicited Alarm Messages (UAMs) are necessary to support the EPAP Automated Database Recovery feature.

Example EPAP Automated Database Reconciliation

Starting with PDBAs in the following current configuration.

Updates 701, 702, and 703 on Node 1 have not been replicated to Node 2.

Active PDBA (Node 1)	Standby PDBA (Node 2)
DB Level-704	DB Level-700
Updates to replicate to standby PDBA	
701	
702	
703	

Now assume there is a fault that takes down the Node 1 PDBA before the replication process is complete. Node 2 has become the Active PDBA and is now receiving provisioning updates.

Failed PDBA (Node 1)	Active PDBA (Node 2)
DB Level-704	DB Level-700
Updates on replication error list	Processing DB Level updates
701	701 (different than 701 on node 1)
702	702 (different than 702 on node 1)
703	703 (different than 703 on node 1)

- Updates 701-703 on Node 1 have not been replicated to Node 2 and,

- Updates 701-703 on Node 1 are different from updates 701-703 on Node 2.

The PDBA that took an update with the latest timestamp (in this example the Node 2 PDBA) will automatically become the Active PDBA and continue taking provisioning updates. The Node 1 PDBA is put in a "REPL_ERR" state and "PDBA Replication Failure" alarm initiates on this PDBA.

A replerr file (REPL_ERR PDBA) with the replication log lists from the Node 1 PDBA is created. This file contains the lost Node 1 provisioning updates (701-703) and is in the format of a PDBI import file. The customer can examine the file and decide whether he wants to reapply these updates to the Active PDBA.

Anytime after the Node 1 PDBA becomes available, the customer will have to temporarily suspend provisioning and perform a PDB copy of the Node 2 PDBA to the Node PDBA to reconcile the PDBs before the Node 1 PDBA can be made active again.

> **NOTE:** Contact the Customer Care Center before performing the PDBA Copy procedure.

EPAP Provisioning Blacklist

Description

The EPAP Provisioning Blacklist feature helps prevent provisioning of protected address strings in the EPAP database. Provisioning a protected address string as a DN, DN Block, or IMSI may result in unintended and incorrect routing of messages by the EAGLE 5 ISS DSM. The EPAP Provisioning Blacklist feature allows the user to define a list of address strings that cannot be provisioned as DN, DN Block or IMSI address strings. The addresses of all HLRs must be provisioned in the provisioning blacklist in order for the EPAP Provisioning Blacklist feature to work as intended.

A maximum of 150 blacklist ranges is supported by EPAP. A blacklist range is defined by two address strings. The beginning and ending address strings used to define a blacklist range must be between 5 and 15 HEX digits. In addition, both address strings must be of the same length.

The ending address must be greater than or equal to the beginning address and must not conflict with DN, DN block, or IMSI values in the PDB.

Limitations

The EPAP Provisioning Blacklist feature has the following limitations:

- The blacklist ranges are stored in the PDB database. Since modification of blacklist data is not supported via the PDBI (Provisioning Database Interface), support of PDBI export and import is not possible. In addition, modification of existing blacklist data is not supported.

- If the blacklist does not include all protected address strings in a customer network, and one of the protected address strings is provisioned as a DN, DN Block, or IMSI, unintended message routing occurs, and may cause network outages.

Alarms

No new alarms are associated with the EPAP Provisioning Blacklist feature.

Error Messages and Log Files

The EPAP Provisioning Blacklist feature has the following associated error message:

- The CONFLICT_FOUND response is updated to indicate that an error resulted from entering the blacklist range.

PDBA Proxy

Description

The EPAP PDBA Proxy feature provides a more reliable connection to the EPAP PDBA in the event of a failure of the active PDBA. Connection redundancy is accomplished by allowing the customer's provisioning system to still use a single IP address, even though the connection may logically be to the previously standby PDB.

During normal provisioning operations, one PDBA is active and the other PDBA is in standby. However, from the customer's provisioning system perspective, the active and standby PDBAs are accessible through a single IP address. If the active PDBA fails, the local EPAP B box will forward provisioning updates to the mated PDB.

When the previously active PDBA recovers, it is aware that the standby PDBA has become active and now both active PDBAs need to be reconciled.

The advantages this feature provides are:

1. The customer's G-Flex network can absorb a single EPAP failure and automatically transfer provisioning to the standby PDBA using the same IP address.

2. A means of reconciling both active PDBAs when the failed PDBA becomes available again.

Limitations

1. The EPAP PDBA Proxy feature cannot be installed on a non-provisionable site.

2. This feature does not require the ADR feature.

3. This feature only provides Virtual IP functionality when the EPAP-A fails.

4. Failure of the network connection to both EPAP A and B, or similar failures that take down both devices require the customer's provisioning system to manually connect to the standby PDB's IP address.

Alarms

A new major application alarm `No PDBA Proxy to Remote PDBA Connection` is generated if the proxy connection fails. See "Major Application Alarm" on page FN-18.

Example EPAP PDBA Proxy

During normal provisioning operations, the flow of information is as follows:

- The customer's provisioning system sends provisioning updates to the Active PDBA on Node 1.

- The Active PDBA checks syntax and writes to the Active PDB.

- The Active PDBA writes to a replication log on the EPAP A and mate EPAP B.

- The Active PDBA sends an ACK response to the customer's provisioning system.

- The Standby PDBA on Node 2 queries the EPAP A replication logs and updates the PDB on Node 2.

In the event of a fault (e.g. server failure) on the Node 1 PDBA as shown in Figure FN-2.

- If the Standby PDBA on Node 2 is reachable, the EPAP B machine on Node 1 will forward any replication logs to the Node 2 PDBA.

- When the Node 2 PDBA has all the replication logs from the EPAP B machine, on Node 1, it now becomes the Active by proxy PDBA.

- The customer's provisioning system can continue provisioning because the EPAP B will be using the proxy to forward the updates to the newly Active PDBA on Node 2.

Figure FN-2.   Virtual IP-Failure of Active PDBA
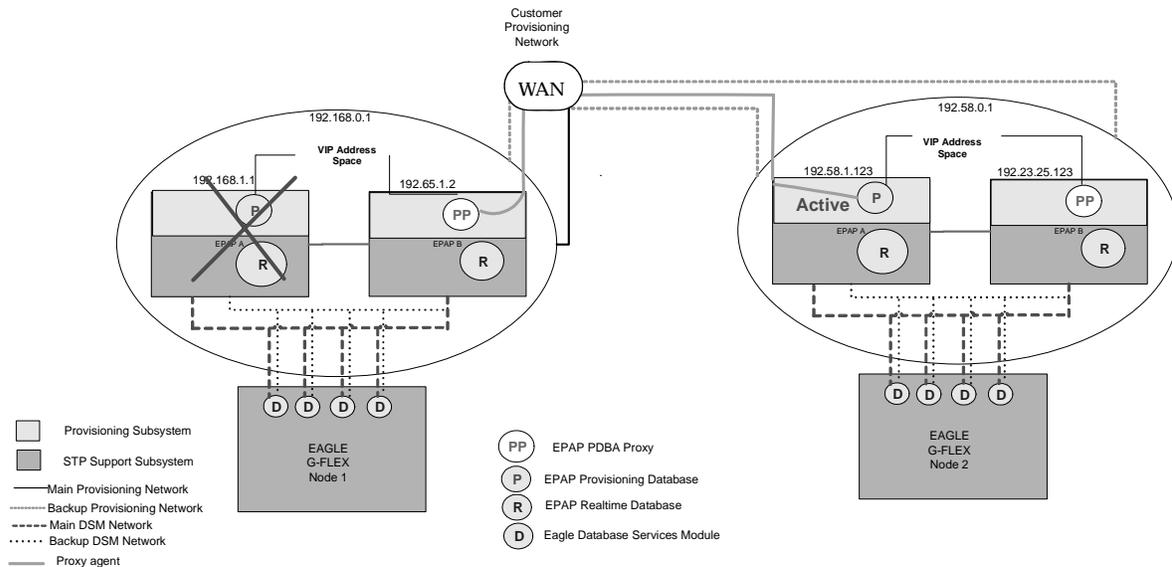
When the Node 1 PDBA is restored to service,

- Any updates that were sent to the Node 2 PDBA while the Node 1 PDBA was down, are forwarded to the Node 1 PDB.

- When all the records are replicated, the Node 1 can become the Active PDBA, and Node 2 reverts back to being the Standby PDBA.

EPAP Update Validation

Description

The EPAP Update Validation feature provides additional data checks (checksums) before applying updates from the EPAP RTDB to the DSM RTDB.

These additional checks are designed to prevent overwriting of existing data records with new data records when operators are provisioning new subscribers.

When update validation is triggered, the DSM card goes DB-DIFF not incoherent. DB-DIFF requires a reload of the DSM card. However, the DSM card will continue to process traffic until it is reloaded.

A checksum of the data about to be overwritten is compared with the old checksum (new data element) in the update about to be applied as well as the existing memory location check. If the checksums and location do not match, the update will not be applied to the DSM RTDB and the DSM will go incoherent.

To use this feature, the EAGLE 5 ISS will first need to be upgraded to Release 34.0.4. The DSM cards will continue to accept and process update records from the EPAP that do not contain the update validation information. After the EAGLE 5 ISS is upgraded, the respective EPAP is upgraded to provide the update validation information. The DSM cards will provide information to the EPAP that details whether or not it can accept and process update validation information (based on the EAGLE 5 ISS software level) from the EPAP.

Alarms

New or Changed UAMs

No new or changed Unsolicited Alarm Messages (UAMs) are necessary to support the EPAP Update Validation feature.

- UAM 035 (existing) is used to warn the customer that a potential database corruption has been detected on a DSM card.

- UAM 033 (existing) is used to notify the customer when the DSM corruption has been corrected.

New or Changed UIMs

No new or changed Unsolicited Information Messages (UIMs) are necessary to support the EPAP Update Validation feature.

Alarms

Major Platform Alarm Changes

The severity of the following platform (hardware) alarms was changed from Critical to Major in EPAP 7.0.

Alarm Codes	Error Descriptor	UAM Number
2000000000000001	LSMS DB Maintenance Required	0371
Major Platform Errors		
3000000001000000	Breaker Panel Feed Error	372
3000000002000000	Breaker Panel Breaker Error	372
3000000004000000	Breaker Panel Monitoring Error	372

Major Application Alarm

The following major application alarm supports the PDBA Proxy (EPAP Virtual IP Address) feature.

Alarm Codes	Error Descriptor	UAM Number
Major Application Errors		
4000000000100000	No EPAP PDBA Proxy to Remote PDBA Connection	0375
4000000000200000	DSM Provisioning Error Coherent DSM gets more than 1000 levels behind the EPAP RTDB	0375

New Major Platform Alarms

The following major platform (hardware) alarms were added in EPAP 7.0.

Alarm Codes	Error Descriptor	UAM Number
Minor Platform Errors		
5000000000000100	Server Core File Detected	0374
5000000000000100	Server Core File Detected	0374
5000000000004000	Server Reboot Watchdog Initiated	0374

Minor Application Alarms

The following minor application alarms support the Automatic PDB Backup feature.

Alarm Codes	Error Descriptor	UAM Number
Minor Application Errors		
6000000000000100	Automatic PDB Backup failed	0375
6000000000000200	RTDB Backup failed	0375
6000000000000400	Automatic RTDB Backup failed	0375
6000000000000800	Automatic Backup cron entry modified	0375

Customer Documentation

Documentation Set

The EPAP documentation is included in the documentation set for EAGLE 5 ISS Release 35.0, which comprises the following manuals and documents. The list is sorted by manual name and is followed by a brief description of each manual.

> **NOTE:** **The most current update of each manual can be found on Tekelec's Customer Support website.**

- *Commands Error Recovery Manual*

- *Commands Manual*

- *Commands Pocket Guide*

- *Commands Quick Reference Guide*

- *Database Administration Manual – Features*

- *Database Administration Manual – Gateway Screening*

- *Database Administration Manual – Global Title Translation*

- *Database Administration Manual – IP7 Secure Gateway*

- *Database Administration Manual – SEAS*

- *Database Administration Manual – SS7*

- *Database Administration Manual – System Management*

- *Dimensioning Guide for EPAP Advanced DB Features*

- *ELAP Administration Manual*

- *EPAP Administration Manual*

- *EPAP DSM Dimensioning Tool*

- *Feature Manual - ECAP*

- *Feature Manual – EIR*

- *Feature Manual – G-Flex C7 Relay*

- *Feature Manual – G-Port*

- *Feature Manual – INP*

- *FTP-Based Table Retrieve Application (FTRA) User Guide*

- *Hardware Manual – EAGLE 5 ISS*

- *Hardware Manual – Tekelec 1000 Application Server*

- *Hardware Manual – Tekelec 1100 Application Server*

- *Installation Manual – EAGLE 5 ISS*

- *Installation Manual - Integrated Applications*

- *LNP Database Synchronization (LSMS with EAGLE 5 ISS)*

- *LNP Feature Activation Guide*

- *Maintenance Manual*

- *Maintenance Pocket Guide*

- *Maintenance Emergency Recovery Pocket Guide*

- *MPS Platform Software and Maintenance Manual (EAGLE 5 ISS with Tekelec 1000 Application Server)*

- *MPS Platform Software and Maintenance Manual (EAGLE 5 ISS with Tekelec 1100 Application Server)*

- *Previously Released Features Manual*

- *Provisioning Database Interface Manual*

- *Release Documentation*

  - *Feature Notice - EAGLE 5 ISS 35.0*

  - *Feature Notice - ELAP 6.0*

  - *Feature Notice - EPAP 7.0*

  - *Master Glossary*

  - *Master Index*

  - *Release Notice (online only)*

  - *System Overview*

- *System Manual – EOAP*

Commands Error Recovery Manual

The *Commands Error Recovery Manual* contains the procedures to resolve error message conditions generated by the commands in the *Commands Manual*. These error messages are presented in numerical order.

Commands Manual

The *Commands Manual* contains procedures for logging into an EAGLE 5 ISS system, logging out of the system, a general description of the terminals, printers, the disk drive used on the system, and a description of all the commands used in the system.

Commands Pocket Guide

The *Commands Pocket Guide* is an abridged version of the *Commands Manual*. It contains all commands and parameters, and it shows the command-parameter syntax.

Commands Quick Reference Guide

The *Commands Quick Reference Guide* contains an alphabetical listing of the commands and parameters. The guide is sized to fit a shirt-pocket.

Database Administration Manual – Features

The *Database Administration Manual – Features* contains procedural information required to configure an EAGLE 5 ISS or an IP^7 Secure Gateway system to implement these features: X.25 Gateway, STP LAN, Database Transport Access, GSM MAP Screening, and EAGLE 5 Integrated Monitoring Support.

Database Administration Manual – Gateway Screening

The *Database Administration Manual - Gateway Screening* contains a description of the Gateway Screening (GWS) feature and the procedures necessary to configure the EAGLE 5 ISS or IP^7 Secure Gateway system to support this feature.

Database Administration Manual – Global Title Translation

The *Database Administration Manual – Global Title Translation* contains procedural information required to configure an EAGLE 5 ISS to implement these features: Global Title Translation, Enhanced Global Title Translation, Variable Length Global Title Translation, Interim Global Title Modification, Flexible GTT Load Sharing, and Origin-based SCCP Routing.

Database Administration Manual – IP^7 Secure Gateway

This manual contains procedural information required to configure the EAGLE 5 ISS to implement the SS7-IP Gateway.

Database Administration Manual – SEAS

The *Database Administration Manual – SEAS* contains the EAGLE 5 ISS configuration procedures that can be performed from the Signaling Engineering and Administration Center (SEAC) or a Signaling Network Control Center (SNCC). Each procedure includes a brief description of the procedure, a flowchart showing the steps required, a list of any EAGLE 5 ISS commands that may be required for the procedure but that are not supported by SEAS, and a reference to optional procedure-related information, which can be found in one of these manuals:

- Database Administration Manual – Gateway Screening

- Database Administration Manual – Global Title Translation

- Database Administration Manual – SS7

Database Administration Manual – SS7

The *Database Administration Manual – SS7* contains procedural information required to configure an EAGLE 5 ISS or an IP^7 Secure Gateway system to implement the SS7 protocol.

Database Administration Manual – System Management

The *Database Administration Manual – System Management* contains procedural information required to manage the EAGLE 5 ISS's database and GPLs, and to configure basic system requirements such as user names and passwords, system-wide security requirements, and terminal configurations.

Dimensioning Guide for EPAP Advanced DB Features

The *Dimensioning Guide for EPAP Advanced DB Features* is used to provide EPAP planning and dimensioning information. This manual is used by Tekelec personnel and EAGLE 5 ISS customers to aid in the sale, planning, implementation, deployment, and upgrade of EAGLE 5 ISS systems equipped with one of the EAGLE 5 ISS EPAP Advanced Database (EADB) Features.

ELAP Administration Manual

The *ELAP Administration Manual* defines the user interface to the EAGLE 5 ISS LNP Application Processor on the MPS/ELAP platform. The manual defines the methods for accessing the user interface, menus, screens available to the user and describes their impact. It provides the syntax and semantics of user input, and defines the output the user receives, including information and error messages, alarms, and status.

EPAP Administration Manual

The *EPAP Administration Manual* describes how to administer the EAGLE 5 ISS Provisioning Application Processor on the MPS/EPAP platform. The manual defines the methods for accessing the user interface, menus, and screens available to the user and describes their impact. It provides the syntax and semantics of user input and defines the output the user receives, including messages, alarms, and status.

Feature Manual - ECAP

The *Feature Manual - ECAP* provides instructions and information on how to install, use, and maintain the Integrated Accounting Feature Application feature on the Eagle Collector Application Processor (ECAP). This feature collects raw MSU data from the EAGLE 5 ISS, categorizes the data into groups, and feeds those groups to another system for accounting activities. Additional features will be added to this manual at a later date.

Feature Manual – EIR

The *Feature Manual - EIR* provides instructions and information on how to install, use, and maintain the EIR feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS. The feature provides network operators with the capability to prevent stolen or disallowed GSM mobile handsets from accessing the network.

Feature Manual – G-Flex C7 Relay

The *Feature Manual - G-Flex C7 Relay* provides an overview of a feature supporting the efficient management of Home Location Registers in various networks. This manual gives the instructions and information on how to install, use, and maintain the G-Flex feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.

Feature Manual – G-Port

The *Feature Manual - G-Port* provides an overview of a feature providing the capability for mobile subscribers to change the GSM subscription network within a portability cluster while retaining their original MSISDNs. This manual provides instructions and information on how to install, use, and maintain the G-Port feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.

Feature Manual – INP

The *Feature Manual - INP* provides the user with information and instructions on how to implement, utilize, and maintain the INAP-based Number Portability (INP) feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 ISS.

FTP-Based Table Retrieve Application (FTRA) User Guide

The *FTP-Based Table Retrieve Application (FTRA) User Guide* describes how to set up and use a PC to serve as the offline application for the EAGLE 5 ISS FTP Retrieve and Replace feature.

Hardware Manual – EAGLE 5 ISS

The *Hardware Manual – EAGLE 5 ISS* contains hardware descriptions and specifications of Tekelec's signaling products. These include the EAGLE 5 ISS system, OEM-based products which include the AS*i* 4000 Service Control Point (SCP), the Netra-based Multi-Purpose Server (MPS), and the Integrated Sentinel with Extended Services Platform (ESP) subassembly.

The Hardware Manual provides an overview of each system and its subsystems, details of standard and optional hardware components in each system, and basic site engineering. Refer to this manual to obtain a basic understanding of each type of system and its related hardware, to locate detailed information about hardware components used in a particular release, and to help configure a site for use with the system hardware.

Hardware Manual – Tekelec 1000 Application Server

The *Hardware Manual - Tekelec 1000 Application Server* provides general specifications and a description of the Tekelec 1000 Applications Server (T1000 AS). This manual also includes site preparation, environmental and other requirements, procedures used to physically install the Tekelec 1000 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).

Hardware Manual – Tekelec 1100 Application Server

The *Hardware Manual - Tekelec 1100 Application Server* provides general specifications and a description of the Tekelec 1100 Applications Server (T1100 AS). This manual also includes site preparation, environmental and other requirements, procedures used to physically install the Tekelec 1100 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).

Installation Manual – EAGLE 5 ISS

The *Installation Manual - EAGLE 5 ISS* contains cabling requirements, schematics, and procedures used for installing the EAGLE 5 ISS along with LEDs, Connectors, Cables, and Power Cords to Peripherals. Refer to this manual to install components or the complete systems.

Installation Manual - Integrated Applications

The *Installation Manual - Integrated Applications* provides the installation information for integrated applications such as EPAP 4.0 or earlier (Netra-based Multi-Purpose Server (MPS) platform) and Sentinel. The manual includes information about frame floors and shelves, LEDs, connectors, cables, and power cords to peripherals. Refer to this manual to install components or the complete systems.

LNP Database Synchronization (LSMS with EAGLE 5 ISS)

The *LNP Database Synchronization Manual - LSMS/EAGLE 5 ISS* describes how to keep the LNP databases at the LSMS and at the network element (the EAGLE 5 ISS is a network element) synchronized through the use of resynchronization, audits and reconciles, and bulk loads. This manual is contained in both the LSMS documentation set and in the EAGLE 5 ISS documentation set.

LNP Feature Activation Guide

The *LNP Feature Activation Guide* contains procedural information required to configure the EAGLE 5 ISS for the LNP feature and to implement these parts of the LNP feature on the EAGLE 5 ISS:

  – LNP services

  – LNP options

  – LNP subsystem application

  – Automatic call gapping

- Triggerless LNP feature

- Increasing the LRN and NPANXX Quantities on the EAGLE 5 ISS

- Activating and Deactivating the LNP Short Message Service (SMS) feature.

Maintenance Manual

The *Maintenance Manual* contains procedural information required for maintaining the EAGLE 5 ISS system and the IP[7] Secure Gateway system. The *Maintenance Manual* provides preventive and corrective maintenance procedures used to maintain the different systems.

Maintenance Pocket Guide

The *Maintenance Pocket Guide* is an abridged version of the *Maintenance Manual* and contains all the corrective maintenance procedures used to maintain the EAGLE 5 ISS.

Maintenance Emergency Recovery Pocket Guide

The *Maintenance Emergency Recovery Pocket Guide* is an abridged version of the Maintenance Manual and contains the corrective maintenance procedures used for critical and major alarms generated on the EAGLE 5 ISS.

MPS Platform Software and Maintenance Manual (EAGLE 5 ISS with Tekelec 1000 Application Server)

The *EAGLE 5 ISS with Tekelec T1000 Application Server* describes the platform software for the Multi-Purpose Server (MPS) based on the Tekelec 1000 Application Server (T1000 AS) and describes how to perform preventive and corrective maintenance for the T1000 AS-based MPS. This manual should be used with the EPAP-based applications (EIR, G-Port, G-Flex, and INP).

MPS Platform Software and Maintenance Manual (EAGLE 5 ISS with Tekelec 1100 Application Server)

The *EAGLE 5 ISS STP with Tekelec T1100 Application Server* describes the platform software for the Multi-Purpose Server (MPS) based on the Tekelec 1100 Application Server (T1100 AS). This manual describes how to perform preventive and corrective maintenance for the T1100 AS-based MPS. This manual should be used with the EPAP-based applications (EIR, G-Port, G-Flex, and INP).

Previously Released Features Manual

The *Previously Released Features Manual* summarizes the features of previous EAGLE, EAGLE 5 ISS, and IP[7] Secure Gateway releases, and it identifies the release number of their introduction.

Provisioning Database Interface Manual

The *Provisioning Database Interface Manual* defines the programming interface that populates the Provisioning Database (PDB) for the EAGLE 5 ISS features supported on the MPS/EPAP platform. The manual defines the provisioning messages, usage rules, and informational and error messages of the interface. The customer uses the PDBI interface information to write his own client application to communicate with the MPS/EPAP platform.

Release Documentation

The *Release Documentation* is a release-specific compilation of the following documents:

- *Feature Notice* - Describes the features contained in the specified release; also provides the hardware baseline, describes the customer documentation set, provides information about customer training, and explains how to access the Customer Support website.

- *Master Glossary* - Contains an alphabetical listing of terms, acronyms, and abbreviations relevant to the system.

- *Master Index* - Lists all index entries used throughout the documentation set.

- *Release Notice* - Describes the changes made to the system during the lifecycle of a release. The final Release Notice provides a list of Generic Program Loads (GPLs), PRs resolved in a build, and all known PRs.

  NOTE: The *Release Notice* is maintained solely on Tekelec's Customer Support Website to provide you with instant access to the most up-to-date release information.

- *System Overview* - Provides high-level information on SS7, the IP[7] Secure Gateway, system architecture, LNP, and EOAP.

System Manual – EOAP

The *System Manual – EOAP* describes the Embedded Operations Support System Application Processor (EOAP) and provides the user with procedures on how to implement the EOAP, replace EOAP-related hardware, device testing and basic troubleshooting information.

How to Locate Documentation on the Customer Support Site

Access to Tekelec's Customer Support area is restricted to current Tekelec customers. This section describes how to log into Tekelec's Customer Support site and how to locate customer documentation. Viewing these files requires Adobe Acrobat Reader.

1   Go to Tekelec's Customer Support login page at **https://support.tekelec.com/index.asp**

2   Enter your assigned username and chosen password, then click **Go.**

> **Or**, if you do not have access to the Customer Support site, click **Need an Account?**
>
> Follow the instructions on the screen.
>
> **NOTE:** **After 20 minutes of inactivity, you will be logged off, and you must repeat this step to regain access.**

3   After successful login, select a product from the Product Support drop-down menu.

4   Select a release number from the Product Support Release drop-down menu.

5   Locate the appropriate documentation section (i.e., a Feature Notice would be under **Notices,** and user documentation would be under **Manuals**).

6   To open the documentation in the same window, double click the document name. To open the documentation in a new window, right-click the document name and select **Open in New Window**.

7   To download the document, right-click the document name and select **Save Target As**.

Customer Training

Tekelec offers a variety of technical training courses designed to provide the knowledge and experience required to properly provision, administer, operate and maintain the EAGLE 5 ISS. To enroll in any of the courses or for schedule information, contact the Tekelec Training Center at (919) 460-3064 or Email **eagletrain@tekelec.com**.

A complete list and schedule of open enrollment can be found at **www.tekelec.com**.

Customer Care Center

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

Technical Assistance

To receive technical assistance, call the Tekelec Customer Care Center at one of the following locations:

Tekelec, Europe and UK

Phone: +44 1784 467 804

Fax: +44 1784 477 120

Email: ecsc@tekelec.com

Tekelec, USA

Phone (within the continental US) 1 888-FOR-TKLC
(outside the continental US) +1 919-460-2150

Fax: +1 919 460 0877

Email: support@tekelec.com

When your call is received, the Customer Care Center issues a Customer Service Report (CSR). Each CSR includes an individual tracking number. When a CSR is issued, the Customer Care Center determines the classification of the trouble. The CSR contains the serial number of the system, problem symptoms, and messages. The Customer Care Center assigns the CSR to a primary engineer, who will work to solve the problem. The Customer Care Center closes the CSR when the problem is resolved.

If a critical problem exists, the Customer Care Center initiates emergency procedures (see the following topic, "Emergency Response").

Emergency Response

If a critical service situation occurs, the Customer Care Center offers emergency response twenty-four hours a day, seven days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure a rapid resolution to the problem.

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

- Failure in the system that prevents transaction processing
- Reduction in system capacity or in system traffic-handling capability
- Inability to restart the system
- Corruption of the database

- Inability to perform maintenance or recovery operations

- Inability to provide any required critical or major trouble notification

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

Appendix A. Acronyms and Terminology

ADR—Automatic Database Recovery

Default File name—The name of the file without any path and its format is same as it is in case of manual backup.

Default File path—The complete path where backup file is stored, when user does not specify any subdirectories within it.

EPAP—Eagle Provisioning and Application Processor

EPAP A—The EPAP application running on MPS server A.

EPAP B—The EPAP application running on MPS server B.

File path—The complete directory path from the root minus the name of the file.

GUI—Graphical User Interface

Mated MPS systems—The two MPS systems located at mated EAGLE 5 ISS sites.

Mate PDB—The collocated server of a PDB, which resides on same MPS system.

Mate RTDB—The collocated server of a RTDB, which resides on same MPS system.

Mate servers—The two MPS servers located at one EAGLE 5 ISS location. From one MPS, the other MPS server in the frame is referred to as its mate.

MPS—A hardware and software platform that can be configured as an Eagle Local Number Portability (LNP) Application Processor (ELAP) or Eagle Provisioning Application Processor (EPAP) server.

MPS server—The Tekelec T1000 Application Server hardware and the MPS platform software comprise one MPS server.

MPS system—Two MPS servers and associated hardware located at one EAGLE 5 ISS site.

PDB—Provisioning Database

PDBA—Provisioning Database Application

Remote machine—Any machine on the network. It may not necessarily run the EPAP software application.

Replication Error List—A list of updates that is created as a result of a failure during the database replication process from the active-to-standby PDB. These are updates that have not been propagated (reconciled) throughout the system and require manual intervention to ensure the EPAP systems properly process the updates.

RTDB—Real Time Database

SCP—Secure Copy

SFTP—Secure File Transfer Protocol

UI—User Interface

Update Validation—The process of generating and verifying checks prior to writing new data records to the RTDB.

VIP—Virtual IP

Virtual IP—An IP address that is not connected to a specific computer or network interface card (NIC) on a computer. Incoming packets are sent to the VIP address, but all packets travel through real network interfaces. VIPs are mostly used for connection redundancy, a VIP address may still be available if a computer or NIC fails because an alternative computer or NIC replies to connections.