

**Oracle® Communications
Tekelec HLR Router**

Feature Notice

Release 4.0

910-6934-001 Revision A

February 2014

Oracle® Communications Feature Notice, Release 4.0

Copyright © 2014, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Table of Contents

EAGLE XG HLR Router	6
Introduction.....	6
HLR Router functionality.....	6
EAGLE XG HLR Router Hardware Configurations (HP G6).....	7
Compatibility.....	8
System Architecture.....	8
HLR Router Components	9
EAGLE XG HLR Router 4.0 Feature.....	11
Support for the Secure Active Network Environment (SANE).....	11
Tekelec Resources and Services.....	12
Customer Care Center.....	12
Emergency Response.....	14
Customer Training.....	15
Locate Product Documentation on the Customer Support Site.....	15
Acronyms.....	16

List of Figures

Figure 1: EAGLE XG HLR Router System Diagram.....8

List of Tables

Table 1: HP G6 Hardware Components.....	7
Table 2: HLR Router 4.0 Compatibility with External Systems.....	8

EAGLE XG HLR Router

This Feature Notice includes feature descriptions, provides the hardware baseline for this release, and explains how to find customer documentation on the Customer Support Site.

Introduction

The EAGLE XG HLR Router allows the optimization of HLR workloads over mobile networks.

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

This *Feature Notice* includes the following topics:

- [EAGLE XG HLR Router Hardware Configurations \(HP G6\)](#)
- [Compatibility](#)
- [System Architecture](#)
- [EAGLE XG HLR Router 4.0 Feature](#)
- [Tekelec Resources and Services](#)
- [Acronyms](#)

HLR Router functionality

HLR Router provides the following functionality:

- SCCP message relay functions for HLR Routing
- PDBI provisioning allowing independent information systems to add, delete, change or retrieve information about any IMSI, DN, or Network Entity association
- The ability to add an NPA to a region using NPA Splits
- On-demand ability to initiate an audit of the remote EPAP provisioning database, and flag differences found between the EPAP and the HLR databases
- Automatic provisioning of blacklist entries for new Network Entities
- Efficient and flexible MTP3-style routing of SS7 signaling between MSCs and HLRs
- A Mate Network Entities table that contains preferred and mate relationships that allows rerouting to a Mate Network Entity if the primary is not available
- Ability to throttle the amount of any GSM messages destined to the HLR
- Exception routing of messages that do not find a successful translation in the provisioning database
- The ability for a remote client to run adhoc, read-only queries on a provisioned database using Query Server
- Geographically independent Disaster Recovery NOAMP servers that can, upon activation, take over the responsibilities of the main NOAMP
- Enhanced application security via the ability to manage the administration of accounts, logins, and passwords
- Real-time alarms and alarm history availability

- The ability to capture and preserve vital collections of configured data using manual and/or automatic backups
- Automatic file-based bulk import of provisioning data on the NOAMP
- On-demand ability to collect performance data on the HLR Router
- Access to the Secure Active Network Environment (SANE)

EAGLE XG HLR Router Hardware Configurations (HP G6)

The EAGLE XG HLR Router requires a hardware configuration that uses HP G6 rack mount servers. The HP G6 rack mount servers and other required hardware can be assembled by Tekelec manufacturing into a frame and delivered as one unit. Additional information about the HP hardware is provided in the Tekelec Platform *Planning Guide*.

Table 1: HP G6 Hardware Components

Part Number	Description	Function	Quantity	Notes
963-9021-01 or 963-9020-01	AC Cabinet with power and cabling or DC Cabinet with power and cabling	Frame	Minimum: 1 Maximum: 1	
963-9053-01	1G Aggregation Switch	Ethernet Stitches	Minimum: 2 Maximum: 2	Per Frame
963-9240-01	SDS Rack Mount Server - NO	Network OAM&P Server	Minimum: 2 Maximum: 2	NOAM&P can be co-located in the same frame as the SOAM and HLRR MPs
963-9241-01	SDS Query Server Rack Mount Server	Query Server	Minimum: 0 Maximum: 1	Per NOAM&P Frame
963-9240-01	SDS Rack Mount Server - SO	System OAM Server	Minimum: 2 Maximum: 2	Per Signaling Frame Maximum of 40 pairs of SOAMs per NOAM&P
963-9240-01	SDS Rack Mount Server - MP	HLR Router Message Processor	Minimum: 1 Maximum: 10	Per Signaling Frame

Compatibility

EAGLE XG HLR Router is a stand alone product deployed in a network running EAGLE® 5 42.0. and higher HLR Router interfaces with EAGLE 5 via a standard M3UA interface. The PDBI interface on EAGLE XG HLR Router is fully compatible with EPAP 12.0 PDBI.

Table 2: HLR Router 4.0 Compatibility with External Systems shows the compatibility of EAGLE XG HLR Router Release 4.0 with the releases of interfacing external systems.

Table 2: HLR Router 4.0 Compatibility with External Systems

Product	Release	Compatibility
EAGLE 5	42.0 and higher	Fully compatible

System Architecture

This figure provides an overview of the EAGLE XG HLR Router architecture.

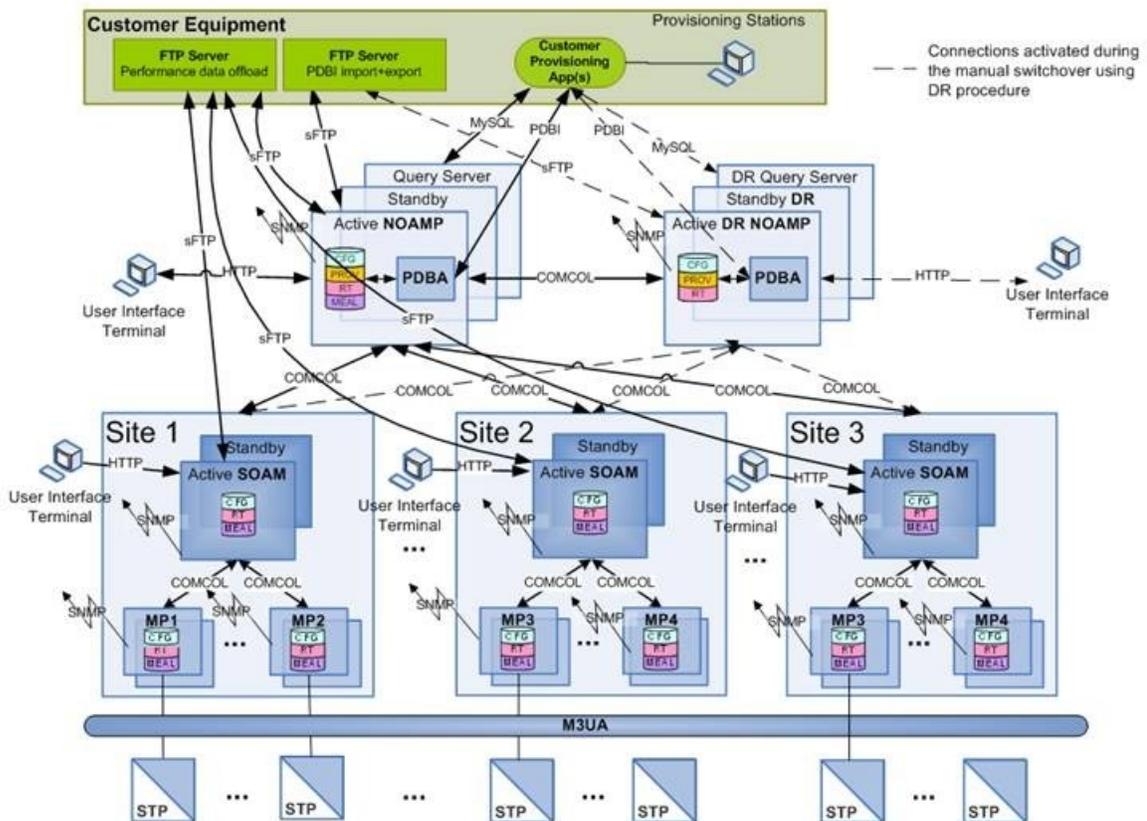


Figure 1: EAGLE XG HLR Router System Diagram

Each MP shall access IMI and two XSI VLANs. Each MP has four physical ports. Two ports on the MP shall be bonded and shall support XMI and IMI VLANs. The other two ports on the MP shall support connectivity to signaling network. The signaling interfaces can be directly connected to the operators signaling switches while IMI shall be connected to Tekelec Telco switches.

SCTP associations are point to point and the destination IP address for an association must be specified. The destination IP address can be in a different subnet from the local subnet of the association. A Message Processor's IP routing shall support L3 routing of messages from MP to the destination IP address STP/SG. To accomplish this, the MP supports user configuration of the Ethernet interface or router address usages for a particular destination IP address.

HLR Router Components

NOAMP

The NOAMP component consists of one active NOAMP server and one standby NOAMP server running in a high availability configuration. It accepts subscriber data provisioned by the customer over PDBI and replicates it to the DR NOAMP, the Query Server and all subtending SOAMs. It also provides a GUI which is used for configuration, user administration and the viewing of alarms and measurements.

NOAMP distributes all successful incoming subscriber provisioning data, independent of source, to all downstream Network Elements and the DR NOAMP at a rate of up to 200 provisioning database updates per second. In order to ensure the database levels of the Network Elements are less than the database levels of the NOAMP and DR NOAMP, the active provisioning site NOAMP provisions the DR NOAMP prior to updating the Network Elements.

DR NOAMP

The DR NOAMP is a geographically independent NOAMP component. The DR NOAMP has the same hardware configuration and network accessibility as the NOAMP.

The DR NOAMP's databases are kept up to date through real-time replication of subscriber and application data from the Active NOAMP. Under normal operating conditions, the DR NOAMP does not provision any downstream systems but if made Active, it will take over all the functions of the Active NOAMP including the PDBI and database replication to subtending SOAMs.

SOAM

The SOAM component consists of one active SOAM server and one standby SOAM server running in a high availability configuration. It accepts subscriber data replicated from the Active NOAMP and in turn replicates it to all subtending MPs located in the same physical frame. SOAM also provides a GUI used for local Signaling configuration and viewing alarms and measurements details specific to components located within the frame (SOAM, MP).

The SOAM supports up to 10 MPs.

Query Server (Optional)

The Query Server is an independent application server containing a replicated version of the PDBI database. It accepts replicated subscriber data from the NOAMP and stores it in a customer accessible MySQL database. A Query Server is located in the same physical frame as each NOAMP component (NOAMP / DR NOAMP).

Network Element

Network Elements are containers that group and create relationships between servers in the network. There are two types of Network Elements:

- NOAMP: such as the NOAMP and the DR NOAMP
- Signaling: contains a pair of SOAM servers and one or more MP servers

The system can support two NOAMP Network Elements and up to 40 Signaling Network Elements.

MPs

The MPs are servers with the HLR Router application installed that are configured for MP functionality. They accept replicated subscriber data from the local SOAM and store it in a subscriber database.

The MP is accessed as a Service Relay Point and is connected to the Eagle STPs via Sigtran M3UA interfaces. Each MP is capable of relaying real-time SCCP messages at a maximum sustained rate of 20,000 (15,000 for MLR) transactions per second for HLR routing lookups. Multiple MP servers may be deployed in a single frame in order to scale query capacity (by increments of 20,000 for SCCP and 15,000 for MLR). Each site can support up to 10 MPs, but the HLR Router System can support up to a total of 96 MPs in the system.

EAGLE XG HLR Router 4.0 Feature

The EAGLE XG HLR Router allows the optimization of HLR workloads over mobile networks by providing a centralized database of subscriber to HLR mappings. This product surpasses the database capacity provided by the existing GFlex.

When an HLR record is needed, the MSC routes the request to the HLR Router. The HLR Router uses global title translation to determine the correct HLR for the subscriber and forwards the MSC request to that HLR. The HLR Router also provides the ability to route to mated HLRs based on SS7 network status, and to route to a default HLR if no translations exist for a given subscriber via exception routing. This allows network providers to maintain translations in a central database, eliminating the need to maintain subscriber routing information at every MSC in the network. This also allows great flexibility in distributing or redistributing subscribers across available HLRs.

The following feature is new to EAGLE XG HLR Router 4.0:

- Support for Secure Active Network Environment (SANE)

Support for the Secure Active Network Environment (SANE)

SANE (Secure Access to Network Elements) is a central Authentication and Authorization system for network elements. It provides single-sign-on capability to network elements for users of the SANE GUI client, and allows network element vendors to use open-source, open-protocol methodologies to integrate clients into the security infrastructure.

Tekelec Resources and Services

Tekelec provides a number of resources for EAGLE XG HLR Router. These include the availability of product documentation online, customer training, and access to the Customer Care Center.

Customer Care Center

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

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

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

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

Tekelec - Global

Email (All Regions): support@tekelec.com

- **USA and Canada**

Phone:

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

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

TAC Regional Support Office Hours:

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

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

Phone:

+1-919-460-2150

TAC Regional Support Office Hours (except Brazil):

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

- **Argentina**

Phone:

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

- **Brazil**

Phone:

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

TAC Regional Support Office Hours:

8:00 a.m. through 5:48 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

- **Chile**

Phone:

1230-020-555-5468

- **Colombia**

Phone:

01-800-912-0537

- **Dominican Republic**

Phone:

1-888-367-8552

- **Mexico**

Phone:

001-888-367-8552

- **Peru**

Phone:

0800-53-087

- **Puerto Rico**

Phone:

1-888-367-8552

- **Venezuela**

Phone:

0800-176-6497

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

Regional Office Hours:

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

- **Signaling**

Phone:

+44 1784 467 804 (within UK)

- **Software Solutions**

Phone:

+33 3 89 33 54 00

- **Asia**

- **India**

Phone:

+91-124-465-5098 or +1-919-460-2150

TAC Regional Support Office Hours:

10:00 a.m. through 7:00 p.m. (GMT plus 5 1/2 hours), Monday through Saturday, excluding holidays

- **Singapore**

Phone:

+65 6796 2288

TAC Regional Support Office Hours:

9:00 a.m. through 6:00 p.m. (GMT plus 8 hours), Monday through Friday, excluding holidays

Emergency Response

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

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

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

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

Customer Training

Oracle offers a variety of technical training courses designed to provide the knowledge and experience required to properly provision, administer, operate, and maintain Oracle products. To enroll in any of the courses or for schedule information, contact the Training Center at (919) 460-3064 or E-mail training@tekelec.com.

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

Locate Product Documentation on the Customer Support Site

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

1. Log into the [Tekelec Customer Support](#) site.

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

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

Acronyms

This document uses some or all of the following acronyms:

DN - Directory Number

EPAP - EAGLE rovisioning Application Processor

GUI - Graphical User Interface

HLR - Home Location Register

IMSI - International Mobile Subscriber Identity

IP - Internet Protocol

ISDN - Integrated Services Digital Network

M3UA - MTP3 User Adaptation Layer

MP - Message Processor

MSC - Mobile Switching Center

MSISDN - Mobile Subscriber ISDN

MTP3 - Message Transfer Part Level 3

NE - Network Entity

NOAMP - Network Operations, Administration, Maintenance and Provisioning

NP - Number Plan

NPA - Number Planning Area

OAM&P - Operations Administration and Maintenance

PC - Point Code

PDBA - Provisioning Database Application

PDBI - Provisioning Database Interface

PDP - Permissive Dialing Period

SANE - Secure Active Network Environment

SCTP - Stream Control Transfer Protocol

SG - Signaling Gateway

SMSC - Short Message Service Center

SNMP - Simple Network Management Protocol

SOAM - System Operations, Administration, and Maintenance server at each site

SSN - Sub System Number

STP - Signaling Transfer Point

Acronyms

TPS - Transactions Per Second

VLAN - Virtual Local Area Network