

**Oracle® Communications
EAGLE Element Management System**

Security Guide

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Chapter 1

Introduction

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This chapter contains general information such as an overview of the manual, how to get technical assistance, and where to find additional information.

Overview

This guide describes how to ensure a secure installation of Oracle Communications EAGLE Element Management System (E5-MS), and explains E5-MS security features.





Scope and Audience

This guide is intended for administrators that are responsible for product and network security.

Documentation Admonishments

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

Table 1: Admonishments

Icon	Description
 DANGER	Danger: (This icon and text indicate the possibility of <i>personal injury</i> .)
 WARNING	Warning: (This icon and text indicate the possibility of <i>equipment damage</i> .)
 CAUTION	Caution: (This icon and text indicate the possibility of <i>service interruption</i> .)
 TOPPLE	Topple: (This icon and text indicate the possibility of <i>personal injury and equipment damage</i> .)

Manual Organization

This manual contains the following chapters:

- [Introduction](#) contains general information such as an overview of the manual, how to get technical assistance, and where to find more information.
- [E5-MS Security Overview](#) describes basic security considerations and provides an overview of E5-MS security.
- [Performing a Secure E5-MS Installation](#) describes the process to ensure a secure installation of E5-MS.
- [Implementing E5-MS Security](#) explains E5-MS security features.

My Oracle Support (MOS)

MOS (<https://support.oracle.com>) is your initial point of contact for all product support and training needs. 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 <http://www.oracle.com/us/support/contact/index.html>. 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 **2** for Non-technical issue

You will be connected to a live agent who can assist you with MOS registration and provide Support Identifiers. Simply mention you are a Tekelec Customer new to MOS.

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

Emergency Response

In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at **1-800-223-1711** (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. 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 Oracle.

Related Publications

For information about additional publications that are related to this document, refer to the *Related Publications Reference* document, which is published as a separate document on the Oracle Technology Network (OTN) site. See [Locate Product Documentation on the Oracle Technology Network Site](#) for more information.

Locate Product Documentation on the Oracle Technology Network Site

Oracle customer documentation is available on the web at the Oracle Technology Network (OTN) 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 www.adobe.com.

1. Log into the Oracle Technology Network site at <http://docs.oracle.com>.
2. Under **Applications**, click the link for **Communications**.
The **Oracle Communications Documentation** window opens with Tekelec shown near the top.
3. Click **Oracle Communications Documentation for Tekelec Products**.
4. Navigate to your Product and then the Release Number, and click the **View** link (the **Download** link will retrieve the entire documentation set).
5. To download a file to your location, right-click the PDF link and select **Save Target As**.

Chapter 2

E5-MS Security Overview

Topics:

- *Basic Security Considerations.....10*
- *Overview of E5-MS Security.....10*

This chapter describes basic security considerations and provides an overview of E5-MS security.

Basic Security Considerations

The following principles are fundamental to using any application securely:

- **Limit privileges as much as possible.** Users should be given only the access necessary to perform their work. User privileges should be reviewed periodically to determine relevance to current work requirements.
- **Monitor system activity.** Establish who should access which system components, and how often, and then monitor the user activity logs.
- **Install software securely.** For example, use firewalls, secure protocols using TLS (SSL), and strong passwords. See [Performing a Secure E5-MS Installation](#) for more information.
- **Learn about and use the E5-MS security features.** See [Implementing E5-MS Security](#) for more information.
- **Keep up to date on security information.** Oracle regularly issues security-related patch updates and security alerts. You must install all security patches as soon as possible. See the "Critical Patch Updates and Security Alerts" Web site:
<http://www.oracle.com/technetwork/topics/security/alerts-086861.html>

Overview of E5-MS Security

The E5-MS is a secure and reliable Element Management System (EMS) that enables administration of EAGLE fault, admin, and measurement data in a central place. The E5-MS also enables fault management for Oracle Communications EAGLE Application Processor (EPAP) and Oracle Communications LSMS.

Operating System Security

The E5-MS requires a Linux 64-bit operating system, such as Oracle Enterprise Linux 6.4. E5-MS was tested on Oracle Enterprise Linux 6.4.

Note: FTP and Telnet are disabled in the default Oracle Linux installation, so connections from E5-MS to other systems in non-secure mode or to the E5-MS Northbound Interface (NBI) application are not possible (NBI connection is via Secure FTP only). If the E5-MS must support and manage systems that do not conform to the recommended secure installation, then FTP and Telnet must also be installed or another operating system that includes these packages should be used.

Ports Usage and Firewall Configuration

The ports used by E5-MS need to be open in firewall configurations. For a complete list of E5-MS ports, see *E5-MS Ports Usage and Firewall Configuration* in *Interface User's Guide*.

MySQL Database Security

The following E5-MS security considerations apply to the MySQL database:

- Secure Database Access Credentials

No *direct* database access is provided for in the E5-MS; all access is programmed.

The internal E5-MS database is pre-configured with a password that you need to change to prevent unauthorized access to the database from the command line. For information about changing the MySQL root user's password, see *E5-MS Database Password Change* in *Interface User's Guide*.

- Use SSH/SSL Connections

SSH/SSL is a robust, commercial-grade, and full-featured toolkit that implements the security and network encryption. SSH/SSL provides secure data transmission through encryption keys. Encryption is required for the connection between the E5-MS and the EAGLE, EPAP, and LSMS systems.

Chapter 3

Performing a Secure E5-MS Installation

Topics:

- [Pre-Installation Configuration.....13](#)
- [Installing E5-MS Securely.....13](#)
- [Post-Installation Configuration.....13](#)

This chapter presents planning information to ensure a secure installation of E5-MS.

For information about installing E5-MS, see *Upgrade/Install Guide*.

Pre-Installation Configuration

All pre-installation configuration is set by the default Oracle Linux installation. No additional user configuration regarding security is required.

For information about installing Oracle Linux, see *Oracle Linux 6 Installation Guide*

Installing E5-MS Securely

All non-essential and non-secure services are removed or excluded from the default installation.

Oracle recommends using the default installation, unless there are specific customer needs for additional services.

Post-Installation Configuration

There are no required post-installation configuration changes pertaining to security.

Establishing various network connections between the E5-MS and other systems is performed by using the EAGLE Discovery, EPAP Discovery, and LSMS Discovery applications as documented in *Interface User's Guide*.

Chapter

4

Implementing E5-MS Security

Topics:

- *Managing Database Password Security.....15*
- *Managing User Password Security.....15*
- *Managing Usergroups and Users.....15*

This chapter explains the E5-MS security features.

Managing Database Password Security

The internal E5-MS database is pre-configured with a password that you need to change to prevent unauthorized access to the database from the command line. For information, see *E5-MS Database Password Change* in *Interface User's Guide*.

Managing User Password Security

The E5-MS provides default security settings and the System Administrator can change various rules and constraints. For example, by default, the E5-MS does not provide any user password expiration limit, which can be set by the administrator after installation by using the E5-MS GUI. Other examples of configurable settings include rules for password composition (minimum length and number of alphabetic/numeric/special characters) and login restrictions such as the maximum permissible number of incorrect login attempts. For more information, see *Password Management* and *Login Restrictions Management* in *Interface User's Guide*.

Managing Usergroups and Users

The E5-MS provides a Security Administration interface to manage usergroups and users. Usergroups are created and E5-MS operations (such as Security Administration and EAGLE Discovery) are assigned to the group. The operations assigned to a group indicate the operations to which users in the group are permitted access. A user can perform only the operations associated with the usergroup to which they belong.

The E5-MS also offers usergroup management to limit and separate users' access authority to both commands and the managed equipment (for example, which EAGLE systems) they can access.

For more information, see *Management of Usergroups and Users* in *Interface User's Guide*.

E

EMS	<p>Element Management System</p> <p>The EMS feature consolidates real-time element management at a single point in the signaling network to reduce ongoing operational expenses and network downtime and provide a higher quality of customer service.</p>
EPAP	<p>EAGLE Provisioning Application Processor</p>

L

LSMS	<p>Local Service Management System</p> <p>An interface between the Number Portability Administration Center (NPAC) and the LNP service databases. The LSMS receives LNP data from the NPAC and downloads that data to the service databases. LNP data can be entered into the LSMS database. The data can then be downloaded to the LNP service databases and to the NPAC.</p>
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S

SSL	<p>Secure Socket Layer (SSL) is an industry standard protocol for clients needing to establish secure (TCP-based) SSL-enabled network connections</p>
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T

TLS	<p>Transport Layer Security</p>
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T

A cryptographic protocol that provides security for communications over networks such as the Internet. TLS encrypts the segments of network connections at the transport layer end-to-end. TLS is an IETF standards track protocol.