

**Oracle® Communications  
EAGLE Element Management System**

**Upgrade/Install Guide**

Release 46.0

**E54392 Revision 2**

February 2015

**ORACLE®**

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Before beginning this procedure, contact My Oracle Support and inform them of your upgrade plans. Refer to Appendix O for instructions on accessing My Oracle Support.

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## 1.0 INTRODUCTION

Release 46.0.1 of Oracle® Communications EAGLE Element Management System (which was earlier known as EAGLE 5- Management System and for sake of brevity, will be referred to as “E5-MS” throughout the document) is a maintenance release of E5-MS product after release 46.0. Prior to it, there have been three releases of E5-MS - R45.0, R45.0.1 (maintenance release) and R46.0. Existing customers, who are at release 45.0/45.0.1/46.0, can upgrade to release 46.0.1. In addition, E5-MS Release 46.0.1 can also be installed for first time for some customers.

Release 45.0.1 of E5-MS implemented two important security related features –

- E5-MS runs with firewall enabled
- Access to E5-MS client is secure (HTTPS based access)

Release 46.0 of E5-MS has upgraded following components –

- WebNMS 5.0 Service Pack 1 to WebNMS 5.2 Service Pack 1
- MySQL 5.0 to MySQL 5.6
- Java 6 to Java 7
- Tomcat 5 to Tomcat 7

Release 46.0.1 of E5-MS has fixes for many must fix bugs including those reported by existing E5-MS customers.

All the upgrades given above will be taken care of in E5-MS installation/upgrade procedure itself. However, for the security related features introduced in release 45.0.1, the following additional procedures will be needed -

- Open required ports on Firewall for E5-MS
- Generate SSL certificate required for HTTPS

Detailed steps for the above procedures have been added to this document.

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### 1.1 PURPOSE AND SCOPE

This document is the Technical Reference for the installation and upgrade procedure of release 46.0.1 of E5-MS. The target audience is those Oracle employees and agents involved with the installation, upgrade of Oracle E5-MS product along with the customers who will use E5-MS to manage the Eagles in their network.

The current version of the document is based on E5-MS release 46.0.1.

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### 1.2 E5-MS SYSTEM REQUIREMENTS

#### 1.2.1 Operating System

- Release 46.0.1 of E5-MS requires a Linux 64-bit operating system, such as Oracle Linux 6.4 or CentOS 6.2.

Release 46.0.1 of E5-MS has been tested on following platform and OS -

- An HP server running 64-bit CentOS 6.2 version
- A SUN server (Netra Server X3-2) running 64-bit Oracle Linux 6.4 version.
- Java 7 should be installed on the system for running E5-MS.
- The partition where E5MS will be installed should have 500GB of space.
- The no. of open files limit (ulimit -n) should be configured to 65536.

#### 1.2.2 Other Packages

For connecting to EAGLEs, TELNET and SSH services should be running on the server. TELNET is required for non-secure EAGLEs and SSH is required for connecting to secure EAGLEs. If the target OS is CentOS, then appropriate packages should be installed to support TELNET and SSH connection to EAGLEs. If the target OS is Oracle Linux then it by default supports SSH. No additional configuration should be required on it.

For receiving measurement data from EAGLEs, FTP/SFTP service should be running on the server. FTP is required for receiving measurements from non-secure EAGLEs and SFTP is required for receiving measurements from secure EAGLE(s). If the target OS is CentOS, then appropriate packages should be installed to support FTP/SFTP. If the target OS is Oracle Linux then it by default support SFTP. No additional configuration should be required on it. Note that if the target OS is Oracle Linux (with SFTP support), then while configuring EAGLE for sending measurement data to E5-MS using ent-ftp-serv command, the ‘security’ parameter must be turned ‘on’.

E5-MS stores the E5-MS machine credentials (system username and password) in encrypted format on disk. These are needed for port forwarding mechanism while connecting to EAGLEs on SSH protocol. In case the system username and/or password are updated, the same must be updated for E5-MS also using the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN E5-MS**.

### 1.2.3 Directories created by E5-MS

E5-MS creates following directory structure on the system –

- /Tekelec/WebNMS – This is E5-MS software installation directory.
- /var/E5-MS – This is the directory where E5-MS application logs are created.
- /opt/E5-MS - This directory contains CMI and LUI modules script and result directories.
- /root/E5-MS/measurement/csvinput – This is the location where measurement files are received from EAGLEs.
- /var/upgrade - This is the backup directory used during E5-MS upgrade.
- /var/backup - This is E5-MS manual and scheduled backup directory.

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## 1.3 E5-MS CLIENT REQUIREMENTS

E5-MS client should be having JRE 7 installed.

E5-MS can be viewed using either of the following web browsers:

- Microsoft® Internet Explorer version 8.0 or later
- Mozilla Firefox® version 16 or later.

**Note:** The browser of choice should have pop-ups enabled.

---

## 1.4 REFERENCES

### 1.4.1 External References

- [1] <http://dev.mysql.com/doc/refman/5.6/en/upgrading.html>  
 [2] <http://dev.mysql.com/doc/refman/5.6/en/replication-compatibility.html>

### 1.4.2 Internal References

- [3] TR007263, Technical Reference, E5-MS Backup and Restore, Latest Revision, Oracle

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## 1.5 ACRONYMS

*Table 1: Acronyms*

Acronym	Description
E5-MS	Eagle 5 – Management System
RPM	Red Hat Package Manager. E5-MS software shall be delivered in form of RPM packages.

*Table 2. Definition of terms*

<b>Term</b>	<b>Definition</b>
Backup	Generation of a copy of the existing configuration files, database tables and other data which can be used later to bring the E5-MS system to the previous configured state
Primary server	In a failover setup, the E5-MS server which has the E5-MS processes up and to which a user can connect through a client
Restore	Using a previously generated copy of backup, to bring the E5-MS system back to a state when the backup was generated
Standalone server	A single E5-MS server with no support for failover
Standby server	In a failover setup, an E5-MS server that monitors the state of primary server and has no E5-MS processes up. It becomes the primary server on detecting a shutdown of primary server.

## 2.0 INSTALLATION PROCEDURE (STANDALONE SERVER)

Purpose	Requirements	Time Required
Installation of E5-MS	<ol style="list-style-type: none"> <li>Admin (root) login of target E5-MS server.</li> <li>E5-MS RPM copied onto the target E5-MS server. If RPM file is on an external media, then it should be mounted to the target E5-MS server.</li> </ol>	1 Hour

Using the information given in section 1.2.1, verify if a proper Operating System is installed on the target E5-MS machine. If the Operating System is correct, then proceed with the following procedure to install E5-MS -

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	-
2	Verify if user 'mysql' exists on the system.	# egrep -i "^mysql" /etc/passwd
3	User 'mysql' exists on the system if the command gives output similar to that given here.	# mysql:x:518:518::/home/mysql:/bin/bash
4	If 'mysql' user exists on system, delete the user by issuing the given command.	# userdel mysql
5	Verify if group 'mysql' exists on the system.	# egrep -i "^mysql" /etc/group
6	Group 'mysql' exists on the system if the command gives output similar to that given here.	# mysql:x:518:
7	If 'mysql' group exists on system, delete the group by issuing the given command.	# groupdel mysql
8	Install E5-MS RPM by issuing the given command. The installation process will install E5-MS RPM as well as execute mysql_upgrade utility to fix any any tablespace related errors.	<pre># rpm -ivh &lt;Path to E5-MS 46.0.1 RPM&gt; # rpm -ivh E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm Preparing... ##### [100%]     1:E5-MS ##### [100%]  Starting mysql daemon.  bin/mysqld_safe: line 489: my_print_defaults: command not found bin/mysqld_safe: line 495: my_print_defaults: command not found  140718 13:20:31 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms8.err'.  140718 13:20:31 mysqld_safe Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data  MySQL daemon started.  Performing mysql upgrade to fix any tablespace issue.  Warning: Using a password on the command line interface can be insecure.</pre>



```
Looking for 'mysql' as: bin/mysql
Looking for 'mysqlcheck' as: bin/mysqlcheck
Running 'mysqlcheck with default connection arguments
Warning: Using a password on the command line interface can
be insecure.
Running 'mysqlcheck with default connection arguments
Warning: Using a password on the command line interface can
be insecure.
mysql.columns_priv          OK
mysql.db                    OK
mysql.event                 OK
mysql.func                  OK
mysql.general_log           OK
mysql.help_category         OK
mysql.help_keyword          OK
mysql.help_relation         OK
mysql.help_topic            OK
mysql.ndb_binlog_index      OK
mysql.plugin                OK
mysql.proc                  OK
mysql.procs_priv            OK
mysql.proxies_priv          OK
mysql.servers               OK
mysql.slow_log              OK
mysql.tables_priv           OK
mysql.time_zone             OK
mysql.time_zone_leap_second OK
mysql.time_zone_name        OK
mysql.time_zone_transition  OK
mysql.time_zone_transition_type OK
mysql.user                  OK
Running 'mysql_fix_privilege_tables'...
Warning: Using a password on the command line interface can
be insecure.
Running 'mysqlcheck with default connection arguments
Warning: Using a password on the command line interface can
be insecure.
Running 'mysqlcheck with default connection arguments
Warning: Using a password on the command line interface can
be insecure.
OK
Shutting down mysql daemon.
Warning: Using a password on the command line interface can
be insecure.
E5-MS installation completed.
140718 13:20:47 mysqld_safe mysqld from pid file
/Tekelec/WebNMS/mysql/data/e5ms8.pid ended
```

9	Move to “/Tekelec/WebNMS/bin/” directory by issuing the given command.	# cd /Tekelec/WebNMS/bin/
10	Execute the UniqueIDLinux.sh script to generate a Unique Machine ID for the system using the MAC ID of the system.  Note down the Unique Machine ID generated by the script.	# sh UniqueIDLinux.sh Your Unique Machine ID is <b>2abVDag3S3</b>  Note: Please use the Unique Machine ID shown above to get Your License Key. Unique Machine ID is encoded version of the MAC address. This Unique Machine ID will be used only for key Generation.  This information will not be disclosed to any other sources.  Press any key to exit.....
11	Send the Unique Machine ID to the Oracle sales representative. The Oracle sales representative shall then send the Unique Machine ID to the Oracle PS team.	-
12	Oracle PS team shall use the Unique Machine ID provided to generate an E5-MS license file using the LAT tool.  The license thus generated shall be applicable to the specific machine where E5-MS has been installed.	-
13	Copy the E5-MS license file to the target machine where E5-MS has been installed.  <b>Note:</b> The user name to whom E5-MS license has been issued and the path of license file should be noted to be used during the first time E5-MS server startup.	-
14	On the target machine, move to “/Tekelec/WebNMS/bin/” directory by issuing the given command.	cd /Tekelec/WebNMS/bin/
15	Use the procedure given in <b>PROCEDURE TO CREATE E5-MS SSL CERTIFICATE</b> to generate SSL certificate needed for HTTPS based access for E5-MS.	-
16	In case a firewall is enabled between the E5-MS server and client or E5-MS server and managed EAGLE(s), use the procedure given in	-

	<p><b>OPENING PORTS USED BY E5-MS IN CASE OF FIREWALL</b> to open the ports used by E5-MS.</p>	
17	<p>Move to /Tekelec/WebNMS/bin directory and Start E5-MS server by using the given command. When required, provide appropriate inputs shown as highlighted.</p> <p><b>Note:</b> For the first time after fresh installation, E5-MS server <b>must</b> be started using startnms.sh script and not using the e5msService. This is because on first startup, it shows the E5-MS license agreement and needs manual inputs regarding licensing.</p>	<pre># sh startnms.sh  &lt;Messages given in LOG MESSAGES ON FIRST STARTUP OF E5-MS SERVER AFTER INSTALLATION are displayed. Keep pressing enter key each time message "Press Enter to continue..." is shown on screen&gt;  Do you accept the LICENSE AGREEMENT (y/n) y  ***** REGISTRATION *****  HOST NAME IS e5ms9  Press 1 to provide the User Name and License File path 2 to Exit  Choose an Option :: 1  Enter User Name : &lt;Provide the user name to whom E5-MS license has been issued&gt;  Enter The License File path : &lt;Path to E5-MS license file&gt;  OS detected : Linux Created table ANNOTATION Created table Alert Created table CORBANode Created table CRITERIAPROPERTIES Created table Event Created table GMapSymbol Created table GroupTable Created table IpAddress Created table MAPPEDPROPERTIES Created table MAPUSERPROPS Created table ManagedGroupObject Created table ManagedObject Created table MapContainer Created table MapDB Created table MapGroup Created table MapLink Created table MapSymbol Created table Network Created table Node</pre>

	<p>Created table PolledData</p> <p>Created table PortObject</p> <p>Created table Printer</p> <p>Created table SnmpInterface</p> <p>Created table SnmpNode</p> <p>Created table SwitchObject</p> <p>Created table TL1Interface</p> <p>Created table TL1Node</p> <p>Created table Tek_Secu_MapUserGrpEagleNode</p> <p>Created table Tek_Secu_MapUsergrpCmdClass</p> <p>Created table Tek_Secu_PasswordConfig</p> <p>Created table Tek_Secu_UserInfo</p> <p>Created table Tek_inventory_card</p> <p>Created table Tek_inventory_eagleNode</p> <p>Created table Tek_inventory_epap</p> <p>Created table Tek_inventory_frame</p> <p>Created table Tek_inventory_lsmsnode</p> <p>Created table Tek_inventory_shelf</p> <p>Created table Tek_inventory_slot</p> <p>Created table TopoObject</p> <p>Created table tek_scheduler_task</p> <p>Created table ObjectTypes</p> <p>Created table USERTABLE</p> <p>Created table HOSTS</p> <p>Created table PORTS</p> <p>Created table ENGINES</p> <p>Created table USERS</p> <p>Created table TrapDisabledMO</p> <p>Created table CHILDRENSTATUS</p> <p>Created table OBJECTSTOLINK</p> <p>Created table ObjectSchedulerRUNNABLE</p> <p>Created table TaskAudit</p> <p>Created table DeviceAudit</p> <p>Created table AttributeAudit</p> <p>Created table ConfigTasks</p> <p>Created table ConfigTaskDetails</p> <p>Created table ConfigAttributes</p> <p>Created table PendingTasks</p> <p>Created table PendingDevices</p> <p>Created table DeviceList</p> <p>Created table DeviceListDetails</p> <p>Created table DeviceUserProps</p>
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	<p>Created table TaskToDeviceListMap</p> <p>Created table PollingObjects</p> <p>Created table ConfigProvider</p> <p>Created table PollingAttributes</p> <p>Created table Providers</p> <p>Created table StatsTables</p> <p>Created table ThresholdObjects</p> <p>Created table CustomView</p> <p>Created table CustomViewProps</p> <p>Created table CustomViewColumns</p> <p>Created table PanelTree</p> <p>Created table Reports</p> <p>Created table DataCollectionAttributes</p> <p>Created table UserPasswordTable</p> <p>Created table UserGroupTable</p> <p>Created table ViewPropertiesTable</p> <p>Created table ViewsToGroupTable</p> <p>Created table ViewToOperationsTable</p> <p>Created table OperationsTreeTable</p> <p>Created table NamedViewToAuthorizedViewTable</p> <p>Created table NotificationLog</p> <p>Created table VarBindLog</p> <p>Created table PolicyObject</p> <p>Created table PolicyActionCondition</p> <p>Created table POLICYUSERPROPS</p> <p>Created table DBPOLICY</p> <p>Created table PolicyScheduleTime</p> <p>Created table AlertPolicyObject</p> <p>Created table ENGINETABLE</p> <p>Created table USMTABLE</p> <p>Created table MonitorNmsParameter</p> <p>Created table OperationsTable</p> <p>Created table BEFailOver</p> <p>Created table PollIDToKeyMap</p> <p>Created table ProvisioningVariantProps</p> <p>Created table ProvisioningVariant</p> <p>Created table UserConfTable</p> <p>Created table NetworkInventory</p> <p>Created table AuthAudit</p> <p>Created table REPORTS_HOURLY</p> <p>Created table REPORTS_DAILY</p> <p>Created table UIDataIdVsPRIId</p>
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	<p>Created table ProvisionResult</p> <p>Created table UserInputData</p> <p>Created table StageIdVsConfigId</p> <p>Created table WIDGETLEVEL</p> <p>Created table WIDGETASSOCIATION</p> <p>Created table WIDGET</p> <p>Created table WIDGETCRITERIA</p> <p>Created table WIDGETDATASOURCE</p> <p>Created table DASHBOARDCOLUMNS</p> <p>Created table DASHBOARDPROPS</p> <p>Created table CCTVVIEWS</p> <p>Created table CCTV</p> <p>Created table DASHBOARD</p> <p>Created table FAULTREPORTS_HOURLY</p> <p>Created table FAULTREPORTS_DAILY</p> <p>Created table SendEmailEventAction</p> <p>Created table SendEmailAlertAction</p> <p>Created table FilterCommandEventAction</p> <p>Created table FilterCommandAlertAction</p> <p>Created table STATSAGGREGATIONHOURLY</p> <p>Created table STATSAGGREGATIONDAILY</p> <p>Created table smsprofiles</p> <p>Created table smsserver_out</p> <p>Created table tek_cmi_cmdclasses</p> <p>Created table tek_cmi_commands</p> <p>Created table tek_cmi_cmdclass_cmd_map</p> <p>Created table tek_cmi_cmd_params</p> <p>Created table tek_cmi_cmd_param_values</p> <p>Created table tek_cmi_cmd_param_map</p> <p>Created table tek_cmi_cmd_param_validation</p> <p>Created table tek_cmi_cmd_param_lookup</p> <p>Created table tekelec_meas_headers</p> <p>Created table tekelec_meas_reports</p> <p>Created table tek_lui_slk_capacity</p> <p>Created table tek_lui_slk_reptstatcard</p> <p>Created table tek_lui_slk_capacity_arch</p> <p>Created table tek_lui_config_data</p> <p>Created table tek_lui_link_data</p> <p>Created table tek_lui_measurements</p> <p>Created table tek_lui_linkdata_timestamp</p> <p>Created table tek_rprt_rept_stat_card</p> <p>Created table tek_rept_tokens</p>
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		<p>Created table tek_nbi_nms_config</p> <p>Created table tek_snmp_agent_config</p> <p>Created table tek_nbi_ftp_config</p> <p>&lt;Messages given in LOG MESSAGES ON STRATING E5-MS SERVER are displayed on console&gt;</p>
18	Launch a new session on the E5-MS machine and login using administrator (root) login.	-
19	Move to /Tekelec/WebNMS/bin directory by issuing the given command.	# cd /Tekelec/WebNMS/bin/
20	<p>Execute installE5MSSchema.sh script to populate CMI and Measurement data in E5-MS database. When required, provide the MySQL root user's password (default password is 'public'). This script shall take about half an hour to complete.</p> <p><b>Note:</b> After successful script completion, E5-MS server restart is needed once for the data to be populated in E5-MS application.</p>	<p># sh installE5MSSchema.sh</p> <p>Please enter MySql password: <b>public</b></p> <p>&lt;Messages given in LOG MESSAGES ON INSTALLATION OF E5-MS SCHEMA are displayed on console&gt;</p>
21	<p>Stop the E5-MS server using the given command.</p> <p><b>Note:</b> Restart of the server is required to populate CMI data on E5-MS GUI.</p>	<p># service e5msService stop</p> <p>Stopping E5-MS server...</p> <p>Warning: Using a password on the command line interface can be insecure.</p> <p>MySql server to be stopped</p> <p>Done.</p> <p>&lt;Messages given in LOG MESSAGES ON STOPPING E5-MS SERVER are displayed on console&gt;</p>
22	Start the E5-MS server using the given command. Output similar to that given here is displayed on console.	<p># service e5msService start</p> <p>Starting E5-MS server...</p> <p>Starting mysql</p> <p>/</p> <p>bin/mysqld_safe: line 489: my_print_defaults: command not found</p> <p>bin/mysqld_safe: line 495: my_print_defaults: command not found</p> <p>140722 07:23:41 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms9.err'.</p> <p>140722 07:23:41 mysqld_safe Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data</p> <p>Warning: Using a password on the command line interface can be insecure.</p> <p>140722 07:23:47 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms9.pid ended</p>

		/ OS detected : Linux <Messages given in <b>LOG MESSAGES ON STRATING E5-MS SERVER</b> are displayed on console>
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### 3.0 INSTALLATION PROCEDURE (FAILOVER SETUP)

In failover setup, there are two E5-MS servers installed with the same release of software, one working as a primary server and the other working as a standby server.

Primary server is the active server where all the E5-MS processes are up and the standby server is one where only MySQL is up and the E5-MS processes are not up. The standby server keeps monitoring the primary server and in case the primary server fails, it takes over the role of primary by starting all the E5-MS processes. In failover setup, database and configuration files are replicated between primary and standby servers.

Purpose	Requirements	Time Required
Installation of E5-MS on Primary and Standby servers	<ol style="list-style-type: none"> <li>Admin (root) login details of target E5-MS servers (Primary and Standby).</li> <li>E5-MS RPM copied onto the target E5-MS servers (Primary and Standby). If RPM file is on an external media, then the media should be mounted to the target E5-MS server.</li> <li>Password of MySQL root user (default password is 'public').</li> </ol>	2 Hours

Using the information given in section 1.2.1, verify if a proper Operating System is installed on the target E5-MS machines (Primary and Standby). If the Operating System is correct, then proceed with the following procedure of E5-MS installation in a failover setup. For clarity, we shall address the Primary server as 'server 1' and the Standby server as 'server 2'.

S. No.	Step	Expected Output
1	Perform steps 1 to 13 from section 2.0 on both the servers (Server 1 and 2).	-
2	On server 1, use the procedure given in <b>PROCEDURE TO CREATE E5-MS SSL CERTIFICATE</b> to generate SSL certificate needed for HTTPS based access for E5-MS.	-
3	<p>Copy the values of ENCRYPTED_TRUST_STORE_PASSWORD and ENCRYPTED_KEY_STORE_PASSWORD from /Tekelec/WebNMS/conf/transportProvider.conf file on server 1 and paste the values in the same file on server 2.</p> <p><b>Note:</b> Values to be copied from server 1 are highlighted. The value shown highlighted here is just an example and the user needs to copy the specific password as listed in their file on server 1.</p>	<p>Copy the highlighted on server 1 -</p> <pre>&lt;ENCRYPTED_TRUST_STORE_PASSWORD&gt;C70z67Ks4t&lt;/ENCRYPTED_TRUST_STORE_PASSWORD&gt;</pre> <pre>&lt;ENCRYPTED_KEY_STORE_PASSWORD&gt;C70z67Ks4t&lt;/ENCRYPTED_KEY_STORE_PASSWORD&gt;</pre> <p>Paste on server 2 within the same xml tags (by default there is no value within tags, overwrite the value if there is already one) –</p> <pre>&lt;ENCRYPTED_TRUST_STORE_PASSWORD&gt;&lt;/ENCRYPTED_TRUST_STORE_PASSWORD&gt;</pre> <pre>&lt;ENCRYPTED_KEY_STORE_PASSWORD&gt;&lt;/ENCRYPTED_KEY_STORE_PASSWORD&gt;</pre>
4	<b>Note:</b> Primary and Secondary servers need to be behind a single firewall and should not have their individual firewalls turned ON. Client machine used to access E5-MS client and managed EAGLE(s) could be on	-

	<p>other side of the firewall.</p> <p>In case a firewall is enabled between E5-MS servers and client or E5-MS servers and managed EAGLE(s), use the procedure given in <b>OPENING PORTS USED BY E5-MS IN CASE OF FIREWALL</b> to open the ports used by E5-MS.</p>	
5	Execute the steps in F.1 to setup replication between the servers.	-
6	On server 1, perform step 17 from section 2.0. Server 1 shall start as primary server.	-
7	Move to /Tekelec/WebNMS/bin directory by issuing the given command.	# cd /Tekelec/WebNMS/bin/
8	<p>Execute installE5MSSchema.sh script to populate CMI and Measurement data in E5-MS database. When required, provide the MySQL root user's password (default password is 'public'). This script shall take about half an hour to complete.</p> <p><b>Note:</b> As database replication has already been set up between the two servers, CMI and Measurement data shall automatically be replicated from server 1 to server 2 and there shall not be need to execute installE5MSSchema.sh script on server 2.</p>	<pre># sh installE5MSSchema.sh Please enter MySql password: public &lt;Messages given in LOG MESSAGES ON INSTALLATION OF E5-MS SCHEMA are displayed on console&gt;</pre>
9	On server 2, perform step 17 from section 2.0. Server 2 shall start as standby server.	-
10	<p>On server 1, shutdown E5-MS server by issuing the command.</p> <p><b>Note:</b> This is needed for populating E5-MS CMI data in E5-MS GUI.</p>	<pre># service e5msService stop Stopping E5-MS server... MySql not stopped for failover Done.</pre>
11	On detecting shutdown of server 1 (primary), server 2 shall assume the responsibility of primary server.	<pre>Starting to do FailOver Tasks. &lt;Messages given in LOG MESSAGES ON STRATING E5-MS SERVER are displayed on console&gt; The new primary server is 10.248.9.3</pre>
12	Start E5-MS server on server 1. It shall now start as standby.	<pre>[root@e5ms9 bin]# service e5msService start Starting E5-MS server... MySQL already running Warning: Using a password on the command line interface can be insecure. /</pre>

		<pre>[root@e5ms9 bin]# OS detected : Linux  Oracle Corporation. Checking for the availability of the Primary Server in the Database. Found an entry.  Trying to connect to the Primary Server at 10.248.9.5  Please wait .....Connected  Starting Oracle Web NMS Standby Server. The Modules will be started once it takes over as the Primary Server.  Monitoring the Primary Server at 10.248.9.5</pre>
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## 4.0 UPGRADE PROCEDURE (STANDALONE SERVER)

A script 'E5MSUpgrade.sh' has been added to "/Tekelec/WebNMS/bin" directory in E5-MS build E5-MS\_450.26.0.0. This script shall enable a user to upgrade E5-MS software/license/both. The following sections describe various procedures.

**Note:** While upgrading to E5-MS Release 46.0.1 from releases 45.0/45.0.1/46.0, the user shall have to upgrade both E5-MS software and license.

### 4.1 UPGRADE E5-MS LICENSE

E5-MS license upgrade shall be required in following cases –

- When a customer purchases some additional features for the currently installed version of E5-MS
- When a customer upgrades E5-MS to a new major release of E5-MS

Purpose	Requirements	Time Required
Upgrading license of E5-MS	<ol style="list-style-type: none"> <li>1. Admin (root) login details of target E5-MS server</li> <li>2. E5-MS license file on the target E5-MS server. If license file is on an external media, then the media should be mounted to the target E5-MS server.</li> </ol>	5 Minutes

Following is the procedure for upgrading E5-MS license -

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	-
2	Check the status of E5-MS server.	# service e5msService status E5-MS server is running.
3	Shutdown E5-MS server in case it is running.	# service e5msService stop Stopping E5-MS server... Done.
4	Check the status of E5-MS server to verify that E5-MS server has been shut down.	# service e5msService status E5-MS server is not started!
5	Check the status of MySQL to verify that it has been shut down. There should not be any entry in the given command output related to E5-MS.	# ps -ef   grep mysql root 59320 59299 0 21:06 pts/0 00:00:00 grep mysql
6	Change directory to /Tekelec/WebNMS/bin.	# cd /Tekelec/WebNMS/bin
7	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.  The script shall upgrade the E5-MS license using the license file provided as input.	# sh E5MSUpgrade.sh Welcome to E5-MS Upgrade.  Please select one of the following options: 1. E5-MS License Upgrade 2. E5-MS Software Upgrade 3. Upgrade Both

		<p>Press any other key to exit...</p> <p>Your Input: <b>1</b></p> <p>Please provide the path of license file (along with the license file name):</p> <p><b>/var/Upgrade/Rel46.0.1/E5MSLicense46.0.1.xml</b></p> <p>E5-MS license upgrade is in progress...</p> <p>License upgrade done.</p>
8	Start E5-MS server. Messages similar to the given shall be displayed on console.	<pre># service e5msService start Starting E5-MS server... Starting mysql / bin/mysqld_safe: line 489: my_print_defaults: command not found bin/mysqld_safe: line 495: my_print_defaults: command not found 140722 07:23:41 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms9.err'. 140722 07:23:41 mysqld_safe Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data Warning: Using a password on the command line interface can be insecure. 140722 07:23:47 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms9.pid ended / OS detected : Linux &lt;Messages given in LOG MESSAGES ON STRATING E5-MS SERVER are displayed on console&gt;</pre>

## 4.2 UPGRADE E5-MS SOFTWARE (RPM)

E5-MS software (RPM) upgrade shall be required when a customer wants to install a new RPM over a currently installed RPM in case of inter upgrade i.e. the RPM shall be of the newer release (say 46.0.1) than the currently installed release 45.0/45.0.1/46.0.

Purpose	Requirements	Time Required
Upgrading E5-MS software (RPM)	<ol style="list-style-type: none"> <li>Admin (root) login details of target E5-MS server</li> <li>E5-MS RPM copied onto the target E5-MS server. If RPM file is on an external media, then the media should be mounted to the target E5-MS server.</li> </ol>	15 Minutes (Depends upon the size of data in E5-MS database)

Using the information given in section 1.2.1, verify if a proper Operating System is installed on the target E5-MS machine. If the Operating System is correct, then proceed with the following procedure to upgrade E5-MS RPM -

S. No.	Step	Expected Output
1	Login to target machine using	-

	administrator (root) login.	
2	Change directory to /Tekelec/WebNMS/bin/backup.	# cd /Tekelec/WebNMS/bin/backup
3	<p>Execute the BackupDB.sh script to take backup of E5MS database. After the -d option, provide a location (absolute path) on server with sufficient space for the backup file. On completion, the script will create a backup file named E5MS_Database_BackUp.sql in the user provided directory.</p> <p><b>Note:</b> This backup is needed in case upgrade fails and system needs to be restored to its pre-upgrade state.</p>	<pre># sh BackupDB.sh -d &lt;Path where backup file needs to be created&gt; e.g. # sh BackupDB.sh -d /tmp Please wait! Backup of E5-MS is in progress..- E5-MS database backup file "E5MS_Database_BackUp.sql" successfully created. \ Backup of directories successfully created.   E5-MS Backup is completed.</pre>
4	Check the status of E5-MS server.	# service e5msService status E5-MS server is running.
5	Shutdown E5-MS server in case it is running.	# service e5msService stop Stopping E5-MS server... Done.
6	Check the status of E5-MS server to verify that E5-MS server has been shut down.	# service e5msService status E5-MS server is not started!
7	Check the status of MySQL to verify that it has been shut down. There should not be any entry in the given command output related to E5-MS.	# ps -ef   grep mysql root      59320 59299  0 21:06 pts/0    00:00:00 grep mysql
8	Change directory to /Tekelec/WebNMS/bin.	# cd /Tekelec/WebNMS/bin
9	<p>Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted. The script shall upgrade the E5-MS software using the RPM file provided as input.</p> <p><b>Note:</b> Installer should take care while providing the path of E5-MS Database dump file when prompted by upgrade script. The file provided should be /var/upgrade/Backup_&lt;Current_Installed_Version&gt;/E5MS_Database_BackUp.sql. This file shall only be required in case E5-MS is being upgraded from R45.0 or 45.0.1. In case E5-MS is being upgraded from R46.0, the upgrade script shall not prompt for this dump</p>	<pre># sh E5MSUpgrade.sh Welcome to E5-MS Upgrade.  Please select one of the following options: 1. E5-MS License Upgrade 2. E5-MS Software Upgrade 3. Upgrade Both Press any other key to exit... Your Input: 2  Please provide the path of E5-MS RPM file (including the RPM file name): /root/Documents/E5MSUpgrade.sh E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm</pre>

	file.	<p>E5-MS RPM provided by you is: /root/Documents/E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm</p> <p>Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): <b>/Tekelec/WebNMS/jre</b></p> <p>Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? <b>Y</b></p> <p>&lt;Messages given in <b>LOG MESSAGES DURING E5-MS UPGRADE</b> are displayed on console&gt;</p>
10	Verify that the RPM has been upgraded to the intended version.	<pre># rpm -qa E5-MS E5-MS-46.0.1-46.0.1_460.16.0.x86_64</pre>
11	<p>If the E5-MS release installed prior to upgrade was 45.0, then use the procedure given in <b>PROCEDURE TO CREATE E5-MS SSL CERTIFICATE</b> to generate SSL certificate needed for HTTPS based access for E5-MS.</p> <p>Skip this step if the E5-MS release installed prior to upgrade was 45.0.1 or 46.0.</p>	-
12	In case a firewall is enabled between E5-MS server and client or E5-MS server and managed EAGLE(s), use the procedure given in <b>OPENING PORTS USED BY E5-MS IN CASE OF FIREWALL</b> to open the ports used by E5-MS.	-
13	Start E5-MS server. Messages similar to the given shall be displayed on console.	<pre># service e5msService start Starting E5-MS server... Starting mysql / bin/mysqld_safe: line 489: my_print_defaults: command not found bin/mysqld_safe: line 495: my_print_defaults: command not found 140722 07:23:41 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms9.err'. 140722 07:23:41 mysqld_safe Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data Warning: Using a password on the command line interface can be insecure. 140722 07:23:47 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms9.pid ended / OS detected : Linux Created table Tek_inventory_epap</pre>

		<p>Created table Tek_inventory_lsmsnode</p> <p>Created table DASHBOARDPROPS</p> <p>Created table STATSAGGREGATIONHOURLY</p> <p>Created table STATSAGGREGATIONDAILY</p> <p>Created table smsprofiles</p> <p>Created table smsserver_out</p> <p>&lt;Messages given in LOG MESSAGES ON STRATING E5-MS SERVER are displayed on console&gt;</p>
14	<p>If the E5-MS release installed prior to upgrade was 45.0 or 45.0.1, then use the procedure given in <b>UPDATING R46.0 XML CHANGES IN E5-MS DATABASE</b> to update E5-MS database for all pre-upgrade E5-MS users for new Command Class Management link introduced in R46.0.</p>	-

### 4.3 UPGRADE E5-MS SOFTWARE (RPM) AND LICENSE

Upgrading both E5-MS software (RPM) and license shall be required in following cases –

- When a customer purchases some additional features and wants to upgrade to a new RPM version for the currently installed release of E5-MS
- When a customer upgrades E5-MS to a new major release of E5-MS

Purpose	Requirements	Time Required
Upgrading software (RPM) and license of E5-MS	<ol style="list-style-type: none"> <li>1. Admin (root) login of target E5-MS server</li> <li>2. E5-MS RPM copied onto the target E5-MS server. If RPM file is on an external media, then it should be mounted to the target E5-MS server.</li> <li>3. E5-MS license file on the target E5-MS server. If license file is on an external media, then the media should be mounted to the target E5-MS server.</li> </ol>	20 Minutes (Depends upon the size of data in E5-MS database)

Using the information given in section 1.2.1, verify if a proper Operating System is installed on the target E5-MS machine. If the Operating System is correct, then proceed with the following procedure for upgrading E5-MS software (RPM) and license –

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	-
2	Change directory to /Tekelec/WebNMS/bin/backup.	# cd /Tekelec/WebNMS/bin/backup
3	Execute the BackupDB.sh script to take backup of E5MS database. After	# sh BackupDB.sh -d <Path where backup file needs to be created>



	<p>the <code>-d</code> option, provide a location (absolute path) on server with sufficient space for the backup file. On completion, the script will create a backup file named <code>E5MS_Database_BackUp.sql</code> in the user provided directory.</p> <p><b>Note:</b> This backup is needed in case upgrade fails and system needs to be restored to its pre-upgrade state.</p>	<p>e.g.</p> <pre># sh BackupDB.sh -d /tmp Please wait! Backup of E5-MS is in progress..- E5-MS database backup file "E5MS_Database_BackUp.sql" successfully created. \ Backup of directories successfully created.   E5-MS Backup is completed.</pre>
4	Check the status of E5-MS server.	<pre># service e5msService status E5-MS server is running.</pre>
5	Shutdown E5-MS server in case it is running.	<pre># service e5msService stop Stopping E5-MS server... Done.</pre>
6	Check the status of E5-MS server to verify that E5-MS server has been shut down.	<pre># service e5msService status E5-MS server is not started!</pre>
7	Check the status of MySQL to verify that it has been shut down. There should not be any entry in the given command output related to E5-MS.	<pre># ps -ef   grep mysql root      59320 59299  0 21:06 pts/0    00:00:00 grep mysql</pre>
8	Change directory to <code>/Tekelec/WebNMS/bin</code> .	<pre># cd /Tekelec/WebNMS/bin</pre>
9	<p>Execute the <code>E5MSUpgrade.sh</code> script and provide appropriate inputs shown as highlighted. The script shall upgrade the E5-MS software and license using the RPM and license file provided as inputs.</p> <p><b>Note:</b> Installer should take care while providing the path of E5-MS Database dump file when prompted by upgrade script. The file provided should be <code>/var/upgrade/Backup_&lt;Current_Installed_Version&gt;/E5MS_Database_BackUp.sql</code>. This file shall only be required in case E5-MS is being upgraded from R45.0 or 45.0.1. In case E5-MS is being upgraded from R46.0, the upgrade script shall not prompt for this dump file.</p>	<pre># sh E5MSUpgrade.sh Welcome to E5-MS Upgrade.  Please select one of the following options: 1. E5-MS License Upgrade 2. E5-MS Software Upgrade 3. Upgrade Both Press any other key to exit... Your Input: 3  Please provide the path of E5-MS RPM file (including the RPM file name): /root/Documents/E5MSUpgrade.sh E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  E5-MS RPM provided by you is: /root/Documents/E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): /Tekelec/WebNMS/jre</pre>

		<p>Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? <b>Y</b></p> <p>&lt;Messages given in <b>LOG MESSAGES DURING E5-MS UPGRADE</b> are displayed on console&gt;</p> <p>Please provide the path of license file (along with the license file name):  <b>/var/Upgrade/Rel46.0.1/E5MSLicense46.0.1.xml</b></p> <p>E5-MS license upgrade is in progress...  License upgrade done.</p>
10	<p>If the E5-MS release installed prior to upgrade was 45.0, then use the procedure given in <b>PROCEDURE TO CREATE E5-MS SSL CERTIFICATE</b> to generate SSL certificate needed for HTTPS based access for E5-MS.</p> <p>Skip this step if the E5-MS release installed prior to upgrade was 45.0.1 or 46.0.</p>	-
11	<p>In case a firewall is enabled between E5-MS server and client or E5-MS server and managed EAGLE(s), use the procedure given in <b>OPENING PORTS USED BY E5-MS IN CASE OF FIREWALL</b> to open the ports used by E5-MS.</p>	-
12	<p>Start E5-MS server. Messages similar to the given shall be displayed on console.</p>	<pre># service e5msService start Starting E5-MS server... Starting mysql / bin/mysqld_safe: line 489: my_print_defaults: command not found bin/mysqld_safe: line 495: my_print_defaults: command not found 140722 07:23:41 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms9.err'. 140722 07:23:41 mysqld_safe Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data Warning: Using a password on the command line interface can be insecure. 140722 07:23:47 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms9.pid ended / OS detected : Linux Created table Tek_inventory_epap</pre>

		<p>Created table Tek_inventory_lsmsnode</p> <p>Created table DASHBOARDPROPS</p> <p>Created table STATSAGGREGATIONHOURLY</p> <p>Created table STATSAGGREGATIONDAILY</p> <p>Created table smsprofiles</p> <p>Created table smsserver_out</p> <p>&lt;Messages given in LOG MESSAGES ON STRATING E5-MS SERVER are displayed on console&gt;</p>
13	<p>If the E5-MS release installed prior to upgrade was 45.0 or 45.0.1, then use the procedure given in <b>UPDATING R46.0 XML CHANGES IN E5-MS DATABASE</b> to update E5-MS database for all pre-upgrade E5-MS users for new Command Class Management link introduced in R46.0.</p>	-

## 5.0 UPGRADE PROCEDURE (FAILOVER SETUP)

In failover setup, there are two E5-MS servers installed with the same release of software, one working as a primary server and the other working as a standby server.

Primary server is the active server where all the E5-MS processes are up and the standby server is one where only MySQL is up and the E5-MS processes are not up. The standby server keeps monitoring the primary server and in case the primary server fails, it takes over the role of primary by starting all the E5-MS processes. In failover setup, database and configuration files are replicated between primary and standby servers.

**Note:** While upgrading to E5-MS Release 46.0.1 from releases 45.0/45.0.1/46.0, the user shall have to upgrade both E5-MS software and license.

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### 5.1 UPGRADE E5-MS LICENSE

Upgrading E5-MS license in a primary-standby setup is simple. The license shall be upgraded when the server is not running. So to make sure that there is no downtime of E5-MS, one needs to upgrade license on the servers one by one.

Purpose	Requirements	Time Required
Upgrading E5-MS license on Primary and Standby servers	<ol style="list-style-type: none"> <li>Admin (root) login details of target E5-MS servers (Primary and Standby)</li> <li>E5-MS license file copied onto the target E5-MS servers (Primary and Standby). If license file is on an external media, then the media should be mounted to the target E5-MS server.</li> </ol>	10 Minutes

Following is the procedure. For clarity, we shall address the Primary server as 'server 1' and the Standby server as 'server 2'.

S. No.	Step	Expected Output
1	Execute steps 1 to 7 in procedure 4.1 to upgrade E5-MS license on server 2 (standby).	-
2	Start server 2. Standby server shall start monitoring server 1 (primary server) and E5-MS processes shall not start.	<pre># service e5msService start Checking for the availability of the Primary Server in the Database. Found an entry. Trying to connect to the Primary Server at 10.248.9.3  Please wait .....Connected  Starting Oracle Web NMS Standby Server. The Modules will be started once it takes over as the Primary Server.  Monitoring the Primary Server at 10.248.9.3</pre>
3	Login to server 1 (primary) using admin (root) login.	-
4	Shutdown server 1 (primary).	<pre># service e5msService stop Stopping E5-MS server... Done.</pre>

5	On detecting the shutdown of server 1 (primary), server 2 (standby) shall start the E5-MS processes and take over the role of primary.	Starting to do FailOver Tasks.  <Messages given in LOG MESSAGES ON STRATING E5-MS SERVER are displayed on console>  The new primary server is 10.248.21.70
6	Execute steps 1 to 7 in procedure 4.1 to upgrade E5-MS license on server 1.	-
7	Start server 1. It shall start as standby server and start monitoring server 2 (primary) and E5-MS processes shall not start.	# service e5msService start  Checking for the availability of the Primary Server in the Database. Found an entry.  Trying to connect to the Primary Server at 10.248.21.70  Please wait .....Connected  Starting Oracle Web NMS Standby Server. The Modules will be started once it takes over as the Primary Server.  Monitoring the Primary Server at 10.248.21.70

## 5.2 UPGRADE E5-MS SOFTWARE (RPM)

In software (RPM) upgrade to R46.0.1, new changes are there in configuration files that need to be taken care of during upgrade.

For software upgrade in a primary-standby setup, one needs to upgrade both the servers separately, one after another.

Purpose	Requirements	Time Required
Upgrading E5-MS software (RPM) on Primary and Standby servers	<ol style="list-style-type: none"> <li>Admin (root) login details of target E5-MS servers (Primary and Standby)</li> <li>E5-MS RPM copied onto the target E5-MS servers (Primary and Standby). If RPM file is on an external media, then the media should be mounted to the target E5-MS server.</li> <li>Passwords of MySQL root user for target E5-MS servers (Primary and Standby)</li> </ol>	60 – 120 Minutes (Depends upon the size of data in E5-MS database)

Using the information given in section 1.2.1, verify if a proper Operating System is installed on the target E5-MS machines (Primary and Standby). If the Operating System is correct, then proceed with the following procedure for upgrading E5-MS. For clarity, we shall address the Primary server as ‘server 1’ and the Standby server as ‘server 2’.

S. No.	Step	Expected Output
1	Login to server 2 (standby) using administrator (root) login.	-
	Change directory to /Tekelec/WebNMS/bin/backup.	# cd /Tekelec/WebNMS/bin/backup
2	Execute the BackupDB.sh script to take backup of E5MS database. After	# sh BackupDB.sh -d <Path where backup file needs to be created>

	<p>the <code>-d</code> option, provide a location (absolute path) on server with sufficient space for the backup file. On completion, the script will create a backup file named <code>E5MS_Database_BackUp.sql</code> in the user provided directory.</p> <p><b>Note:</b> This backup is needed in case upgrade fails and system needs to be restored to its pre-upgrade state.</p>	<pre>e.g. # sh BackupDB.sh -d /tmp Please wait! Backup of E5-MS is in progress..-  E5-MS database backup file "E5MS_Database_BackUp.sql" successfully created.  \ Backup of directories successfully created.    E5-MS Backup is completed.</pre>
3	<p>Shutdown the E5-MS server on server 2.</p>	<pre># service e5msService stop Stopping E5-MS server... MySql not stopped for failover Done.</pre>
4	<p>Check the status of E5-MS server to verify that server has been shut down.</p>	<pre># service e5msService status E5-MS server is not started!</pre>
5	<p>Change directory to <code>/Tekelec/WebNMS/bin</code>.</p>	<pre># cd /Tekelec/WebNMS/bin</pre>
6	<p>Stop MySQL by running the script.</p> <p><b>Note:</b> Default password is 'public'.</p>	<pre># sh stopMySQL.sh Enter password: &lt;&gt;</pre>
7	<p>Login to server 1 (primary) using administrator (root) login.</p>	-
8	<p>Change directory to <code>/Tekelec/WebNMS/bin/backup</code>.</p>	<pre># cd /Tekelec/WebNMS/bin/backup</pre>
9	<p>Execute the <code>BackupDB.sh</code> script to take backup of E5MS database. After the <code>-d</code> option, provide a location (absolute path) on server with sufficient space for the backup file. On completion, the script will create a backup file named <code>E5MS_Database_BackUp.sql</code> in the user provided directory.</p> <p><b>Note:</b> This backup is needed in case upgrade fails and system needs to be restored to its pre-upgrade state.</p>	<pre># sh BackupDB.sh -d &lt;Path where backup file needs to be created&gt;  e.g. # sh BackupDB.sh -d /tmp Please wait! Backup of E5-MS is in progress..-  E5-MS database backup file "E5MS_Database_BackUp.sql" successfully created.  \ Backup of directories successfully created.    E5-MS Backup is completed.</pre>
10	<p>Shutdown the E5-MS server on server 1.</p>	<pre># service e5msService stop Stopping E5-MS server... MySql not stopped for failover</pre>

		Done.
11	Check the status of E5-MS server to verify that server has been shut down.	# service e5msService status E5-MS server is not started!
12	Change directory to /Tekelec/WebNMS/bin.	# cd /Tekelec/WebNMS/bin
13	Stop MySQL by running the script. <b>Note:</b> Default password is 'public'.	# sh stopMySQL.sh Enter password: <>
14	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted. <b>Note:</b> Installer should take care while providing the path of E5-MS Database dump file when prompted by upgrade script. The file provided should be /var/upgrade/Backup_<Current_Installed_Version>/E5MS_Database_BackUp.sql. This file shall only be required in case E5-MS is being upgraded from R45.0 or 45.0.1. In case E5-MS is being upgraded from R46.0, the upgrade script shall not prompt for this dump file.	# sh E5MSUpgrade.sh Welcome to E5-MS Upgrade.  Please select one of the following options: 1. E5-MS License Upgrade 2. E5-MS Software Upgrade 3. Upgrade Both Press any other key to exit... Your Input: 2  Please provide the path of E5-MS RPM file (including the RPM file name): /root/Documents/E5MSUpgrade.sh E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  E5-MS RPM provided by you is: /root/Documents/E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): /Tekelec/WebNMS/jre  Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y  <Messages given in LOG MESSAGES DURING E5-MS UPGRADE are displayed on console>
15	Verify that the RPM has been upgraded to the intended version.	# rpm -qa E5-MS E5-MS-46.0.1-46.0.1_460.16.0.x86_64
16	Copy the E5MS database backup file generated during server 1 upgrade (var/upgrade/Backup_<Current_Installed_Version>/E5MS_Database_BackUp.sql) to server 2.	-
17	Login to server 2 (standby) using admin (root) login.	-
18	On server 2, change directory to /Tekelec/WebNMS/bin.	# cd /Tekelec/WebNMS/bin
19	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown	# sh E5MSUpgrade.sh

	<p>as highlighted.</p> <p><b>Note:</b> User should take care while providing the path of E5-MS Database dump file when prompted by upgrade script. The file provided should be the one that was copied from server 1 in step 16 above and not the one generated by upgrade script on server 2. This file shall only be required in case E5-MS is being upgraded from R45.0 or 45.0.1. In case E5-MS is being upgraded from R46.0, the upgrade script shall not prompt for this dump file.</p>	<pre>Welcome to E5-MS Upgrade.  Please select one of the following options: 1. E5-MS License Upgrade 2. E5-MS Software Upgrade 3. Upgrade Both Press any other key to exit... Your Input: 2  Please provide the path of E5-MS RPM file (including the RPM file name): /root/Documents/E5MSUpgrade.sh E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  E5-MS RPM provided by you is: /root/Documents/E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): /Tekelec/WebNMS/jre  Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y  &lt;Messages given in LOG MESSAGES DURING E5-MS UPGRADE are displayed on console&gt;</pre>
20	<p>Verify that the RPM has been upgraded to the intended version.</p>	<pre># rpm -qa E5-MS E5-MS-46.0.1-46.0.1_460.16.0.x86_64</pre>
21	<p><b>Note:</b> Primary and Secondary servers need to be behind a single firewall and should not have their individual firewalls turned ON. Client machine used to access E5-MS client and managed EAGLE(s) could be on other side of the firewall.</p> <p>In case a firewall is enabled between E5-MS servers and client or E5-MS servers and managed EAGLE(s), use the procedure given in <b>OPENING PORTS USED BY E5-MS IN CASE OF FIREWALL</b> to open the ports used by E5-MS on both the servers.</p>	-
22	<p>If the E5-MS release installed prior to upgrade was 45.0, then on server 1, use the procedure given in <b>PROCEDURE TO CREATE E5-MS SSL CERTIFICATE</b> to generate SSL certificate needed for HTTPS based access for E5-MS.</p> <p>Skip this step and the next step (23) if the E5-MS release installed prior to</p>	-



	upgrade was 45.0.1 or 46.0.	
23	<p>Copy the values of ENCRYPTED_TRUST_STORE_PASSWORD and ENCRYPTED_KEY_STORE_PASSWORD from /Tekelec/WebNMS/conf/transportProvider.conf file on server 1 and paste the values in the same file on server 2.</p> <p><b>Note:</b> Values to be copied from server 1 are highlighted. The value shown highlighted here is just an example and the user needs to copy the specific password as listed in their file on server 1.</p>	<p>Copy the highlighted on server 1 -</p> <pre>&lt;ENCRYPTED_TRUST_STORE_PASSWORD&gt;C70z67Ks4t&lt;/ENCRYPTED_TRUST_STORE_PASSWORD&gt;</pre> <pre>&lt;ENCRYPTED_KEY_STORE_PASSWORD&gt;C70z67Ks4t&lt;/ENCRYPTED_KEY_STORE_PASSWORD&gt;</pre> <p>Paste on server 2 within the same xml tags (by default there is no value within tags, overwrite the value if there is already one) –</p> <pre>&lt;ENCRYPTED_TRUST_STORE_PASSWORD&gt;&lt;/ENCRYPTED_TRUST_STORE_PASSWORD&gt;</pre> <pre>&lt;ENCRYPTED_KEY_STORE_PASSWORD&gt;&lt;/ENCRYPTED_KEY_STORE_PASSWORD&gt;</pre>
24	Execute the steps in section F.2 in <b>PROCEDURE TO SETUP FAILOVER</b> to setup replication between the servers.	
25	<p>Start E5-MS server on server 1. It shall start as primary server.</p> <p><b>Note:</b> The server where <b>PROCEDURE TO CREATE E5-MS SSL CERTIFICATE</b> was executed must be started first.</p>	<pre># service e5msService start Starting E5-MS server... MySQL already running OS detected : Linux Created table Tek_inventory_epap Created table Tek_inventory_lsmsnode Created table DASHBOARDPROPS Created table STATSAGGREGATIONHOURLY Created table STATSAGGREGATIONDAILY Created table smsprofiles Created table smsserver_out</pre> <p>&lt;Messages given in <b>LOG MESSAGES ON STRATING E5-MS SERVER</b> are displayed on console&gt;</p>
26	If the E5-MS release installed prior to upgrade was 45.0 or 45.0.1, then on server 1, use the procedure given in <b>UPDATING R46.0 XML CHANGES IN E5-MS DATABASE</b> to update E5-MS database for all pre-upgrade E5-MS users for new Command Class Management link introduced in R46.0.	-
27	Start E5-MS server on server 2. It shall start as standby server and start monitoring server 1 (primary) and E5-MS processes shall not start.	<pre># service e5msService start Starting E5-MS server... MySQL already running Warning: Using a password on the command line interface can be insecure.</pre>

		<pre> / [root@e5ms9 bin]# OS detected : Linux  Oracle Corporation.  Checking for the availability of the Primary Server in the Database. Found an entry.  Trying to connect to the Primary Server at 10.248.9.5  Please wait .....Connected  Starting Oracle Web NMS Standby Server. The Modules will be started once it takes over as the Primary Server.  Monitoring the Primary Server at 10.248.9.5 </pre>
28	<p>If the E5-MS release installed prior to upgrade was 45.0 or 45.0.1, then on server 2, use the procedure given in <b>UPDATING R46.0 XML CHANGES IN E5-MS DATABASE</b> to update E5-MS database for all pre-upgrade E5-MS users for new Command Class Management link introduced in R46.0.</p>	-

### 5.3 UPGRADE E5-MS SOFTWARE (RPM) AND LICENSE

The procedure to upgrade E5-MS software (RPM) and license shall be similar to procedure 4.3.

For software and license upgrade in a failover setup, one needs to upgrade both the servers separately, one after another.

Purpose	Requirements	Time Required
Upgrading E5-MS software (RPM) and license on Primary and Standby servers	<ol style="list-style-type: none"> <li>Admin (root) login details of target E5-MS servers (Primary and Standby).</li> <li>E5-MS license file copied onto the target E5-MS servers (Primary and Standby). If license file is on an external media, then the media should be mounted to the target E5-MS server.</li> <li>E5-MS RPM copied onto the target E5-MS servers (Primary and Standby). If RPM file is on an external media, then the media should be mounted to the target E5-MS server.</li> <li>Passwords of MySQL root user for target E5-MS servers (Primary and Standby).</li> </ol>	60 – 120 Minutes (Depends upon the size of data in E5-MS database)

Note that there shall be a downtime of E5-MS services during the upgrade procedure.

Using the information given in section 1.2.1, verify if a proper Operating System is installed on the target E5-MS machines (Primary and Standby). If the Operating System is correct, then proceed with the following procedure to upgrade E5-MS. For clarity, we shall address the Primary server as ‘server 1’ and the Standby server as ‘server 2’.

S. No.	Step	Expected Output
1	Login to server 2 (standby) using administrator (root) login.	-
2	Change directory to /Tekelec/WebNMS/bin/backup.	# cd /Tekelec/WebNMS/bin/backup
3	Execute the BackupDB.sh script to take backup of E5MS database. After the -d option, provide a location (absolute path) on server with sufficient space for the backup file. On completion, the script will create a backup file named E5MS_Database_BackUp.sql in the user provided directory.  <b>Note:</b> This backup is needed in case upgrade fails and system needs to be restored to its pre-upgrade state.	# sh BackupDB.sh -d <Path where backup file needs to be created>  e.g. # sh BackupDB.sh -d /tmp  Please wait! Backup of E5-MS is in progress..-  E5-MS database backup file "E5MS_Database_BackUp.sql" successfully created.  \ Backup of directories successfully created.     E5-MS Backup is completed.
4	Shutdown the E5-MS server on server 2.	# service e5msService stop  Stopping E5-MS server...  MySQL not stopped for failover  Done.
5	Check the status of E5-MS server to verify that server has been shut down.	# service e5msService status  E5-MS server is not started!
6	Change directory to /Tekelec/WebNMS/bin.	# cd /Tekelec/WebNMS/bin
7	Stop MySQL by running the script. <b>Note:</b> Default password is ‘public’.	# sh stopMySQL.sh  Enter password: <>
8	Login to server 1 (primary) using administrator (root) login.	-
9	Change directory to /Tekelec/WebNMS/bin/backup.	# cd /Tekelec/WebNMS/bin/backup
10	Execute the BackupDB.sh script to take backup of E5MS database. After the -d option, provide a location (absolute path) on server with sufficient space for the backup file. On completion, the script will create a backup file named	# sh BackupDB.sh -d <Path where backup file needs to be created>  e.g. # sh BackupDB.sh -d /tmp  Please wait! Backup of E5-MS is in progress..-

	<p>E5MS_Database_BackUp.sql in the user provided directory.</p> <p><b>Note:</b> This backup is needed in case upgrade fails and system needs to be restored to its pre-upgrade state.</p>	<pre>E5-MS database backup file "E5MS_Database_BackUp.sql" successfully created.  \ Backup of directories successfully created.    E5-MS Backup is completed.</pre>
11	<p>Shutdown the E5-MS server on server 1.</p>	<pre># service e5msService stop Stopping E5-MS server... MySql not stopped for failover Done.</pre>
12	<p>Check the status of E5-MS server to verify that server has been shut down.</p>	<pre># service e5msService status E5-MS server is not started!</pre>
13	<p>Change directory to /Tekelec/WebNMS/bin.</p>	<pre># cd /Tekelec/WebNMS/bin</pre>
14	<p>Stop MySQL by running the script.</p> <p><b>Note:</b> Default password is 'public'.</p>	<pre># sh stopMySQL.sh Enter password: &lt;&gt;</pre>
15	<p>Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.</p> <p><b>Note:</b> Installer should take care while providing the path of E5-MS Database dump file when prompted by upgrade script. The file provided should be /var/upgrade/Backup_&lt;Current_Installed_Version&gt;/E5MS_Database_BackUp.sql. This file shall only be required in case E5-MS is being upgraded from R45.0 or 45.0.1. In case E5-MS is being upgraded from R46.0, the upgrade script shall not prompt for this dump file.</p>	<pre># sh E5MSUpgrade.sh Welcome to E5-MS Upgrade.  Please select one of the following options: 1. E5-MS License Upgrade 2. E5-MS Software Upgrade 3. Upgrade Both Press any other key to exit... Your Input: 3  Please provide the path of E5-MS RPM file (including the RPM file name): /root/Documents/E5MSUpgrade.sh E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  E5-MS RPM provided by you is: /root/Documents/E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): /Tekelec/WebNMS/jre  Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y  &lt;Messages given in LOG MESSAGES DURING E5-MS UPGRADE are displayed on console&gt;</pre>

		<p>Please provide the path of license file (along with the license file name):  <code>/var/Upgrade/Rel46.0.1/E5MSLicense46.0.1.xml</code></p> <p>E5-MS license upgrade is in progress...  License upgrade done.</p>
16	Verify that the RPM has been upgraded to the intended version.	<pre># rpm -qa E5-MS E5-MS-46.0.1-46.0.1_460.16.0.x86_64</pre>
17	Copy the E5MS database backup file generated during server 1 upgrade (var/upgrade/Backup_<Current_Installed_Version>/E5MS_Database_BackUp.sql) to server 2.	-
18	Login to server 2 (standby) using admin (root) login.	-
19	On server 2, change directory to /Tekelec/WebNMS/bin.	<pre># cd /Tekelec/WebNMS/bin</pre>
20	<p>Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.</p> <p><b>Note:</b> Installer should take care while providing the path of E5-MS Database dump file when prompted by upgrade script. The file provided should be the one that was copied from server 1 in step 17 above and not the one generated by upgrade script on server 2. This file shall only be required in case E5-MS is being upgraded from R45.0 or 45.0.1. In case E5-MS is being upgraded from R46.0, the upgrade script shall not prompt for this dump file.</p>	<pre># sh E5MSUpgrade.sh Welcome to E5-MS Upgrade.  Please select one of the following options: 1. E5-MS License Upgrade 2. E5-MS Software Upgrade 3. Upgrade Both Press any other key to exit... Your Input: 3  Please provide the path of E5-MS RPM file (including the RPM file name): /root/Documents/E5MSUpgrade.sh E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  E5-MS RPM provided by you is: /root/Documents/E5-MS-46.0.1-46.0.1_460.16.0.x86_64.rpm  Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): /Tekelec/WebNMS/jre  Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y  &lt;Messages given in LOG MESSAGES DURING E5-MS UPGRADE are displayed on console&gt;  Please provide the path of license file (along with the license file name): /var/Upgrade/Rel46.0.1/E5MSLicense46.0.1.xml</pre>

		E5-MS license upgrade is in progress... License upgrade done.
21	Verify that the RPM has been upgraded to the intended version.	# rpm -qa E5-MS E5-MS-46.0.1-46.0.1_460.16.0.x86_64
22	<b>Note:</b> Primary and Secondary servers need to be behind a single firewall and should not have their individual firewalls turned ON. Client machine used to access E5-MS client and managed EAGLE(s) could be on other side of the firewall.  In case a firewall is enabled between E5-MS servers and client or E5-MS servers and managed EAGLE(s), use the procedure given in <b>OPENING PORTS USED BY E5-MS IN CASE OF FIREWALL</b> to open the ports used by E5-MS on both the servers.	-
23	If the E5-MS release installed prior to upgrade was 45.0, then on server 1, use the procedure given in <b>PROCEDURE TO CREATE E5-MS SSL CERTIFICATE</b> to generate SSL certificate needed for HTTPS based access for E5-MS.  Skip this step and the next step (24) if the E5-MS release installed prior to upgrade was 45.0.1 or 46.0.	-
24	Copy the values of ENCRYPTED_TRUST_STORE_PASSWORD and ENCRYPTED_KEY_STORE_PASSWORD from /Tekelec/WebNMS/conf/transportProvider.conf file on server 1 and paste the values in the same file on server 2.  <b>Note:</b> Values to be copied from server 1 are highlighted. The value shown highlighted here is just an example and the user needs to copy the specific password as listed in their file on server 1.	Copy the highlighted values on server 1 -  <ENCRYPTED_TRUST_STORE_PASSWORD>C70z67Ks4t</ENCRYPTED_TRUST_STORE_PASSWORD>  <ENCRYPTED_KEY_STORE_PASSWORD>C70z67Ks4t</ENCRYPTED_KEY_STORE_PASSWORD>  Paste on server 2 within the same xml tags (by default there is no value within tags, overwrite the value if there is already one) –  <ENCRYPTED_TRUST_STORE_PASSWORD></ENCRYPTED_TRUST_STORE_PASSWORD>  <ENCRYPTED_KEY_STORE_PASSWORD></ENCRYPTED_KEY_STORE_PASSWORD>
25	Execute the steps in section F.2 in <b>PROCEDURE TO SETUP FAILOVER</b> to setup replication between the servers.	
26	Start E5-MS server on server 1. It shall start as primary server.  <b>Note:</b> The server where	# service e5msService start Starting E5-MS server... MySQL already running

	<p><b>PROCEDURE TO CREATE E5-MS SSL CERTIFICATE</b> was executed must be started first.</p>	<pre>OS detected : Linux Created table Tek_inventory_epap Created table Tek_inventory_lsmsnode Created table DASHBOARDPROPS Created table STATSAGGREGATIONHOURLY Created table STATSAGGREGATIONDAILY Created table smsprofiles Created table smsserver_out  &lt;Messages given in LOG MESSAGES ON STRATING E5-MS SERVER are displayed on console&gt;</pre>
27	<p>If the E5-MS release installed prior to upgrade was 45.0 or 45.0.1, then on server 1, use the procedure given in <b>UPDATING R46.0 XML CHANGES IN E5-MS DATABASE</b> to update E5-MS database for all pre-upgrade E5-MS users for new Command Class Management link introduced in R46.0.</p>	-
28	<p>Start E5-MS server on server 2. It shall start as standby server and start monitoring server 1 (primary) and E5-MS processes shall not start.</p>	<pre># service e5msService start Starting E5-MS server... MySQL already running Warning: Using a password on the command line interface can be insecure. / [root@e5ms9 bin]# OS detected : Linux  Oracle Corporation. Checking for the availability of the Primary Server in the Database. Found an entry.  Trying to connect to the Primary Server at 10.248.9.5  Please wait .....Connected  Starting Oracle Web NMS Standby Server. The Modules will be started once it takes over as the Primary Server.  Monitoring the Primary Server at 10.248.9.5</pre>
29	<p>If the E5-MS release installed prior to upgrade was 45.0 or 45.0.1, then on server 2, use the procedure given in <b>UPDATING R46.0 XML CHANGES IN E5-MS</b></p>	-

	<b>DATABASE</b> to update E5-MS database for all pre-upgrade E5-MS users for new Command Class Management link introduced in R46.0.	
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## **6.0 RESTORATION OF E5-MS IN CASE OF SOFTWARE UPGRADE FAILURE**

If software upgrade of E5-MS fails due to any reason, following steps are recommended to restore E5-MS to its previous state –

- 1) Find the E5-MS RPM installed on the system prior to failed attempt of upgrade. Also, get the E5-MS installation document applicable to this E5-MS RPM.
- 2) Do a fresh installation of E5-MS as mentioned in E5-MS installation document.
- 3) During the failed attempt to upgrade software, a backup of E5-MS database and configuration files is taken and placed at location “/var/upgrade/Backup\_<Current\_Version>” on the system. After installing E5-MS afresh, the support engineer shall need to restore E5-MS state from the above path. For restoring data, section 4.0 in Backup and Restore TR (TR007263, latest version) should be followed.
- 4) In case of upgrade failure of a primary-standby setup, the server on which upgrade failed shall be restored using the above steps and then failover should be created again on the setup.

## APPENDIX A. LOG MESSAGES ON FIRST STARTUP OF E5-MS SERVER AFTER INSTALLATION

Headless Exception detected. Continuing in the command line mode...

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The following terms shall have the following meanings:

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Do you accept the LICENSE AGREEMENT (y/n)





## APPENDIX B. LOG MESSAGES ON STRATING E5-MS SERVER

Oracle Corporation.

Starting Oracle E5-MS "Primary" Server Modules, please wait  
This edition of Oracle EAGLE 5 - Management System with release 46.0.1 is a registered  
version in name of EMS in company Aricent.

```
Process : NmsAuthenticationManager          [ Started ]
Process : ParseMeasReports                  [ Started ]
Process : MeasurementScheduler              [ Started ]
Process : TL1CustomViewsMgr                [ Started ]
Process : NmsConfigurationServer           [ Started ]
Process : CommunicationBEProcess           [ Started ]
Process : WebNMSAgentApp                   [ Started ]
Process : StartProvModule                  [ Started ]
Process : SnmpAgentProcess                  [ Started ]
Process : NmsTftpServer                    [ Started ]
Process : WebNMSMgmtBEProcess              [ Started ]
Process : UtilizationScheduler             [ Started ]
Process : TL1DiscProcess                   [ Started ]
Process : NMSTAServer                      [ Started ]
Process : StorageServer                    [ Started ]
Process : EMSInitializationProcess         [ Started ]
Process : UserConfigProcess                [ Started ]
Process : E5msSchedulerProcess             [ Started ]
Process : WebNMSBackUp                    [ Started ]
Process : RunJSPModule                     [ Started ]
Process : MapServerBE                      [ Started ]
Process : ProcessTest                      [ Started ]
Process : CLIFactoryBinder                 [ Started ]
Process : RunRmiRegistry                   [ Started ]
Process : EventMgr                         [ Started ]
Process : DBServer                         [ Started ]
Process : StartTelnetClient                [ Started ]
Process : NmsPolicyMgr                     [ Started ]
Process : NMSMServer                       [ Started ]
Process : NbiProcess                       [ Started ]
Process : TL1EventProcess                  [ Started ]
Process : Collector                        [ Started ]
Process : TL1GatewayProcess                [ Started ]
Process : CMISchedulerInitiator            [ Started ]
Process : ParsingScheduler                 [ Started ]
Process : AdminModuleInit                  [ Started ]
Process : DataMgmtRPI                      [ Started ]
Process : NMSSAServer                      [ Started ]
Process : NmsAuthManager                   [ Started ]
Process : NmsMainFE                        [ Started ]
Process : TAServerFE                       [ Started ]
Process : SAServerFE                       [ Started ]
Process : AuthenticationManagerFE          [ Started ]
Process : NmsSAServerFE                    [ Started ]
Process : EventFE                          [ Started ]
Process : MapFE                            [ Started ]
Process : PolicyFE                         [ Started ]
Process : AlertFE                          [ Started ]
Process : UserConfigProcessFE              [ Started ]
Process : ConfigFE                         [ Started ]
Process : StorageServerFE                  [ Started ]
Process : AuthorizationManagerFE           [ Started ]
Process : StartTelnetClientFE              [ Started ]
Process : PollFE                           [ Started ]
Process : ExampleFE                        [ Started ]
Process : TopoFE                           [ Started ]
```

```
Process : MServerFE [ Started ]
Process : ProvisioningFE [ Started ]
Process : CommunicationFEProcess [ Started ]
Process : WebNMSMgmtFEProcess [ Started ]
```

Verifying connection with web server ... verified

Oracle E5-MS Server modules started successfully at Nov 25,2014 05:57:50 PM

Please connect your client to the web server on port: 8443

## APPENDIX C. LOG MESSAGES ON STOPPING E5-MS SERVER

Interrupt signal received Shutting down Oracle E5-MS Server

Trying to Shutdown Oracle E5-MS Server

Schedulers Stopped successfully

All Shut Down Observers Notified

```
Process : CommunicationFEProcess      [ Stopped ]
Process : WebNMSMgmtFEProcess         [ Stopped ]
Process : NmsSAServerFE               [ Stopped ]
Process : StorageServerFE             [ Stopped ]
Process : TAServerFE                  [ Stopped ]
Process : ExampleFE                   [ Stopped ]
Process : UserConfigProcessFE         [ Stopped ]
Process : ProvisioningFE              [ Stopped ]
Process : StartTelnetClientFE         [ Stopped ]
Process : PolicyFE                    [ Stopped ]
Process : ConfigFE                    [ Stopped ]
Process : TopoFE                      [ Stopped ]
Process : PollFE                      [ Stopped ]
Process : AlertFE                     [ Stopped ]
Process : EventFE                     [ Stopped ]
Process : MapFE                       [ Stopped ]
Process : AuthorizationManagerFE      [ Stopped ]
Process : AuthenticationManagerFE     [ Stopped ]
Process : MServerFE                   [ Stopped ]
Process : SAServerFE                  [ Stopped ]
Process : MeasurementScheduler        [ Stopped ]
Process : SnmpAgentProcess            [ Stopped ]
Process : NbiProcess                  [ Stopped ]
Process : E5msSchedulerProcess        [ Stopped ]
Process : UtilizationScheduler        [ Stopped ]
Process : ParsingScheduler            [ Stopped ]
Process : ParseMeasReports            [ Stopped ]
Process : CMISchedulerInitiator       [ Stopped ]
Process : EMSInitializationProcess    [ Stopped ]
Process : CommunicationBEProcess      [ Stopped ]
Process : WebNMSMgmtBEProcess         [ Stopped ]
Process : DataMgmtRPI                 [ Stopped ]
```

```
Process : AdminModuleInit          [ Stopped ]
Process : TL1GatewayProcess        [ Stopped ]
Process : TL1CustomViewsMgr       [ Stopped ]
Process : TL1EventProcess         [ Stopped ]
Process : TL1DiscProcess          [ Stopped ]
Process : UserConfigProcess       [ Stopped ]
Process : StorageServer           [ Stopped ]
Process : StartTelnetClient       [ Stopped ]
Process : CLIFactoryBinder        [ Stopped ]
Process : StartProvModule         [ Stopped ]
Process : NmsConfigurationServer  [ Stopped ]
Process : ProcessTest            [ Stopped ]
Process : WebNMSAgentApp         [ Stopped ]
Process : WebNMSBackUp           [ Stopped ]
Process : NmsMainFE              [ Stopped ]
Process : NmsPolicyMgr           [ Stopped ]
Process : EventMgr               [ Stopped ]
Process : Collector              [ Stopped ]
Process : MapServerBE           [ Stopped ]
Process : NmsAuthenticationManager [ Stopped ]
Process : NmsAuthManager         [ Stopped ]
Process : NmsTftpServer          [ Stopped ]
Process : NMSTAServer            [ Stopped ]
Process : NMSMServer            [ Stopped ]
Process : NMSSAServer            [ Stopped ]
Process : DBServer               [ Stopped ]
Process : RunJSPModule           [ Stopped ]
Process : RunRmiRegistry         [ Stopped ]
```

All Database connections disconnected

Oracle E5-MS Server Successfully Shut Down

## APPENDIX D. LOG MESSAGES ON INSTALLATION OF E5-MS SCHEMA

Warning: Using a password on the command line interface can be insecure.

Data insertion for Measurement module: Start

Table tekelec\_meas\_reports: Start

Table tekelec\_meas\_reports: Done!

Data insertion for Measurement module: Done!

Warning: Using a password on the command line interface can be insecure.

Warning: Using a password on the command line interface can be insecure.

Data insertion for CMI module: Start

Table tek\_cmi\_cmdclasses: Start

Table tek\_cmi\_cmdclasses: Done!

Table tek\_cmi\_commands: Start

Table tek\_cmi\_commands: Done!

Table tek\_cmi\_cmdclass\_cmd\_map: Start

Table tek\_cmi\_cmdclass\_cmd\_map: Done!

Table tek\_cmi\_cmd\_params: Start

Table tek\_cmi\_cmd\_params: Done!

Table tek\_cmi\_cmd\_param\_values: Start

Table tek\_cmi\_cmd\_param\_values: Done!

Table tek\_cmi\_cmd\_param\_map: Start

Table tek\_cmi\_cmd\_param\_map: Done!

Table tek\_cmi\_cmd\_param\_validation: Start

Table tek\_cmi\_cmd\_param\_validation: Done!

Table tek\_cmi\_cmd\_param\_lookup: Start

Table tek\_cmi\_cmd\_param\_lookup: Done!

Data insertion for CMI module: Done!

## APPENDIX E. LOG MESSAGES DURING E5-MS UPGRADE

**Note:** Database dump file needed for restoring old data (see highlighted below) shall be required only in case E5-MS is being upgraded from R45.0 or 45.0.1. In case E5-MS is being upgraded from R46.0, the upgrade script shall not prompt for this dump file.

E5-MS software upgrade is in progress!

Please do not close the command terminal or interrupt the script execution.....

Please wait! Backup of E5-MS is in progress...

E5-MS database backup file "E5MS\_Database\_BackUp.sql" successfully created.

Backup of directories successfully created.

E5-MS Backup is completed.

E5-MS RPM upgrade is in progress...

current\_version: 450.30.0

MySQL version prior to release 5.6 found, E5MS data needs to be backed up for compatibility changes.

MySQL daemon not running, Explicitly starting MySQL.

bin/safe\_mysqld: line 199: my\_print\_defaults: command not found

bin/safe\_mysqld: line 204: my\_print\_defaults: command not found

nohup: redirecting stderr to stdout

MySQL daemon started.

Shutting down mysqld.

MySQL data successfully backed up at /var/upgrade/Backup\_450.30.0/MySQL\_Backup.sql

MySQL daemon not running.

Starting mysqld ...

bin/mysqld\_safe: line 489: my\_print\_defaults: command not found

bin/mysqld\_safe: line 495: my\_print\_defaults: command not found

... mysqld started.

Performing mysql upgrade to repair any tablespace.

Warning: Using a password on the command line interface can be insecure.

Looking for 'mysql' as: bin/mysql

Looking for 'mysqlcheck' as: bin/mysqlcheck

Running 'mysqlcheck with default connection arguments

Warning: Using a password on the command line interface can be insecure.

Running 'mysqlcheck with default connection arguments

Warning: Using a password on the command line interface can be insecure.

mysql.columns\_priv OK

mysql.db OK

mysql.event OK

mysql.func OK

mysql.general\_log OK

```
mysql.help_category          OK
mysql.help_keyword          OK
mysql.help_relation         OK
mysql.help_topic            OK
mysql.ndb_binlog_index      OK
mysql.plugin                OK
mysql.proc                  OK
mysql.procs_priv            OK
mysql.proxies_priv          OK
mysql.servers               OK
mysql.slow_log              OK
mysql.tables_priv           OK
mysql.time_zone             OK
mysql.time_zone_leap_second OK
mysql.time_zone_name        OK
mysql.time_zone_transition  OK
mysql.time_zone_transition_type OK
mysql.user                  OK
```

Running 'mysql\_fix\_privilege\_tables'...

Warning: Using a password on the command line interface can be insecure.

Running 'mysqlcheck with default connection arguments

Warning: Using a password on the command line interface can be insecure.

Running 'mysqlcheck with default connection arguments

Warning: Using a password on the command line interface can be insecure.

OK

Warning: Using a password on the command line interface can be insecure.

Restoring mysql database.

Warning: Using a password on the command line interface can be insecure.

Please provide the path of E5-MS Database dump file (including the dump file name):  
/var/upgrade/Backup\_450.30.0/E5MS\_Database\_BackUp.sql

E5-MS dump file provided by you is:  
/var/upgrade/Backup\_450.30.0/E5MS\_Database\_BackUp.sql

Restoring E5-MS database. Please do not close the console window, it may take several minutes depending upon E5-MS data size and system performance.....

Warning: Using a password on the command line interface can be insecure.

E5-MS data restoration: start

E5-MS data restoration: done



E5-MS data migration completed on new MySQL version, please re setup mysql replication for E5-MS failover.

Performing mysql upgrade on restored data.

Warning: Using a password on the command line interface can be insecure.

Looking for 'mysql' as: bin/mysql

Looking for 'mysqlcheck' as: bin/mysqlcheck

Running 'mysqlcheck with default connection arguments

Warning: Using a password on the command line interface can be insecure.

Running 'mysqlcheck with default connection arguments

Warning: Using a password on the command line interface can be insecure.

mysql.columns_priv	OK
mysql.db	OK
mysql.event	OK
mysql.func	OK
mysql.general_log	OK
mysql.help_category	OK
mysql.help_keyword	OK
mysql.help_relation	OK
mysql.help_topic	OK
mysql.host	OK
mysql.innodb_index_stats	OK
mysql.innodb_table_stats	OK
mysql.ndb_binlog_index	OK
mysql.plugin	OK
mysql.proc	OK
mysql.procs_priv	OK
mysql.proxies_priv	OK
mysql.servers	OK
mysql.slave_master_info	OK
mysql.slave_relay_log_info	OK
mysql.slave_worker_info	OK
mysql.slow_log	OK
mysql.tables_priv	OK
mysql.time_zone	OK
mysql.time_zone_leap_second	OK
mysql.time_zone_name	OK
mysql.time_zone_transition	OK
mysql.time_zone_transition_type	OK
mysql.user	OK

Running 'mysql\_fix\_privilege\_tables'...

Warning: Using a password on the command line interface can be insecure.

Running 'mysqlcheck with default connection arguments

Warning: Using a password on the command line interface can be insecure.

Running 'mysqlcheck with default connection arguments

Warning: Using a password on the command line interface can be insecure.

WebNmsDB.ANNOTATION	OK
WebNmsDB.Alert	OK
WebNmsDB.AlertPolicyObject	OK
WebNmsDB.AttributeAudit	OK
WebNmsDB.AuthAudit	OK
WebNmsDB.BEFailOver	OK
WebNmsDB.CCTV	OK
WebNmsDB.CCTVIEWS	OK
WebNmsDB.CHILDRENSTATUS	OK
WebNmsDB.CORBANode	OK
WebNmsDB.CRITERIAPROPERTIES	OK
WebNmsDB.ConfigAttributes	OK
WebNmsDB.ConfigProvider	OK
WebNmsDB.ConfigTaskDetails	OK
WebNmsDB.ConfigTasks	OK
WebNmsDB.CustomView	OK
WebNmsDB.CustomViewColumns	OK
WebNmsDB.CustomViewProps	OK
WebNmsDB.DASHBOARD	OK
WebNmsDB.DASHBOARDCOLUMNS	OK
WebNmsDB.DBPOLICY	OK
WebNmsDB.DataCollectionAttributes	OK
WebNmsDB.DeviceAudit	OK
WebNmsDB.DeviceList	OK
WebNmsDB.DeviceListDetails	OK
WebNmsDB.DeviceUserProps	OK
WebNmsDB.ENGINES	OK
WebNmsDB.ENGINETABLE	OK
WebNmsDB.Event	OK
WebNmsDB.FAULTREPORTS_DAILY	OK
WebNmsDB.FAULTREPORTS_HOURLY	OK
WebNmsDB.FilterCommandAlertAction	OK
WebNmsDB.FilterCommandEventAction	OK
WebNmsDB.GMapSymbol	OK
WebNmsDB.GroupTable	OK
WebNmsDB.HOSTS	OK
WebNmsDB.IpAddress	OK
WebNmsDB.MAPPEDPROPERTIES	OK
WebNmsDB.MAPUSERPROPS	OK

WebNmsDB.ManagedGroupObject	OK
WebNmsDB.ManagedObject	OK
WebNmsDB.MapContainer	OK
WebNmsDB.MapDB	OK
WebNmsDB.MapGroup	OK
WebNmsDB.MapLink	OK
WebNmsDB.MapSymbol	OK
WebNmsDB.MonitorNmsParameter	OK
WebNmsDB.NMS_STATUS_MONITOR7_17_2014	OK
WebNmsDB.NamedViewToAuthorizedViewTable	OK
WebNmsDB.Network	OK
WebNmsDB.NetworkInventory	OK
WebNmsDB.Node	OK
WebNmsDB.NotificationLog	OK
WebNmsDB.OBJECTSTOLINK	OK
WebNmsDB.ObjectSchedulerRUNNABLE	OK
WebNmsDB.ObjectTypes	OK
WebNmsDB.OperationsTable	OK
WebNmsDB.OperationsTreeTable	OK
WebNmsDB.POLICYUSERPROPS	OK
WebNmsDB.PORTS	OK
WebNmsDB.PanelTree	OK
WebNmsDB.PendingDevices	OK
WebNmsDB.PendingTasks	OK
WebNmsDB.PolicyActionCondition	OK
WebNmsDB.PolicyObject	OK
WebNmsDB.PolicyScheduleTime	OK
WebNmsDB.PollIDToKeyMap	OK
WebNmsDB.PolledData	OK
WebNmsDB.PollingAttributes	OK
WebNmsDB.PollingObjects	OK
WebNmsDB.PortObject	OK
WebNmsDB.Printer	OK
WebNmsDB.Providers	OK
WebNmsDB.ProvisionResult	OK
WebNmsDB.ProvisioningVariant	OK
WebNmsDB.ProvisioningVariantProps	OK
WebNmsDB.REPORTS_DAILY	OK
WebNmsDB.REPORTS_HOURLY	OK
WebNmsDB.Reports	OK
WebNmsDB.STATSDATA7_17_2014	OK
WebNmsDB.STRINGDATA7_11_2014	OK

WebNmsDB.STRINGDATA7_12_2014	OK
WebNmsDB.STRINGDATA7_13_2014	OK
WebNmsDB.STRINGDATA7_14_2014	OK
WebNmsDB.STRINGDATA7_15_2014	OK
WebNmsDB.STRINGDATA7_16_2014	OK
WebNmsDB.STRINGDATA7_17_2014	OK
WebNmsDB.SendEmailAlertAction	OK
WebNmsDB.SendEmailEventAction	OK
WebNmsDB.SnmpInterface	OK
WebNmsDB.SnmpNode	OK
WebNmsDB.StageIdVsConfigId	OK
WebNmsDB.StatsTables	OK
WebNmsDB.SwitchObject	OK
WebNmsDB.TL1Interface	OK
WebNmsDB.TL1Node	OK
WebNmsDB.TaskAudit	OK
WebNmsDB.TaskToDeviceListMap	OK
WebNmsDB.Tek_Secu_MapUserGrpEagleNode	OK
WebNmsDB.Tek_Secu_MapUsergrpCmdClass	OK
WebNmsDB.Tek_Secu_PasswordConfig	OK
WebNmsDB.Tek_Secu_UserInfo	OK
WebNmsDB.Tek_inventory_card	OK
WebNmsDB.Tek_inventory_eagleNode	OK
WebNmsDB.Tek_inventory_frame	OK
WebNmsDB.Tek_inventory_shelf	OK
WebNmsDB.Tek_inventory_slot	OK
WebNmsDB.ThresholdObjects	OK
WebNmsDB.TopoObject	OK
WebNmsDB.TrapDisabledMO	OK
WebNmsDB.UIDataIdVsPRIId	OK
WebNmsDB.USERS	OK
WebNmsDB.USERTABLE	OK
WebNmsDB.USMTABLE	OK
WebNmsDB.UserConfTable	OK
WebNmsDB.UserGroupTable	OK
WebNmsDB.UserInputData	OK
WebNmsDB.UserPasswordTable	OK
WebNmsDB.VACMACCESSTABLE	OK
WebNmsDB.VACMCONTEXTTABLE	OK
WebNmsDB.VACMSECURITYTOGROUPTABLE	OK
WebNmsDB.VACMVIEWTREEFAMILYTABLE	OK
WebNmsDB.VarBindLog	OK

WebNmsDB.ViewPropertiesTable	OK
WebNmsDB.ViewToOperationsTable	OK
WebNmsDB.ViewsToGroupTable	OK
WebNmsDB.WIDGET	OK
WebNmsDB.WIDGETASSOCIATION	OK
WebNmsDB.WIDGETCRITERIA	OK
WebNmsDB.WIDGETDATASOURCE	OK
WebNmsDB.WIDGETLEVEL	OK
WebNmsDB.tek_cmi_cmd_param_lookup	OK
WebNmsDB.tek_cmi_cmd_param_map	OK
WebNmsDB.tek_cmi_cmd_param_validation	OK
WebNmsDB.tek_cmi_cmd_param_values	OK
WebNmsDB.tek_cmi_cmd_params	OK
WebNmsDB.tek_cmi_cmdclass_cmd_map	OK
WebNmsDB.tek_cmi_cmdclasses	OK
WebNmsDB.tek_cmi_commands	OK
WebNmsDB.tek_lui_config_data	OK
WebNmsDB.tek_lui_link_data	OK
WebNmsDB.tek_lui_linkdata_timestamp	OK
WebNmsDB.tek_lui_measurements	OK
WebNmsDB.tek_lui_slk_capacity	OK
WebNmsDB.tek_lui_slk_capacity_arch	OK
WebNmsDB.tek_lui_slk_reptstatcard	OK
WebNmsDB.tek_nbi_ftp_config	OK
WebNmsDB.tek_nbi_nms_config	OK
WebNmsDB.tek_rept_tokens	OK
WebNmsDB.tek_rprt_rept_stat_card	OK
WebNmsDB.tek_scheduler_task	OK
WebNmsDB.tek_snmp_agent_config	OK
WebNmsDB.tekelec_meas_headers	OK
WebNmsDB.tekelec_meas_reports	OK

OK

Shutting down MySQL.

Warning: Using a password on the command line interface can be insecure.

Removing temp files.

RPM upgrade done.

E5-MS configuration files restoration is in progress...

Restore process done.

Adding E5-MS release 460.5.0 changes...

File changes complete

```
E5-MS R46.0 CMI and Measurement Schema changes are applicable.....
Deleting existing E5-MS schema.....
Starting mysql
140717 16:27:57 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms8.err'.
140717 16:27:57 mysqld_safe Starting mysqld daemon with databases from
/Tekelec/WebNMS/mysql/data
Data deletion for Measurement module: Start
    Table tekelec_meas_reports: Start
    Table tekelec_meas_reports: Done!
Data deletion for Measurement module: Done!
Data deletion for CMI module: Start
    Table tek_cmi_cmd_param_lookup: Start
    Table tek_cmi_cmd_param_lookup: Done!
    Table tek_cmi_cmd_param_validation: Start
    Table tek_cmi_cmd_param_validation: Done!
    Table tek_cmi_cmd_param_map: Start
    Table tek_cmi_cmd_param_map: Done!
    Table tek_cmi_cmd_param_values: Start
    Table tek_cmi_cmd_param_values: Done!
    Table tek_cmi_cmd_params: Start
    Table tek_cmi_cmd_params: Done!
    Table tek_cmi_cmdclass_cmd_map: Start
    Table tek_cmi_cmdclass_cmd_map: Done!
    Table tek_cmi_commands: Start
    Table tek_cmi_commands: Done!
    Table tek_cmi_cmdclasses: Start
    Table tek_cmi_cmdclasses: Done!
Data deletion for CMI module: Done!
Stopping mysql
140717 16:28:07 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms8.pid
ended
Adding new E5-MS schema.....
Starting mysql
140717 16:28:15 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms8.err'.
140717 16:28:15 mysqld_safe Starting mysqld daemon with databases from
/Tekelec/WebNMS/mysql/data
Data insertion for Measurement module: Start
    Table tekelec_meas_reports: Start
    Table tekelec_meas_reports: Done!
Data insertion for Measurement module: Done!
Data insertion for CMI module: Start
    Table tek_cmi_cmdclasses: Start
    Table tek_cmi_cmdclasses: Done!
```

```
Table tek_cmi_commands: Start
Table tek_cmi_commands: Done!
Table tek_cmi_cmdclass_cmd_map: Start
Table tek_cmi_cmdclass_cmd_map: Done!
Table tek_cmi_cmd_params: Start
Table tek_cmi_cmd_params: Done!
Table tek_cmi_cmd_param_values: Start
Table tek_cmi_cmd_param_values: Done!
Table tek_cmi_cmd_param_map: Start
Table tek_cmi_cmd_param_map: Done!
Table tek_cmi_cmd_param_validation: Start
Table tek_cmi_cmd_param_validation: Done!
Table tek_cmi_cmd_param_lookup: Start
Table tek_cmi_cmd_param_lookup: Done!
Data insertion for CMI module: Done!
Stopping mysql
140717 16:28:31 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms8.pid
ended
E5-MS Schema updated successfully
E5-MS R46.0 CMI and Measurement Schema changes end
Release changes added.

Software upgrade is completed.
```

## APPENDIX F. PROCEDURE TO SETUP FAILOVER

To setup failover DB replication is a must. To enable DB replication, one needs to set up various GLOBAL PARAMETERS. Also, changes need to be done in E5-MS for establishing failover between the primary and standby servers.

### F.1 IN CASE OF FRESH INSTALLATION

In case of fresh installation, one of the servers can be assumed as ‘Primary’ and the other as ‘Standby’ server.

Before proceeding with setting up of failover in case of E5-MS R46.0.1 installation, the following details should be known -

- MySQL root user’s password for both primary and standby servers. Default password is ‘public’.
- Hostnames for both primary and standby servers: In the procedure given below, these values shall be called ‘primary server hostname’ and ‘standby server hostname’ respectively.

S. No.	Step	Expected Output
1	Login in to primary E5MS server using user ‘root’.	-
2	In the system’s hosts file, add the DNS entries for both primary and standby servers as shown here.  On CentOS, the hosts file is placed in ‘/etc’ directory.	<PRIMARY SERVER IP> <PRIMARY SERVER HOSTNAME> <STANDBY SERVER IP> <STANDBY SERVER HOSTNAME>  10.248.10.25 e5ms8 10.248.10.21 e5ms9
3	Replace the ‘localhost’ value in the given statement in /Tekelec/WebNMS/classes/hbplib/hibernate.cfg.xml file with the hostname of server.	Update the following statement in /Tekelec/WebNMS/classes/hbplib/hibernate.cfg.xml –  <property name="connection.url">jdbc:mysql://localhost/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>  As –  <property name="connection.url">jdbc:mysql://<hostname>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>  e.g.  <property name="connection.url">jdbc:mysql://e5ms7/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>
4	Move to directory /Tekelec/WebNMS/bin.	cd /Tekelec/WebNMS/bin
5	Change the server-id value in ‘startMySQL.sh’ file. Any number in the range 1 to 2 <sup>32</sup> -1 can be used as the value for server-id.	-
6	Start MySQL server by invoking startMySQL.sh script.	sh startMySQL.sh  # bin/safe_mysqld: line 199: my_print_defaults: command not found



		bin/safe_mysqld: line 204: my_print_defaults: command not found nohup: redirecting stderr to stdout  Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data
7	Move to '/Tekelec/WebNMS/mysql/bin' directory.	cd /Tekelec/WebNMS/mysql/bin
8	Connect to the MySQL client by executing mysql in '/Tekelec/WebNMS/mysql/bin' directory.  Provide the password for MySQL root user when prompted. Default password is 'public'.	./mysql -uroot -p<password>  Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 125 Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)  Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.  Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.  mysql>
9	Login in to standby E5MS server using user 'root'.	-
10	In the system's hosts file, add the DNS entries for both primary and standby servers as shown here.  On CentOS, the hosts file is placed in '/etc' directory.	<PRIMARY SERVER IP> <PRIMARY SERVER HOSTNAME> <STANDBY SERVER IP> <STANDBY SERVER HOSTNAME>  10.248.10.25 e5ms8 10.248.10.21 e5ms9
11	Replace the 'localhost' value in the given statement in /Tekelec/WebNMS/classes/hbplib/hibernate.cfg.xml file with the hostname of server.	Update the following statement in /Tekelec/WebNMS/classes/hbplib/hibernate.cfg.xml –  <property name="connection.url">jdbc:mysql://localhost/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>  As –  <property name="connection.url">jdbc:mysql://<hostname>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>  e.g.  <property name="connection.url">jdbc:mysql://e5ms8/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>
12	Move to directory /Tekelec/WebNMS/bin.	cd /Tekelec/WebNMS/bin
13	Change the server-id value in 'startMySql.sh' file. Any number in the range 1 to 2^32-1 can be used	-

	as the value for server-id, however, the value used must not be same as the one used on primary server.	
14	Start MySQL server by invoking startMySQL.sh script.	<pre>sh startMySQL.sh  # bin/safe_mysqld: line 199: my_print_defaults: command not found bin/safe_mysqld: line 204: my_print_defaults: command not found nohup: redirecting stderr to stdout  Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data</pre>
15	Move to '/Tekelec/WebNMS/mysql/bin' directory.	<pre>cd /Tekelec/WebNMS/mysql/bin</pre>
16	<p>Connect to the MySQL client by executing mysql in '/Tekelec/WebNMS/mysql/bin' directory.</p> <p>Provide the password for MySQL root user when prompted. Default password is 'public'.</p>	<pre>./mysql -uroot -p&lt;password&gt;  Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor.  Commands end with ; or \g. Your MySQL connection id is 125 Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)  Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.  Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.  mysql&gt;</pre>
17	<p>Execute the five MySQL commands on primary server. Replace the values given in &lt;&gt; by actual values.</p> <p><b>Note:</b> In the CREATE USER command, the values for 'primary replication user' and 'primary replication user password' can be provided as intended by the user. However, both these values should be noted down to be used later in the GRANT REPLICATION SLAVE command.</p>	<pre>GRANT ALL PRIVILEGES ON *.* TO root@'&lt;primary server hostname&gt;' IDENTIFIED BY '&lt;primary server's mysql root user password&gt;';  GRANT ALL PRIVILEGES ON *.* TO root@'&lt;standby server hostname&gt;' IDENTIFIED BY '&lt;standby server's mysql root user password&gt;';  CREATE USER '&lt;primary replication user&gt;'@'localhost' IDENTIFIED BY '&lt;primary replication user password&gt;';  GRANT REPLICATION SLAVE ON *.* TO '&lt;primary replication user&gt;'@'&lt;standby server hostname&gt;' IDENTIFIED BY '&lt;primary replication user password&gt;';  FLUSH PRIVILEGES;</pre>
18	<p>Execute the five MySQL commands on standby server. Replace the values given in &lt;&gt; by actual values.</p> <p><b>Note:</b> In the CREATE USER command, the values for 'primary replication user' and 'primary replication user password' can be provided as intended by the user. However, both these values should be noted down to be used later in the GRANT REPLICATION SLAVE command.</p>	<pre>GRANT ALL PRIVILEGES ON *.* TO root@'&lt;primary server hostname&gt;' IDENTIFIED BY '&lt;primary server's mysql root user password&gt;';  GRANT ALL PRIVILEGES ON *.* TO root@'&lt;standby server hostname&gt;' IDENTIFIED BY '&lt;standby server's mysql root user password&gt;';  CREATE USER '&lt;standby replication user&gt;'@'localhost' IDENTIFIED BY '&lt;standby replication user password&gt;';  GRANT REPLICATION SLAVE ON *.* TO '&lt;standby replication user&gt;'@'&lt;primary server hostname&gt;' IDENTIFIED BY '&lt;standby replication user password&gt;';  FLUSH PRIVILEGES;</pre>

19	<p>Run SHOW MASTER STATUS command on the MySQL prompt on primary server.</p> <p>Note the values for columns 'File' and 'Position'. Let us call them PrimaryLogFile and PrimaryLogPosition to be used later in the procedure.</p>	<pre>mysql&gt; SHOW MASTER STATUS; +-----+-----+-----+-----+   File             Position   Binlog_Do_DB   Binlog_Ignore_DB   Executed_Gtid_Set   +-----+-----+-----+-----+   log-bin.000004   545       WebNmsDB       mysql               +-----+-----+-----+-----+ 1 row in set (0.00 sec)</pre>
20	<p>Run SHOW MASTER STATUS command on the MySQL prompt on standby server.</p> <p>Note the values for columns 'File' and 'Position'. Let us call them StandbyLogFile and StandbyLogPosition to be used later in the procedure.</p>	<pre>mysql&gt; SHOW MASTER STATUS; +-----+-----+-----+-----+   File             Position   Binlog_Do_DB   Binlog_Ignore_DB   Executed_Gtid_Set   +-----+-----+-----+-----+   log-bin.000004   545       WebNmsDB       mysql               +-----+-----+-----+-----+ 1 row in set (0.00 sec)</pre>
21	<p>Execute the two MySQL commands on the primary server. In the command, use the values for &lt;StandbyLogPosition&gt; and &lt;StandbyLogFile&gt; noted earlier in this procedure.</p>	<pre>CHANGE MASTER TO MASTER_HOST='&lt;standby server hostname&gt;', MASTER_PORT=3306, MASTER_USER='&lt;standby replication user&gt;', MASTER_PASSWORD='&lt;standby replication user password&gt;', MASTER_LOG_POS=&lt;StandbyLogPosition&gt;, MASTER_LOG_FILE='&lt;StandbyLogFile&gt;';  START SLAVE;</pre>
22	<p>Execute the two MySQL commands on the standby server. In the command, replace the values for &lt;PrimaryLogPosition&gt; and &lt;PrimaryLogFile&gt; noted earlier in this procedure.</p>	<pre>CHANGE MASTER TO MASTER_HOST='&lt;primary server hostname&gt;', MASTER_PORT=3306, MASTER_USER='&lt;primary replication user&gt;', MASTER_PASSWORD='&lt;primary replication user password&gt;', MASTER_LOG_POS=&lt;PrimaryLogPosition&gt;, MASTER_LOG_FILE='&lt;PrimaryLogFile&gt;';  START SLAVE;</pre>
23	<p>Verify that replication has been setup correctly by executing the given command at the MySQL client on the standby server.</p> <p>Verify the highlighted values in the command output. Both should be 'Yes' for correct replication setup.</p>	<pre>SHOW SLAVE STATUS\G;  Output similar to the following is displayed -  ***** 1. row ***** Slave_IO_State: Waiting for master to send event Master_Host: e5ms1 Master_User: primary Master_Port: 3306 Connect_Retry: 60 Master_Log_File: log-bin.000002 Read_Master_Log_Pos: 120 Relay_Log_File: relay-bin.000002 Relay_Log_Pos: 149415 Relay_Master_Log_File: log-bin.000001 Slave_IO_Running: Yes Slave_SQL_Running: Yes Replicate_Do_DB: Replicate_Ignore_DB: Replicate_Do_Table: Replicate_Ignore_Table: Replicate_Wild_Do_Table: Replicate_Wild_Ignore_Table: Last_Errno: 0 Last_Error:</pre>

		<pre> Skip_Counter: 0 Exec_Master_Log_Pos: 149254 Relay_Log_Space: 229712 Until_Condition: None Until_Log_File: Until_Log_Pos: 0 Master_SSL_Allowed: No Master_SSL_CA_File: Master_SSL_CA_Path: Master_SSL_Cert: Master_SSL_Cipher: Master_SSL_Key: Seconds_Behind_Master: 770 Master_SSL_Verify_Server_Cert: No Last_IO_Errno: 0 Last_IO_Error: Last_SQL_Errno: 0 Last_SQL_Error: Replicate_Ignore_Server_Ids: Master_Server_Id: 1 Master_UUID: 836db629-e017-11e3-b81f-00151a6e0499 Master_Info_File: /Tekelec/WebNMS/mysql/data/master.info SQL_Delay: 0 SQL_Remaining_Delay: NULL Slave_SQL_Running_State: creating table Master_Retry_Count: 86400 Master_Bind: Last_IO_Error_Timestamp: Last_SQL_Error_Timestamp: Master_SSL_Crl: Master_SSL_Crlpath: Retrieved_Gtid_Set: Executed_Gtid_Set: Auto_Position: 0 1 row in set (0.00 sec) </pre>
24	<p>Verify that the replication has been setup correctly by executing the given command at the MySQL client on the primary server.</p> <p>Verify the highlighted values in the command output. Both should be 'Yes' for correct replication setup.</p>	<pre> SHOW SLAVE STATUS \G;  Output similar to the following is displayed -  ***** 1. row ***** Slave_IO_State: Waiting for master to send event  Master_Host: e5ms12 Master_User: secondary Master_Port: 3306 Connect_Retry: 60 Master_Log_File: log-bin.000002 Read_Master_Log_Pos: 120 Relay_Log_File: relay-bin.000002 Relay_Log_Pos: 149415 Relay_Master_Log_File: log-bin.000001 Slave_IO_Running: Yes Slave_SQL_Running: Yes Replicate_Do_DB: Replicate_Ignore_DB: Replicate_Do_Table: Replicate_Ignore_Table: Replicate_Wild_Do_Table: Replicate_Wild_Ignore_Table: Last_Errno: 0 Last_Error: Skip_Counter: 0 </pre>

		<pre> Exec_Master_Log_Pos: 149254 Relay_Log_Space: 229712 Until_Condition: None Until_Log_File: Until_Log_Pos: 0 Master_SSL_Allowed: No Master_SSL_CA_File: Master_SSL_CA_Path: Master_SSL_Cert: Master_SSL_Cipher: Master_SSL_Key: Seconds_Behind_Master: 770 Master_SSL_Verify_Server_Cert: No Last_IO_Errno: 0 Last_IO_Error: Last_SQL_Errno: 0 Last_SQL_Error: Replicate_Ignore_Server_Ids: Master_Server_Id: 1 Master_UUID: 836db629-e017-11e3-b81f- 00151a6e0499 Master_Info_File: /Tekelec/WebNMS/mysql/data/master.info SQL_Delay: 0 SQL_Remaining_Delay: NULL Slave_SQL_Running_State: creating table Master_Retry_Count: 86400 Master_Bind: Last_IO_Error_Timestamp: Last_SQL_Error_Timestamp: Master_SSL_Crl: Master_SSL_Crlpath: Retrieved_Gtid_Set: Executed_Gtid_Set: Auto_Position: 0 1 row in set (0.00 sec) </pre>
25	<p>On primary server, login to E5-MS database and create a DUMMY table. After creation, verify that it has been created successfully by using SHOW TABLES command.</p>	<pre> ./mysql -uroot -p&lt;password&gt; Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor.  Commands end with ; or \g. Your MySQL connection id is 125 Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)  Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.  Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.  Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  mysql&gt; USE WebNmsDB; Reading table information for completion of table and column names You can turn off this feature to get a quicker startup with -A  Database changed mysql&gt; CREATE TABLE DUMMY(dummy_column VARCHAR(100)); </pre>

		Query OK, 0 rows affected (0.21 sec) mysql> SHOW TABLES;
26	On standby server, login to E5-MS database and verify that the DUMMY is present by using SHOW TABLES command.	./mysql -uroot -p<password>  Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 125 Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)  Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.  Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.  Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  mysql> USE WebNmsDB; Reading table information for completion of table and column names You can turn off this feature to get a quicker startup with -A  Database changed mysql> SHOW TABLES;
27	On standby server, delete the DUMMY table from E5-MS database by using DROP TABLE command.	mysql> DROP TABLE DUMMY; Query OK, 0 rows affected (0.05 sec)
28	On primary server, verify that the DUMMY table no more exists in E5-MS database using SHOW TABLES command.	mysql> SHOW TABLES;

**Note:** The entry for primary and standby servers must also be done on the client machines' hosts file. On Windows machine, the hosts file is present at 'C:\Windows\System32\drivers\etc' folder. The following two lines should be added in the hosts file –

```
<PRIMARY SERVER IP> <PRIMARY SERVER HOSTNAME>
<STANDBY SERVER IP> <STANDBY SERVER HOSTNAME>
```

e.g.

```
10.248.10.25 e5ms8
10.248.10.21 e5ms9
```

---

## **F.2 IN CASE OF UPGRADE**

Before proceeding with setting up of failover in case of E5-MS upgrade to R46.0.1, the following details should be known -

- MySQL root user's password for both primary and standby servers
- Hostnames for both primary and standby servers: In the procedure given below, these values shall be called 'primary server hostname' and 'standby server hostname' respectively

- MySQL replication user name and its password on primary server: In the procedure given below, these values shall be called 'primary replication user' and 'primary replication user password' respectively.
- MySQL replication user name and its password on Standby E5MS server: In the procedure given below, these values shall be called 'standby replication user' and 'standby replication user password' respectively.

S. No.	Step	Expected Output
1	Login in to primary E5MS server using user 'root'.	-
2	Move to directory /Tekelec/WebNMS/bin.	cd /Tekelec/WebNMS/bin
3	Change the server-id value in 'startMySql.sh' file. Any number in the range 1 to 2^32-1 can be used as the value for server-id.	-
4	Start MySQL server by invoking startMySql.sh script.	sh startMySqlQL.sh
5	Move to '/Tekelec/WebNMS/mysql/bin' directory.	cd /Tekelec/WebNMS/mysql/bin
6	Connect to the MySQL client by executing mysql in '/Tekelec/WebNMS/mysql/bin' directory.  Provide the password for MySQL root user when prompted.	./mysql -uroot -p<password>  Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 125 Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)  Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.  Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.  mysql>
7	Login in to standby E5MS server using user 'root'.	-
8	Move to directory /Tekelec/WebNMS/bin.	cd /Tekelec/WebNMS/bin
9	Change the server-id value in 'startMySql.sh' file. Any number in the range 1 to 2^32-1 can be used as the value for server-id, however, the value used must not be same as the one used on primary server.	-
10	Start MySQL server by invoking startMySql.sh script.	sh startMySqlQL.sh
11	Move to '/Tekelec/WebNMS/mysql/bin' directory.	cd /Tekelec/WebNMS/mysql/bin
12	Connect to the MySQL client by executing mysql in '/Tekelec/WebNMS/mysql/bin' directory.  Provide the password for MySQL	./mysql -uroot -p<password>  Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 125

	root user when prompted.	<pre>Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)  Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.  Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.  mysql&gt;</pre>
13	Take backup of database on the primary server and restore it on the standby server. This is to ensure that both the databases are in sync before failover setup.	<pre>a. Run /Tekelec/WebNMS/bin/backup/BackupDB.sh script on the primary server.  b. Tar the contents of /var/backup directory - cd /var/backup tar cvf /tmp/backup.tar *  c. Transfer the tar file created above to the standby server - scp /tmp/backup.tar root@&lt;secondaryserverip&gt;:/tmp/  d. Restore the tar file on the standby server - cd /var/backup tar xvf /tmp/backup.tar cd /Tekelec/WebNMS/bin/backup/ ./RestoreDB.sh /var/backup/E5MS_Database_BackUp.sql</pre>
14	On primary server, check if replication slave privilege for primary replication user is present for standby host by executing the given query.	<pre>show grants for '&lt;primary replication user&gt;'@&lt;standby server hostname&gt;;</pre>
15	<p>If output similar to what is given here is observed, it means replication privileges were provided to a user (primary replication user) logging from standby host. In this case, skip the next step.</p> <p>Else, if output is similar to error log as shown, it means that replication privileges were not given to primary replication user from standby host during earlier failover setup. In this case, execute next step.</p>	<pre>+-----+   Grants for &lt;primary replication user&gt;@&lt;standby server hostname &gt;  +-----+   GRANT REPLICATION SLAVE ON *.* TO &lt;primary replication user&gt;@&lt;standby server hostname&gt; IDENTIFIED BY PASSWORD '*3C0FBEB25545FC3BEFC6B26880D8D51D07A4A455'   +-----+ 1 row in set (0.00 sec)  ERROR 1141 (42000): There is no such grant defined for user &lt;primary replication user&gt; on host '&lt;standby server hostname&gt;'</pre>
16	Remove any privileges for all hosts by executing the given command on MySQL prompt.	<pre>REVOKE REPLICATION SLAVE ON *.* FROM '&lt;primary replication user&gt;'@'%';</pre>
17	Execute the two MySQL commands. Replace the values given in <> by actual values.	<pre>GRANT REPLICATION SLAVE ON *.* TO '&lt;primary replication user&gt;'@&lt;standby server hostname&gt;' IDENTIFIED BY '&lt;primary replication user password&gt;';  FLUSH PRIVILEGES;</pre>
18	On standby server, check if replication slave privilege for standby replication user is present	<pre>show grants for '&lt;standby replication user&gt;'@&lt;primary server hostname&gt;;</pre>



	for primary host by executing the given query.	
19	<p>If output similar to what is given here is observed, it means replication privileges were provided to a user (primary replication user) logging from standby host. In this case, skip the next step.</p> <p>Else, if output is similar to error log as shown, it means that replication privileges were not given to primary replication user from standby host during earlier failover setup. In this case, execute next step.</p>	<pre> +-----+ +-----+   Grants for &lt;standby replication user&gt;@&lt;primary server hostname &gt;  +-----+ +-----+   GRANT REPLICATION SLAVE ON *.* TO &lt;standby replication user&gt;@&lt;primary server hostname&gt; IDENTIFIED BY PASSWORD '*3C0FBEB25545FC3BEFC6B26880D8D51D07A4A455'   +-----+ +-----+ 1 row in set (0.00 sec)  ERROR 1141 (42000): There is no such grant defined for user &lt;standby replication user&gt; on host '&lt;primary server hostname&gt;' </pre>
20	Remove any privileges for all hosts by executing the given command on MySQL prompt.	REVOKE REPLICATION SLAVE ON *.* FROM '<standby replication user>'@'%';
21	Execute the two MySQL commands. Replace the values given in <> by actual values.	<pre> GRANT REPLICATION SLAVE ON *.* TO '&lt;standby replication user&gt;'@&lt;primary server hostname&gt;' IDENTIFIED BY '&lt;standby replication user password&gt;';  FLUSH PRIVILEGES; </pre>
22	<p>Run SHOW MASTER STATUS command on the MySQL prompt on primary server.</p> <p>Note the values for columns 'File' and 'Position'. Let us call them PrimaryLogFile and PrimaryLogPosition to be used later in the procedure.</p>	<pre> mysql&gt; SHOW MASTER STATUS; +-----+-----+-----+-----+   File            Position   Binlog_Do_DB   Binlog_Ignore_DB   Executed_Gtid_Set   +-----+-----+-----+-----+   log-bin.000004            545   WebNmsDB        mysql   +-----+-----+-----+-----+ 1 row in set (0.00 sec) </pre>
23	<p>Run SHOW MASTER STATUS command on the MySQL prompt on standby server.</p> <p>Note the values for columns 'File' and 'Position'. Let us call them StandbyLogFile and StandbyLogPosition to be used later in the procedure.</p>	<pre> mysql&gt; SHOW MASTER STATUS; +-----+-----+-----+-----+   File            Position   Binlog_Do_DB   Binlog_Ignore_DB   Executed_Gtid_Set   +-----+-----+-----+-----+   log-bin.000004            545   WebNmsDB        mysql   +-----+-----+-----+-----+ 1 row in set (0.00 sec) </pre>
24	Execute the three MySQL commands on the primary server. In the command, use the values for <StandbyLogPosition> and <StandbyLogFile> noted earlier in this procedure.	<pre> STOP SLAVE;  CHANGE MASTER TO MASTER_HOST='&lt;standby server hostname&gt;', MASTER_PORT=3306, MASTER_USER='&lt;standby replication user&gt;', MASTER_PASSWORD='&lt;standby replication user password&gt;', MASTER_LOG_POS=&lt;StandbyLogPosition&gt;, MASTER_LOG_FILE='&lt;StandbyLogFile&gt;';  START SLAVE; </pre>
25	Execute the three MySQL commands on the standby server. In the command, replace the values for <PrimaryLogPosition> and <PrimaryLogFile> noted earlier in	<pre> STOP SLAVE;  CHANGE MASTER TO MASTER_HOST='&lt;primary server hostname&gt;', MASTER_PORT=3306, MASTER_USER='&lt;primary replication user&gt;', MASTER_PASSWORD='&lt;primary replication user password&gt;', MASTER_LOG_POS=&lt;PrimaryLogPosition&gt;, </pre>

	this procedure.	<pre> MASTER_LOG_FILE='&lt;PrimaryLogFile&gt;';  START SLAVE; </pre>
26	<p>Verify that replication has been setup correctly by executing the given command at the MySQL client on the standby server.</p> <p>Verify the highlighted values in the command output. Both should be 'Yes' for correct replication setup.</p>	<pre> SHOW SLAVE STATUS\G;  Output similar to the following is displayed -  ***** 1. row ***** Slave_IO_State: Waiting for master to send event       Master_Host: e5ms1       Master_User: primary       Master_Port: 3306       Connect_Retry: 60       Master_Log_File: log-bin.000002       Read_Master_Log_Pos: 120       Relay_Log_File: relay-bin.000002       Relay_Log_Pos: 149415       Relay_Master_Log_File: log-bin.000001       Slave_IO_Running: Yes       Slave_SQL_Running: Yes       Replicate_Do_DB:       Replicate_Ignore_DB:       Replicate_Do_Table:       Replicate_Ignore_Table:       Replicate_Wild_Do_Table:       Replicate_Wild_Ignore_Table:       Last_Errno: 0       Last_Error:       Skip_Counter: 0       Exec_Master_Log_Pos: 149254       Relay_Log_Space: 229712       Until_Condition: None       Until_Log_File:       Until_Log_Pos: 0       Master_SSL_Allowed: No       Master_SSL_CA_File:       Master_SSL_CA_Path:       Master_SSL_Cert:       Master_SSL_Cipher:       Master_SSL_Key:       Seconds_Behind_Master: 770 Master_SSL_Verify_Server_Cert: No       Last_IO_Errno: 0       Last_IO_Error:       Last_SQL_Errno: 0       Last_SQL_Error:       Replicate_Ignore_Server_Ids:       Master_Server_Id: 1       Master_UUID: 836db629-e017-11e3-b81f- 00151a6e0499       Master_Info_File: /Tekelec/WebNMS/mysql/data/master.info       SQL_Delay: 0       SQL_Remaining_Delay: NULL       Slave_SQL_Running_State: creating table       Master_Retry_Count: 86400       Master_Bind:       Last_IO_Error_Timestamp:       Last_SQL_Error_Timestamp:       Master_SSL_Crl:       Master_SSL_Crlpath:       Retrieved_Gtid_Set: </pre>

		<pre> Executed_Gtid_Set:   Auto_Position: 0 1 row in set (0.00 sec) </pre>
27	<p>Verify that the replication has been setup correctly by executing the given command at the MySQL client on the primary server.</p> <p>Verify the highlighted values in the command output. Both should be 'Yes' for correct replication setup.</p>	<pre> SHOW SLAVE STATUS \G;  Output similar to the following is displayed -  ***** 1. row *****  Slave_IO_State: Waiting for master to send event        Master_Host: e5ms12       Master_User: secondary       Master_Port: 3306       Connect_Retry: 60       Master_Log_File: log-bin.000002       Read_Master_Log_Pos: 120       Relay_Log_File: relay-bin.000002       Relay_Log_Pos: 149415       Relay_Master_Log_File: log-bin.000001       Slave_IO_Running: Yes       Slave_SQL_Running: Yes       Replicate_Do_DB:       Replicate_Ignore_DB:       Replicate_Do_Table:       Replicate_Ignore_Table:       Replicate_Wild_Do_Table:       Replicate_Wild_Ignore_Table:       Last_Errno: 0       Last_Error:       Skip_Counter: 0       Exec_Master_Log_Pos: 149254       Relay_Log_Space: 229712       Until_Condition: None       Until_Log_File:       Until_Log_Pos: 0       Master_SSL_Allowed: No       Master_SSL_CA_File:       Master_SSL_CA_Path:       Master_SSL_Cert:       Master_SSL_Cipher:       Master_SSL_Key:       Seconds_Behind_Master: 770       Master_SSL_Verify_Server_Cert: No       Last_IO_Errno: 0       Last_IO_Error:       Last_SQL_Errno: 0       Last_SQL_Error:       Replicate_Ignore_Server_Ids:       Master_Server_Id: 1       Master_UUID: 836db629-e017-11e3-b81f- 00151a6e0499       Master_Info_File: /Tekelec/WebNMS/mysql/data/master.info       SQL_Delay: 0       SQL_Remaining_Delay: NULL       Slave_SQL_Running_State: creating table       Master_Retry_Count: 86400       Master_Bind:       Last_IO_Error_Timestamp:       Last_SQL_Error_Timestamp:       Master_SSL_Crl:       Master_SSL_Crlpath:       Retrieved_Gtid_Set:       Executed_Gtid_Set: </pre>

		<p style="text-align: right;">Auto_Position: 0</p> <p>1 row in set (0.00 sec)</p>
28	<p>On primary server, login to E5-MS database and create a DUMMY table. After creation, verify that it has been created successfully by using SHOW TABLES command.</p>	<pre>./mysql -uroot -p&lt;password&gt;  Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor.  Commands end with ; or \g. Your MySQL connection id is 125 Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)  Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.  Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.  Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  mysql&gt; USE WebNmsDB; Reading table information for completion of table and column names You can turn off this feature to get a quicker startup with -A  Database changed mysql&gt; CREATE TABLE DUMMY(dummy_column VARCHAR(100)); Query OK, 0 rows affected (0.21 sec)  mysql&gt; SHOW TABLES;</pre>
29	<p>On standby server, login to E5-MS database and verify that the DUMMY is present by using SHOW TABLES command.</p>	<pre>./mysql -uroot -p&lt;password&gt;  Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor.  Commands end with ; or \g. Your MySQL connection id is 125 Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)  Copyright (c) 2000, 2014, Oracle and/or its affiliates. All rights reserved.  Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.  Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  mysql&gt; USE WebNmsDB; Reading table information for completion of table and column names You can turn off this feature to get a quicker startup with -A  Database changed mysql&gt; SHOW TABLES;</pre>
30	<p>On standby server, delete the DUMMY table from E5-MS</p>	<pre>mysql&gt; DROP TABLE DUMMY; Query OK, 0 rows affected (0.05 sec)</pre>

	database by using DROP TABLE command.	
31	On primary server, verify that the DUMMY table no more exists in E5-MS database using SHOW TABLES command.	mysql> SHOW TABLES;

**Note:** The entry for primary and standby servers must also be done on the client machines' hosts file. On Windows machine, the hosts file is present at 'C:\Windows\System32\drivers\etc' folder. The following two lines should be added in the hosts file –

```
<PRIMARY SERVER IP> <PRIMARY SERVER HOSTNAME>
<STANDBY SERVER IP> <STANDBY SERVER HOSTNAME>
```

e.g.

```
10.248.10.25 e5ms8
10.248.10.21 e5ms9
```

## APPENDIX G. PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN E5-MS

1. Shutdown E5-MS server.

```
service e5msService stop
```

2. Execute /Tekelec/WebNMS/bin/E5MSConfigurationScript.sh script to update system user and its password in E5-MS.

```
# sh E5MSConfigurationScript.sh
Please enter E5-MS home path.(Absolute path till WebNMS directory)
/Tekelec/WebNMS/
Press 1 To update current system username and password in E5-MS
2 To update current mysql root user's password in E5-MS
3 To Exit
Your Choice (1, 2 or 3): 1
Enter Username (e.g. root): root
Enter Password: abcd@123
Do you want to proceed with the entered username and password?(y/n): y
Username and Password updated successfully in E5-MS.
```

3. Start E5-MS server.

```
service e5msService start
```

## APPENDIX H. PROCEDURE TO UPDATE MYSQL ROOT USER'S PASSWORD

### H.1 FOR STANDALONE SERVER

1. Shutdown E5-MS server  
`service e5msService stop`

2. Start MySQL using /Tekelec/WebNMS/bin/startMySQL.sh  
`sh startMySQL.sh`

3. Update MySQL root user's password using following steps –

a. Login to MySQL using root user and its current password –

```
[root@e5ms-12 bin]# ./mysql -u root -p
Enter password:

Warning: Using a password on the command line interface can be insecure.
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 125
Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise
Server - Advanced Edition (Commercial)

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```

b. Set mysql as database -

```
mysql> use mysql;
```

c. Set new password for root user and flush –

```
mysql> SET PASSWORD FOR 'root'@'localhost' = PASSWORD('hello');
Query OK, 0 rows affected (0.00 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.00 sec)
```

d. Commit the change and exit MySQL –

```
mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> exit
Bye
```

4. Stop MySQL using /Tekelec/WebNMS/bin/stopMySQL.sh. When prompted for password, supply the new password set in step 3.

```
[root@e5ms-12 bin]# sh stopMySQL.sh
Enter password:
STOPPING server from pid file /Tekelec/WebNMS/mysql/data/e5ms-12.pid
130910 00:45:26 mysqld ended
```

5. Execute /Tekelec/WebNMS/bin/E5MSConfigurationScript.sh script to update the new MySQL root user's password in E5-MS.

```
# sh E5MSConfigurationScript.sh
Please enter E5-MS home path.(Absolute path till WebNMS directory)
```

```
/Tekelec/WebNMS/  
Press 1 To update current system username and password in E5-MS  
2 To update current mysql root user's password in E5-MS  
3 To Exit  
Your Choice (1, 2 or 3): 2  
Enter new password for MySQL root user: hello  
Do you want to proceed with the entered password? (y/n) y  
MySQL Password updated successfully.
```

6. Start E5-MS server.

```
service e5msService start
```

---

## H.2 FOR FAILOVER SETUP

To update MySQL user's password for a failover setup, replication needs to be stopped first, MySQL root user's password needs to be updated and then replication setup needs to be re-created between the servers. Following are the steps -

1. Stop database replication between the servers by running following commands on both Primary and Standby servers -

a. Login to MySQL using root user and its current password -

```
[root@e5ms-12 bin]# ./mysql -u root -p  
Enter password:  
Warning: Using a password on the command line interface can be insecure.  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 125  
Server version: 5.6.18-enterprise-commercial-advanced-log MySQL Enterprise  
Server - Advanced Edition (Commercial)  
  
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```

b. STOP SLAVE;

c. RESET SLAVE;

d. QUIT

2. Shutdown standby server and then Primary server by using following command -

```
# service e5msService stop  
Stopping E5-MS server...  
MySQL not stopped for failover  
Done.
```

3. Follow steps 3 to 5 in section H.1 to update MySQL root user's password on Primary and Standby servers.

4. Follow steps 18 to 25 in section F.1 to setup replication again between the two servers.

5. Start primary server.

6. Start standby server.



## APPENDIX I. PROCEDURE TO CREATE E5-MS SSL CERTIFICATE

To create SSL certificate needed for HTTPS based access for E5-MS, the user needs to execute E5MSCertificateCreationScript.sh script present in /Tekelec/WebNMS/bin directory. During execution of script, it shall ask the user for various inputs. The user should provide appropriate inputs (fitting the constraints) as highlighted in the sample script execution below –

```
[root@e5ms8 bin]# cd /Tekelec/WebNMS/bin

[root@e5ms8 bin]# sh E5MSCertificateCreationScript.sh

Welcome to E5-MS SSL Certificate creation wizard!!!

Please provide E5-MS home path (Absolute path till 'WebNMS' directory e.g.
/Tekelec/WebNMS): /Tekelec/WebNMS

Please provide the country name (e.g. US)-
(Must not be empty, permitted characters - alphabets and space): US

Please provide the state name (e.g. North Carolina)-
(Must not be empty, permitted characters - alphabets and space): North Carolina

Please provide the organization name (e.g. Oracle)-
(Must not be empty, permitted characters - alphanumeric, underscore, dot and space):
Oracle

Please provide the organization unit name (e.g. E5MS)-
(Must not be empty, permitted characters - alphanumeric, underscore, dot and space):
E5MS

Please provide the keystore password -
(Must not be empty, length at least six, space not allowed, permitted characters-
alphanumeric, !, @ and #):<provide a password fitting the constraints>

Please provide E5MS root user's password (used for E5MS client login):<>

Trying to generate encrypted password for keystore and trust store...

Creating certificates for BE in localhost server.
Certificate stored in file </Tekelec/WebNMS/Certs/server.cer>
Certificate was added to keystore
The Certificates and key files were created in /Tekelec/WebNMS/Certs and copied into
the respective conf directories
Done.

Updating keystore and trust store password in transportProvider.conf file...

Passwords successfully updated.
```

**Note:** The default E5-MS root user's password used for client login is 'public'. So, for fresh installation the same password should be supplied when asked in the script. For upgrade scenario, in case this root user's password has been changed by the customer, the updated password should be supplied when asked in the script.

## APPENDIX J. OPENING PORTS USED BY E5-MS IN CASE OF FIREWALL

Primary and Secondary servers need to be behind a single firewall and should not have their individual firewalls turned ON. Client machine used to access E5-MS client and managed EAGLE(s) could be on other side of the firewall.

In case a firewall is enabled between E5-MS servers and client or E5-MS servers and managed EAGLE(s), the ports used by E5-MS needs to be opened on the firewall for proper functioning of E5-MS with the firewall.

The ports used by E5-MS, their types and purpose have been given in the table below. All these must be opened up on the firewall.

**Note:** Ports for SSH (22), Telnet (23) and SNMP (161) must be opened bidirectionally.

S. No.	Port and Type	Purpose
1	20 (TCP)	Data port for FTP
2	21 (TCP)	Command port for FTP
3	22 (TCP)	Port used for SSH connection
4	23 (TCP)	Port used for TELNET connection
5	69 (UDP)	TFTP service port used by WebNMS
6	161 (UDP)	SNMP port
7	162 (UDP)	SNMP trap port used for receiving traps.
8	1099 (TCP)	RMI Registry port used in Client-Server communication
9	2000 (TCP)	NMS BE port used for communication between BE and FE servers.
10	2300 (TCP)	Config Server port
11	3306 (TCP)	MySQL
12	4500 (TCP)	SAS (SNMP Applet Server) port. In BE - FE combination, all SAS related information is passed through a socket.
13	4567 (TCP)	For Web NMS client server communication
14	8001 (UDP)	Web NMS Agent port.
15	8002 (UDP)	Port to receive SNMP set request from NMS
16	8443 (TCP)	for SSL connection
17	9000 (TCP)	Used by i-net Clear Reports server
18	9999 (TCP)	SUM Port
19	36001 (TCP)	NMS FE Secondary Port
20	36002 (TCP)	Web NMS Client Server communication port
21	36003 (TCP)	RMI Server Socket Port.
22	Port Range (TCP)	For NBI FTP module to transfer measurement files from E5MS to NMS using FTP (passive mode), the port range (ports used for ftp) for the FTP server needs to be configured at NMS. The ports specified in port range on NMS need to be opened on E5MS server firewall as well.

## APPENDIX K. UPDATING R46.0 XML CHANGES IN E5-MS DATABASE

In R46.0, new Command Class Management functionality has been added to E5-MS. For this functionality, a new link named 'Command Class Management' has been added in E5-MS GUI's left navigation pane. The entry for this new link is kept in "/Tekelec/WebNMS/html/defaultsToNewUsers/Tree.xml" file.

After upgrade to R46.0, if any new user is created on E5-MS and assigned 'Command Class Management' functionality, then 'Command Class Management' link will show up in the E5-MS GUI's left navigation pane. However, for pre-upgrade E5-MS users to see the 'Command Class Management' link in E5-MS client, script '/Tekelec/WebNMS/bin/developertools/DBXmlTool.sh' must be run. Following are the steps -

- 1) Update the CLASSPATH value in '/Tekelec/WebNMS/bin/developertools/DBXmlTool.sh' to add "/NetMonitor/build/E5MS\_Common.jar:./NetMonitor/build/E5MS\_Server.jar:" as shown below -

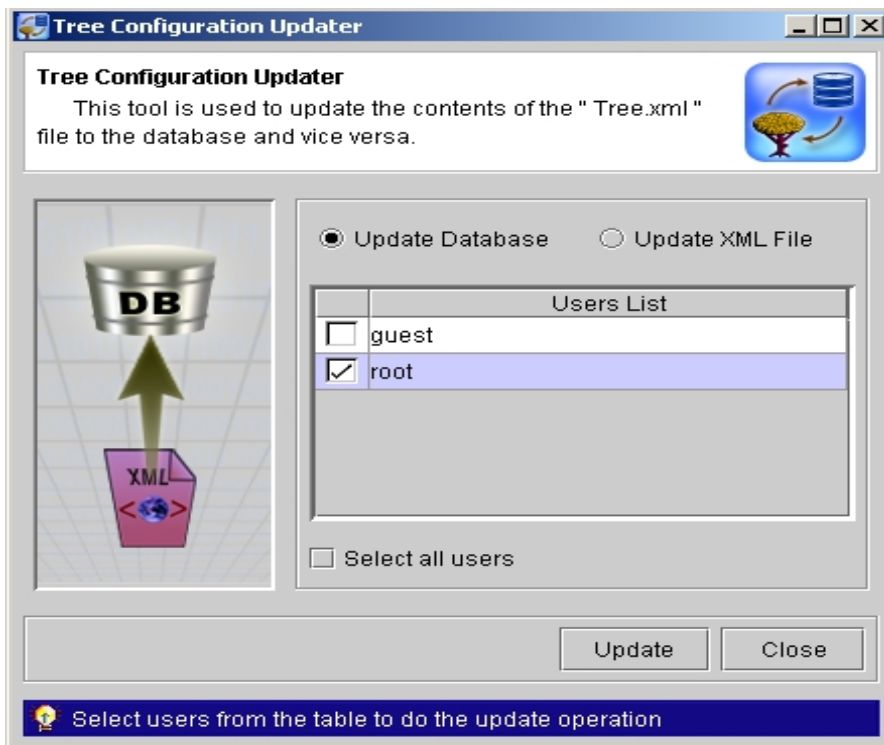
Update -

```
CLASSPATH=$NMS_CLASSES/AdventNetTtl.jar:$NMS_CLASSES/ManagementServer.jar:$NMS_SERVER_CLASSES:$NMS_CLASSES:$XML_CLASSPATH:$SNMP_CLASSPATH:$DB_CLASSPATH:$TRANSACTION_CLASSPATH:$NMS_CLASSES/ApiUtils.jar:$NMS_CLASSES/JimiProClasses.jar:$NMS_CLASSES/AdventNetNPrevalent.jar:$HBN_CLASSPATH:$HBN_LIB_CLASSPATH:$NMS_CLASSES/Mail.jar:$JSON_CLASSPATH
```

As -

```
CLASSPATH=./NetMonitor/build/E5MS_Common.jar:./NetMonitor/build/E5MS_Server.jar:$NMS_CLASSES/AdventNetTtl.jar:$NMS_CLASSES/ManagementServer.jar:$NMS_SERVER_CLASSES:$NMS_CLASSES:$XML_CLASSPATH:$SNMP_CLASSPATH:$DB_CLASSPATH:$TRANSACTION_CLASSPATH:$NMS_CLASSES/ApiUtils.jar:$NMS_CLASSES/JimiProClasses.jar:$NMS_CLASSES/AdventNetNPrevalent.jar:$HBN_CLASSPATH:$HBN_LIB_CLASSPATH:$NMS_CLASSES/Mail.jar:$JSON_CLASSPATH
```

- 2) Execute '/Tekelec/WebNMS/bin/developertools/DBXmlTool.sh' for all the users. It will launch a screen shown below. Select 'Update Database' and check the 'Select all users' checkbox and click the 'Update' button.



**Note:** For reference on how to run DBXmlTool.sh, please visit:

[http://www.webnms.com/webnms/help/developer\\_guide/java\\_client\\_framework/cust\\_client\\_tree/java\\_tree\\_configuration\\_updater.html](http://www.webnms.com/webnms/help/developer_guide/java_client_framework/cust_client_tree/java_tree_configuration_updater.html)

## **APPENDIX L. SETTING E5-MS SYSTEM TIME ZONE**

In case, the time zone for E5-MS system is not set properly, the following procedure should be used to set it -

- 1) Set server to time zone X (e.g. IST).
- 2) Start E5-MS server using command 'service e5msService start'.
- 3) Launch E5-MS client and perform resync on a configured EAGLE.
- 4) Validate that E5-MS Timestamp on E5-MS Alarms GUI reflects time zone X.
- 5) Use system command 'system-config-date' to change server time zone to Y (e.g. CDT).
- 6) Stop E5-MS server using command 'service e5msService stop'.
- 7) Start E5-MS server using command 'service e5msService start'.
- 8) Launch E5-MS client. Due to E5-MS server restart, resync will automatically trigger for added EAGLE(s).
- 9) Validate that E5-MS Timestamp on Alarms GUI now reflects time zone Y.

## APPENDIX M. PURPOSE OF E5-MS LOG FILES

Log files in E5-MS are placed at two locations - /Tekelec/WebNMS/logs and /var/E5-MS directories.

The log files placed in /Tekelec/WebNMS/logs directory are created by WebNMS framework. The purpose of these log files can be found at the below given link -

[http://www.webnms.com/webnms/help/developer\\_guide/logging\\_service/web\\_nms\\_logfiles.html](http://www.webnms.com/webnms/help/developer_guide/logging_service/web_nms_logfiles.html)

The log files placed in /var/E5-MS directory are customized log files that are created by various E5-MS modules. The purpose of these log files is self explanatory as per the location and mentioned below -

- 1) /var/E5-MS/measurement/logs –E5-MS Measurement module logs
- 2) /var/E5-MS/configuration/logs – E5-MS Configuration (CMI) module logs
- 3) /var/E5-MS/security/logs – E5-MS Security related logs
- 4) /var/E5-MS/fault/logs – E5-MS Fault module logs
- 5) /var/E5-MS/discovery/logs/ - Logs related to discovery of devices in E5-MS
- 6) /var/E5-MS/maps/logs – Map related logs in E5-MS
- 7) /var/E5-MS/inventory/logs – E5-MS Inventory module logs
- 8) /var/E5-MS/channel/logs – E5-MS Client and server communication channel related logs
- 9) /var/E5-MS/userOperations/logs – Logs related to user operations in E5-MS
- 10) /var/E5-MS/linkUtilization/logs – E5-MS Link Utilization Interface (LUI) module logs
- 11) /var/E5-MS/scheduler/logs - E5-MS Scheduler module logs
- 12) /var/E5-MS/license/logs - E5-MS Licensing related logs
- 13) /var/E5-MS/nbi/logs - E5-MS Northbound Interface (NBI) module logs
- 14) /var/E5-MS/reporting/logs – E5-MS Reporting module logs

## APPENDIX N. ADDING A NON ADMIN USER FOR SSH PORT FORWARDING

- 1) Create a new user on the system using `adduser` command.

```
# adduser e5msuser
```

- 2) Provide a password for the newly created user using `passwd` command. Provide the highlighted inputs as required.

```
# passwd e5msuser
Changing password for user e5msuser.
# New password: <provide new password here>
Retype new password: <confirm new password here>
passwd: all authentication tokens updated successfully.
```

- 3) Change directory to `/Tekelec/WebNMS/bin`.

```
# cd /Tekelec/WebNMS/bin
```

- 4) Execute `E5MSConfigurationScript.sh` script to update the newly created user in E5-MS. Provide the highlighted inputs as required.

```
# sh E5MSConfigurationScript.sh

Please enter E5-MS home path (Absolute path till 'WebNMS' directory):
/Tekelec/WebNMS/
Press 1 To update current system username and password in E5-MS
    2 To update current mysql root user's password in E5-MS
    3 To Exit
Your Choice (1, 2 or 3): 1
Enter Username (e.g. root): e5msuser
Enter Password: <e5msuser's password>
Do you want to proceed with the entered username and password?(y/n): Y
Username and Password updated successfully in E5-MS.
```

- 5) Change directory to `/Tekelec/WebNMS/conf/tekelec`.

```
# cd /Tekelec/WebNMS/conf/tekelec
```

- 6) Edit `server_conf.properties` file, make the following change and save it.

Update entry -

```
LinuxMachinePrompt=\#
```

to -

```
LinuxMachinePrompt=$
```

- 7) Restart the E5MS server for the above change to take effect.

```
# service e5msServcie restart
```

## APPENDIX O. 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.



## APPENDIX P. 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](http://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.