Oracle® Communications
EAGLE Element Management System

Install/Upgrade Guide

Release 46.2

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Oracle Communications EAGLE Element Management System Install/Upgrade Guide, Release 46.2

CAUTION: Use only the guide downloaded from the Oracle Technology Network (OTN) (http://www.oracle.com/technetwork/indexes/documentation/oracle-comms-tekelec-2136003.html).
Before upgrading your system, access the My Oracle Support web portal (https://support.oracle.com) and review any Knowledge Alerts that may be related to the System Health Check or the Upgrade.

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

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1.0 INTRODUCTION

Release 46.2 of Oracle® Communications EAGLE Element Management System (hereafter referred to as "OCEEMS") is a major release of OCEEMS product after the maintenance release 46.0.1. Prior to it, there have been four releases of OCEEMS - R45.0, R45.0.1 (maintenance release), R46.0 and R46.0.1 (maintenance release). Existing customers, who are at release 45.0/45.0.1/46.0/ 46.0.1, can upgrade to release 46.2. Additionally, customers not having any earlier release of OCEEMS installed on their system can directly install release 46.2.

Release 46.2 of OCEEMS has fixes for many must-fix bugs including those reported by existing OCEEMS customers and implemented some enhancements including rebranding to adopt the new product name OCEEMS (it was previously known as E5-MS) and logging during upgrade. Refer to section 7.0 for details of logging feature.

Reporting Studio is an optional feature of OCEEMS that is provided as a separate RPM to customers. Installation of Reporting Studio can be done using its installation document. It must be installed on the same machine where OCEEMS is installed and after OCEEMS has been successfully installed/upgraded. On an existing setup where OCEEMS and Reporting Studio are currently installed and OCEEMS is upgraded to a new release, Reporting Studio shall continue to work with the upgraded OCEEMS release provided the new OCEEMS license have Reporting Studio feature enabled.

1.1 PURPOSE AND SCOPE

This document is a reference for the installation and upgrade procedure of release 46.2 of OCEEMS. The target audience is those Oracle employees and agents involved with the installation and upgrade of OCEEMS product along with the customers who will use OCEEMS to manage EAGLE(s), EPAP and LSMS in their network.

1.2 OCEEMS SERVER REQUIREMENTS

1.2.1 Hardware and Operating System

Release 46.2 of OCEEMS shall be tested on following platforms and OS -

- SUN Netra Server X3-2 running version 6.7 of 64-bit Oracle Linux or CentOS
- HP Gen8 server running version 6.7 of 64-bit CentOS

1.2.2 Disk Space

The hard disk partition where OCEEMS is to be installed should have at least 500GB of space. In addition, limit for the no. of open files (ulimit -n) on the system should be configured to 65536.

1.2.3 Software Package Requirements

1.2.3.1 Java Runtime

Oracle JRE 1.7 or higher should be available on the system for running OCEEMS server. Before release 46.2 of OCEEMS, JRE package required by OCEEMS was bundled with OCEEMS installation. However, starting release 46.2, OCEEMS shall no longer use the bundled JRE package but require JRE to be installed separately on the system. Please go through Appendix Q to understand the steps needed to install JRE on the system.

1.2.3.2 TELNET/SSH

For connecting to network elements like EAGLE(s), EPAP(s) and LSMS(s), the SSH service should be running on the OCEEMS machine. SSH is required for securely connecting to EAGLE(s), EPAP(s) and LSMS(s). **For security reasons, it is recommended that all the network elements should communicate with OCEEMS over secure connections to enhance the security of the connection and to provide a level of protection for the transported data. Optional features for secure communication are available and highly recommended for interfacing to the EAGLE(s).**

The TELNET application client is required and utilized as part of the connection to both secure and non-secure EAGLEs, so it needs to be installed on the OCEEMS server along with the SSH service and SSH client before installation of OCEEMS. If the target OS is Oracle Linux then it by default has SSH service enabled, so only the TELNET application package installation should be required on the server.

1.2.3.3 FTP/SFTP

For receiving measurement data (CSV files) from EAGLEs, FTP/SFTP service should be running on the server. FTP is required for receiving measurement files from EAGLEs over non-secure connection and SFTP is required for receiving measurement files from EAGLE(s) over secure connection. **It is recommended that all the network elements should communicate with OCEEMS over secure connection, so use of FTP should be avoided as much as possible**. If the target OS is Oracle Linux then it by default supports SFTP, so only FTP package installation should be required on it (if required). In addition, in case the machine supports SFTP, then while configuring EAGLE for sending measurement data to OCEEMS using ent-ftp-serv command, the 'security' parameter must be turned 'on'.

1.2.3.4 Download and installation of software packages

Note that the customer might not have the OCEEMS machine on a network that can access the Yum server to download the packages (and their dependencies) directly on the machine, so **it is advised that packages must be downloaded and installed manually**.

1.2.4 OCEEMS Licensing Requirements

A new OCEEMS license shall be required in the following cases –

1.2.4.1 Fresh installation

A new OCEEMS license file shall be needed when the customer installs OCEEMS for the first time.

1.2.4.2 Feature upgrade

A new OCEEMS license file shall be needed when a customer purchases some additional features for the currently installed release of OCEEMS. In this case, the license shall be of the same OCEEMS release that is currently installed on customer's system with the additionally purchased features enabled.

1.2.4.3 Software release upgrade

A new OCEEMS license file shall be needed when a customer upgrades OCEEMS to a new release of OCEEMS. In this case, the license required shall be of the OCEEMS release that customer wishes to upgrade to.

1.2.5 Directories created by OCEEMS

OCEEMS creates following directory structure on the system –

- /Tekelec/WebNMS – This is OCEEMS software installation directory.
- /var/E5-MS – This is the directory where OCEEMS 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 directory where measurement files are received from EAGLEs.
- /var/upgrade - This is the backup directory used during OCEEMS upgrade.
- /var/backup - This directory contains OCEEMS manual and scheduled backups.

1.2.6 OCEEMS Password Requirements

1.2.6.1 System user credentials

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

1.2.6.2 MySQL Root user credentials

When OCEEMS is installed for the first time on a system, it is installed with a default password for MySQL's root user. Customers are advised to update the password as per their own choice. The procedure to update the password has been described in section **PROCEDURE TO UPDATE MYSQL ROOT USER'S PASSWORD**.

1.3 OCEEMS CLIENT REQUIREMENTS

OCEEMS client is a java based application client that is launched when a user clicks on the 'Launch OCEEMS Client' button on the OCEEMS login page opened in a web browser. Following are the requirements for launching OCEEMS client.

1.3.1 Web Browser Requirement

OCEEMS login page can be viewed using either of the following web browsers:

- Microsoft® Internet Explorer version 11.0 or later
- Mozilla Firefox® version 38.0 or later

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

1.3.2 Java Runtime Environment

The machine where OCEEMS client is to be used should be having Java Runtime 1.7 or higher installed and the browser of choice should have Java enabled.

1.4 References

1.4.1 External

[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

None

1.5 Acronyms

Acronym	Description
EPAP	EAGLE Provisioning Application Processor
LSMS	Local Service Management System
OCEEMS	Oracle® Communications EAGLE Element Management System (earlier known as EAGLE 5 – Management System i.e. E5-MS)
RPM	Red Hat Package Manager. OCEEMS software shall be delivered in form of RPM packages.

Table 1: Acronyms

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

Table 2: Definition of terms

2.0 INSTALLATION PROCEDURE (STANDALONE SERVER)

Purpose	Requirements	Time Required
Installation of OCEEMS	1. Admin (root) login of target OCEEMS server 2. OCEEMS RPM copied onto the target OCEEMS server. If RPM file is on an external media, then it should be mounted to the target OCEEMS server.	1 Hour

Before installing OCEEMS, using the information given in section 1.2, verify that the system meets all the requirements. If the system meets all the requirements, then proceed with the following procedure to install OCEEMS –

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 OCEEMS RPM by issuing the given command. The installation process will install OCEEMS RPM as well as execute mysql_upgrade utility to fix any any tablespace related errors.	`# rpm -ivh` **<Path to OCEEMS 46.2 RPM>**
		`# rpm -ivh E5-MS-46.2.0_462.5.0.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`
		`150418 08:12:16 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms8.err'.`
		`150418 08:12:16 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.
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. 150418 08:12:29 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms8.pid ended OCEEMS installation completed.
9	In /Tekelec/WebNMS/conf/tekelec/common.config file, remove the space in line "lsms_Web_Protocol = https " after https and save the file.	Change the line – lsms_Web_Protocol = https<space> To – lsms_Web_Protocol = https
10	Move to "/Tekelec/WebNMS/bin/" directory by issuing the given command.	# cd /Tekelec/WebNMS/bin/
11	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 **2abVDag3S3** 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.....
12	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.	-
13	Oracle PS team shall use the Unique Machine ID provided to generate an OCEEMS license file using the LAT tool. The license thus generated shall be applicable to the specific machine where OCEEMS has been installed.	-
14	Copy the OCEEMS license file to the target machine where OCEEMS has been installed. **Note**: The user name to whom OCEEMS license has been issued and the path of license file should be noted, to be used during the first time	-

	OCEEMS server startup.	
15	On the target machine, move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	`cd /Tekelec/WebNMS/bin/`
16	Use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** to generate SSL certificate needed for HTTPS based access for OCEEMS.	-
17	In case a firewall is enabled between the OCEEMS server and client or OCEEMS server and managed EAGLE(s), use the procedure given in **OPENING PORTS USED BY OCEEMS IN CASE OF FIREWALL** to open the ports used by OCEEMS.	-

18	Move to /Tekelec/WebNMS/bin directory and Start OCEEMS server by using the given command. When required, provide appropriate inputs shown as highlighted.
	
	Note: For the first time after fresh installation, OCEEMS server **must** be started using startnms.sh script and not using the e5msService. This is because on first startup, it shows the OCEEMS license agreement and needs manual inputs regarding licensing.
		`# sh startnms.sh`
		
		`<Messages given in` LOG MESSAGES ON FIRST STARTUP OF OCEEMS SERVER AFTER INSTALLATION `are displayed. Keep pressing enter key each time message "Press Enter to continue..." is shown on screen>`
		
		`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 : <Provide the user name to whom OCEEMS license has been issued>`
		
		`Enter The License File path : <Path to OCEEMS license file>`
		
		`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 Created table PolledData Created table PortObject Created table Printer Created table SnmpInterface Created table SnmpNode Created table SwitchObject Created table TL1Interface Created table TL1Node Created table Tek_Secu_MapUserGrpEagleNode Created table Tek_Secu_MapUsergrpCmdClass Created table Tek_Secu_PasswordConfig Created table Tek_Secu_UserInfo Created table Tek_inventory_card Created table Tek_inventory_eagleNode Created table Tek_inventory_epap Created table Tek_inventory_frame Created table Tek_inventory_lsmsnode Created table Tek_inventory_shelf Created table Tek_inventory_slot Created table TopoObject Created table tek_scheduler_task Created table ObjectTypes Created table USERTABLE

		Created table HOSTS Created table PORTS Created table ENGINES Created table USERS Created table TrapDisabledMO Created table CHILDRENSTATUS Created table OBJECTSTOLINK Created table ObjectSchedulerRUNNABLE Created table TaskAudit Created table DeviceAudit Created table AttributeAudit Created table ConfigTasks Created table ConfigTaskDetails Created table ConfigAttributes Created table PendingTasks Created table PendingDevices Created table DeviceList Created table DeviceListDetails Created table DeviceUserProps Created table TaskToDeviceListMap Created table PollingObjects Created table ConfigProvider Created table PollingAttributes Created table Providers Created table StatsTables Created table ThresholdObjects Created table CustomView Created table CustomViewProps Created table CustomViewColumns Created table PanelTree Created table Reports Created table DataCollectionAttributes Created table UserPasswordTable Created table UserGroupTable Created table ViewPropertiesTable Created table ViewsToGroupTable Created table ViewToOperationsTable

		Created table OperationsTreeTable Created table NamedViewToAuthorizedViewTable Created table NotificationLog Created table VarBindLog Created table PolicyObject Created table PolicyActionCondition Created table POLICYUSERPROPS Created table DBPOLICY Created table PolicyScheduleTime Created table AlertPolicyObject Created table ENGINETABLE Created table USMTABLE Created table MonitorNmsParameter Created table OperationsTable Created table BEFailOver Created table PollIDToKeyMap Created table ProvisioningVariantProps Created table ProvisioningVariant Created table UserConfTable Created table NetworkInventory Created table AuthAudit Created table REPORTS_HOURLY Created table REPORTS_DAILY Created table UIDataIdVsPRId Created table ProvisionResult Created table UserInputData Created table StageIdVsConfigId Created table WIDGETLEVEL Created table WIDGETASSOCIATION Created table WIDGET Created table WIDGETCRITERIA Created table WIDGETDATASOURCE Created table DASHBOARDCOLUMNS Created table DASHBOARDPROPS Created table CCTVVIEWS Created table CCTV Created table DASHBOARD Created table FAULTREPORTS_HOURLY

		Created table FAULTREPORTS_DAILY Created table SendEmailEventAction Created table SendEmailAlertAction Created table FilterCommandEventAction Created table FilterCommandAlertAction Created table STATSAGGREGATIONHOURLY Created table STATSAGGREGATIONDAILY Created table smsprofiles Created table smsserver_out Created table tek_cmi_cmdclasses Created table tek_cmi_commands Created table tek_cmi_cmdclass_cmd_map Created table tek_cmi_cmd_params Created table tek_cmi_cmd_param_values Created table tek_cmi_cmd_param_map Created table tek_cmi_cmd_param_validation Created table tek_cmi_cmd_param_lookup Created table tekelec_meas_headers Created table tekelec_meas_reports Created table tek_lui_slk_capacity Created table tek_lui_slk_reptstatcard Created table tek_lui_slk_capacity_arch Created table tek_lui_config_data Created table tek_lui_link_data Created table tek_lui_measurements Created table tek_lui_linkdata_timestamp Created table tek_rprt_rept_stat_card Created table tek_rept_tokens Created table tek_nbi_nms_config Created table tek_snmp_agent_config Created table tek_nbi_ftp_config <Messages given in LOG MESSAGES ON STARTING OCEEMS SERVER are displayed on console>
19	Launch a new session on the OCEEMS machine and login using administrator (root) login.	-
20	Move to /Tekelec/WebNMS/bin directory by issuing the given	# cd /Tekelec/WebNMS/bin/

	command.	

21	Execute installE5MSSchema.sh script to populate CMI and Measurement data in OCEEMS database. When required, provide the MySQL root user's password. This script shall take about half an hour to complete.
	
	Note: After successful script completion, OCEEMS server restart is needed once for the data to be populated in OCEEMS application.
		`# sh installE5MSSchema.sh`
		
		`Please enter MySql password: <password>`
		
		`<Messages given in` LOG MESSAGES ON INSTALLATION OF OCEEMS SCHEMA `are displayed on console>`

22	Stop the OCEEMS server using the given command.
	
	Note: Restart of the server is required to populate CMI data on OCEEMS GUI.
		`# service e5msService stop`
		
		`Stopping OCEEMS server...`
		
		`Warning: Using a password on the command line interface can be insecure.`
		
		`MySql server to be stopped`
		
		`Done.`
		
		`<Messages given in` LOG MESSAGES ON STOPPING OCEEMS SERVER `are displayed on console>`

23	Start the OCEEMS server using the given command. Output similar to that given here is displayed on console.	`# service e5msService start`
		
		`Starting OCEEMS 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`
		
		`150418 08:12:50 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms9.err'.`
		
		`150418 08:12:50 mysqld_safe Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data`
		
		`Warning: Using a password on the command line interface can be insecure.`
		
		`150418 08:12:50 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms9.pid ended`
		
		`/`
		
		`OS detected : Linux`
		
		`<Messages given in` LOG MESSAGES ON STARTING OCEEMS SERVER `are displayed on console>`

3.0 INSTALLATION PROCEDURE (FAILOVER SETUP)

In a failover setup, there are two OCEEMS servers installed on two machines, both having the same release of software and one working as a primary server and the other working as a standby server.

Primary server is the active server where all the OCEEMS processes are up and the standby server is one where only MySQL process is up and the OCEEMS 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 OCEEMS processes. In failover setup, to keep database and configuration of both the servers in sync, database and configuration files are replicated between primary and standby servers.

Purpose	Requirements	Time Required
Installation of OCEEMS on Primary and Standby servers	1. Admin (root) login details of target OCEEMS servers (Primary and Standby). 2. OCEEMS RPM copied onto the target OCEEMS servers (Primary and Standby). If RPM file is on an external media, then the media should be mounted to the target OCEEMS server. 3. Password of MySQL root user.	2 Hours

Before installing OCEEMS, using the information given in section 1.2, verify that both Primary and Standby systems meet all the requirements. If the systems meet all the requirements, then proceed with the following procedure of OCEEMS 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 14 from section 2.0 on both the servers (Server 1 and 2).	-
2	On server 1, use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** to generate SSL certificate needed for HTTPS based access for OCEEMS.	–
3	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. **Note**: Values to be copied from server 1are 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 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>

4	**Note**: 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 OCEEMS client and managed EAGLE(s) could be on other side of the firewall. In case a firewall is enabled between OCEEMS servers and client or OCEEMS servers and managed EAGLE(s), use the procedure given in **OPENING PORTS USED BY OCEEMS IN CASE OF FIREWALL** to open the ports used by OCEEMS.	-
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	Execute installE5MSSchema.sh script to populate CMI and Measurement data in OCEEMS database. When required, provide the MySQL root user's password. This script shall take about half an hour to complete.
	
	Note: As database replication has already been set up between the two servers, CMI, 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.
		`# sh installE5MSSchema.sh`
		
		`Please enter MySql password: <password>`
		
		<Messages given in LOG MESSAGES ON INSTALLATION OF OCEEMS SCHEMA are displayed on console>

9	On server 2, perform step 17 from section 2.0. Server 2 shall start as standby server.	-

10	On server 1, shutdown OCEEMS server by issuing the command.
	
	Note: This is needed for populating OCEEMS CMI data in OCEEMS GUI.
		`# service e5msService stop`
		
		`Stopping OCEEMS server...`
		
		`MySql not stopped for failover`
		
		`Done.`

11	On detecting shutdown of server 1 (primary), server 2 shall assume the responsibility of primary server.	`Starting to do FailOver Tasks.`
		
		<Messages given in LOG MESSAGES ON STARTING OCEEMS SERVER are displayed on console>
		
		`The new primary server is 10.248.9.3`

12	Start OCEEMS server on server 1. It shall now start as standby.	[root@e5ms9 bin]# service e5msService start Starting OCEEMS 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

4.0 UPGRADE PROCEDURE (STANDALONE SERVER)

Script 'E5MSUpgrade.sh' available in "/Tekelec/WebNMS/bin" directory shall enable a user to upgrade OCEEMS software/license/both. The following sections describe various procedures.

Note: While upgrading to OCEEMS Release 46.2 from releases 45.0/45.0.1/46.0/46.0.1, the user shall have to upgrade OCEEMS software as well as license.

4.1 Upgrade OCEEMS License

OCEEMS license upgrade shall be required in following cases –

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

Purpose	Requirements	Time Required
Upgrading license of OCEEMS	1. Admin (root) login details of target OCEEMS server 2. OCEEMS license file on the target OCEEMS server. If license file is on an external media, then the media should be mounted to the target OCEEMS server.	5 Minutes

Following is the procedure for upgrading OCEEMS license -

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	-
2	Check the status of OCEEMS server.	`# service e5msService status` `E5-MS server is running.`

3	Shutdown OCEEMS server in case it is running.	`# service e5msService stop`
		`Stopping E5-MS server...`
		`Done.`

4	Check the status of OCEEMS server to verify that OCEEMS 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 OCEEMS.	`# 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 OCEEMS license using the license
		`# sh E5MSUpgrade.sh`
		`Welcome to E5-MS Upgrade.`
		
		`Please select one of the following options:`
		`1. E5-MS License Upgrade`

	file provided as input. OCEEMS license upgrade logs will be captured in log file named '/var/upgrade/logs/upgrade_<system date>_<system time stamp>.log'. Please refer to section 7.0 for details of logging feature.	2. E5-MS Software Upgrade 3. Upgrade Both Press any other key to exit... Your Input: **1** Please provide the path of license file (along with the license file name): **/var/Upgrade/Rel46.2/E5MSLicense46.2.xml** E5-MS license upgrade is in progress... License upgrade done.
8	Start OCEEMS server. Messages similar to the given shall be displayed on console.	# 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 <Messages given in LOG MESSAGES ON STARTING OCEEMS SERVER are displayed on console>

4.2 Upgrade OCEEMS Software (RPM)

OCEEMS 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 46.2) than the currently installed releases 45.0/45.0.1/46.0/46.0.1.

Purpose	Requirements	Time Required
Upgrading OCEEMS software (RPM)	1. Admin (root) login details of target OCEEMS server 2. OCEEMS RPM copied onto the target OCEEMS server. If RPM file is on an external media, then the media should be	15 Minutes (Depends upon the size of data in OCEEMS

	mounted to the target OCEEMS server.	database)

Before upgrading OCEEMS, using the information given in section 1.2, verify that the system meets the requirements. If the system meets all the requirements, then proceed with the following procedure to upgrade OCEEMS RPM –

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	-
2	Run the procedure given in **UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO PRESERVE CUSTOM** ALARM/EVENT VIEWS to preserve the custom alarm/event views.	-
3	Change directory to /Tekelec/WebNMS/bin/backup.	`# cd /Tekelec/WebNMS/bin/backup`

4	Execute the BackupDB.sh script to take backup of OCEEMS 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.
	
	Note: 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.`

5	Skip this step if existing installed version is 45.0. If existing installed version is 45.0.1/46.0/46.0.1/46.2, then copy the 'BackUp.conf' file available in OCEEMS ISO to "/Tekelec/WebNMS/conf" directory. Note that 'BackUp.conf' already exists in "/Tekelec/WebNMS/conf" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	`# cp <Absolute path of OCEEMS ISO>/BackUp.conf /Tekelec/WebNMS/conf` `# cp: overwrite `/Tekelec/WebNMS/conf/BackUp.conf'? y`

<table>
<tr>
<td>6</td>
<td>Skip this step if existing installed version is 45.0.

Perform following steps for 45.0.1/46.0/46.0.1/46.2 respectively -

• If existing installed version is 45.0.1, then rename the ‘RPMUpgrade_45.0.1.sh’ file available in OCEEMS ISO to ‘RPMUpgrade.sh’ and copy it to “/Tekelec/WebNMS/bin” directory.

• If existing installed version is 46.0, then rename the ‘RPMUpgrade_46.0.sh’ file available in OCEEMS ISO to ‘RPMUpgrade.sh’ and copy it to “/Tekelec/WebNMS/bin” directory.

• If existing installed version is 46.0.1, then rename the ‘RPMUpgrade_46.0.1.sh’ file available in OCEEMS ISO to ‘RPMUpgrade.sh’ and copy it to “/Tekelec/WebNMS/bin” directory.

• If existing installed version is 46.2, then rename the ‘RPMUpgrade_46.2.sh’ file available in OCEEMS ISO to ‘RPMUpgrade.sh’ and copy it to “/Tekelec/WebNMS/bin” directory.

Note that ‘RPMUpgrade.sh’ already exists in “/Tekelec/WebNMS/bin” directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.</td>
<td>If existing installed release is 45.0.1 -

<code># cp <Absolute path of OCEEMS ISO>/RPMUpgrade_45.0.1.sh /tmp/RPMUpgrade.sh</code>

<code># cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin</code>

<code># cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y</code><br><br>If existing installed release is 46.0 -<br><br><code># cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.sh /tmp/RPMUpgrade.sh</code><br><br><code># cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin</code><br><br><code># cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y</code>

If existing installed release is 46.0.1 -

<code># cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.1.sh /tmp/RPMUpgrade.sh</code>

<code># cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin</code>

<code># cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y</code><br><br>If existing installed release is 46.2 -<br><br><code># cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.2.sh /tmp/RPMUpgrade.sh</code><br><br><code># cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin</code><br><br><code># cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y</code></td>
</tr>
<tr>
<td>7</td>
<td>Check the status of OCEEMS server.</td>
<td><code># service e5msService status</code>

<code>E5-MS server is running.</code></td>
</tr>
<tr>
<td>8</td>
<td>Shutdown OCEEMS server in case it is running.</td>
<td><code># service e5msService stop</code>

<code>Stopping E5-MS server...</code>

<code>Done.</code></td>
</tr>
<tr>
<td>9</td>
<td>Check the status of OCEEMS server to verify that OCEEMS server has</td>
<td><code># service e5msService status</code></td>
</tr>
</table>

	been shut down.	E5-MS server is not started!
10	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 OCEEMS.	# ps -ef | grep mysql root 59320 59299 0 21:06 pts/0 00:00:00 grep mysql
11	Change directory to /Tekelec/WebNMS/bin.	# cd /Tekelec/WebNMS/bin
12	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted. The script shall upgrade the OCEEMS software using the RPM file provided as input. **Note**: 1) Starting release 46.2, OCEEMS shall no longer user the bundled JRE but the system based JRE package. Therefore, the path of system based JRE package (as noted in section 1.1.1 in Appendix Q) shall be provided when upgrade script prompts for the path of JRE 2) Installer should take care while providing the path of OCEEMS Database dump file when prompted by upgrade script. The file provided should be /var/upgrade/Backup_450.30.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_450.33.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.12.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.18.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 45.0 or 45.0.1 or 46.0 or 46.0.1 respectively. 3) OCEEMS upgrade logs will be captured in a log file named '/var/upgrade/logs/upgrade_<system date>_<system time stamp>.log'. Please refer to section 7.0 for details of logging feature.	# 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/E5-MS-46.2.0_462.5.0.x86_64.rpm E5-MS RPM provided by you is: /root/Documents/E5-MS-46.2.0_462.5.0.x86_64.rpm Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): <Abolute path of 'jre' directory on system> Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y <Messages given in LOG MESSAGES DURING OCEEMS UPGRADE are displayed on console>
13	Verify that the RPM has been upgraded to the intended version.	# rpm -qa E5-MS E5-MS-46.2.0_462.5.0.x86_64
14	If the OCEEMS release installed prior to upgrade was 45.0 or 45.0.1,	-

	then use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** to generate SSL certificate needed for HTTPS based access for OCEEMS. Skip this step if the OCEEMS release installed prior to upgrade was 46.0 or 46.0.1.	
15	In case a firewall is enabled between OCEEMS server and client or OCEEMS server and managed EAGLE(s), use the procedure given in **OPENING PORTS USED BY OCEEMS IN** CASE OF FIREWALL to open the ports used by OCEEMS.	-

16	Start OCEEMS server. Messages similar to the given shall be displayed on console.	`# service e5msService start`
		`Starting OCEEMS 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`
		`Created table Tek_inventory_lsmsnode`
		`Created table DASHBOARDPROPS`
		`Created table STATSAGGREGATIONHOURLY`
		`Created table STATSAGGREGATIONDAILY`
		`Created table smsprofiles`
		`Created table smsserver_out`
		
		`<Messages given in` LOG MESSAGES ON STARTING

		OCEEMS SERVER `are displayed on console>`
17	Use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	–

4.3 Upgrade OCEEMS Software (RPM) and License

Upgrading both OCEEMS 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 OCEEMS
- When a customer upgrades OCEEMS to a new major release of OCEEMS

Purpose	Requirements	Time Required
Upgrading software (RPM) and license of OCEEMS	1. Admin (root) login of target OCEEMS server 2. OCEEMS RPM copied onto the target OCEEMS server. If RPM file is on an external media, then it should be mounted to the target OCEEMS server. 3. OCEEMS license file on the target OCEEMS server. If license file is on an external media, then the media should be mounted to the target OCEEMS server.	20 Minutes (Depends upon the size of data in OCEEMS database)

Before upgrading OCEEMS, using the information given in section 1.2, verify that the system meets all the requirements. If the system meets all the requirements, then proceed with the following procedure for upgrading OCEEMS software (RPM) and license –

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	-
2	Run the procedure given in **UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO PRESERVE CUSTOM** ALARM/EVENT VIEWS to preserve the custom alarm/event views.	-
3	Change directory to /Tekelec/WebNMS/bin/backup.	`# cd /Tekelec/WebNMS/bin/backup`

4	Execute the BackupDB.sh script to take backup of OCEEMS 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	`# 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..-`

	user provided directory.
	
	Note: This backup is needed in case upgrade fails and system needs to be restored to its pre-upgrade state.
		`E5-MS database backup file "E5MS_Database_BackUp.sql" successfully created.`
		
		`\`
		`Backup of directories successfully created.`
		
		`|`
		`E5-MS Backup is completed.`

5	Skip this step if existing installed version is 45.0.
	
	If existing installed version is 45.0.1/46.0/46.0.1/46.2, then copy the 'BackUp.conf' file available in OCEEMS ISO to "/Tekelec/WebNMS/conf" directory.
	
	Note that 'BackUp.conf' already exists in "/Tekelec/WebNMS/conf" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.
		`# cp <Absolute path of OCEEMS ISO>/BackUp.conf /Tekelec/WebNMS/conf`
		
		`# cp: overwrite `/Tekelec/WebNMS/conf/BackUp.conf'? y`

6	Skip this step if existing installed version is 45.0. Perform following steps for 45.0.1/46.0/46.0.1/46.2 respectively - • If existing installed version is 45.0.1, then rename the 'RPMUpgrade_45.0.1.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.0, then rename the 'RPMUpgrade_46.0.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.0.1, then rename the 'RPMUpgrade_46.0.1.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin"	If existing installed release is 45.0.1 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_45.0.1.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`  If existing installed release is 46.0 -  `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.sh /tmp/RPMUpgrade.sh`  `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin`  `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y` If existing installed release is 46.0.1 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.1.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y` If existing installed release is 46.2 -

	directory.
	• If existing installed version is 46.2, then rename the 'RPMUpgrade_46.2.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory.
	Note that 'RPMUpgrade.sh' already exists in "/Tekelec/WebNMS/bin" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.
		`# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.2.sh /tmp/RPMUpgrade.sh`
		`# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin`
		`# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`

7	Check the status of OCEEMS server.	`# service e5msService status` `E5-MS server is running.`

8	Shutdown OCEEMS server in case it is running.	`# service e5msService stop`
		`Stopping E5-MS server...`
		`Done.`

9	Check the status of OCEEMS server to verify that OCEEMS server has been shut down.	`# service e5msService status` `E5-MS server is not started!`
10	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 OCEEMS.	`# ps -ef | grep mysql` `root 59320 59299 0 21:06 pts/0 00:00:00 grep mysql`
11	Change directory to /Tekelec/WebNMS/bin.	`# cd /Tekelec/WebNMS/bin`

12	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted. The script shall upgrade the OCEEMS software and license using the RPM and license file provided as inputs.
	Note:
	1) Starting release 46.2, OCEEMS shall no longer user the bundled JRE but the system based JRE package. Therefore, the path of system based JRE package (as noted in section 1.1.1 in Appendix Q) shall be provided when upgrade script prompts for the path of JRE.
	2) Installer should take care while providing the path of OCEEMS Database dump file when
		`# 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/E5-MS-46.2.0_462.5.0.x86_64.rpm`

	prompted by upgrade script. The file provided should be /var/upgrade/Backup_450.30.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_450.33.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.12.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.18.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 45.0 or 45.0.1 or 46.0 or 46.0.1 respectively. 3) OCEEMS software and license upgrade logs shall be captured in a log file named '/var/upgrade/logs/upgrade_<system date>_<system time stamp>.log'. Please refer to section 7.0 for details of logging feature.	E5-MS RPM provided by you is: /root/Documents/E5-MS-46.2.0_462.5.0.x86_64.rpm Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): <Abolute path of 'jre' directory on system> Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y <Messages given in LOG MESSAGES DURING OCEEMS UPGRADE are displayed on console> Please provide the path of license file (along with the license file name): **/var/Upgrade/Rel46.2/E5MSLicense46.2.xml** E5-MS license upgrade is in progress... License upgrade done.
13	If the OCEEMS release installed prior to upgrade was 45.0 or 45.0.1, then use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** to generate SSL certificate needed for HTTPS based access for OCEEMS. Skip this step if the OCEEMS release installed prior to upgrade was 46.0 or 46.0.1.	-
14	In case a firewall is enabled between OCEEMS server and client or OCEEMS server and managed EAGLE(s), use the procedure given in **OPENING PORTS USED BY OCEEMS IN CASE OF FIREWALL** to open the ports used by OCEEMS.	-
15	Start OCEEMS server. Messages similar to the given shall be displayed on console.	# service e5msService start Starting OCEEMS 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 Created table Tek_inventory_lsmsnode Created table DASHBOARDPROPS Created table STATSAGGREGATIONHOURLY Created table STATSAGGREGATIONDAILY Created table smsprofiles Created table smsserver_out <Messages given in LOG MESSAGES ON STARTING OCEEMS SERVER are displayed on console>
16	Use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	-

5.0 UPGRADE PROCEDURE (FAILOVER SETUP)

In a failover setup, there are two OCEEMS servers installed on two machines, both having the same release of software and one working as a primary server and the other working as a standby server.

Primary server is the active server where all the OCEEMS processes are up and the standby server is one where only MySQL is up and the OCEEMS 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 OCEEMS processes. In failover setup, to keep database and configuration of both the servers in sync, database and configuration files are replicated between primary and standby servers.

Note: While upgrading to OCEEMS Release 46.2 from releases 45.0/45.0.1/46.0/46.0.1, the user shall have to upgrade OCEEMS software as well as license.

5.1 Upgrade OCEEMS License

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

Purpose	Requirements	Time Required
Upgrading OCEEMS license on Primary and Standby servers	1. Admin (root) login details of target OCEEMS servers (Primary and Standby) 2. OCEEMS license file copied onto the target OCEEMS servers (Primary and Standby). If license file is on an external media, then the media should be mounted to the target OCEEMS server.	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 OCEEMS license on server 2 (standby).	-

2	Start server 2. Standby server shall start monitoring server 1 (primary server) and OCEEMS 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 10.248.9.3`
		`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`

3	Login to server 1 (primary) using admin (root) login.	-

4	Shutdown server 1 (primary).	`# service e5msService stop`
		`Stopping OCEEMS server...`
		`Done.`

5	On detecting the shutdown of server 1 (primary), server 2 (standby) shall start the OCEEMS processes and take over the role of primary.	`Starting to do FailOver Tasks.`
		<Messages given in LOG MESSAGES ON STARTING OCEEMS 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 OCEEMS license on server 1.	-

7	Start server 1. It shall start as standby server and start monitoring server 2 (primary) and OCEEMS 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 OCEEMS Software (RPM)

In software (RPM) upgrade to R46.2, new changes are there in configuration files, CMI and Measurement schema 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 OCEEMS software (RPM) on Primary and Standby servers	1. Admin (root) login details of target OCEEMS servers (Primary and Standby) 2. OCEEMS RPM copied onto the target OCEEMS servers (Primary and Standby). If RPM file is on an external media, then the media should be mounted to the target OCEEMS server. 3. Passwords of MySQL root user for target OCEEMS servers (Primary and Standby)	60 – 120 Minutes (Depends upon the size of data in OCEEMS database)

Before upgrading OCEEMS, using the information given in section 1.2, verify that both primary and standby systems meet all the requirements. If both the systems meet all the requirements, then proceed with the following procedure for upgrading OCEEMS. 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	Run the procedure given in **UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO PRESERVE CUSTOM** ALARM/EVENT VIEWS to preserve the custom alarm/event views.	-
3	Change directory to /Tekelec/WebNMS/bin/backup.	`# cd /Tekelec/WebNMS/bin/backup`

4	Execute the BackupDB.sh script to take backup of OCEEMS 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.
	
	Note: 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.`

5	Skip this step if existing installed version is 45.0. If existing installed version is 45.0.1/46.0/46.0.1/46.2, then copy the 'BackUp.conf' file available in OCEEMS ISO to "/Tekelec/WebNMS/conf" directory. Note that 'BackUp.conf' already exists in "/Tekelec/WebNMS/conf" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	`# cp <Absolute path of OCEEMS ISO>/BackUp.conf /Tekelec/WebNMS/conf` `# cp: overwrite `/Tekelec/WebNMS/conf/BackUp.conf'? y`
6	Skip this step if existing installed version is 45.0. Perform following steps for 45.0.1/46.0/46.0.1/46.2 respectively -	If existing installed release is 45.0.1 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_45.0.1.sh /tmp/RPMUpgrade.sh`

	• If existing installed version is 45.0.1, then rename the 'RPMUpgrade_45.0.1.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.0, then rename the 'RPMUpgrade_46.0.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.0.1, then rename the 'RPMUpgrade_46.0.1.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.2, then rename the 'RPMUpgrade_46.2.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. Note that 'RPMUpgrade.sh' already exists in "/Tekelec/WebNMS/bin" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	`# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`  If existing installed release is 46.0 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y` If existing installed release is 46.0.1 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.1.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`  If existing installed release is 46.2 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.2.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`

7	Shutdown the OCEEMS server on server 2.	`# service e5msService stop`
		`Stopping E5-MS server...`
		`MySql not stopped for failover`
		`Done.`

8	Check the status of OCEEMS server to verify that server has been shut down.	`# service e5msService status` `E5-MS server is not started!`
9	Change directory to /Tekelec/WebNMS/bin.	`# cd /Tekelec/WebNMS/bin`
10	Stop MySQL by running the script.	`# sh stopMySQL.sh` `Enter password: <>`

11	Login to server 1 (primary) using administrator (root) login.	-
12	Run the procedure given in **UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO PRESERVE CUSTOM** ALARM/EVENT VIEWS to preserve the custom alarm/event views.	-
13	Change directory to /Tekelec/WebNMS/bin/backup.	`# cd /Tekelec/WebNMS/bin/backup`

14	Execute the BackupDB.sh script to take backup of OCEEMS 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.
	
	Note: 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.`

15	Skip this step if existing installed version is 45.0. If existing installed version is 45.0.1/46.0/46.0.1/46.2, then copy the 'BackUp.conf' file available in OCEEMS ISO to "/Tekelec/WebNMS/conf" directory. Note that 'BackUp.conf' already exists in "/Tekelec/WebNMS/conf" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	`# cp <Absolute path of OCEEMS ISO>/BackUp.conf /Tekelec/WebNMS/conf` `# cp: overwrite `/Tekelec/WebNMS/conf/BackUp.conf'? y`

16	Skip this step if existing installed version is 45.0.
	Perform following steps for 45.0.1/46.0/46.0.1/46.2 respectively -
	• If existing installed version is 45.0.1, then rename the
		If existing installed release is 45.0.1 -
		`# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_45.0.1.sh /tmp/RPMUpgrade.sh`
		`# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin`
		`# cp: overwrite`

	‘RPMUpgrade_45.0.1.sh’ file available in OCEEMS ISO to ‘RPMUpgrade.sh’ and copy it to “/Tekelec/WebNMS/bin” directory. • If existing installed version is 46.0, then rename the ‘RPMUpgrade_46.0.sh’ file available in OCEEMS ISO to ‘RPMUpgrade.sh’ and copy it to “/Tekelec/WebNMS/bin” directory. • If existing installed version is 46.0.1, then rename the ‘RPMUpgrade_46.0.1.sh’ file available in OCEEMS ISO to ‘RPMUpgrade.sh’ and copy it to “/Tekelec/WebNMS/bin” directory. • If existing installed version is 46.2, then rename the ‘RPMUpgrade_46.2.sh’ file available in OCEEMS ISO to ‘RPMUpgrade.sh’ and copy it to “/Tekelec/WebNMS/bin” directory. Note that ‘RPMUpgrade.sh’ already exists in “/Tekelec/WebNMS/bin” directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	`/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y  If existing installed release is 46.0 - # cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.sh /tmp/RPMUpgrade.sh # cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin # cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y If existing installed release is 46.0.1 - # cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.1.sh /tmp/RPMUpgrade.sh # cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin # cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y  If existing installed release is 46.2 - # cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.2.sh /tmp/RPMUpgrade.sh # cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin # cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y
17	Shutdown the OCEEMS server on server 1.	# service e5msService stop Stopping E5-MS server... MySql not stopped for failover Done.
18	Check the status of OCEEMS server to verify that server has been shut down.	# service e5msService status E5-MS server is not started!
19	Change directory to /Tekelec/WebNMS/bin.	# cd /Tekelec/WebNMS/bin
20	Stop MySQL by running the script.	# sh stopMySQL.sh Enter password: <>
21	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown	# sh E5MSUpgrade.sh

	as highlighted. **Note**: 1) Starting release 46.2, OCEEMS shall no longer user the bundled JRE but the system based JRE package. Therefore, the path of system based JRE package (as noted in section 1.1.1 in Appendix Q) shall be provided when upgrade script prompts for the path of JRE 2) Installer should take care while providing the path of OCEEMS Database dump file when prompted by upgrade script. The file provided should be /var/upgrade/Backup_450.30.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_450.33.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.12.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.18.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 45.0 or 45.0.1 or 46.0 or 46.0.1 respectively. 3) OCEEMS upgrade logs will be captured in a log file named '/var/upgrade/logs/upgrade_<system date>_<system time stamp>.log'. Please refer to section 7.0 for details of logging feature.	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/E5-MS-46.2.0_462.5.0.x86_64.rpm E5-MS RPM provided by you is: /root/Documents/E5-MS-46.2.0_462.5.0.x86_64.rpm Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): <Abolute path of 'jre' directory on system> Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y <Messages given in LOG MESSAGES DURING OCEEMS UPGRADE are displayed on console>
22	Verify that the RPM has been upgraded to the intended version.	# rpm -qa E5-MS E5-MS-46.2.0_462.5.0.x86_64
23	Move to the OCEEMS backup directory (default location of backup is /var/backup) and delete 'NmsProcessesBE.conf', 'serverparameters.conf' and 'SmartUpdateManager.xml' files from there. This is needed because these files are no longer part of backup after upgrade to 46.2 and the old copies must be removed from backup. Run the given commands and provide input in affirmative as shown highlighted -	# cd /var/backup # rm conf/NmsProcessesBE.conf rm: remove regular file `conf/NmsProcessesBE.conf'? y  # rm conf/serverparameters.conf rm: remove regular file `conf/serverparameters.conf'? y # rm conf/SmartUpdateManager.xml

		rm: remove regular file `conf/SmartUpdateManager.xml'? y
24	Copy the OCEEMS database backup file generated during server 1 upgrade (var/upgrade/Backup_<Current_Installed_Version>/E5MS_Database_BackUp.sql) to server 2 at any temporary location (e.g. /tmp). The file copied should be /var/upgrade/Backup_450.30.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_450.33.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.12.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.18.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 45.0 or 45.0.1 or 46.0 or 46.0.1 respectively.	-
25	Login to server 2 (standby) using admin (root) login.	-
26	Update the /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml file to point the JDBC connection to the hostname of the standby server.	Update the following statement in /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml – <property name="connection.url">jdbc:mysql://<hostname of standby server>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>
27	On server 2, change directory to /Tekelec/WebNMS/bin.	# cd /Tekelec/WebNMS/bin
28	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted. **Note**: 1) Starting release 46.2, OCEEMS shall no longer user the bundled JRE but the system based JRE package. Therefore, the path of system based JRE package (as noted in section 1.1.1 in Appendix Q) shall be provided when upgrade script prompts for the path of JRE. 2) User should take care while providing the path of OCEEMS Database dump file when prompted by upgrade script. The file provided should be the one that was copied from server 1 in	# 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/E5-MS-46.2.0_462.5.0.x86_64.rpm

	step 17 above and not the one generated by upgrade script on server 2. 3) OCEEMS upgrade logs will be captured in log file named '/var/upgrade/logs/upgrade_<system date>_<system time stamp>.log'. Please refer to section 7.0 for details of logging feature.	E5-MS RPM provided by you is: /root/Documents/E5-MS-46.2.0_462.5.0.x86_64.rpm Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): <Abolute path of 'jre' directory on system> Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y <Messages given in LOG MESSAGES DURING OCEEMS UPGRADE are displayed on console>
29	Verify that the RPM has been upgraded to the intended version.	# rpm -qa E5-MS E5-MS-46.2.0_462.5.0.x86_64
30	Move to the OCEEMS backup directory (default location of backup is /var/backup) and delete 'NmsProcessesBE.conf', 'serverparameters.conf' and 'SmartUpdateManager.xml' files from there. This is needed because these files are no longer part of backup after upgrade to 46.2 and the old copies must be removed from backup. Run the given commands and provide input in affirmative as shown highlighted -	# cd /var/backup # rm conf/NmsProcessesBE.conf rm: remove regular file `conf/NmsProcessesBE.conf'? y  # rm conf/serverparameters.conf  rm: remove regular file `conf/serverparameters.conf'? y # rm conf/SmartUpdateManager.xml rm: remove regular file `conf/SmartUpdateManager.xml'? y
31	**Note**: 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 OCEEMS client and managed EAGLE(s) could be on other side of the firewall. In case a firewall is enabled between OCEEMS servers and client or OCEEMS servers and managed EAGLE(s), use the procedure given in **OPENING PORTS USED BY OCEEMS IN CASE OF FIREWALL** to open the ports used by OCEEMS on both the servers.	-
32	If the OCEEMS release installed prior to upgrade was 45.0 or 45.0.1, then on server 1, use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL**	-

	CERTIFICATE to generate SSL certificate needed for HTTPS based access for OCEEMS. Skip this step and the next step if the OCEEMS release installed prior to upgrade was 46.0 or 46.0.1.	
33	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. **Note**: Values to be copied from server 1are 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 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>
34	Execute the steps in section F.2 in to setup replication between the servers.	
35	Start OCEEMS server on server 1. It shall start as primary server. **Note**: The server where **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** was executed must be started first.	# service e5msService start Starting OCEEMS 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 <Messages given in LOG MESSAGES ON STARTING OCEEMS SERVER are displayed on console>
36	Use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	-
37	Start OCEEMS server on server 2. It shall start as standby server and start monitoring server 1 (primary) and OCEEMS processes shall not start.	# service e5msService start Starting OCEEMS 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
38	Use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	-

5.3 Upgrade OCEEMS Software (RPM) and License

The procedure to upgrade OCEEMS 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 OCEEMS software (RPM) and license on Primary and Standby servers	1. Admin (root) login details of target OCEEMS servers (Primary and Standby). 2. OCEEMS license file copied onto the target OCEEMS servers (Primary and Standby). If license file is on an external media, then the media should be mounted to the target OCEEMS server. 3. OCEEMS RPM copied onto the target OCEEMS servers (Primary and Standby). If RPM file is on an external media, then the media should be mounted to the target OCEEMS server. 4. Passwords of MySQL root user for target OCEEMS servers (Primary and Standby).	60 – 120 Minutes (Depends upon the size of data in OCEEMS database)

Note that there shall be a downtime of OCEEMS services during the upgrade procedure.

Before proceeding with upgrade, using the information given in section 1.2, verify that both primary and standby systems meet all the requirements. If the systems meet all the requirements, then proceed with the following procedure to upgrade OCEEMS. 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	Run the procedure given in **UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO PRESERVE CUSTOM** ALARM/EVENT VIEWS to preserve the custom alarm/event views.	-
3	Change directory to /Tekelec/WebNMS/bin/backup.	`# cd /Tekelec/WebNMS/bin/backup`

4	Execute the BackupDB.sh script to take backup of OCEEMS 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.
	
	Note: 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.`

5	Skip this step if existing installed version is 45.0. If existing installed version is 45.0.1/46.0/46.0.1/46.2, then copy the 'BackUp.conf' file available in OCEEMS ISO to "/Tekelec/WebNMS/conf" directory. Note that 'BackUp.conf' already exists in "/Tekelec/WebNMS/conf" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	`# cp <Absolute path of OCEEMS ISO>/BackUp.conf /Tekelec/WebNMS/conf` `# cp: overwrite `/Tekelec/WebNMS/conf/BackUp.conf'? y`
6	Skip this step if existing installed	If existing installed release is 45.0.1 -

	version is 45.0. Perform following steps for 45.0.1/46.0/46.0.1/46.2 respectively - • If existing installed version is 45.0.1, then rename the 'RPMUpgrade_45.0.1.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.0, then rename the 'RPMUpgrade_46.0.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.0.1, then rename the 'RPMUpgrade_46.0.1.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.2, then rename the 'RPMUpgrade_46.2.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. Note that 'RPMUpgrade.sh' already exists in "/Tekelec/WebNMS/bin" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	`# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_45.0.1.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`  If existing installed release is 46.0 -  `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.sh /tmp/RPMUpgrade.sh`  `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin`  `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y` If existing installed release is 46.0.1 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.1.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`  If existing installed release is 46.2 -  `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.2.sh /tmp/RPMUpgrade.sh`  `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin`  `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`

7	Shutdown the OCEEMS server on server 2.	`# service e5msService stop`
		
		`Stopping E5-MS server...`
		
		`MySql not stopped for failover`
		
		`Done.`

8	Check the status of OCEEMS server to verify that server has been shut down.	`# service e5msService status`
		
		`E5-MS server is not started!`

9	Login to server 1 (primary) using	-

	administrator (root) login.	
10	Run the procedure given in **UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO PRESERVE CUSTOM** ALARM/EVENT VIEWS to preserve the custom alarm/event views.	-
11	Change directory to /Tekelec/WebNMS/bin/backup.	`# cd /Tekelec/WebNMS/bin/backup`

12	Execute the BackupDB.sh script to take backup of OCEEMS 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.
	
	Note: 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.`

13	Skip this step if existing installed version is 45.0. If existing installed version is 45.0.1/46.0/46.0.1/46.2, then copy the 'BackUp.conf' file available in OCEEMS ISO to "/Tekelec/WebNMS/conf" directory. Note that 'BackUp.conf' already exists in "/Tekelec/WebNMS/conf" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	`# cp <Absolute path of OCEEMS ISO>/BackUp.conf /Tekelec/WebNMS/conf` `# cp: overwrite `/Tekelec/WebNMS/conf/BackUp.conf'? y`

14	Skip this step if existing installed version is 45.0.
	Perform following steps for 45.0.1/46.0/46.0.1/46.2 respectively -
	• If existing installed version is 45.0.1, then rename the 'RPMUpgrade_45.0.1.sh' file available in OCEEMS
		If existing installed release is 45.0.1 -
		`# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_45.0.1.sh /tmp/RPMUpgrade.sh`
		`# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin`
		`# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`

	ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.0, then rename the 'RPMUpgrade_46.0.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.0.1, then rename the 'RPMUpgrade_46.0.1.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. • If existing installed version is 46.2, then rename the 'RPMUpgrade_46.2.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. Note that 'RPMUpgrade.sh' already exists in "/Tekelec/WebNMS/bin" directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	If existing installed release is 46.0 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`  If existing installed release is 46.0.1 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.0.1.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y` If existing installed release is 46.2 - `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.2.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y`

15	Shutdown the OCEEMS server on server 1.	`# service e5msService stop`
		`Stopping E5-MS server...`
		`MySql not stopped for failover`
		`Done.`

16	Check the status of OCEEMS server to verify that server has been shut down.	`# service e5msService status` `E5-MS server is not started!`
17	On server 2, stop MySQL process. For this, change directory to /Tekelec/WebNMS/bin and stop MySQL by running the given script.	`# sh stopMySQL.sh` `Enter password: <>`
18	On server 1, stop MySQL process. For this, change directory to /Tekelec/WebNMS/bin and stop MySQL by running the given script.	`# sh stopMySQL.sh` `Enter password: <>`

19	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.
	
	Note:
	
	1) Starting release 46.2, OCEEMS shall no longer user the bundled JRE but the system based JRE package. Therefore, the path of system based JRE package (as noted in section 1.1.1 in Appendix Q) shall be provided when upgrade script prompts for the path of JRE.
	
	2) Installer should take care while providing the path of OCEEMS Database dump file when prompted by upgrade script. The file provided should be /var/upgrade/Backup_450.30.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_450.33.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.12.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.18.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 45.0 or 45.0.1 or 46.0 or 46.0.1 respectively.
	
	3) OCEEMS upgrade and license upgrade logs will be captured in log file named '/var/upgrade/logs/ upgrade_<system date>_<system time stamp>.log'. Please refer to section 7.0 for details of logging feature.
		`# 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/E5-MS-46.2.0_462.5.0.x86_64.rpm`
		
		`E5-MS RPM provided by you is:`
		`/root/Documents/E5-MS-46.2.0_462.5.0.x86_64.rpm`
		
		`Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): <Abolute path of 'jre' directory on system>`
		
		`Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y`
		
		<Messages given in LOG MESSAGES DURING OCEEMS UPGRADE are displayed on console>
		
		`Please provide the path of license file (along with the license file name):`
		`/var/Upgrade/Rel46.2/E5MSLicense46.2.xml`
		
		`E5-MS license upgrade is in progress...`
		`License upgrade done.`

20	Verify that the RPM has been upgraded to the intended version.	`# rpm -qa E5-MS` `E5-MS-46.2.0_462.5.0.x86_64`
21	Move to the OCEEMS backup directory (default location of backup is /var/backup) and delete 'NmsProcessesBE.conf', 'serverparameters.conf' and 'SmartUpdateManager.xml' files from there. This is needed because these files are no longer part of backup after upgrade to 46.2 and the old copies must be removed from	`# cd /var/backup` `# rm conf/NmsProcessesBE.conf` `rm: remove regular file `conf/NmsProcessesBE.conf'? y`  `# rm conf/serverparameters.conf`

	backup. Run the given commands and provide input in affirmative as shown highlighted -	`rm: remove regular file `conf/serverparameters.conf'? y`  `# rm conf/SmartUpdateManager.xml`  `rm: remove regular file `conf/SmartUpdateManager.xml'? y`
22	Copy the OCEEMS database backup file generated during server 1 upgrade (var/upgrade/Backup_<Current_Installed_Version>/E5MS_Database_BackUp.sql) to server 2 at any temporary location (e.g. /tmp). The file copied should be /var/upgrade/Backup_450.30.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_450.33.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.12.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_460.18.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 45.0 or 45.0.1 or 46.0 or 46.0.1 respectively.	-
23	Login to server 2 (standby) using admin (root) login.	-
24	On server 2, update the /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml file to point the JDBC connection to the hostname of the standby server.	Update the following statement in /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml – `<property name="connection.url">jdbc:mysql://<hostname of standby server>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>`
25	Change directory to /Tekelec/WebNMS/bin.	`# cd /Tekelec/WebNMS/bin`

26	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.
	
	Note:
	
	1) Starting release 46.2, OCEEMS shall no longer user the bundled JRE but the system based JRE package. Therefore, the path of system based JRE package (as noted in section 1.1.1 in Appendix Q) shall be provided when upgrade script prompts for
		`# 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`

	the path of JRE. 2) Installer should take care while providing the path of OCEEMS Database dump file when prompted by upgrade script. The file provided should be the one that was copied from server 1 in step 15 above and not the one generated by upgrade script on server 2. 3) OCEEMS software and license upgrade logs will be captured in log file named '/var/upgrade/logs/upgrade_<system date>_<system time stamp>.log'. Please refer to section 7.0 for details of logging feature.	Please provide the path of E5-MS RPM file (including the RPM file name): /root/Documents/E5-MS-46.2.0_462.5.0.x86_64.rpm E5-MS RPM provided by you is: /root/Documents/E5-MS-46.2.0_462.5.0.x86_64.rpm Please provide the path where JRE is installed (e.g. /Tekelec/WebNMS/jre): <Abolute path of 'jre' directory on system> Are you sure you want to upgrade E5-MS using the above RPM file (Y/N)? y <Messages given in LOG MESSAGES DURING OCEEMS UPGRADE are displayed on console> Please provide the path of license file (along with the license file name): **/var/Upgrade/Rel46.2/E5MSLicense46.2.xml** E5-MS license upgrade is in progress... License upgrade done.
27	Verify that the RPM has been upgraded to the intended version.	# rpm -qa E5-MS E5-MS-46.2.0_462.5.0.x86_64
28	Move to the OCEEMS backup directory (default location of backup is /var/backup) and delete 'NmsProcessesBE.conf', 'serverparameters.conf' and 'SmartUpdateManager.xml' files from there. This is needed because these files are no longer part of backup after upgrade to 46.2 and the old copies must be removed from backup. Run the given commands and provide input in affirmative as shown highlighted -	# cd /var/backup # rm conf/NmsProcessesBE.conf rm: remove regular file `conf/NmsProcessesBE.conf'? y  # rm conf/serverparameters.conf  rm: remove regular file `conf/serverparameters.conf'? y # rm conf/SmartUpdateManager.xml rm: remove regular file `conf/SmartUpdateManager.xml'? y
29	**Note**: 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 OCEEMS client and managed EAGLE(s) could be on	-

	other side of the firewall. In case a firewall is enabled between OCEEMS servers and client or OCEEMS servers and managed EAGLE(s), use the procedure given in **OPENING PORTS USED BY OCEEMS IN CASE OF FIREWALL** to open the ports used by OCEEMS on both the servers.	
30	If the OCEEMS release installed prior to upgrade was 45.0 or 45.0.1, then on server 1, use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** to generate SSL certificate needed for HTTPS based access for OCEEMS. Skip this step and the next step if the OCEEMS release installed prior to upgrade was 46.0 or 46.0.1.	–

31	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.
	
	Note: Values to be copied from server 1are 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>`

32	Execute the steps in section F.2 in to setup replication between the servers.	

33	Start OCEEMS server on server 1. It shall start as primary server.
	
	Note: The server where **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** was executed must be started first.
		`# service e5msService start`
		`Starting OCEEMS 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 <Messages given in LOG MESSAGES ON STARTING OCEEMS SERVER are displayed on console>
34	Use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	-
35	Start OCEEMS server on server 2. It shall start as standby server and start monitoring server 1 (primary) and OCEEMS processes shall not start.	# service e5msService start Starting OCEEMS 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
36	Use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	-

6.0 RESTORATION OF OCEEMS IN CASE OF SOFTWARE UPGRADE FAILURE

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

1) Find the OCEEMS RPM installed on the system prior to failed attempt of upgrade. Also, get the OCEEMS installation document applicable to that OCEEMS RPM.
2) Do a fresh installation of OCEEMS as mentioned in OCEEMS installation document.
3) During the failed attempt to upgrade software, a backup of OCEEMS database and configuration files is taken and placed at location "/var/upgrade/Backup_<Current_Installed_Version>" on the system. After installing OCEEMS afresh, the support engineer shall need to restore OCEEMS state using the backup mentioned in previous statement. For restoring data, section 6.1 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.

6.1 Restoring OCEEMS from an existing backup file

A system user with privileges to execute **/Tekelec/WebNMS/bin/backup/RestoreDB.sh** script will have the ability to restore OCEEMS system to a previous state by using a database backup file generated earlier. Before restoring the contents (data and configuration), OCEEMS server must be shut down. This is because the restore script deletes the existing database tables in database and re-creates them using the database backup file provided by user during the restoration of OCEEMS.

6.1.1 Restoring from the default/any other backup location

Restore script can be executed using the command given below -

```
# sh /Tekelec/WebNMS/bin/backup/RestoreDB.sh <absolute path of database backup file>
```

Note that the path of database backup file provided while running the restore script must also have the other configuration files backed up by OCEEMS. The default location of backup automatically has all the content backed up by OCEEMS as shown below.

- /var/backup/Classes
- /var/backup/commandManagerScripts
- /var/backup/conf
- /var/backup/defaultconf
- /var/backup/html
- /var/backup/linkUtilizationScripts
- /var/backup/reportingStudio
- /var/backup/users
- /var/backup/E5MS_Database_BackUp.sql

In case, user wishes to provide a location of the backup file that is different from the default location, s/he must first verify that the location has all the contents mentioned above. In case the non-default location does not have all the contents, then the user should first copy the contents from the default location to the non-default location and then proceed with restoration.

For example, for restoring from the default OCEEMS backup location, following command can be issued -

```
# sh /Tekelec/WebNMS/bin/backup/RestoreDB.sh /var/backup/E5MS_Database_BackUp.sql
```

Sample output of restore script execution is shown in **LOG MESSAGES WHILE RESTORING OCEEMS**.

6.1.2 Default restore contents

The restore script uses the entries in **/Tekelec/WebNMS/bin/backup/TablesToRestore.conf** file to know what to restore (data and configuration). This has been explained below -

- Database tables

```
<RESTORE TABLES="ALL"
       DYNAMIC_TABLES="true"
       SKIP_INDEX="TRUE">
</RESTORE>
```

  The above statement means restoring all the database tables present in the database backup file.

- Configuration

```
<FILES_TO_RESTORE
DIR_NAMES="conf/tekelec,users,commandManagerScripts,linkUtilizationScripts,reporti
ngStudio"
FILE_NAMES="defaultconf/usernamePassword.conf,conf/securitydbData.xml,conf/clientp
arameters.conf,classes/hbnlib/hibernate.cfg.xml,classes/hbnlib/secondary/hibernate
.cfg.xml,conf/transportProvider.conf,conf/trapport.conf,conf/NmsProcessesBE.conf,c
onf/serverparameters.conf,conf/SmartUpdateManager.xml,html/NMSSocketPort.html">
</FILES_TO_RESTORE>
```

  The above statement means restoring all the files listed in 'FILE_NAMES' tag and all the directories listed in 'DIR_NAMES' tag respectively.

6.1.3 Time taken in restore

The time taken by restore process shall depend upon the size of OCEEMS backup. The size of backup will in turn depend upon the size of OCEEMS database backup file. Restoration will approximately take few minutes (for e.g. 10 to 15 minutes for small database) or more depending upon the size of backup.

6.1.4 Status of restore

The status of restore shall be shown through relevant log messages on console as shown in **LOG MESSAGES WHILE RESTORING OCEEMS.**

7.0 LOGGING DURING UPGRADE

Release 46.2 of OCEEMS has implemented a new feature of logging for the upgrade procedure. In earlier releases, logs during upgrade were only available on the console where upgrade was being done and not available after the console was closed.

In Release 46.2, all the logs appearing on console during upgrade shall automatically be saved in a file named 'upgrade_<date>_<time_stamp>.log' located in "/var/upgrade/logs" directory. The date and timestamp used in the file name will signify the system date and time when upgrade was started by the user. A temporary file named 'upgrade.temp' will also be created during upgrade in the same directory and will have some intermediate upgrade related log messages. On completion of upgrade, the log messages in this file shall be copied to 'upgrade_<date>_<time_stamp>.log' file and this temporary file will be deleted from the system. This file will also be created on fresh installation of R46.2 and will not be deleted in that case because the code for deletion of this file is available in upgrade workflow only.

Note: The script responsible for OCEEMS upgrade is picked from the existing (installed) RPM and not from the new RPM that is being upgraded to. This is why the upgrade log will not be available on upgrade to release 46.2 in spite of the supporting code being there in the new RPM. However, once release 46.2 is installed, then on any subsequent upgrade to a newer release, upgrade logs will be available as per the details given in the above paragraph.

APPENDIX A. LOG MESSAGES ON FIRST STARTUP OF OCEEMS SERVER AFTER INSTALLATION

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

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```
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Do you accept the LICENSE AGREEMENT   (y/n)

y
```

APPENDIX B. LOG MESSAGES ON STARTING OCEEMS SERVER

```
Oracle Corporation.

Starting Oracle OCEEMS "Primary" Server Modules, please wait
This edition of Oracle Communications EAGLE Element Management System with release 46.2.0
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 OCEEMS Server modules started successfully at Apr 18,2015 02:54:19 AM

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

APPENDIX C. LOG MESSAGES ON STOPPING OCEEMS SERVER

```
Interrupt signal received Shutting down Oracle OCEEMS Server

Trying to Shutdown Oracle OCEEMS 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 OCEEMS Server Successfully Shut Down
```

APPENDIX D. LOG MESSAGES ON INSTALLATION OF OCEEMS 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 OCEEMS UPGRADE

Note: Database dump file needed for restoring old data (see highlighted below) shall be required only in case OCEEMS is being upgraded from R45.0 or 45.0.1. In case OCEEMS is being upgraded from R46.0 or 46.0.1, the upgrade script shall not prompt for this dump file. Release 46.2 onwards, these upgrade logs will also be captured in log file 'upgrade_<date>_<time stamp>.log' located in "/var/upgrade/logs" directory.

```
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
Installed OCEEMS rpm version: 450
Current rpm version is less than MySql5.6 upgrade release.
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 OCEEMS Database dump file (including the dump file name):
/var/upgrade/Backup_450.30.0/E5MS_Database_BackUp.sql


OCEEMS dump file provided by you is:
/var/upgrade/Backup_450.30.0/E5MS_Database_BackUp.sql


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

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


OCEEMS data restoration: start


OCEEMS data restoration: done


OCEEMS data migration completed on new MySql version, please re setup mysql replication
for OCEEMS 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.CCTVVIEWS                                 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.UIDataIdVsPRId                      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.
OCEEMS upgrade completed.
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
OCEEMS R46.0 CMI and Measurement Schema changes are applicable.....
Deleting existing OCEEMS 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!
Stoping mysql
140717 16:28:07 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms8.pid
ended
Adding new OCEEMS 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!
Stoping mysql
140717 16:28:31 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms8.pid
ended
OCEEMS Schema updated successfully.
OCEEMS 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 necessary. To enable DB replication, one needs to set up various GLOBAL PARAMETERS. In addition, changes need to be done in OCEEMS 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 OCEEMS R46.2 installation, 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.

S. No.	Step	Expected Output
1	Login in to primary OCEEMS 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 e5ms1 10.248.10.21 e5ms2
3	Replace the 'localhost' value in the given statement in /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml file with the hostname of the primary server.	Replace the 'localhost' value in the given statement in /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml file with the hostname of the primary server as shown below - <property name="connection.url">jdbc:mysql://localhost/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property> As – <property name="connection.url">jdbc:mysql://<hostname of primary server>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property> e.g. <property name="connection.url">jdbc:mysql://e5ms1/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 2^32-1 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.
		`./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)`
		
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		`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 OCEEMS 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 e5ms1`
		`10.248.10.21 e5ms2`

11	Replace the 'localhost' value in the given statement in /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml file with the hostname of standby server.	Replace the 'localhost' value in the given statement in /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml file with the hostname of the standby server as shown below -
		
		`<property name="connection.url">jdbc:mysql://localhost/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>`
		
		As –
		
		`<property name="connection.url">jdbc:mysql://<hostname of`

		standby server>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property> e.g. <property name="connection.url">jdbc:mysql://e5ms2/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.	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
15	Move to '/Tekelec/WebNMS/mysql/bin' directory.	cd /Tekelec/WebNMS/mysql/bin
16	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>
17	Execute the five MySQL commands on primary server. Replace the values given in <> by actual values.	GRANT ALL PRIVILEGES ON *.* TO root@'<primary server hostname>' IDENTIFIED BY '<primary server's mysql root user password>'; GRANT ALL PRIVILEGES ON *.* TO root@'<standby server hostname>' IDENTIFIED BY '<standby server's mysql root user password>';

	Note: 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.	`CREATE USER '<primary replication user>'@'localhost' IDENTIFIED BY '<primary replication user password>';`
		
		`GRANT REPLICATION SLAVE ON *.* TO '<primary replication user>'@'<standby server hostname>' IDENTIFIED BY '<primary replication user password>';`
		
		`FLUSH PRIVILEGES;`

18	Execute the five MySQL commands on standby server. Replace the values given in <> by actual values.
	
	Note: 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.
		`GRANT ALL PRIVILEGES ON *.* TO root@'<primary server hostname>' IDENTIFIED BY '<primary server's mysql root user password>';`
		
		`GRANT ALL PRIVILEGES ON *.* TO root@'<standby server hostname>' IDENTIFIED BY '<standby server's mysql root user password>';`
		
		`CREATE USER '<standby replication user>'@'localhost' IDENTIFIED BY '<standby replication user password>';`
		
		`GRANT REPLICATION SLAVE ON *.* TO '<standby replication user>'@'<primary server hostname>' IDENTIFIED BY '<standby replication user password>';`
		
		`FLUSH PRIVILEGES;`

19	Run SHOW MASTER STATUS command on the MySQL prompt on primary server.
	
	Note the values for columns 'File' and 'Position'. Let us call them PrimaryLogFile and PrimaryLogPosition to be used later in the procedure.
		`mysql> 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)`

20	Run SHOW MASTER STATUS command on the MySQL prompt on standby server.
	
	Note the values for columns 'File' and 'Position'. Let us call them StandbyLogFile and StandbyLogPosition to be used later in the procedure.
		`mysql> 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)`

21	Execute the two MySQL commands on the primary server. In the command, use the values for <StandbyLogPosition> and <StandbyLogFile> noted earlier in this procedure.	`CHANGE MASTER TO MASTER_HOST='<standby server hostname>', MASTER_PORT=3306, MASTER_USER='<standby replication user>', MASTER_PASSWORD='<standby replication user password>', MASTER_LOG_POS=<StandbyLogPosition>, MASTER_LOG_FILE='<StandbyLogFile>';`
		
		`START SLAVE;`

22	Execute the two MySQL commands on the standby server. In the command, replace the values for <PrimaryLogPosition> and <PrimaryLogFile> noted earlier in this procedure.	CHANGE MASTER TO MASTER_HOST='<primary server hostname>', MASTER_PORT=3306, MASTER_USER='<primary replication user>', MASTER_PASSWORD='<primary replication user password>', MASTER_LOG_POS=<PrimaryLogPosition>, MASTER_LOG_FILE='<PrimaryLogFile>'; START SLAVE;
23	Verify that replication has been setup correctly by executing the given command at the MySQL client on the standby server. Verify the highlighted values in the command output. Both should be 'Yes' for correct replication setup.	SHOW SLAVE STATUS\G; Output similar to the follwing 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: Executed_Gtid_Set: Auto_Position: 0 1 row in set (0.00 sec)
24	Verify that the replication has been setup correctly by executing the given command at the MySQL client on the primary server. Verify the highlighted values in the command output. Both should be 'Yes' for correct replication setup.	SHOW SLAVE STATUS \G; Output similar to the follwing is displayed - *************************** 1. row *************************** Slave_IO_State: Waiting for master to send event Master_Host: e5ms2 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: Auto_Position: 0 1 row in set (0.00 sec)
25	On primary server, login to OCEEMS database and create a DUMMY table. After creation, verify that it has been created successfully 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> CREATE TABLE DUMMY(dummy_column VARCHAR(100)); Query OK, 0 rows affected (0.21 sec) mysql> SHOW TABLES;
26	On standby server, login to OCEEMS 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 OCEEMS 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 OCEEMS 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 e5ms1
10.248.10.21 e5ms2
```

F.2 In case of Upgrade

Before proceeding with setting up of failover in case of OCEEMS upgrade to R46.2, 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 OCEEMS server: In the procedure given below, these values shall be called ‘standby replication user’ and ‘standby replication user password’ respectively.

Note: Before proceeding with setting up of failover give in the table below, e5msService must be stopped on both primary and standby servers.

S. No.	Step	Expected Output
1	Login in to primary OCEEMS 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 startMySQL.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)`
		
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		`owners.`
		
		`mysql>`

7	Login in to standby OCEEMS 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 startMySQL.sh`
11	Move to	`cd /Tekelec/WebNMS/mysql/bin`

	'/Tekelec/WebNMS/mysql/bin' directory.	

12	Take backup of database and configuration files 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.	a. On both primary and standby servers, create a temporary backup location for storing backups. For this, run the following command on both the servers –
		`mkdir /tmp/backup`
		
		b. On primary server, run /Tekelec/WebNMS/bin/backup/BackupDB.sh script and take backup in temporary backup location "/tmp/backup". Run following commands -
		`cd /Tekelec/WebNMS/bin/backup`
		`sh BackupDB.sh -d /tmp/backup/`
		
		c. On primary server, run following commands to tar the contents of /tmp/backup directory -
		`cd /tmp/backup`
		`tar cvf /tmp/primarybackup.tar *`
		
		d. On primary server, run following commands to transfer the tar file created above to the standby server -
		`scp /tmp/primarybackup.tar root@<ip of secondary server>:/tmp`
		
		e. On standby server, run following commands to restore the contents of tar file transferred from primary server -
		`cd /tmp/backup`
		`tar xvf /tmp/primarybackup.tar`
		`cd /Tekelec/WebNMS/bin/backup/`
		`./RestoreDB.sh /tmp/backup/E5MS_Database_BackUp.sql`

13	On standby server, update the /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml file to point the JDBC connection to the hostname of the standby server. This needs to be done because while restoring database and configurations files in the earlier step, hibernate.cfg.xml file on the standby server gets overwritten by the one from primary and value of hostname needs to be corrected to point to standby server's hostname.	Update the following statement in /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml – `<property name="connection.url">jdbc:mysql://<hostname of standby server>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>`

14	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)`
		
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		Corporation and/or its affiliates. Other names may be trademarks of their respective owners. mysql>
15	On primary server, check if replication slave privilege for primary replication user is present for standby host by executing the given query.	show grants for '<primary replication user>'@'<standby server hostname>';
16	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, execute next step. 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, skip the next step.	+-- --+ | Grants for <primary replication user>@<standby server hostname >| +-- --+ | GRANT REPLICATION SLAVE ON *.* TO <primary replication user>@<standby server hostname> IDENTIFIED BY PASSWORD '*3C0FBEB25545FC3BEFC6B26880D8D51D07A4A455' | +-- --+ 1 row in set (0.00 sec) ERROR 1141 (42000): There is no such grant defined for user <primary replication user> on host '<standby server hostname>'
17	Remove any privileges for all hosts by executing the given command on MySQL prompt.	REVOKE REPLICATION SLAVE ON *.* FROM '<primary replication user>'@'<standby server hostname>';
18	Execute the two MySQL commands. Replace the values given in <> by actual values.	GRANT REPLICATION SLAVE ON *.* TO '<primary replication user>'@'<standby server hostname>' IDENTIFIED BY '<primary replication user password>'; FLUSH PRIVILEGES;
19	On standby server, check if replication slave privilege for standby replication user is present for primary host by executing the given query.	show grants for '<standby replication user>'@'<primary server hostname>';
20	If output similar to what is given here is observed, it means replication privileges were provided to a user (standby replication user) logging from primary host. In this case, execute next step. Else, if output is similar to error log as shown, it means that replication privileges were not given to standby replication user from primary host during earlier failover setup. In this case, skip the next step.	+-- --+ | Grants for <standby replication user>@<primary server hostname >| +-- --+ | GRANT REPLICATION SLAVE ON *.* TO <standby replication user>@<primary server hostname> IDENTIFIED BY PASSWORD '*3C0FBEB25545FC3BEFC6B26880D8D51D07A4A455' | +-- --+ 1 row in set (0.00 sec)

		ERROR 1141 (42000): There is no such grant defined for user <standby replication user> on host '<primary server hostname>'
21	Remove any privileges for all hosts by executing the given command on MySQL prompt.	REVOKE REPLICATION SLAVE ON *.* FROM '<standby replication user>'@'<primary server hostname>';
22	Execute the two MySQL commands. Replace the values given in <> by actual values.	GRANT REPLICATION SLAVE ON *.* TO '<standby replication user>'@'<primary server hostname>' IDENTIFIED BY '<standby replication user password>'; FLUSH PRIVILEGES;
23	Run SHOW MASTER STATUS command on the MySQL prompt on primary server. Note the values for columns 'File' and 'Position'. Let us call them PrimaryLogFile and PrimaryLogPosition to be used later in the procedure.	mysql> 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)
24	Run SHOW MASTER STATUS command on the MySQL prompt on standby server. Note the values for columns 'File' and 'Position'. Let us call them StandbyLogFile and StandbyLogPosition to be used later in the procedure.	mysql> 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)
25	Execute the three MySQL commands on the primary server. In the command, use the values for <StandbyLogPosition> and <StandbyLogFile> noted earlier in this procedure.	STOP SLAVE; CHANGE MASTER TO MASTER_HOST='<standby server hostname>', MASTER_PORT=3306, MASTER_USER='<standby replication user>', MASTER_PASSWORD='<standby replication user password>', MASTER_LOG_POS=<StandbyLogPosition>, MASTER_LOG_FILE='<StandbyLogFile>'; START SLAVE;
26	Execute the three MySQL commands on the standby server. In the command, replace the values for <PrimaryLogPosition> and <PrimaryLogFile> noted earlier in this procedure.	STOP SLAVE; CHANGE MASTER TO MASTER_HOST='<primary server hostname>', MASTER_PORT=3306, MASTER_USER='<primary replication user>', MASTER_PASSWORD='<primary replication user password>', MASTER_LOG_POS=<PrimaryLogPosition>,

		MASTER_LOG_FILE='<PrimaryLogFile>'; START SLAVE;
27	Verify that replication has been setup correctly by executing the given command at the MySQL client on the standby server. Verify the highlighted values in the command output. Both should be 'Yes' for correct replication setup.	SHOW SLAVE STATUS\G; Output similar to the follwing 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: Executed_Gtid_Set: Auto_Position: 0 1 row in set (0.00 sec)
28	Verify that the replication has been setup correctly by executing the given command at the MySQL client on the primary server. Verify the highlighted values in the command output. Both should be 'Yes' for correct replication setup.	SHOW SLAVE STATUS \G; Output similar to the follwing 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: Auto_Position: 0 1 row in set (0.00 sec)
29	On primary server, login to OCEEMS database and create a DUMMY table. After creation, verify that it has been created successfully 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> CREATE TABLE DUMMY(dummy_column VARCHAR(100)); Query OK, 0 rows affected (0.21 sec) mysql> SHOW TABLES;
30	On standby server, login to OCEEMS 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;
31	On standby server, delete the DUMMY table from OCEEMS database by using `DROP TABLE` command.	mysql> DROP TABLE DUMMY; Query OK, 0 rows affected (0.05 sec)
32	On primary server, verify that the DUMMY table no more exists in OCEEMS 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 OCEEMS

1. Shutdown OCEEMS server.
   ```
   service e5msService stop
   ```

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

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

3. Start OCEEMS server.
   ```
   service e5msService start
   ```

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

H.1 For Standalone Server

1. Shutdown OCEEMS 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 OCEEMS.

```
# sh E5MSConfigurationScript.sh
Please enter OCEEMS home path.(Absolute path till WebNMS directory)
/Tekelec/WebNMS/
Press 1 To update current system username and password in OCEEMS
2 To update current mysql root user's password in OCEEMS
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 OCEEMS 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 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 OCEEMS 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 OCEEMS SSL CERTIFICATE

To create SSL certificate needed for HTTPS based access for OCEEMS, 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 OCEEMS SSL Certificate creation wizard!!!

Please provide OCEEMS 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):
OCEEMS

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.
```

APPENDIX J. OPENING PORTS USED BY OCEEMS 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 OCEEMS client and managed EAGLE(s) could be on other side of the firewall.

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

The ports used by OCEEMS, 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), SNMP (161), SNMP v3 user discovery ports (1234 and 8002) must be opened bi-directionally.

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	1234 (TCP)	Port for SNMP v3 user discovery by NMS for receiving traps from OCEEMS
10	2000 (TCP)	NMS BE port used for communication between BE and FE servers.
11	2300 (TCP)	Config Server port
12	3306 (TCP)	MySQL
13	4500 (TCP)	SAS (SNMP Applet Server) port In BE - FE combination, all SAS related information is passed through a socket.
14	4567 (TCP)	For Web NMS client server communication
15	8001 (UDP)	Web NMS Agent port
16	8002 (UDP)	Port for SNMP v3 user discovery by NMS and to receive SNMP set request from NMS after user discovery
17	8443 (TCP)	for SSL connection
18	9000 (TCP)	Used by i-net Clear Reports server
19	9999 (TCP)	SUM Port
20	36001 (TCP)	NMS FE Secondary Port
21	36002 (TCP)	Web NMS Client Server communication port
22	36003 (TCP)	RMI Server Socket Port.
23	Port Range (TCP)	For NBI FTP module to transfer measurement files from OCEEMS 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 OCEEMS server firewall as well.

APPENDIX K. UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO PRESERVE CUSTOM ALARM/EVENT VIEWS

Before proceeding with upgrade of OCEEMS, DBXML tool needs to be executed so that the custom alarm/event views created by users are preserved after upgrade. For this, follow the steps given below -

1) Edit the CLASSPATH value in '/Tekelec/WebNMS/bin/developertools/DBXmlTool.sh' file to include entries "./NetMonitor/build/E5MS_Common.jar:./NetMonitor/build/E5MS_Server.jar:" as shown below -

   Update -

   ```
   CLASSPATH=$NMS_CLASSES/AdventNetTL1.jar:$NMS_CLASSES/ManagementServer.jar:$NMS_SER
   VER_CLASSES:$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:$J
   SON_CLASSPATH
   ```

   As –

   ```
   CLASSPATH=./NetMonitor/build/E5MS_Common.jar:./NetMonitor/build/E5MS_Server.jar:$N
   MS_CLASSES/AdventNetTL1.jar:$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/AdventNetNPr
   evalent.jar:$HBN_CLASSPATH:$HBN_LIB_CLASSPATH:$NMS_CLASSES/Mail.jar:$JSON_CLASSPAT
   H
   ```

2) Copy the 'updateUsers.sh' script available in OCEEMS ISO to /Tekelec/WebNMS/bin/developertools directory using the command given below –

   ```
   # cp <absolute path of OCEEMS ISO>/updateUsers.sh
   /Tekelec/WebNMS/bin/developertools
   ```

3) Move to /Tekelec/WebNMS/bin/developertools directory.

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

4) Run the updateUsers.sh script with the 'updateXML' option as shown below –

   ```
   # sh updateUsers.sh <Password of MySQL root user> updateXML
   ```

   Sample output of the script is given below for reference (Note: failure for user 'guest' can be ignored) –

   ```
   Warning: Using a password on the command line interface can be insecure.
   DBXmlTool.sh updateXML guest
   TransactionAPI create instance called.
   WARNING!! More than one property has the same ALIAS name - USERGRPNAME. This may
   lead to undesirable results.
   WARNING!! More than one property has the same ALIAS name - SNMPPORT. This may lead
   to undesirable results.

   "updateXML" operation Failed for user guest

   Reason for Failure : com.adventnet.nms.store.NmsStorageException: Exception There
   is no data found in Database for userName : guest id : null
   DBXmlTool.sh updateXML root
   TransactionAPI create instance called.
   WARNING!! More than one property has the same ALIAS name - USERGRPNAME. This may
   lead to undesirable results.
   WARNING!! More than one property has the same ALIAS name - SNMPPORT. This may lead
   to undesirable results.

   "updateXML" operation Successful for user root
   ```

APPENDIX L. UPDATING XML CHANGES IN OCEEMS DATABASE

In R46.0, new Command Class Management functionality was added to OCEEMS. For this functionality, a new link named 'Command Class Management' was added in OCEEMS 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 OCEEMS and assigned 'Command Class Management' functionality, then 'Command Class Management' link will show up in the OCEEMS GUI's left navigation pane. However, for pre-upgrade OCEEMS users to see the 'Command Class Management' link in OCEEMS client, DBXmlTool must be run. In R46.2, a number of changes have been done for rebranding purpose i.e. updating old E5MS references to the new name OCEEMS.

'/Tekelec/WebNMS/bin/developertools/updateUsers.sh' script should be run to update OCEEMS database with the above changes. Follow the below given steps -

1) Move to /Tekelec/WebNMS/bin/developertools directory.

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

2) Run updateUsers.sh script for updating database by using the following command -

```
# sh updateUsers.sh <Password of MySQL root user> updateDB
```

Sample output of the script is given below for reference –

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

DBXmlTool.sh updateDB guest
TransactionAPI create instance called.
WARNING!! More than one property has the same ALIAS name - USERGRPNAME. This may
lead to undesirable results.
WARNING!! More than one property has the same ALIAS name - SNMPPORT. This may lead
to undesirable results.
"updateDB" operation Successful for user guest

DBXmlTool.sh updateDB root
TransactionAPI create instance called.
WARNING!! More than one property has the same ALIAS name - USERGRPNAME. This may
lead to undesirable results.
WARNING!! More than one property has the same ALIAS name - SNMPPORT. This may lead
to undesirable results.

"updateDB" operation Successful for user root

DBXmlTool.sh updateDB user1
TransactionAPI create instance called.
WARNING!! More than one property has the same ALIAS name - USERGRPNAME. This may
lead to undesirable results.
WARNING!! More than one property has the same ALIAS name - SNMPPORT. This may lead
to undesirable results.

"updateDB" operation Successful for user user1
```

APPENDIX M. SETTING OCEEMS SYSTEM TIME ZONE

In case, the time zone for OCEEMS 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 OCEEMS server using command 'service e5msService start'.
3) Launch OCEEMS client and perform resync on a configured EAGLE.
4) Validate that OCEEMS Timestamp on OCEEMS 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 OCEEMS server using command 'service e5msService stop'.
7) Start OCEEMS server using command 'service e5msService start'.
8) Launch OCEEMS client. Due to OCEEMS server restart, resync will automatically trigger for added EAGLE(s).
9) Validate that OCEEMS Timestamp on Alarms GUI now reflects time zone Y.

APPENDIX N. PURPOSE OF OCEEMS LOG FILES

Log files in OCEEMS 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

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

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

APPENDIX O. 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 OCEEMS. Provide the highlighted inputs as required.

```
# sh E5MSConfigurationScript.sh

Please enter OCEEMS home path (Absolute path till 'WebNMS' directory):
/Tekelec/WebNMS/
Press 1 To update current system username and password in OCEEMS
      2 To update current mysql root user's password in OCEEMS
      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 OCEEMS.
```

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 OCEEMS server for the above change to take effect.

```
# service e5msServcie restart
```

APPENDIX P. LOG MESSAGES WHILE RESTORING OCEEMS

```
[root@e5ms-12 backup]# sh RestoreDB.sh /var/backup/E5MS_Database_BackUp.sql
restore path :: /var/backup


WARNING! Attempting to restore the data!!! This will result in losing your current
data!!! Do you want to continue [y/n]?
y


Script will attempt to restore E5-MS database from the dump file:
/var/backup/E5MS_Database_BackUp.sql


E5-MS database restoration in progress...


Successfully restored E5-MS database.


The following files will be restored now to E5-MS:


/Tekelec/WebNMS//Tekelec/WebNMS/conf/tekelec
/Tekelec/WebNMS/conf/tekelec/lui.properties
/Tekelec/WebNMS/conf/tekelec/InventoryCommands.txt
/Tekelec/WebNMS/conf/tekelec/security.properties
/Tekelec/WebNMS/conf/tekelec/tekmeas.conf
/Tekelec/WebNMS/conf/tekelec/lui_template_script.txt
/Tekelec/WebNMS/conf/tekelec/ContinentZonalMap.xml
/Tekelec/WebNMS/conf/tekelec/CmiParameters.conf
/Tekelec/WebNMS/conf/tekelec/EagleCardNameNumMap.xml
/Tekelec/WebNMS/conf/tekelec/ModulesConf.xml
/Tekelec/WebNMS/conf/tekelec/common.config
/Tekelec/WebNMS/conf/tekelec/fault.properties
/Tekelec/WebNMS/conf/tekelec/NbiParameters.conf
/Tekelec/WebNMS/conf/tekelec/server_conf.properties
/Tekelec/WebNMS/conf/tekelec/reporting.properties
/Tekelec/WebNMS//Tekelec/WebNMS/users
/Tekelec/WebNMS//Tekelec/WebNMS/users/root
/Tekelec/WebNMS/users/root/toolbar.dtd
/Tekelec/WebNMS//Tekelec/WebNMS/users/root/listmenus
/Tekelec/WebNMS/users/root/listmenus/dummy.txt
/Tekelec/WebNMS/users/root/sysadminmenu.xml
/Tekelec/WebNMS//Tekelec/WebNMS/users/root/policymenus
/Tekelec/WebNMS/users/root/policymenus/nonperiodicpolicymenu.xml
```

/Tekelec/WebNMS/users/root/policymenus/periodicpolicymenu.xml

/Tekelec/WebNMS/users/root/AudioInfo.xml

/Tekelec/WebNMS/users/root/mibmenu.xml

/Tekelec/WebNMS/users/root/HomePageLayout.xml

/Tekelec/WebNMS/users/root/increments.conf

/Tekelec/WebNMS//Tekelec/WebNMS/users/root/mapmenus

/Tekelec/WebNMS/users/root/mapmenus/dummy.txt

/Tekelec/WebNMS/users/root/panelmenubar.dtd

/Tekelec/WebNMS/users/root/FramesInfo.conf

/Tekelec/WebNMS/users/root/alertsmenu.xml

/Tekelec/WebNMS/users/root/maptoolbar.xml

/Tekelec/WebNMS/users/root/clientparameters.conf

/Tekelec/WebNMS/users/root/framemenu.xml

/Tekelec/WebNMS/users/root/tl1browsermenu.xml

/Tekelec/WebNMS/users/root/TreeOperations.xml

/Tekelec/WebNMS/users/root/Tree.xml

/Tekelec/WebNMS/users/root/maptoolbar.dtd

/Tekelec/WebNMS/users/root/frameoptions.xml

/Tekelec/WebNMS//Tekelec/WebNMS/users/guest

/Tekelec/WebNMS/users/guest/toolbar.dtd

/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/listmenus

/Tekelec/WebNMS/users/guest/listmenus/dummy.txt

/Tekelec/WebNMS/users/guest/sysadminmenu.xml

/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/policymenus

/Tekelec/WebNMS/users/guest/policymenus/nonperiodicpolicymenu.xml

/Tekelec/WebNMS/users/guest/policymenus/periodicpolicymenu.xml

/Tekelec/WebNMS/users/guest/AudioInfo.xml

/Tekelec/WebNMS/users/guest/mibmenu.xml

/Tekelec/WebNMS/users/guest/HomePageLayout.xml

/Tekelec/WebNMS/users/guest/increments.conf

/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/mapmenus

/Tekelec/WebNMS/users/guest/mapmenus/dummy.txt

/Tekelec/WebNMS/users/guest/panelmenubar.dtd

/Tekelec/WebNMS/users/guest/alertsmenu.xml

/Tekelec/WebNMS/users/guest/maptoolbar.xml

/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/state

/Tekelec/WebNMS/users/guest/state/dummy.txt

/Tekelec/WebNMS/users/guest/clientparameters.conf

/Tekelec/WebNMS/users/guest/framemenu.xml

/Tekelec/WebNMS/users/guest/tl1browsermenu.xml

/Tekelec/WebNMS/users/guest/TreeOperations.xml

/Tekelec/WebNMS/users/guest/Tree.xml

/Tekelec/WebNMS/users/guest/maptoolbar.dtd

/Tekelec/WebNMS/users/guest/frameoptions.xml

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/kanav

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/kanav/Kanav

/Tekelec/WebNMS/commandManagerScripts/kanav/Kanav/kan.bsh

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/viv

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/usr4

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/usr4/default

/Tekelec/WebNMS/commandManagerScripts/usr4/default/scr1.bsh

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/usr4/cat1

/Tekelec/WebNMS/commandManagerScripts/usr4/cat1/scr1.bsh

/Tekelec/WebNMS/commandManagerScripts/usr4/cat1/scr4.bsh

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/arjun

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/arjun/default

/Tekelec/WebNMS/commandManagerScripts/arjun/default/hashhhh.bsh

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/k2

/Tekelec/WebNMS//Tekelec/WebNMS/commandManagerScripts/kan

/Tekelec/WebNMS/linkUtilizationScripts/aricentstp_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/tekelecstp_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/eagle9_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/tklc9010801_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/stpd1180801_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/eale5_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/tklc1071501_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/eagle3_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/pveagle03_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/eagle8_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/tklc1180601_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/eagle6_lui_script.bsh

/Tekelec/WebNMS/linkUtilizationScripts/tklc1170501_lui_script.bsh

/Tekelec/WebNMS//Tekelec/WebNMS/reportingStudio

/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration_WithSeverity.rpt

/Tekelec/WebNMS/reportingStudio/Resources_Top10_PerCount.rpt

/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration_WithSeverity.rpt

/Tekelec/WebNMS/reportingStudio/LinkReport_withErlang_PercentUtilization.rpt

/Tekelec/WebNMS/reportingStudio/All_Events.rpt

/Tekelec/WebNMS/reportingStudio/Alarms_Top10_PerCount.rpt

/Tekelec/WebNMS/reportingStudio/Alarms_Top10_PerSeverity.rpt

```
/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration_WithSeverity_UAM_Number.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration_WithSeverity_UAM_Number.rpt
/Tekelec/WebNMS/reportingStudio/EventSummary_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/CardReport_withErlang_PercentUtilization.rpt
/Tekelec/WebNMS/reportingStudio/Resources_Top10_PerSeverity.rpt
/Tekelec/WebNMS/reportingStudio/All_Alarms.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Inventory_OOSCards.rpt
/Tekelec/WebNMS/reportingStudio/LinkSetReport_withErlang_PercentUtilization.rpt
/Tekelec/WebNMS/reportingStudio/Inventory_AllCards.rpt
/Tekelec/WebNMS/reportingStudio/Measurement_Systot_STP.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDate.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDate.rpt
/Tekelec/WebNMS/reportingStudio/AlarmSummary_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration.rpt
/Tekelec/WebNMS/defaultconf/usernamePassword.conf
/Tekelec/WebNMS/conf/securitydbData.xml
/Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml
/Tekelec/WebNMS/classes/hbnlib/secondary/hibernate.cfg.xml
All the files & directories specified in the FILES_TO_RESTORE tag are successfully
restored


E5-MS successfully restored.
```

APPENDIX Q. INSTALLATION OF JAVA RUNTIME FOR OCEEMS

Prior to release 46.2 of OCEEMS, OCEEMS installation package included the Java Runtime (JRE) package, which was used to run OCEEMS application. In release 46.2, the bundled JRE package shall be removed from the OCEEMS installation. In place of bundled JRE package, a system based JRE package shall be used to run the OCEEMS application. The following sections describe the steps needed for transition from bundled JRE to system based JRE.

1.1.1 Installation of JRE on system

Oracle Java 1.7 or higher shall be required for OCEEMS. Therefore, it must be installed on the target machine where OCEEMS 46.2 needs to be installed/upgraded (in case a release of OCEEMS older than 46.2 is already installed). In case Oracle JRE 1.7 or higher is not already installed on the machine, the user shall be required to download it from the link http://www.java.com/en/download/ and install it. Note the location of 'jre' directory in the Java installation on the system (it shall be needed in the next step while setting JAVA_HOME variable and while running OCEEMS upgrade script for upgrading OCEEMS). After successful installation of Java, JAVA_HOME system variable shall be set using the steps given in the following section.

1.1.2 Setting JAVA_HOME system variable

Before proceeding with the installation/upgrade of Release 46.2 of OCEEMS on the machine where Java has been installed, the user shall be required to create a system variable JAVA_HOME on the machine using the steps given below –

1) Login to machine using system user 'root'.
2) Move to /etc/profile.d directory.
   # cd /etc/profile.d
3) Create a new file named custom.sh. Skip this step if the file already exists in the directory.
   # touch custom.sh
4) In file 'custom.sh' add a export statement for the JAVA_HOME variable, whose value should be the absolute path of the 'jre' folder present in the Java installed on the system in the previous section.
   export JAVA_HOME=<absolute path of the 'jre' folder present in the Java installation>

   e.g. if Java was installed in directory /usr/java/jdk1.7.0_40, then the statement to be added in 'custom.sh' shall be -
   export JAVA_HOME=/usr/java/jdk1.7.0_40/jre
5) Save the file and exit the command terminal.
6) Login again using system user 'root' and verify that the JAVA_HOME variable is visible now.
   # echo $JAVA_HOME
   /usr/java/jdk1.7.0_40/jre

1.1.3 Java verification before OCEEMS installation/upgrade

OCEEMS installation/upgrade procedure shall automatically check the correctness of Java on the system before actually proceeding with installation/upgrade of OCEEMS. Installation/upgrade shall proceed only if various checks for Java are successful; else, it shall not proceed and exit providing the cause of failure. The user can then fix the issue using the cause given and try the installation/upgrade again.

The following checks shall be performed before proceeding with OCEEMS installation/upgrade –

1) **JAVA_HOME should not point to OCEEMS bundled JRE package** – In case the JAVA_HOME variable set on the system points to the JRE package bundled with OCEEMS, OCEEMS installation/upgrade shall not proceed and exit with the following error message –

   JAVA_HOME is set to the OCEEMS embedded version!

   Please perform a standalone Java installation, configure JAVA_HOME as recommended in the OCEEMS Installation/Upgrade guide and try again.

2) **JAVA_HOME variable should be set correctly** - In case the JAVA_HOME variable is not set correctly (e.g. points to a location where Java is not present), installation/upgrade shall not proceed and exit with the following error message –

   JAVA_HOME is not set properly!

   Please set JAVA_HOME as recommended in the OCEEMS installation/upgrade guide and try again.

3) **Java 1.7 or higher should be installed** - In case the JAVA_HOME variable set on the system points to a version of Java that is lower than 1.7, installation/upgrade shall not proceed and exit with the following error message –

   Required Java version for OCEEMS is not installed on server!

   Please perform a standalone Java installation, configure JAVA_HOME as recommended in the OCEEMS Installation/Upgrade guide and try again.

1.1.4 Removal of bundled JRE package

In case of OCEEMS upgrade to release 46.2 from an older release, the bundled JRE package (available in /Tekelec/WebNMS/jre directory) present in the old OCEEMS installation shall automatically be removed during the upgrade procedure. This shall be done to ensure that OCEEMS does not use the bundled JRE after upgrade.

1.1.5 Java verification on OCEEMS server startup

After successful installation/upgrade to OCEEMS release 46.2, correctness of Java shall be checked each time on the OCEEMS server startup. This check shall prevent against any undesirable change in the java installation after OCEEMS has been successfully installed/upgraded and started. The following checks shall be performed each time before OCEEMS server startup –

1) **JAVA_HOME variable should be set correctly** - In case, there is any undesirable change in JAVA_HOME variable (e.g. user modifies the name of the variable or deletes it altogether) then the following error message shall be displayed and OCEEMS server shall not start –

   JAVA_HOME is not set properly!

   Please set JAVA_HOME as recommended in the OCEEMS installation/upgrade guide and try again.

2) **Java 1.7 or higher should be installed** - If the Java version pointed to by the JAVA_HOME variable is not as per OCEEMS recommendation (i.e. 1.7 or higher) then the following error message shall be displayed and OCEEMS server shall not start –

   Required Java version for OCEEMS is not installed on server!

   Please perform a standalone Java installation, configure JAVA_HOME as recommended in the OCEEMS Installation/Upgrade guide and try again.

APPENDIX R. 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 an Oracle Customer new to MOS.

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

APPENDIX S. LOCATE PRODUCT DOCUMENTATION ON THE ORACLE HELP CENTER SITE

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

1. Access the Oracle Help Center site at http://docs.oracle.com/.
2. Click Industries.
3. Under the Oracle Communications subheading, click the Oracle Communications documentation link.
   The Communications Documentation page appears.
4. Under the heading "Network Session Delivery and Control Infrastructure," click on EAGLE.
   The EAGLE Documentation page appears.
5. Under the heading "EAGLE Element Management System," select the Release Number.
   A list of the entire documentation set for the release appears.
6. To download a file to your location, right-click the PDF link, select Save target as (or similar command based on your browser), and save to a local folder.