Oracle® Communications
EAGLE Element Management System

Install/Upgrade Guide

Release 46.5

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ORACLE®

Oracle Communications EAGLE Element Management System Install/Upgrade Guide, Release 46.5

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 T for instructions on accessing My Oracle Support.

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1.0 INTRODUCTION

Release 46.5 of Oracle® Communications EAGLE Element Management System (hereafter referred to as "OCEEMS") is a major release of OCEEMS product after the release 46.3. Existing customers, who are at release 46.2 or 46.3 can upgrade to release 46.5. Additionally, customers can also directly install release 46.5 on their systems.

Release 46.5 of OCEEMS has fixes for many must-fix bugs and implemented enhancements like various enhancements in Command Manager Interface, support of IPv6 for EPAP devices on southbound, removal of the need of root privileges to run/maintain OCEEMS and support of EAGLE SLIC card.

1.1 PURPOSE AND SCOPE

This document is a reference for the installation and upgrade procedure of release 46.5 of OCEEMS. The target audience are 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 References

1.2.1 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

1.2.2 Internal

[3] OCEEMS Reporting Studio 46.3 Install/Upgrade Guide
[4] OCEEMS 46.2 Install/Upgrade Guide

1.3 Acronyms

Acronym	Description
EPAP	EAGLE Provisioning Application Processor
LSMS	Local Service Management System
OCEEMS	Oracle® Communications EAGLE Element Management System
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

1.4 OCEEMS Server Requirements

Before moving ahead with the installation/upgrade, make sure all the pre–requisite mentionen in this section are met. Specially make sure the following items are incorporated in the server before you move ahead with the installation/upgrade.

- All rpm packages mentioned in this section are installed

- JAVA_HOME is set as is mentioned in Java Runtime below

- A compatible browser is available with java enabled as mentioned in OCEEMS Client Requirements (Browser requirement)

These are some of the common mistaked people make during upgrade in a hurry. Go through the complete procedure mentioned in this section to minimize chances of failure/rework.

1.4.1 Hardware and Operating System

Release 46.5 of OCEEMS shall be tested on following platforms and OS -

- SUN Netra Server X3-2 running version 7.0 of 64-bit Oracle Linux or CentOS

- HP Gen8 server running version 7.0 of 64-bit CentOS

1.4.2 Disk Space and Open File Limit

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. All the harddisk space should be under one partition.

1.4.3 Software Package Requirements

1.4.3.1 Various rpms

Following are some of the rpms/packages missing under Oracle Linux 7 and are required to be present in the server. Install these rpms before moving ahead with the installation of OCEEMS 46.5.

 'bc' command is required while installation/upgrade of OCEEMS RPM. It might not be available on the system by default. Therefore, users are advised to verify its availability and install it (if not available) before proceeding with installation/upgrade of OCEEMS. This command can be installed by installing 'bc' package on the system (version of the package should be compatible with OS version).

'lsof' command is required by the OCEEMS Measruement module and should be installed on the system before OCEEMS is started. Therefore, users are advised to verify its availability and install it (if not available) before starting OCEEMS server.

'libaio' package is required under Oracle Linux 7.0. This package is required during OCEEMS installation.

'unzip'comamnd is required during installatiopn of i-net clear reports.

Note: Without all these rpms in place, installation is bound to fail. Make sure to install 64 bit version of the rpms as the Oracle Linux 7 is 64 bit.

1.4.3.2 Java Runtime

Oracle JRE 1.8 or higher (64-bit) should be available on the system and JAVA_HOME should be set properly for running OCEEMS server. Please execute through Appendix R irrespective of JRE 1.8 is installed in the system or not.

1.4.3.3 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.

1.4.3.4 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'.

1.4.3.5 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**.

1.4.4 OCEEMS Licensing Requirements

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

1.4.4.1 Fresh Installation

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

1.4.4.2 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.

1.4.4.3 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.

1.4.5 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.

- FTP input directory for EAGLE's measurement files - In 46.3 and later releases, OCEEMS' dependence on 'root' user has been removed and now OCEEMS shall be run using a non-root user only (in case of fresh installation) or by a non-root/root user (in case of upgrade). Before 46.3, the ftp input path for measurement files from EAGLE was "/root/E5-MS/measurement/csvinput". In 46.3, the ftp input path for measurement files on OCEEMS machine, in case of OCEEMS being run by a non-root user, is "/opt/E5-MS/measurement/csvinput". Therefore, customers are advised the follwoing –

  o In case of fresh installation of OCEEMS, customer shall configure ftp path "/opt/E5-MS/measurement/csvinput" on EAGLE.

  o In case of upgrade of OCEEMS –

    ▪ When customer wishes to run OCEEMS with root user, no change is needed in the ftp path ("/root/E5-MS/measurement/csvinput") already configured on EAGLE.

- When customer wishes to run OCEEMS with a non-root user, customer shall update the ftp path on EAGLE from its current value "/root/E5-MS/measurement/csvinput" to "/opt/E5-MS/measurement/csvinput".

- /var/upgrade - This is the backup directory used during OCEEMS upgrade.

- /var/backup - This directory contains OCEEMS manual and scheduled backups.

1.4.6 OCEEMS Password Requirements

1.4.6.1 System User for OCEEMS

OCEEMS stores the login credentials of the system user used for starting/stopping/configuration of OCEEMS in an encrypted format on disk. These credentials are needed for port forwarding mechanism while connecting to EAGLEs on SSH. Before release 46.3, OCEEMS used system user 'root' for this. In 46.3 and later releases, the dependence on 'root' user has been removed and OCEEMS can also be operated by a non-root system user. For installation/upgrade to 46.5, the login credentials of the non-root user used by the customer for OCEEMS operation must be updated for OCEEMS using the procedure given in section **APPENDIX G. PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS**

1.4.6.2 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 **APPENDIX G. PROCEDURE TO UPDATE MYSQL ROOT USER'S PASSWORD.**

Note: OCEEMS users can change the MySQL Temporary directory from /tmp to user-defined directoryby executing steps in **Appendix W. Change Temp Directory for Mysql**

1.4.7 Entries in Server's /etc/hosts File

OCEEMS system's hosts file (which is usually available in /etc directory) should have the entry for system's IP address and hostname. This is required for name resolution in DNS system. In case of failover-based setup, both primary and standby machines should have entries for both the systems' IP addresses and hostnames. For example, for a setup where primary server's IP and hostname are '10.248.10.21' and 'oceemspri' and standby server's IP and hostname are '10.248.10.22' and 'oceemssec', the entries in /etc/hosts file on both the machines should look like -

```
10.248.10.21 oceemspri
10.248.10.22 oceemssec
```

1.4.8 OCEEMS Machine to be Dual Stack for IPv6 Support

From OCEEMS R46.3 can support EPAP version 16.1 that comes with IPv6 support. A precondition for OCEEMS to support IPv6 enabled EPAP devices is that the machine on which OCEEMS is installed should be dual stack (that is should be able to communicate with other devices over both IPv4 and IPv6). For a failover based OCEEMS setup, both primary and standby servers must be dual stack.

1.4.9 OCEEMS Operations by non-root user

Before R46.3, only super user 'root' could perform OCEEMS operations like start/stop/restart of OCEEMS server and update of OCEEMS configuration files. R46.3 has added a feature wherein, in case of fresh installation, OCEEMS operations (start/stop/restart/configurational changes in files) shall be done by a non-root user and in case of upgrade, it shall be customer's choice to use root/non-root user for OCEEMS operations.

After fresh installation or upgrade (if the customer wants to use a non-root user for OCEEMS operations), the super user 'root' shall need to execute the 'updatePrivilegesForUser.sh' script. This script shall configure a non-root user, associate it to a group and provide required privileges to this user for OCEEMS operations. In addition, it shall also set the SNMP trap receiving port for OCEEMS in a way so that OCEEMS started by a non-root user can listen to it. Reading of **Error! Reference source not found.** is suggested to understand this change in detail. The

installation/upgrade procedures in this document have been updated to take care of this change. Two points that need more explanations have been discussed below in detail –

1.4.9.1 OCEEMS SNMP port for incoming device traps

The standard SNMP port 162 used by OCEEMS for receiving the traps coming from network devices is a reserved port that can only be used by processes started by 'root' user. A process started by a non-root user can only bind to an unreserved port in the range 1024-65535. In 46.3, OCEEMS, when started by a non-root user, shall not be able to bind to port 162 for receiving the incoming traps. To address this limitation, following options shall be available –

- **Updating device SNMP port to use an unreserved port value** – In this option, user shall need to change the SNMP port on all managed network devices (EAGLE, EPAP, LSMS) from standard value of 162 to a port in the range 1024-65535. User shall be required to change the trap port on all managed network devices before proceeding with OCEEMS installation/upgrade procedure. Then, while executing 'updatePrivilegesForUser.sh' script, user shall have the option to provide the SNMP port (in range 1024-65535) configured on network devices and the script shall store the port in "/Tekelec/WebNMS/conf/trapport.conf" file for use in OCEEMS. OCEEMS shall then directly listen to the traps coming on the unreserved port value defined in trapport.conf file.

- **Use trap-forwarding mechanism on OCEEMS machine** – Alternatively, if a change in standard port value 162 is not desired at managed network devices, OCEEMS shall use a trap forwarding mechanism to forward all traps coming on port 162 on OCEEMS machine to a port in the range 1024-65535. For this, user shall be needed to provide an unreserved port value in the range 1024-65535 while executing 'updatePrivilegesForUser.sh' script. The default value for this shall be 64000 and user shall have the ability to provide any other unused port value from the unreserved port range. The script shall then store this port value in "/Tekelec/WebNMS/conf/trapport.conf" file and create the trap forwarding mechanism on OCEEMS machine to forward all traps coming on reserved port 162 to the unreserved port entered by user and available in trapport.conf file. In this case, network devices shall continue sending traps to OCEEMS on port 162, which shall be forwarded by OS to an unreserved port defined in trapport.conf file, and OCEEMS shall listen to them on that unreserved port.

  Note: For network devices added to OCEEMS over IPv4, iptables functionality provided by OS shall be used for forwarding traps coming on port 162 to an unreserved port. For network devices added to OCEEMS over IPv6 (EPAP version 16.1), ip6tables functionality provided by OS shall be used. Ip6tables can work only with kernel version 3.10. Therefore, in case user needs traps from IPv6 enabled EPAP (16.1) to come on port 162 and then used the trap forwarding mechanism, s/he must use kernel 3.10 or higher on the OS. If user cannot use the kernel version 3.10 or higher required for trap forwarding, then s/he shall be needed to use an unreserved SNMP port on IPv6 enabled EPAP so that OCEEMS can directly listen to traps coming on that port and trap forwarding is not required.

1.4.9.2 Changes needed in EAGLE configuration for FTP path and user

Before R46.3, OCEEMS expected the incoming measurement CSV files from EAGLE to arrive in directory '/root/E5-MS/measurement/csvinput'. However, in R46.3, when started with a non-root user, OCEEMS cannot make file operations in the above directory because it is owned by the 'root' user. To address this, the expected path of measurement files has been changed '/opt/E5-MS/measurement/csvinput' in OCEEMS.

The same change shall be required at all the managed EAGLEs so that they start sending measurement files at the new path using the non-root user configured for OCEEMS. For this, the following command needs to be run on all the managed EAGLEs –

```
chg-ftp-serv:ipaddr=<IP address of OCEEMS machine>:app=meas:path="/opt/E5-
MS/measurement/csvinput":login=<non-root user configured for OCEEMS>
```

When the above command asks for the password, provide the non-root user's password. Sample output of the command is shown below -

```
> chg-ftp-serv:ipaddr=10.248.10.21:app=meas:path="/opt/E5-
    MS/measurement/csvinput":login=ems1
```

```
    tekelecstp 16-05-05 17:13:31 MST  EAGLE5 46.3.0.0.0-68.18.0

    chg-ftp-serv:ipaddr=10.248.10.21:app=meas:path="/opt/E5-
      MS/measurement/csvinput":login=emsuser

    Command entered at terminal #19.

;

 Enter Password :

    tekelecstp 16-05-05 17:19:30 MST  EAGLE5 46.3.0.0.0-68.18.0

    CHG-FTP-SERV: MASP B - Cannot access standby fixed disk.

    CHG-FTP-SERV: MASP B - Simplex database update.

Command Accepted - Processing

    CHG-FTP-SERV: MASP B - COMPLTD

;

Command Executed
```

1.5 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.

1.5.1 Web Browser Requirements

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

- Microsoft® Internet Explorer version 11.0 or later
- Mozilla Firefox® version 39.0 or later

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

1.5.2 Java Runtime Environment (JRE)

The machine where OCEEMS client is to be used should be having Java Runtime 1.8 (64 bit) installed and the browser of choice should have Java enabled.

1.5.3 Entries in Client Machine's hosts File

For client machines to render EAGLE card graphics successfully in OCEEMS client and to be able to switchover from primary to standby server in case of failover, client machine's 'hosts' file should have the hostname and IP address entries of OCEEMS server(s). On Windows based client machine, the hosts file is present at 'C:\Windows\System32\drivers\etc' folder. The following entries should be done in client machine's hosts file -

- In case of standalone setup -

  ```
  <OCEEMS SERVER IP>      <OCEEMS SERVER HOSTNAME>
  ```

  e.g. In case the hostname of OCEEMS server is 'oceems' and IP address is '10.248.10.25', then the following entry shoud be added in hosts file -

  ```
  10.248.10.25     oceems
  ```

- In case of failover based setup -

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

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

e.g. In case the hostname of primary OCEEMS server is 'oceemspri' and IP address is '10.248.10.25' and hostname of standby OCEEMS server is 'oceemssec' and IP address is '10.248.10.21', then the following entries shoud be added in hosts file -

```
10.248.10.25      oceemspri
10.248.10.21      oceemssec
```

1.6 Reporting Studio Feature

Reporting Studio is an optional feature of OCEEMS that is provided as a separate ISO to customers and must be installed on the same machine where OCEEMS is installed. For OCEEMS R46.5, Reporting Studio version 46.5, which is based on i-net Clear Reports framework version 15.x, shall be needed. Installation/upgrade of Reporting Studio 46.5 should be done using document [3] after OCEEMS R46.5 has been installed/upgraded to.

1.7 OCEEMS Installatiaon/Upgrade Overview

1.7.1   Installation Phases for StandAlone OCEEMS Server

Note: This case is for first time installation of OCEEMS 46.5

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	**Cumm ulative**		
Pre-Requsite	30	30	Complete all the Pre-reqisite mentioned in the section 1.4 - OCEEMS Server requirements and section 1.5 OCEEMS Client Requirements.	**OCEEMS Server Requirements** **OCEEMS Client Requirements**
Installation	60	90	Installation of OCEEMS and required configuration	**Installation Procedure (Standalone Server)**
Check OCEEMS Client GUI	5	95	Check OCEEMS Client GUI opens in a compatible browser.	**Appendix Y**

Table 3: Installation Phases for a StandAlone OCEEMS Servers

1.7.2   Installation Phases for FailOver Setup of OCEEMS Servers

Note: This case is for first time installation of OCEEMS 46.5 where there is Active-Standby Failover setup

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	**Cumm ulative**		
Pre-Requsite	30	30	Complete all the Pre-reqisite mentioned in the section 1.4 - OCEEMS Server requirements and section 1.5 OCEEMS Client Requirements.	**OCEEMS Server Requirements** **OCEEMS Client Requirements**
Installation	120	150	Installation of failover setup and required configuration	**Installation Procedure (Failover Setup)**
Check OCEEMS Client GUI	5	155	Check OCEEMS Client GUI opens in a compatible browser.	**Appendix Y**

Table 4: Installation Phases for Failover setup of OCEEMS Servers

1.7.3   Upgrade Procedure (StandAlone Server - When OS Upgrade is required)

Note: This case is for upgrade from OCEEMS 46.2 to 46.5

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	**Cumm ulative**		
Upgrade	240	240	OS Upgrade OCEEMS application Upgrade	**Upgrade Procedure (Standalone Server- when OS upgrade is required)**
Check OCEEMS Client GUI	5	245	Check OCEEMS Client GUI opens in a compatible browser.	**Appendix Y**

Table 5: Installation Phases for a StandAlone OCEEMS Server with OS Upgrade

1.7.4   Upgrade Procedure (StandAlone Server- When OS Upgrade is NOT required)

Note: This case is for upgrade from OCEEMS 46.3 to 46.5 and for intra release upgrade (46.5.x to 46.5.y)

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	**Cumm ulative**		
Upgrade	180	180	OCEEMS application Upgrade	**Upgrade Procedure (Standalone Server- when OS upgrade not required)**
Check OCEEMS Client GUI	5	185	Check OCEEMS Client GUI opens in a compatible browser.	**Appendix Y**

Table 6: Installation Phases for a StandAlone OCEEMS Server without OS Upgrade

1.7.5   Upgrade Procedure (Failover Setup - When OS Upgrade is required)

Note: This case is for upgrade from OCEEMS 46.2 to 46.5 in a failover setup

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	**Cumm ulative**		
Upgrade	300	300	OS Upgrade – Both Servers OCEEMS application Upgrade – Both Servers	**Upgrade Procedure (Failover Server- when OS upgrade is required)**
Check OCEEMS Client GUI	5	305	Check OCEEMS Client GUI opens in a compatible browser.	**Appendix Y**

Table 7: Installation Phases for a StandAlone OCEEMS Server without OS Upgrade

1.7.6   Upgrade Procedure (Failover Setup - When OS Upgrade is not required)

Note: This case is for upgrade from OCEEMS 46.3 to 46.5 and for intra release upgrade (46.5.x to 46.5.y) in a failover setup

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	**Cumm ulative**		
Upgrade	210	210	OCEEMS application Upgrade – Both Servers	**Upgrade Procedure (Failover Setup- when OS upgrade is not required)**
Check OCEEMS Client GUI	5	215	Check OCEEMS Client GUI opens in a compatible browser.	**Appendix Y**

Table 8: Installation Phases for a StandAlone OCEEMS Server without OS Upgrade

2.0 INSTALLATION PROCEDURE (STANDALONE SERVER)

Purpose	Requirements	Time Required
Installation of OCEEMS	1. Admin (root) login of target OCEEMS server 2. OCEEMS 46.5 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. Login credentials of the non-root user created for OCEEMS 4. Password of MySQL root user.	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/Commands
1	Login to target machine using administrator (root) login.	Successful 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 `<mark>`<Path to OCEEMS 46.5 RPM>`</mark>
		`# rpm -ivh E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm`
		`Preparing...`
		`########################################### [100%]`
		`Updating / installing...`
		`   1:E5-MS`
		`########################################### [100%]`
		`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 08:12:16 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...
		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	Move to "/Tekelec/WebNMS/bin/" directory by issuing the given command.	`# cd /Tekelec/WebNMS/bin/`

10	Execute the UniqueIDLinux.sh script to generate a Unique Machine ID for the system using the MAC ID of the system. Note down the Unique Machine ID generated by the script.	`# sh UniqueIDLinux.sh`
		
		`Your Unique Machine ID is    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...........`

11	Send the Unique Machine ID to the Oracle sales representative. The Oracle sales representative shall then send the Unique Machine ID to the Oracle PS team.	`Successfully send the Unique Machine ID.`
12	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.	`Receive the License file.`
13	Login using the 'root' user.	`Sucessful Login.`
14	In case a firewall is enabled between the OCEEMS server and client machine or OCEEMS server and managed devices (EAGLE, EPAP, LSMS), then all the ports mentioned in **OPENING PORTS USED BY OCEEMS IN CASE OF**	`Successfully open the ports that are required to be opened.`

	FIREWALL should be opened for proper functioning of OCEEMS.	
15	On the target machine, move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	`# cd /Tekelec/WebNMS/bin/`

16	Execute updatePrivilegesForUser.sh script to create a non-root user for OCEEMS.	`# sh updatePrivilegesForUser.sh non-root`
		
		`<Messages given in` **PROCEDURE TO CREATE A NON-ROOT USER FOR OCEEMS** `are displayed. Provide the inputs as required by the script>`

17	Copy the OCEEMS 46.5 license file on the system at a location that can be accessed by the non-root user created for OCEEMS. **Note**: The user name to whom OCEEMS license has been issued and the path of license file should be noted down. These details are needed during the first OCEEMS server startup after installation.	`Copy the license file to the home directory of the non-root user e.g. /home/emsadmuser.`
18	Logout from 'root' user and login using the non-root user.	`This step onwards you will not need the root session. All commands are to be executed from non-root admin user. Ideally close down the session that was opened with root user to avoid the chance of running command from root user by mistake. Open a fresh session (PuTTY or whatever) for the non-root admin user.`
19	Move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	`$ cd /Tekelec/WebNMS/bin/`
20	Use the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS** to update the non-root user and its password in OCEEMS.	`Successful execution of the procedure.`
21	Use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** to generate SSL certificate needed for HTTPS based web access for OCEEMS client.	`Successful execution of the procedure.`

22	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
		`$ 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)`

	is because on first startup, it shows the OCEEMS license agreement and needs manual inputs regarding licensing.	<pre>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</pre>

```
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 tek_cmi_type_cmds_history
```

<table>
<tr><td colspan="2"></td><td>

```
Created table tek_cmi_script_control_modes
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>

</td></tr>
<tr><td>23</td><td>Launch a new session on the OCEEMS machine and login using the non-root user.</td><td>

```
Successful launch of a new session with non-
root user.
```

</td></tr>
<tr><td>24</td><td>Move to /Tekelec/WebNMS/bin directory by issuing the given command.</td><td>

```
$ cd /Tekelec/WebNMS/bin/
```

</td></tr>
<tr><td>25</td><td>Execute installE5MSSchema.sh script to populate CMI, NBI and Measurement module data in OCEEMS database. When prompted by the script, provide the MySQL root user's password.

Note: After successful script completion, OCEEMS server restart is needed once for the data to be populated in OCEEMS application.</td><td>

```
$ sh installE5MSSchema.sh
Please enter MySql password: <password>
```

<Messages given in **LOG MESSAGES ON INSTALLATION OF OCEEMS SCHEMA** are displayed on console>

</td></tr>
<tr><td>26</td><td>Stop the OCEEMS server using the given command.

Note: Restart of the server is required to populate CMI data on OCEEMS GUI.</td><td>

```
$ 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>

</td></tr>
</table>

27	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>```

28	Procedure Complete	This procedure is complete.

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 shuts down, 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 46.5 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. Login credentials of the non-root users created for OCEEMS on the Primary and Standby servers 4. 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 20 from section 2.0 on both the servers (Server 1 and 2).	-

2	One both the servers, update the system's 'hosts' file to add the DNS entries for both primary and standby servers.
	
	On CentOS, the hosts file is placed in '/etc' directory.
		`<PRIMARY SERVER IP> <PRIMARY SERVER HOSTNAME>`
		`<STANDBY SERVER IP> <STANDBY SERVER HOSTNAME>`
		
		Sample entries -
		`10.248.10.25 e5ms1`
		`10.248.10.21 e5ms2`

3	Login as non-root user on server 1 and use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** to generate SSL certificate needed for HTTPS based access for OCEEMS.	`Successful execution of the procedure`

4	Login as non-root user on server 2 and 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	Copy the highlighted on server 1 -
		
		`<ENCRYPTED_TRUST_STORE_PASSWORD>`C70z67Ks4t`</ENCRYPTED_TRUST_STORE_PASSWORD>`
		
		`<ENCRYPTED_KEY_STORE_PASSWORD>`C70z67Ks4t`</ENCRYPTED_KEY_STORE_PASSWORD>`

	the values in the same file on server 2.
	
	Note: Values to be copied from server 1 are highlighted. The value shown highlighted here is just an example and the user needs to copy the specific password as listed in their file on server 1.
		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>`

5	**Note**: Primary and Secondary servers must 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.	Suucessful open of ports if OCEEMS is behind firewall.
6	Execute the steps in section F.1 to setup replication between the servers.	`Successful replication between the servers`

7	On server 1, 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.
		`$ cd /Tekelec/WebNMS/bin`
		
		`$ 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 tek_cmi_type_cmds_history
Created table tek_cmi_script_control_modes
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
```<br><br><Messages given in **LOG MESSAGES ON STARTING OCEEMS SERVER** are displayed on console> |
| 8 | Open a new session on server 1 using the non-root user and move to /Tekelec/WebNMS/bin directory by issuing the given command. | ```
# cd /Tekelec/WebNMS/bin/
``` |
| 9 | Execute installE5MSSchema.sh script to populate CMI, NBI and Measurement module data in OCEEMS database. When required, provide the MySQL root user's password.<br><br>**Note**: Since database replication has already been set up between the two servers, CMI, NBI and Measurement module 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>
```<br><Messages given in **LOG MESSAGES ON INSTALLATION OF OCEEMS SCHEMA** are displayed on console> |
| 10 | On server 2, move to "/Tekelec/WebNMS/bin" directory and start OCEEMS server by using the given command. When required, provide appropriate inputs shown as highlighted.<br><br>**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. | ```
$ cd /Tekelec/WebNMS/bin
$ sh startnms.sh
```<br><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><br>```
Do you accept the LICENSE AGREEMENT   (y/n)
y

       ******* REGISTRATION *******
HOST NAME IS e5ms8


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 : <mark>**\<Path to OCEEMS license file\>**</mark>
		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 OCEEMS Standby Server. The Modules will be started once it takes over as the Primary Server.
		Monitoring the Primary Server at 10.248.9.5
11	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.
12	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
13	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 10.248.9.3 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```

14	Procedure Complete	This procedure is complete.

4.0 UPGRADE PROCEDURE (STANDALONE SERVER- WHEN OS UPGRADE IS REQUIRED)

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	Successful Login

2	Take a backup of the system.
	
	Save the backup created. This will be used after OS upgrade.
		`# cd /Tekelec/WebNMS/bin/backup/`
		
		`# sh BackupDB.sh -d <directory where backup needs to be created>`

3	Install Oracle Linux 7 on the machine.	`Successful installation of Oracle Linux 7`
4	Install OCEEMS 46.2 on Oracle Linux 7. Refer Section 2.0 of OCEEMS 46.2 Install/Upgrade Guide	`Successful installation of OCEEMS 46.2`

5	Restore the backup taken in Step 2.	`# service e5msService stop`
		
		`# cd /Tekelec/WebNMS/bin/backup/`
		
		`# sh RestoreDB.sh <backup_file path>`

6	Start OCEEMS server	`# service e5msService start`
7	Upgrade the system from 46.2 to 46.5. Refer Section 4.0 to upgrade.	Successful Upgrade
8	Procedure Complete	This procedure is complete.

5.0 UPGRADE PROCEDURE (STANDALONE SERVER- WHEN OS UPGRADE NOT REQUIRED)

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

Note: While upgrading to OCEEMS Release 46.5 from releases 46.2 and 46.3, the user shall have to upgrade OCEEMS software as well as license.

5.1 Upgrade OCEEMS License

OCEEMS license upgrade shall be required in the following cases –

- Inter-release upgrade: In case of OCEEMS upgrade to a new release, before starting OCEEMS server, license upgrade to that release shall be required.

- Intra-release upgrade: In case customer purchases some additional features for the currently installed version of OCEEMS, license upgrade with the additional features enabled shall be required.

In case of 46.5, a license upgrade shall be required only when OCEEMS software has been upgraded to 46.5 and a non-root user has been created for OCEEMS as per procedure 5.2. Therefore, the procedure given below assumes that a non-root user for OCEEMS exists on the system.

Purpose	Requirements	Time Required
Upgrading license of OCEEMS	1. Login credentials of the root user on the target OCEEMS server 2. OCEEMS 46.5 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 and the license file should be copied to a location on the server that is accessible to the root user.	5 Minutes

S. No.	Step	Expected Output
1	Login to target machine using the root user.	Successful Login
2	Check the status of OCEEMS server.	`$ service e5msService status`

3	Shutdown OCEEMS server in case it is running. Skip this step is OCEEMS server is not running.	`$ service e5msService stop`
		
		`Stopping OCEEMS server...`
		
		`Warning: Using a password on the command line interface can be insecure.`
		
		`MySql server to be stopped`
		
		`Done.`

4	Check the status of OCEEMS server to verify that OCEEMS server has been shut down.	`$ service e5msService status`
		
		`OCEEMS server is not started!`

5	Change directory to /Tekelec/WebNMS/bin.	`$ cd /Tekelec/WebNMS/bin`

6	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.
	
	The script shall upgrade the OCEEMS license using the license 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 9.0 for details of logging feature.
		``
		$ sh E5MSUpgrade.sh
		Welcome to OCEEMS Upgrade.
		
		Please select one of the following options:
		1. OCEEMS License Upgrade
		2. OCEEMS 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):
		/opt/Upgrade/Rel46.5/OCEEMSLicense46.5.xml
		
		OCEEMS license upgrade is in progress...
		License upgrade done.
		``

7	Execute this step only if customer needs to run OCEEMS using a non-root user, else move to step 10. Execute updatePrivilegesForUser.sh script to create a non-root user for OCEEMS.	``` # sh updatePrivilegesForUser.sh non-root ``` <Messages given in **PROCEDURE TO CREATE A NON-ROOT USER FOR OCEEMS** are displayed. Provide the inputs as required by the script>

8	Logout from 'root' user and login using the non-root user.
	
	Move to "/Tekelec/WebNMS/bin" directory by issuing the given command.
		``
		$ cd /Tekelec/WebNMS/bin/
		``

9	Use the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS** to update the non-root user and its password in OCEEMS.	``` Successful execution of the procedure ```

10	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
		`<Messages given in ` **LOG MESSAGES ON STARTING OCEEMS SERVER** ` are displayed on console>`
11	Procedure Complete	This procedure is complete.

5.2 Upgrade OCEEMS Software (RPM)

OCEEMS software upgrade shall be required in the following cases –

- Inter-release upgrade: When a customer wants to upgrade to a new release of OCEEMS. Upgrade to release 46.5 is supported from releases 46.2 and 46.3.

- Intra-release upgrade: When a customer wants to upgrade to a newer RPM version for the currently installed release of OCEEMS.

Purpose	Requirements	Time Required
Upgrading OCEEMS software (RPM)	1. Admin (root) login details of target OCEEMS server 2. OCEEMS 46.5 RPM copied onto the target OCEEMS server. 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 for the target OCEEMS server	60 to 180 Minutes (Depends upon the size of data in OCEEMS database)

Note: Before upgrading OCEEMS, verify that the system meets all the requirements for OCEEMS given in section 1.4. If the system meets all the requirements, then proceed with the following procedure to upgrade OCEEMS –

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	Successful 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.	Successful execution of the procedure
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	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	If upgrading from version 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. If upgrading from version 46.3, then rename the 'RPMUpgrade_46.3.sh' file available in OCEEMS ISO to 'RPMUpgrade.sh' and copy it to "/Tekelec/WebNMS/bin" directory. If it is an intra release upgrade i.e. upgrade from 46.5.x to 46.5.y, skip this step. 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 /Tekelec/WebNMS/bin/RPMUpgrade.sh # cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? y   # cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.3.sh /Tekelec/WebNMS/bin/RPMUpgrade.sh # 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. To stop MySQL, move to directory "/Tekelec/WebNMS/bin/" and execute "stopMySQL.sh" script if it is running. | ```
# ps -ef | grep mysql
root    59320 59299  0 21:06 pts/0    00:00:00
grep mysql
``` |
| 11 | Change directory to /Tekelec/WebNMS/bin.<br><br>**Note**: If upgrading from version 46.3 and OCEEMS server was running using a non-root user, execute updatePrivilegesForUser.sh script to give back the privileges to root user for upgrade. | ```
# cd /Tekelec/WebNMS/bin


# sh updatePrivilegesForUser.sh root
``` |
| 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.<br><br>**Note**:<br><br>1) 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_462.16.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_463.13.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 46.2 or 46.3 respectively. For intra release upgrade case (upgrade from 46.5.x to 46.5.y), the path of the file provided should be /var/upgrade/Backup_465.x.0/E5MS_Database_BackUp.sql<br><br>2) OCEEMS upgrade logs will be captured in a log file named '/var/upgrade/logs/upgrade_<system date>_<system time | ```
# sh E5MSUpgrade.sh
Welcome to OCEEMS Upgrade.


Please select one of the following options:
1. OCEEMS License Upgrade
2. OCEEMS Software Upgrade
3. Upgrade Both
Press any other key to exit...
Your Input: 2


Please provide the path of OCEEMS RPM file
(including the RPM file name):
/root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm


OCEEMS RPM provided by you is:
/root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm


Are you sure you want to upgrade OCEEMS using
the above RPM file (Y/N)? y
``` |

	stamp>.log'. Please refer to section 9.0 for details of logging feature.	`<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-46.5.0.0.0_465.1.0.x86_64`
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. If it is intra release upgrade (upgrade from 46.5.x to 46.5.y), Skip step14 to step 20)	`Successful opening of ports if OCEEMS is behind firewall.`

15	Execute this step only if customer needs to run OCEEMS using a non-root user, else move to step 19.
	
	Note: If the release prior upgrade was 46.3 and a non-root user was used for OCEEMS operations then it is compulsary to create a non-root user after upgrade.
	
	Execute updatePrivilegesForUser.sh script to create a non-root user for OCEEMS.
		`# sh updatePrivilegesForUser.sh non-root`
		
		`<Messages given in` **PROCEDURE TO CREATE A NON-ROOT USER FOR OCEEMS** `are displayed. Provide the inputs as required by the script>`

16	Logout from 'root' user and login using the non-root user.	`If customer is to use non-root user to run OCEEMS, this step onwards he will not need the root session. All commands are to be executed from non-root admin user. Ideally close down the session that was opened with root user to avoid the chance of running command from root user by mistake. Open a fresh session (PuTTY or whatever) for the non-root admin user.`
17	Move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	`$ cd /Tekelec/WebNMS/bin/`
18	Use the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS** to update the non-root user and its password in OCEEMS.	`Successful execution of the procedure`

19	Start MySQL by executing script 'startMySQL.sh'.	`$ 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
20	Use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	Successful execution of the procedure
21	Procedure Complete	This procedure is complete.

Note:
1. In case of upgrade of OCEEMS software from any previous releases (46.2/46.3) to 46.5, before starting server, license upgrade to 46.5 shall be required. Therefore, after the above procedure is done, installer shall need to upgrade OCEEMS license using procedure 5.1 before starting server using the non-root user for OCEEMS.
2. In case of intra upgrade, wherein OCEEMS software is upgraded from a previous version of 46.5 to a newer version of 46.5, it is assumed that steps 14 to 20 of the above procedure and license upgrade are already done during installation/previous upgrade of 46.5 and shall not be required this time. Therefore, OCEEMS server can be started after step 13.

5.3 Upgrade OCEEMS Software (RPM) and License

Upgrading both OCEEMS software (RPM) and license shall be required in following cases –

- Inter release upgrade: When a customer wants to upgrade to a new release of OCEEMS. Upgrade to release 46.5 is supported from releases 46.2 and 46.3.

- Intra-release upgrade: When a customer wants to upgrade to a newer RPM version for the currently installed release of OCEEMS.

Purpose	Requirements	Time Required
Upgrading software (RPM) and license of OCEEMS	1. Admin (root) login details of target OCEEMS server 2. OCEEMS 46.5 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 46.5 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.	60 to 180 Minutes (Depends upon the size of data in OCEEMS database)

Note: Before upgrading OCEEMS, verify that the system meets all the requirements given in section 1.4. 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.	Successful Login
2	Run the procedure given in **UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO PRESERVE CUSTOM ALARM/EVENT VIEWS** to	Successful execution of the procedure

	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	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	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.
	
	If existing installed version is 46.3, then rename the 'RPMUpgrade_46.3.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
		```# 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
		
		```# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.3.sh /tmp/RPMUpgrade.sh```
		
		```# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin```
		
		```# cp: overwrite `/Tekelec/WebNMS/bin/RPMUpgrade.sh'?``` y

	existing file, provide a response in affirmative as shown highlighted.	

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. To stop MySQL, move to directory "/Tekelec/WebNMS/bin/" and execute "stopMySQL.sh" script if it is running.	`# ps -ef	grep mysql`  `root 59320 59299 0 21:06 pts/0 00:00:00 grep mysql`

11	Change directory to /Tekelec/WebNMS/bin.
	
	Note: If upgrading from version 46.3 and OCEEMS server was running using a non-root user, execute updatePrivilegesForUser.sh script to give back the privileges to root user for upgrade. Else, there is no need to execute this script.
		`# cd /Tekelec/WebNMS/bin`
		
		`# sh updatePrivilegesForUser.sh root`

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) 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_462.16.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_463.13.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 46.2 or 46.3 respectively.
	
	2) OCEEMS software and license upgrade logs shall be captured in
		`# sh E5MSUpgrade.sh`
		`Welcome to OCEEMS Upgrade.`
		
		`Please select one of the following options:`
		`1. OCEEMS License Upgrade`
		`2. OCEEMS Software Upgrade`
		`3. Upgrade Both`
		`Press any other key to exit...`
		`Your Input:` ==3==
		
		`Please provide the path of OCEEMS RPM file (including the RPM file name):`
		==`/root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm`==
		
		`OCEEMS RPM provided by you is:`
		`/root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm`

	a log file named '/var/upgrade/logs/upgrade_<system date>_<system time stamp>.log'. Please refer to section 9.0 for details of logging feature.	`Are you sure you want to upgrade OCEEMS using the above RPM file (Y/N)?` <mark>y</mark>
		
		`<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):`
		<mark>**/var/Upgrade/Rel46.5/E5MSLicense46.5.xml**</mark>
		
		`OCEEMS license upgrade is in progress...`
		
		`License upgrade done.`

13	Verify that the RPM has been upgraded to the intended version.	`# rpm -qa E5-MS`
		
		`E5-MS-`46.5.0.0.0_465.1.0.`x86_64`

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.	`Successful opening of ports if OCEEMS is behind firewall.`
15	Execute this step only if customer needs to run OCEEMS using a non-root user, else move to step 19. Execute updatePrivilegesForUser.sh script to create a non-root user for OCEEMS.	`# sh updatePrivilegesForUser.sh non-root` `<Messages given in` **PROCEDURE TO CREATE A NON-ROOT USER FOR OCEEMS** `are displayed. Provide the inputs as required by the script>`
16	Logout from 'root' user and login using the non-root user.	`If customer is to use non-root user to run OCEEMS, this step onwards s/he will not need the root session. All commands are to be executed from non-root admin user. Ideally close down the session that was opened with root user to avoid the chance of running command from root user by mistake. Open a fresh session (PuTTY or whatever) for the non-root admin user.`
17	Move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	`$ cd /Tekelec/WebNMS/bin/`
18	Use the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS** to	`Successful execution of the procedure`

	update the non-root user and its password in OCEEMS.	

19	Start OCEEMS server. Messages similar to the given shall be displayed on console.	`$ service e5msService start`
		
		`Starting OCEEMS server...`
		
		`Starting mysql`
		
		`/`
		
		`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`
		
		`/`
		
		`Created table tek_cmi_type_cmds_history`
		
		`<Messages given in` **LOG MESSAGES ON STARTING OCEEMS SERVER** `are displayed on console>`

20	Use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	Successful execution of the procedure
21	Procedure Complete	This procedure is complete.

6.0 UPGRADE PROCEDURE (FAILOVER SERVER- WHEN OS UPGRADE IS REQUIRED)

S. No.	Step	Expected Output
1	Login to primary server using administrator (root) login.	Successful Login

2	Take a backup of the system.
	
	Save the backup created. This will be used after OS upgrade.
		`# cd /Tekelec/WebNMS/bin/backup/`
		
		`# sh BackupDB.sh -d <directory where backup needs to be created>`

3	Install Oracle Linux 7 on both primary ans standby server.	`Sucessful installation of Oracle Linux 7.`
4	Create OCEEMS 46.2 failover setup on Oracle Linux 7. Refer Section 3.0 of OCEEMS 46.2 Install/Upgrade Guide	`Successful creation of 46.2 failover setup`
5	Restore the backup taken in Step 2.	`Successful restore`
6	Start OCEEMS server. The servers will start as primary and standby servers.	`# service e5msService start`
7	When the setup is up and running on Linux 7, upgrade the system from 46.2 to 46.5. Refer Section 7.0 to upgrade.	Successful upgrade from 46.2 to 46.5
8	Procedure Complete	This procedure is complete.

7.0　UPGRADE PROCEDURE (FAILOVER SETUP- WHEN OS UPGRADE IS NOT REQUIRED)

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 of primary server shutdown, 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 46.5 from releases 46.2/46.3, the user shall have to upgrade OCEEMS software as well as license.

7.1　Upgrade OCEEMS License

OCEEMS license upgrade shall be required as explained in section 5.1. Upgrading OCEEMS license in a primary-standby setup is equivalent to upgrading license on both the servers one by one. The license shall be upgraded when the server is not running. To make sure that there is no downtime of OCEEMS, it is recommended to first upgrade license on the standby server and then on primary.

Note: In case of 46.5, a license upgrade shall be required only when OCEEMS software has been upgraded to 46.5 and a non-root user has been created for OCEEMS as per procedure 7.2. Therefore, the procedure given below assumes that non-root users for OCEEMS exist on both the primary and standby.

Purpose	Requirements	Time Required
Upgrading OCEEMS license on Primary and Standby servers	1. Login credentials of the root users on the target OCEEMS servers 2. OCEEMS 46.5 license file on the target OCEEMS servers (Primary and Standby). If license file is on an external media, then the media should be mounted onto the target OCEEMS server and the license file should be copied to a location that is accessible to the non-root user for OCEEMS.	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 9 in procedure 5.1 to upgrade OCEEMS license on server 2 (standby).	Successful execution of the procedure

2	Start server 2. It shall come up as standby and 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 OCEEMS 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 the non-root user (if OCEEMS is configured to be operated by non-root user) or the root user for OCEEMS.	Successful 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 9 in procedure 5.1 to upgrade OCEEMS license on server 1.	Successful execution of the procedure

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 OCEEMS Standby Server. The Modules will be started once it takes over as the Primary Server.```
		
		 ```Monitoring the Primary Server at 10.248.21.70```

8	Procedure Complete	This procedure is complete.

7.2 Upgrade OCEEMS Software (RPM)

OCEEMS software upgrade shall be required as explained in section 5.2. 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 46.5 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 to 180 Minutes (Depends upon the size of data in OCEEMS database)

Note: Before upgrading OCEEMS, verify that both primary and standby systems meets all the requirements for OCEEMS given in section 1.4. If the systems meets 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.	Successful 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.	Successful execution of the procedure
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	Copy the 'BackUp.conf' file available in OCEEMS ISO to "/Tekelec/WebNMS/conf" directory.
	 Note that 'BackUp.conf' already exists in "/Tekelec/WebNMS/conf"
		`# cp <Absolute path of OCEEMS ISO>/BackUp.conf /Tekelec/WebNMS/conf`
		
		 `# cp: overwrite`
		 `` `/Tekelec/WebNMS/conf/BackUp.conf'? y ``

	directory, so when the copy command asks for overwriting the existing file, provide a response in affirmative as shown highlighted.	

6	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.	`# 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

	If existing installed version is 46.3, then rename the 'RPMUpgrade_46.3.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_46.3.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.
	
	Note: If upgrading from version 46.3 and OCEEMS server was running using a non-root user, execute updatePrivilegesForUser.sh script to give back the privileges to root user for upgrade. Else, there is no need to execute this script.
		`# sh stopMySQL.sh`
		`Enter password:` <>
		
		`# sh updatePrivilegesForUser.sh root`

11	Login to server 1 (primary) using administrator (root) login.	Successful Login
12	Run the procedure given in **UPDATING DATABASE CHANGES IN XML FILES PRIOR TO UPGRADE TO**	Successful execution of the procedure

	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 `<mark>`<Path where backup file needs to be created>`</mark>
		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	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 `<code>`/Tekelec/WebNMS/conf/BackUp.conf'? </code><mark>`y`</mark>
16	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. If existing installed version is 46.3, then rename the 'RPMUpgrade_46.3.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	`# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.2.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `<code>`/Tekelec/WebNMS/bin/RPMUpgrade.sh'? </code><mark>`y`</mark>  `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.3.sh /tmp/RPMUpgrade.sh` `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin` `# cp: overwrite `<code>`/Tekelec/WebNMS/bin/RPMUpgrade.sh'? </code><mark>`y`</mark>

	existing file, provide a response in affirmative as shown highlighted.	

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.
	
	Note: If upgrading from version 46.3 and OCEEMS server was running using a non-root user, execute updatePrivilegesForUser.sh script to give back the privileges to root user for upgrade. Else, there is no need to execute this script.
		`# sh stopMySQL.sh`
		`Enter password: `==`<>`==
		
		`# sh updatePrivilegesForUser.sh root`

21	On server 1, execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.
	
	Note:
	
	1) 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_462.16.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_463.13.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 46.2 or 46.3 respectively.
	
	2) 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 9.0 for details of logging feature.
		`# sh E5MSUpgrade.sh`
		`Welcome to OCEEMS Upgrade.`
		
		`Please select one of the following options:`
		`1. OCEEMS License Upgrade`
		`2. OCEEMS Software Upgrade`
		`3. Upgrade Both`
		`Press any other key to exit...`
		`Your Input: `==`2`==
		
		`Please provide the path of OCEEMS RPM file (including the RPM file name):`
		==`/root/Documents/E5-MS-`==
		==`46.5.0.0.0_465.1.0.x86_64.rpm`==
		
		`OCEEMS RPM provided by you is:`
		`/root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm`
		
		`Are you sure you want to upgrade OCEEMS 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-46.5.0.0.0_465.1.0.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'? `` <mark>`y`</mark>
		
		`# rm conf/serverparameters.conf`
		
		`rm: remove regular file` `` `conf/serverparameters.conf'? `` <mark>`y`</mark>
		
		`# rm conf/SmartUpdateManager.xml`
		
		`rm: remove regular file` `` `conf/SmartUpdateManager.xml'? `` <mark>`y`</mark>

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_462.16.0/E5MS_Database_BackUp.sql or /var/upgrade/Backup_463.13.0/E5MS_Database_BackUp.sql depending on whether the currently installed release was 46.2 or 46.3 respectively.	Successful execution of the procedure

25	Execute this step only if customer needs to run OCEEMS using non-root user, else move to step 29.
	
	Execute updatePrivilegesForUser.sh script to create a non-root user for OCEEMS.
		`# sh updatePrivilegesForUser.sh non-root`
		
		`<Messages given in ` **`PROCEDURE TO CREATE A NON-ROOT USER FOR OCEEMS`** ` are displayed. Provide the inputs as required by the script>`

26	Logout from 'root' user and login using the non-root user.	`If customer is to use non-root user to run OCEEMS, this step onwards s/he will not need the root session. All commands are to be executed from non-root admin user. Ideally close down the session that was opened with root user to avoid the chance of running command from root user by mistake. Open a fresh session (PuTTY or whatever) for the non-root admin user.`

27	Move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	`$ cd /Tekelec/WebNMS/bin/`
28	Use the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS** to update the non-root user and its password in OCEEMS.	Successful execution of the procedure
29	Login to server 2 (standby) using admin (root) login.	Successful Login
30	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://`<mark>`<hostname of standby server>`</mark>`/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>`
31	On server 2, change directory to /Tekelec/WebNMS/bin.	`# cd /Tekelec/WebNMS/bin`

32	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.
	
	Note:
	
	1) 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 step 24 above and not the one generated by upgrade script on server 2.
	
	2) OCEEMS upgrade logs shall be captured in log file named '/var/upgrade/logs/upgrade_<system date>_<system time stamp>.log'. Please refer to section 9.0 for details of logging feature.
		`# sh E5MSUpgrade.sh`
		`Welcome to OCEEMS Upgrade.`
		
		`Please select one of the following options:`
		`1. OCEEMS License Upgrade`
		`2. OCEEMS Software Upgrade`
		`3. Upgrade Both`
		`Press any other key to exit...`
		`Your Input: `<mark>`2`</mark>
		
		`Please provide the path of OCEEMS RPM file (including the RPM file name):`
		<mark>`/root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm`</mark>
		
		`OCEEMS RPM provided by you is: /root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm`
		
		`Are you sure you want to upgrade OCEEMS using the above RPM file (Y/N)? `<mark>`y`</mark>
		
		`<Messages given in `**`LOG MESSAGES DURING OCEEMS UPGRADE`**` are displayed on console>`

33	Verify that the RPM has been upgraded to the intended version.	``` # rpm -qa E5-MS E5-MS-46.5.0.0.0_465.1.0.x86_64 ```
34	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 ```
35	Execute this step only if customer needs to run OCEEMS using non-root user, else move to step 39. **Note**: If the release prior upgrade was 46.3 and a non-root user was used for OCEEMS operations then it is compulsary to create a non-root user after upgrade. Execute updatePrivilegesForUser.sh script to create a non-root user for OCEEMS.	``` # sh updatePrivilegesForUser.sh non-root ``` <Messages given in **PROCEDURE TO CREATE A NON-ROOT USER FOR OCEEMS** `are displayed. Provide the inputs as required by the script>`
36	Logout from 'root' user and login using the non-root user.	``` If customer is to use non-root user to run OCEEMS, this step onwards s/he will not need the root session. All commands are to be executed from non-root admin user. Ideally close down the session that was opened with root user to avoid the chance of running command from root user by mistake. Open a fresh session (PuTTY or whatever) for the non-root admin user. ```
37	Move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	``` $ cd /Tekelec/WebNMS/bin/ ```
38	Use the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS** to update the non-root user and its password in OCEEMS.	Successful execution of the procedure
39	Login as either non-root users on both the servers (if OCEEMS is configured to be operated by non-	Successful execution of the procedure

	root user) or the root user and execute the steps in section F.2 in to setup database replication between the primary and standby servers.	
40	On server 1, use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	Successful execution of the procedure
41	On server 2, use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	Successful execution of the procedure
42	In case of upgrade from any previous releases (46.2/46/3) to 46.5, license upgrade to 46.5 shall be required. Therefore, installer shall need to upgrade OCEEMS license using procedure 7.1 before starting server using the non-root user for OCEEMS. In that case, skip the next two steps.	Successful execution of the procedure

43	In case of upgrade from any previous version of 46.5 to a newer version of 46.5 (intra-release upgrade), login as either non-root user (if OCEEMS is configured to be operated by non-root user) or the root user on server 1 and start OCEEMS server. It shall start as primary server.	`$ service e5msService start`
		
		`Starting OCEEMS server...`
		
		`MySQL already running`
		
		`OS detected : Linux`
		
		`Created table tek_cmi_type_cmds_history`
		
		`<Messages given in `**`LOG MESSAGES ON STARTING`**
		`OCEEMS SERVER`` are displayed on console>`

44	Login as either non-root user (if OCEEMS is configured to be operated by non-root user) or the root user on server 2 and start OCEEMS server. 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 OCEEMS Standby Server. The Modules will be started once it takes over as the Primary Server. Monitoring the Primary Server at 10.248.9.5
45	Procedure Complete	This procedure is complete.

7.3 Upgrade OCEEMS Software (RPM) and License

OCEEMS software and license upgrade shall be required as explained in section 5.3. The procedure to upgrade OCEEMS software (RPM) and license shall also be similar to procedure 5.3.

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 46.5 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 46.5 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 to 180 Minutes (Depends upon the size of data in OCEEMS database)

Note:

1. There shall be downtime of OCEEMS services during the upgrade procedure.

2. Before upgrading OCEEMS, verify that both primary and standby systems meets all the requirements for OCEEMS given in section 1.4. 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.	Successful 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.	Successful execution of the procedure
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 `<mark>`<Path where backup file needs to be created>`</mark>
		
		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	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'? `<mark>`y`</mark>
6	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. If existing installed version is 46.3, then rename the 'RPMUpgrade_46.3.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'? `<mark>`y`</mark>   `# cp <Absolute path of OCEEMS ISO>/RPMUpgrade_46.3.sh /tmp/RPMUpgrade.sh`  `# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin`  `# cp: overwrite `` `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? `<mark>`y`</mark>

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.	Successful 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.	Successful execution of the procedure
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	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	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.	```# 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```

	If existing installed version is 46.3, then rename the 'RPMUpgrade_46.3.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_46.3.sh /tmp/RPMUpgrade.sh`
		
		`# cp /tmp/RPMUpgrade.sh /Tekelec/WebNMS/bin`
		
		`# cp: overwrite`
		`` `/Tekelec/WebNMS/bin/RPMUpgrade.sh'? `` <mark>y</mark>

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:` <mark><></mark>

18	On server 1, Change directory to /Tekelec/WebNMS/bin.
	
	Stop MySQL by running the script.
	
	Note: If upgrading from version 46.3 and OCEEMS server was running using a non-root user, execute updatePrivilegesForUser.sh script to give back the privileges to root user for upgrade. Else, there is no need to execute this script.
		`# cd /Tekelec/WebNMS/bin`
		`# sh stopMySQL.sh`
		`Enter password:` <mark><></mark>
		
		`# sh updatePrivilegesForUser.sh root`

19	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.
	
	Note:
	
	1) 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_462.16.0/E 5MS_Database_BackUp.sql or /var/upgrade/Backup_463.13.0/E 5MS_Database_BackUp.sql
		`# sh E5MSUpgrade.sh`
		`Welcome to OCEEMS Upgrade.`
		
		`Please select one of the following options:`
		`1. OCEEMS License Upgrade`
		`2. OCEEMS Software Upgrade`
		`3. Upgrade Both`
		`Press any other key to exit...`
		`Your Input:` <mark>3</mark>

	depending on whether the currently installed release was 46.2 or 46.3 respectively.
	
	2) 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 9.0 for details of logging feature.
		```\nPlease provide the path of OCEEMS RPM file\n(including the RPM file name):\n/root/Documents/E5-MS-\n46.5.0.0.0_465.1.0.x86_64.rpm\n\n\nOCEEMS RPM provided by you is:\n/root/Documents/E5-MS-\n46.5.0.0.0_465.1.0.x86_64.rpm\n\n\nAre you sure you want to upgrade OCEEMS using\nthe above RPM file (Y/N)? y\n```
		 `<Messages given in ` **LOG MESSAGES DURING OCEEMS UPGRADE** ` are displayed on console>`
		 ```\nPlease provide the path of license file (along\nwith the license file name):\n``` **/var/Upgrade/Rel46.5/OCEEMSLicense46.5.xml**
		 ```\nOCEEMS license upgrade is in progress...\nLicense upgrade done.\n```

20	Verify that the RPM has been upgraded to the intended version.	```\n# rpm -qa E5-MS\nE5-MS-46.5.0.0.0_465.1.0.x86_64\n```
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 if they exist. 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 -	```\n# cd /var/backup\n\n\n# rm conf/NmsProcessesBE.conf\nrm: remove regular file\n`conf/NmsProcessesBE.conf'? y\n\n\n# rm conf/serverparameters.conf\nrm: remove regular file\n`conf/serverparameters.conf'? y\n\n\n# rm conf/SmartUpdateManager.xml\nrm: remove regular file\n`conf/SmartUpdateManager.xml'? y\n```
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_462.16.0/E5M	Successful execution of the step

	S_Database_BackUp.sql or /var/upgrade/Backup_463.13.0/E5M S_Database_BackUp.sql depending on whether the currently installed release was 46.2 or 46.3 respectively.	

23	Execute this step only if customer needs to run OCEEMS using non-root user, else move to step 27.
	
	Execute updatePrivilegesForUser.sh script to create a non-root user for OCEEMS.
		```# sh updatePrivilegesForUser.sh non-root```
		
		`<Messages given in `**`PROCEDURE TO CREATE A NON-ROOT USER FOR OCEEMS`**` are displayed. Provide the inputs as required by the script>`

24	Logout from 'root' user and login using the non-root user.	`If customer is to use non-root user to run OCEEMS, this step onwards s/he will not need the root session. All commands are to be executed from non-root admin user. Ideally close down the session that was opened with root user to avoid the chance of running command from root user by mistake. Open a fresh session (PuTTY or whatever) for the non-root admin user.`
25	Move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	`$ cd /Tekelec/WebNMS/bin/`
26	Use the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS** to update the non-root user and its password in OCEEMS.	Successful execution of the procedure
27	Login to server 2 (standby) using admin (root) login.	Successful Login
28	On server 2, verify that the JDBC connection in /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml file is pointing to the hostname of the standby server. If not, then update the value to point to the hostname of 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>`

29	Change directory to /Tekelec/WebNMS/bin.
	
	Note: If upgrading from version 46.3 and OCEEMS server was running using a non-root user, execute updatePrivilegesForUser.sh script to give back the privileges to root user for upgrade. Else, there is no need to execute this script.
		```# cd /Tekelec/WebNMS/bin```
		
		```# sh updatePrivilegesForUser.sh root```

30	Execute the E5MSUpgrade.sh script and provide appropriate inputs shown as highlighted.
	
	Note:
	
	1) 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 22 above and not the one generated by upgrade script on server 2.
	
	2) 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 9.0 for details of logging feature.
		```# sh E5MSUpgrade.sh```
		```Welcome to OCEEMS Upgrade.```
		
		```Please select one of the following options:```
		```1. OCEEMS License Upgrade```
		```2. OCEEMS Software Upgrade```
		```3. Upgrade Both```
		```Press any other key to exit...```
		```Your Input: 3```
		
		```Please provide the path of OCEEMS RPM file (including the RPM file name):```
		```/root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm```
		
		```OCEEMS RPM provided by you is:```
		```/root/Documents/E5-MS-46.5.0.0.0_465.1.0.x86_64.rpm```
		
		```Are you sure you want to upgrade OCEEMS 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/Rel46.5/E5MSLicense46.5.xml```
		
		```OCEEMS license upgrade is in progress...```
		```License upgrade done.```

31	Verify that the RPM has been upgraded to the intended version.	```# rpm -qa E5-MS``` ```E5-MS-46.5.0.0.0_465.1.0.x86_64```

32	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 if they exist. 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.	```# 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```

	Run the given commands and provide input in affirmative as shown highlighted -	``` # rm conf/SmartUpdateManager.xml rm: remove regular file `conf/SmartUpdateManager.xml'? y ```
33	Execute this step only if customer needs to run OCEEMS using non-root user, else move to step 37. Move to "/Tekelec/WebNMS/bin" directory and execute updatePrivilegesForUser.sh script to create a non-root user for OCEEMS.	``` # cd /Tekelec/WebNMS/bin/ # sh updatePrivilegesForUser.sh non-root ``` <Messages given in **PROCEDURE TO CREATE A NON-ROOT USER FOR OCEEMS** are displayed. Provide the inputs as required by the script>
34	Logout from 'root' user and login using the non-root user.	If customer is to use non-root user to run OCEEMS, this step onwards s/he will not need the root session. All commands are to be executed from non-root admin user. Ideally close down the session that was opened with root user to avoid the chance of running command from root user by mistake. Open a fresh session (PuTTY or whatever) for the non-root admin user.

35	Move to "/Tekelec/WebNMS/bin" directory by issuing the given command.	```
		$ cd /Tekelec/WebNMS/bin/
		``

36	Use the procedure given in **PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS** to update the non-root user and its password in OCEEMS.	Successful execution of the procedure
37	Login as either non-root users (if OCEEMS is configured to be operated by non-root user) or the root users on both the servers and execute the steps in section F.2 in to setup replication between the servers.	Successful Login
38	As either non-root user (if OCEEMS is configured to be operated by non-root user) or the root user on server 1, use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	Successful execution of the procedure
39	As either non-root user (if OCEEMS is configured to be operated by non-root user) or the root user on server 2, use the procedure given in **UPDATING XML CHANGES IN OCEEMS DATABASE** to update OCEEMS database.	Successful execution of the procedure

40	Start OCEEMS server on server 1 by either non-root user (if OCEEMS is configured to be operated by non-root user) or the root user. It shall start as primary server.	```$ service e5msService start```
		
		```Starting OCEEMS server...```
		
		```MySQL already running```
		
		```OS detected : Linux```
		
		```Created table tek_cmi_type_cmds_history```
		
		```<Messages given in``` **LOG MESSAGES ON STARTING OCEEMS SERVER** ```are displayed on console>```

41	Start OCEEMS server on server 2 as either non-root user (if OCEEMS is configured to be operated by non-root user) or the root user. 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 OCEEMS Standby Server. The Modules will be started once it takes over as the Primary Server.```
		
		```Monitoring the Primary Server at 10.248.9.5```

42	Procedure Complete	This procedure is complete.

8.0 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 8.1 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.

8.1 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.

8.1.1 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**.

8.1.2 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.

8.1.3 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.

8.1.4 Status of restore

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

9.0 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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Press Enter to continue...

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"Upgrades" mean a Major Release identified by the change in the digit to the left of the first decimal place reading from left to right in a Zoho Corp. product release number. For instance, in Zoho Corp. Product Release X.a and Y.a - X and Y are upgrades or Major Releases.

```
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ALONG WITH THIS PRODUCT.

Do you accept the LICENSE AGREEMENT   (y/n)

y
```

APPENDIX B. LOG MESSAGES ON STARTING OCEEMS SERVER

```
Oracle Corporation.

Starting Oracle Communications EAGLE Element Management System "Primary" Server Modules,
please wait
This edition of Oracle Communications EAGLE Element Management System with release
46.5.0.0.0 is a registered version in name of EMS in company Aricent.


Process : NmsAuthenticationManager              [ Started ]
Process : ParseMeasReports                      [ Started ]
Process : CheckReplication                      [ 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

OCEEMS Server modules started successfully at Jun 16, 2016 10:33:26 PM

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

```
Process : PollFE                              [ Started ]
Process : ExampleFE                           [ Started ]
Process : TopoFE                              [ Started ]
Process : MServerFE                           [ Started ]
Process : ProvisioningFE                      [ Started ]
Process : CommunicationFEProcess              [ Started ]
Process : WebNMSMgmtFEProcess                 [ Started ]
```

APPENDIX C. LOG MESSAGES ON STOPPING OCEEMS SERVER

```
Interrupt signal received Shutting down OCEEMS Server


Trying to Shutdown 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 : CheckReplication              [ 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


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.
Data insertion for NBI module: Start
Data insertion for NBI 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 R46.0/46.0.1/46.2. 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.

```
OCEEMS software upgrade is in progress!

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


Please wait! OCEEMS Backup is in progress...

OCEEMS database backup file "E5MS_Database_BackUp.sql" successfully created.

Backup of directories successfully created.

OCEEMS Backup is completed.


OCEEMS RPM upgrade is in progress...

Current RPM version: 462.16.0

Installed OCEEMS rpm version: 462

Current OCEEMS rpm version is lower than the version supporting MySQL 5.6.31.

MySQL version in use is lower than 5.6.31, OCEEMS data needs to be backed up for upgrade.

MySQL already running.

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

MySQL data successfully backed up at /var/upgrade/Backup_462.16.0/MySql_Backup.sql

Invoking MySQL backup, OCEEMS data needs to be backed up for compatibility changes.

Shutting down MySQL, this will break MySQL replication in OCEEMS failover setup! Please
re-setup MySQL replication for OCEEMS failover post upgrade.

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

MySQL release change detected, backing up MySQL directory to
/var/upgrade/Backup_462.16.0/mysql

No MySQL backup directory found.

MySQL backup completed.

MySQL not running.

Starting mysqld ...

... 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_462.16.0/E5MS_Database_BackUp.sql


OCEEMS dump file provided by you is:
/var/upgrade/Backup_462.16.0/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.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.STATSAGGREGATIONDAILY	OK
WebNmsDB.STATSAGGREGATIONHOURLY	OK
WebNmsDB.STATSDATA6_3_2016	OK
WebNmsDB.STRINGDATA6_3_2016	
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_epap	OK
WebNmsDB.Tek_inventory_frame	OK
WebNmsDB.Tek_inventory_lsmsnode	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.smsprofiles                             OK

WebNmsDB.smsserver_out                           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.


OCEEMS configuration files restoration is in progress...

Restore process done.


Adding OCEEMS release 463.5.0 changes...

Starting mysql for upgrading CMI and Measurment module databases.

160603 17:24:06 mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/e5ms12.err'.

160603 17:24:06 mysqld_safe Starting mysqld daemon with databases from
/Tekelec/WebNMS/mysql/data

File changes complete.


CMI table 'tek_cmi_script_control_modes' does not exists! Creating table.

Upgrading CMI script files for setting default script execution control mode to
'Coninue'...

Done!


Restoring 'server.keystore' file from '/Tekelec/WebNMS/conf' into

'/Tekelec/WebNMS/apache/tomcat/conf' directory...

Done!


OCEEMS R46.3 CMI and Measurement Schema changes are applicable.....


OCEEMS CMI custom command classes backup: Start

Custom command Classes:: []

OCEEMS CMI custom command classes backup: Done!


Deleting existing OCEEMS schema........

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!


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 NBI module: Start

Data insertion for NBI 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!

OCEEMS Schema updated successfully.


OCEEMS CMI custom command classes backup restoration: Start

OCEEMS CMI custom command classes backup restoration: Done!


OCEEMS R46.3 CMI and Measurement Schema changes end.

Stoping mysql

160603 17:25:02 mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/e5ms12.pid
ended


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 R46.5 installation, the following details should be known -

- The login credentials of the non-root users created for OCEEMS on both primary and standby servers.
- 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 non-root user for OCEEMS.	-

2	Update the hibernate.cfg.xml file placed in "/Tekelec/WebNMS/classes/hbnlib" directory to replace the 'localhost' value in the given statement 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>`

3	Move to directory /Tekelec/WebNMS/bin.	`$ cd /Tekelec/WebNMS/bin`
4	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.	–
5	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``` |
| 6 | Move to '/Tekelec/WebNMS/mysql/bin' directory. | ```$ cd /Tekelec/WebNMS/mysql/bin``` |
| 7 | 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: 5.6.31-enterprise-commercial-
advanced-log MySQL Enterprise Server - Advanced
Edition (Commercial)

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be trademarks of their respective owners.

mysql>``` |
| 8 | Login in to the standby OCEEMS server using the non-root user configured for OCEEMS. | – |
| 9 | Update the hibernate.cfg.xml file placed in "/Tekelec/WebNMS/classes/hbnlib" directory to replace the 'localhost' value in the given statement with the hostname of the 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/WebNmsD
B?dumpQueriesOnException=true&jdbcCompliantTrunc
ation=false</property>```

As –

```<property
name="connection.url">jdbc:mysql://<hostname of
standby
server>/WebNmsDB?dumpQueriesOnException=true&jdb
cCompliantTruncation=false</property>```

e.g.

```<property
name="connection.url">jdbc:mysql://e5ms2/WebNmsDB?du
mpQueriesOnException=true&jdbcCompliantTruncatio
n=false</property>``` |

10	Move to directory /Tekelec/WebNMS/bin.	`$ cd /Tekelec/WebNMS/bin`
11	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.	-

12	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`

13	Move to '/Tekelec/WebNMS/mysql/bin' directory.	`$ cd /Tekelec/WebNMS/mysql/bin`

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: 5.6.31-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)`
		
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		`mysql>`

15	On the MySQL session opened in step 7 on the primary server, execute the given five MySQL commands. 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
		`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 '<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>';`

	the GRANT REPLICATION SLAVE command.	`FLUSH PRIVILEGES;`

16	On the MySQL session opened in step 14 on the standby server, execute the given five MySQL commands. 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;`

17	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.000002 | 973 | WebNmsDB | mysql |
+---------------+----------+--------------+-------------+
1 row in set (0.00 sec)``` |
| 18 | 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)``` |
| 19 | Execute the given 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;` |
| 20 | Execute the two MySQL commands on the standby server. In the command, replace the values for | `CHANGE MASTER TO MASTER_HOST='<primary server hostname>', MASTER_PORT=3306, MASTER_USER='<primary replication user>', MASTER_PASSWORD='<primary` |

	<PrimaryLogPosition> and <PrimaryLogFile> noted earlier in this procedure.	```replication user password>',
MASTER_LOG_POS=<PrimaryLogPosition>,
MASTER_LOG_FILE='<PrimaryLogFile>';

START SLAVE;``` |
| 21 | 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) ```
22	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)
```

| 23 | 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`<mark>`<password>`</mark>

`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: 5.6.31-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)`

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`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;` |
| 24 | On standby server, login to OCEEMS database and verify that the DUMMY is present by using SHOW TABLES command. | `./mysql -uroot  -p`<mark>`<password>`</mark>

`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: 5.6.31-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)` |

		Copyright (c) 2000, 2016, 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;
25	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)`
26	On primary server, verify that the DUMMY table no more exists in OCEEMS database using `SHOW TABLES` command.	`mysql> SHOW TABLES;`
27	Procedure Complete	This procedure is complete.

Note: For client switchover to function, the entries for primary and standby servers must be done in 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 R46.5, the following details should be known -

- The login credentials of the non-root users created for OCEEMS on both primary and standby servers
- 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 either the non-root user (if OCEEMS is configured to be operated by non-root user) or the root user for OCEEMS.	-
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 by invoking the 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: 5.6.31-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial)`
		
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		`owners.`
		
		`mysql>`

7	Login in to standby OCEEMS server using either the non-root user (if OCEEMS is configured to be operated by non-root user) or the root user for OCEEMS.	–
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 '/Tekelec/WebNMS/mysql/bin' directory.	`$ cd /Tekelec/WebNMS/mysql/bin`

12	Take backup of database and configuration files on the primary server and restore them 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 directory for storing backups. For this, run the following command on both the servers –
		`$ mkdir /tmp/backup`
		
		Note: If the "/tmp/backup" directory is already present on the system, make sure the non-root user configured for OCEEMS has write permission over it.
		
		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 <username>@<ip of secondary server>:/tmp`
		Note: Username shall be either non-root user (if OCEEMS is configured to be operated by non-root user) or the root user
		
		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	Move to 'Tekelec/WebNMS/bin' directory and start MySQL by executing startMySQL.sh script.
	
	After MySQL is started, Move to '/Tekelec/WebNMS/mysql/bin'
		`$ cd /Tekelec/WebNMS/bin`
		
		`$ sh startMySQL.sh`
		
		`$ cd /Tekelec/WebNMS/mysql/bin`

	directory and connect to the MySQL client. 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: 5.6.31-enterprise-commercial- advanced-log MySQL Enterprise Server - Advanced Edition (Commercial) Copyright (c) 2000, 2016, 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> ```
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	``` show grants for '<standby replication user>'@'<primary server hostname>'; ```

	standby replication user is present for primary host by executing the given query.	

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.000002	973	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	`STOP SLAVE;`

	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;``` |
| 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.<br><br>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: 5.6.31-enterprise-commercial-
advanced-log MySQL Enterprise Server - Advanced
Edition (Commercial)

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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`<mark>`<password>`</mark> 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: 5.6.31-enterprise-commercial-advanced-log MySQL Enterprise Server - Advanced Edition (Commercial) Copyright (c) 2000, 2016, 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;
33	Procedure Complete	This procedure is complete.

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

Execute /Tekelec/WebNMS/bin/E5MSConfigurationScript.sh script to update the system user and its password for 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): <non-root system user for OCEEMS>

Enter Password: <above 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.
```

Note: If OCEEMS server is already running when this procedure is applied, then a restart of OCEEMS server shall be required to make the above change effective. Use the following command to restart OCEEMS -

```
service e5msService restart
```

Note that if it is first time configuration and e5ms software is not running, do not restart the e5ms service. Go back to the installation step. Please check whether OCEEMS server is running or not by using the following command:

```
service e5msService status
```

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 -uroot -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: 5.6.31-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 -uroot -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: 5.6.31-enterprise-commercial-advanced-log MySQL Enterprise
    Server - Advanced Edition (Commercial)

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    affiliates. Other names may be trademarks of their respective owners.
    ```

    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 A NON-ROOT USER FOR OCEEMS

Before release 46.3, OCEEMS supported installation/upgrade as well as regular operations (like start/stop/restart of server and updates in configuration files) through super user 'root' only. Starting release 46.3, OCEEMS shall restrict the use of 'root' user to installation/upgrade procedure only. After installation/upgrade of OCEEMS, the 'root' user shall be required to run /Tekelec/WebNMS/bin/updatePrivilegesForUser.sh script. This script shall create a non-root user for OCEEMS operations (start/stop/restart of server and updates in configuration files) as well as do the initial configuration that is required by OCEEMS and can be done only by the system admin account. The tasks performed by the script when run with option 'non-root' are given below -

- Create a non-root system user for OCEEMS operations (script shall provide the option to create a new system user or update an existing system user)
- Create a new group or update an existing group to be associated to the above non-root user
- Assign group ownership of various OCEEMS directories to the above group
- Configure SNMP trap receiving port for OCEEMS for traps coming from IPv4 and IPv6 based network devices

A sample run of the script with 'non-root' option has been provided below (inputs provided by the user have been highlighted) -

```
[root@localhost bin]# sh updatePrivilegesForUser.sh non-root

The script shall try to create a non-root user on the system with limited
privileges for operation(start/stop/configuration) of OCEEMS...

This user can be an existing user or a non-existing user...

In case of a non-existing user, script shall create the user and provide
required privileges for operation of OCEEMS...

In case of an existing user, the user's privileges shall be updated to
enable operation of OCEEMS...

The recommended non-root user created will be 'emsadmuser' with group
'emsadm'...

Do you want to proceed with default non-root user? (y/n)y

The script will now continue with the default username and group....

Please provide the password for the user –
(Non-empty, no spaces, only with permitted characters- alphanumeric, !, @ and
#):
Please provide the SNMP trap forwarding port configured on devices (EAGLE/EPAP/LSMS)
for OCEEMS (default is 162):

Are you sure you want to procced with default port 162 (Y/N)? y

Proceeding with port 162...

Since port 162 is a reserved port for root processes, OCEEMS started with
a non-root user can not listen to it...

Therefore, OCEEMS needs an unreserved port, to which the SNMP traps coming
from devices (EAGLE/EPAP/LSMS) at port 162, shall be forwarded...

OCEEMS shall then listen to this unreserved port for all the SNMP traps...

Please provide a port number in range [1024-65535] that OCEEMS shall listen
to for SNMP traps (default is 64000):

Proceeding with port 64000...
```

```
Are you sure you want to procced with default port 64000 (Y/N)? y

Do you want to support network devices over IPV6?(Y/N) n

Adding PREROUTING entry in iptables for forwarding of SNMP traps coming on port
162 to 64000.
Done!

Saving PREROUTING entry to persist on machine restart.
Done!

Updating value of 'trapport' parameter in /Tekelec/WebNMS/conf/trapport.conf to 64000.
Done!

Creating non-root user 'emsuser' with group 'emsgroup'.

Done!

Changing group ownership of OCEEMS directories to group 'emsgroup'.
Done!

Modifying read/write permissions for OCEEMS directories.
Done!

Providing sudo access to user 'emsuser' for system command 'lsof'.
Done!

OCEEMS operations (start/stop/configuration) can now be done using user 'emsuser'.

Close this session and start a new session using user 'emsuser' to proceed with
OCEEMS operation with user 'emsuser'.
```

APPENDIX J. 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 –

```
[emsadmuser@e5ms8 bin]$ cd /Tekelec/WebNMS/bin

[emsadmuser@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 K. 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 L. 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) Verify that the CLASSPATH value in '/Tekelec/WebNMS/bin/developertools/DBXmlTool.sh' file includes the entries "./NetMonitor/build/E5MS_Common.jar:./NetMonitor/build/E5MS_Server.jar:" If these enties are not there, add them 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) Move to /Tekelec/WebNMS/bin/developertools directory.

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

3) 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 M. UPDATING XML CHANGES IN OCEEMS DATABASE

In R46.0, "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. After upgrade to R46.0, for pre-upgrade OCEEMS users to see the 'Command Class Management' link in OCEEMS client, the **updateUsers.sh** script 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. All such changes are available in XML files. Script **'/Tekelec/WebNMS/bin/developertools/updateUsers.sh'** should be run to pick the above changes from XML files and update users' information in OCEEMS database.

Follow the below given steps to execute updateUsers.sh script to update users' information in OCEEMS database -

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 N. 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 O. 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 P. 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 Q. 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 OCEEMS database from the dump file:
/var/backup/E5MS_Database_BackUp.sql


OCEEMS database restoration in progress...


Successfully restored OCEEMS database.


The following files will be restored now to OCEEMS:


/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

```
OCEEMS successfully restored.
```

APPENDIX R. INSTALLATION OF JAVA RUNTIME FOR OCEEMS

Java Runtime (JRE) package 1.8 or higher (64-bit) is required to run OCEEMS application. The following sections describe the steps needed for intsllation of JRE on the system as required by OCEEMS.

1.1.1 Installation of JRE on system

In case Java is not installed on the machine or a lower version is installed, the user shall be required to download the 64-bit package from the link http://www.java.com/en/download/ and install/upgrade it. After installation, it is advised to note down the absolute path of 'jre' directory in the Java installation on the system (it shall be needed in the section 1.1.2 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. Note that JAVA_HOME should be set properly for running OCEEMS server.

1.1.2 Setting JAVA_HOME system variable

Before proceeding with the installation/upgrade of Release 46.5 of OCEEMS, the user shall be required to create (if it does not already exist) or update (if it exists but points to an older JRE) the system variable JAVA_HOME using the steps given below –

1) Login to machine using system user 'root'.

2) Check if java is installed. Under Oracle Linux, run the following command.
   # find / -name jre

   If the output is blank that means java is not installed on system. Please install java and then proceed to step-5.

3) If Java is installed, Check if JAVA_HOME is already set. Under Oracle Linux, Run the following command.
   # echo $JAVA_HOME
   If output is blank, JAVA_HOME is not set. Go to step 5.

4) If JAVA_HOME is set, check if it is set to correct path. Check that the path of jre found in step-2 above and the path of JAVA_HOME found in step-3 above are same or not. If path is same, this procedure is
   complete.

   If JAVA_HOME path is not properly set, Go to step-5

5) Move to /etc/profile.d directory.
   # cd /etc/profile.d

6) Create a new file named custom.sh. Skip this step if the file already exists in the directory.
   # touch custom.sh

7) In file 'custom.sh', verify the export statement for the JAVA_HOME variable. Add a new export statement (if not already exists) or update the existing export statement (if points to an older JRE path) to point to the absolute path of the 'jre' folder present in the Java installed on the system in section 1.1.1.
   export JAVA_HOME=<absolute path of the 'jre' folder present in the Java installation>

   e.g. if Java is installed in directory /usr/java/jdk1.8.0_91, then the statement in 'custom.sh' shall be -
   export JAVA_HOME=/usr/java/jdk1.8.0_91/jre

8) Save the file and exit the command terminal.

9) Login again using system user 'root' and verify that the value of JAVA_HOME variable. It should point to the version of java installed in section 1.1.1.
   # echo $JAVA_HOME
   /usr/java/jdk1.8.0_91/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 1.8 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 1.8, 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 Java verification on OCEEMS server startup

After successful installation/upgrade to OCEEMS release 46.5, 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 1.8 or higher should be installed** - If the Java version pointed to by the JAVA_HOME variable is not as per OCEEMS recommendation (i.e. 1.8 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 S. IPV6 SUPPORT ON OCEEMS

OCEEMS R46.3 can support EPAP version 16.1 that comes with IPv6 support. A precondition for OCEEMS to support IPv6 enabled EPAP devices is that the machine on which OCEEMS is installed should be dual stack (that is support IPv4 and IPv6 both).

APPENDIX T. 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 U. 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.

APPENDIX V. PROCEDURE TO MOUNT OCEEMS ISO FILE

To proceed with OCEEMS 46.5 installation/upgrade, the OCEEMS iso file should be mounted on the system. To mount the iso file, follow the steps given below:

1) Create a directory:

   ```
   mkdir /mnt/oceems
   ```

2) Mount the ISO:

   ```
   mount -o loop <path to OCEEMS ISO file> /mnt/oceems
   ```

3) On running 'ls –ltr' on the '/mnt/oceems' directory, output similar to the following shall appear:

   ```
   -r-xr-xr-x   1 root root      2542 May 30 09:44 BackUp.conf

   -r--r--r--   1 root root 511695525 May 30 09:44 E5-MS-
   46.5.0.0.0_465.7.0.x86_64.rpm

   dr-xr-xr-x   2 root root      2048 May 30 09:42 Packages

   -r-xr-xr-x   1 root root      6332 May 30 09:44 RPMUpgrade_45.0.1.sh

   -r-xr-xr-x   1 root root      8533 May 30 09:44 RPMUpgrade_46.0.1.sh

   -r-xr-xr-x   1 root root      8533 May 30 09:44 RPMUpgrade_46.0.sh

   -r-xr-xr-x   1 root root      9863 May 30 09:44 RPMUpgrade_46.2.sh

   -r-xr-xr-x   1 root root      9862 May 30 09:44 RPMUpgrade_46.3.sh

   -r--r--r--   1 root root      2937 May 30 09:45 TRANS.TBL

   dr-xr-xr-x   4 root root      2048 May 30 09:42 umvt

   -r-xr-xr-x   1 root root      1230 May 30 09:44 updateUsers.sh

   dr-xr-xr-x   4 root root      2048 May 30 09:42 upgrade

   -r--r--r--   1 root root        36 May 30 09:45 uuid
   ```

APPENDIX W. CHANGE TEMP DIRECTORY FOR MYSQL

OCEEMS users can update the Temporary directory used by MySQL from /tmp to user-defined directory. User needs to execute changeMysqlTmpdir.sh script and restart OCEEMS MySQL process. The changeMysqlTmpdir.sh script is utilized to redefine the MySQL temp directory variable (tmpdir). This setting change is necessary for systems with limited space in the /tmp directory. For large OCEEMS setups, the size of MySQL cache file can be large, so it's recommended that users shall update their MySQL tmpdir path using the following procedure.

Following steps shall be executed, after all the steps for installation/upgrade are executed and the OCEEMS server is up and running. After executing the changeMysqlTmpdir.sh script, restart the OCEEMS server to reload the updated configuration. Execute this script with the same user as the cuurent OCEEMS user (root/nonroot) and new directory path shall have same access rights as OCEEMS user.

To proceed with changing the temporary directory for MySQL, follow the steps given below:

1) Go to /Tekelec/WebNMS/bin/ where changeMysqlTmpdir.sh file is present

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

2) Execute changeMysqlTmpdir.sh script

```
sh changeMysqlTmpdir.sh


######################################################################
###########
This Script will update the directory used by MySQL, for creating
temporary files.
By Default MySQL uses /tmp directory, In case user wish to change this
directory.
Please continue executing this script, a new /tmp Directory will be
created as
/Tekelec/WebNMS/tmp by Default, or user can provide a valid Directory
path as input
Restart OCEEMS MySQL Process in order to let these changes take place.


Execute this script with the same user as your OCEEMS user & new directory path
shall have same access rights as OCEEMS user.

######################################################################
###########
Do you want to continue, changing the temporary directory for MySQL (Y/N)?
Y


Enter path for updating MySQL Temp directory (Default is:
/Tekelec/WebNMS/tmp)
Press Enter for selecting the default Directory or provide you input:
/Tekelec/WebNMS/mysqlTmp
MySQL temp directory changed to /Tekelec/WebNMS/mysqlTmp
```

3) Restart MySQL service in order to let this change take place. Execute OCEEMS service start

```
service e5msService stop
```

User can verify that mysql process is killed, execute

```
ps –ef | grep mysql

[root@e5ms1 bin]# ps -ef | grep mysql
root      34680 34064  0 01:11 pts/4    00:00:00 grep --color=auto
mysql

service e5msService start
```

User can verify that MySQL temp directory changed by logging into MySQL, execute following steps:

```
cd /Tekelec/WebNMS/mysql/bin

sh mysql -uroot -ppublic WebNmsDB
Warning: Using a password on the command line interface can be
insecure.
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 1
Server version: 5.6.31-enterprise-commercial-advanced-log MySQL
Enterprise Server - Advanced Edition (Commercial)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

mysql> show variables like '%tmp%';
+--------------------------+------------------------+
| Variable_name            | Value                  |
+--------------------------+------------------------+
| default_tmp_storage_engine | InnoDB               |
| innodb_tmpdir            |                        |
| max_tmp_tables           | 32                     |
| slave_load_tmpdir        | /Tekelec/WebNMS/mysqlTmp |
| tmp_table_size           | 16777216               |
| tmpdir                   | /Tekelec/WebNMS/mysqlTmp |
+--------------------------+------------------------+
6 rows in set (0.00 sec)
```

APPENDIX X. PROCEDURE TO UNINSTALL OCEEMS

S. No.	Step	Expected Output
1	Login to target machine using administrator (root) login.	-
2	Shutdown the OCEEMS server.	`# service e5msService stop`
3	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. To stop MySQL, move to directory "/Tekelec/WebNMS/bin/" and execute "stopMySQL.sh" script if it is running.	`# ps -ef	grep mysql`  `root 59320 59299 0 21:06 pts/0 00:00:00 grep mysql`
4	Remove the OCEEMS application	`# rpm -ev E5-MS`
5	Procedure Complete	This procedure is complete.

APPENDIX Y. PROCEDURE TO OPEN OCEEMS CLIENT GUI

S. No.	Step	Expected Output
1	Open a browser	Open a compatible browser of Microsoft® Internet Explorer version 11.0 (or later) or Mozilla Firefox® version 39.0 (or later).
2	Open the OCEEMS Client GUI	On the browser address bar, input the following URL. htts://<OCEEMS server IP>:8443 Press Enter. Input the values as is asked. If more details are required, refer the document "Interface User Guide", section "OCEEMS Graphical User Interface".
3	Check GUI is working	Check that OCEEMS client GUI opens properly.