Oracle® Communications
EAGLE Element Management System

Install/Upgrade Guide

Release 47.0

F98323-06

April 2025

Oracle Communications EAGLE Element Management System Install/Upgrade Guide, Release 47.0

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 U for instructions on accessing My Oracle Support.

What's New in This Guide

This section introduces the documentation updates for Release 47.0 in Oracle Communications EMS Install/Upgrade Guide.

Release 47.0 – F98323-06, April 2025

- Made the following updates in Chapter 4, Upgrade Procedure (Standalone/Failover Server).
  - Updated the steps to perform the upgrade procedure.
  - Removed Notes 4, 5, and 6 from step 10.
  - Updated the folder name from "sch" with "/usr/java/jdk-17/conf/security" in step 11.
  - Updated the folder name from "sc" with "/usr/java/jdk-17/conf/security" in step 19.
  - Updated the note in step 26.
- Added Chapter 5 EMS Failover Upgrade.

Release 47.0 – F98323-05, January 2025

Added Chapter 7 Baremetal to VM Migration.

Release 47.0 – F98323-04, December 2024

Added a new section to list the steps to upgrade the OCEEMS license.

Release 47.0 – F98323-03, November 2024

Updated the steps to configure OpenLDAP Client in Appendix Z.

Release 47.0 – F98323-02, September 2024

- Added a note about EMS's compatibility with RHEL in the Hardware and Operating System section.
- Added the section OpenWebStart Configuration to list the steps to configure the OpenWebStart software.

Release 47.0 – F98323-01, June 2024

- Updated the release version to 47.0 in the entire document.
- Updated the Oracle Linux version to 8.8 in the entire document.
- Updated the Introduction chapter for release 47.0.
- Updated the procedure to uninstall OCEEMS in Appendix X.
- Added the package ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm in the Required Packages/Libraries section.
- Updated the Oracle Linux version and Java versions tested with the EMS releases in the Hardware and Operating Design section.
- Updated the Java version and Java Runtime Environment details in the Java Runtime section.
- Updated the build details for Java (TM) SE Runtime Environment and the note about the Java version corresponding to EMS version in the Java Runtime Environment (JRE) section.
- Updated the versions for the packages, that EMS 47.0 has been tested with, in the Required Packages and Libraries section.
- Updated the sample output for the command used at all the managed EAGLEs to start sending measurement files at the new path using the non-root user configured for OCEEMS in the Changes needed in EAGLE configuration for FTP path and user section.

- Updated the information about the web browsers to access the OCEEMS login page in the Web Browser Requirements section.
- Removed the sections Upgrade Provcedure (StandAlone Server - When OS Upgrade is not required) and Upgrade Provcedure (FailOver Setup - When OS Upgrade is not required) from Chapter 1.
- Made the following updates in the Installation Procedure (Standalone Server) chapter:
    - Updated the command to install OCEEMS RPM in step 8.
    - Updated the command to start OCEEMS server 1 and server 2 in steps 22 and 27 respectively.
    - Added step 28 to provide information about performing the Key Exchange steps on server 1 and 2.
    - Added a note with the reference to the "Procedure to Create OCEEMS SSL Certificate" to generate the necessary SSL certificate for HTTPS-based web access for the OCEEMS client after the procedure to install OCEEMS.
- Made the following updates in Installation Procedure (FailOver Setup) chapter:
    - Updated the command to start the OCEEMS server 1 and server 2 in step 7 and step 10 respectively.
    - Added step 14 to provide information about performing the Key Exchange procedure on server 1 and 2.
- Removed the following chapters:
    - Upgrade Procedure (STANDALONE SERVER - WHEN OS UPGRADE NOT REQUIRED)
    - Upgrade Procedure (FAILOVER SERVER - WHEN OS UPGRADE IS REQUIRED)
    - Upgrade Procedure (FAILOVER SERVER - WHEN OS UPGRADE IS NOT REQUIRED)
- Updated the command to connect to MySQL client in the following sections:
    - In steps 8, 17, 27, and 28 in Appendix F1.
    - In steps 7, 17, and 33 in in Appendix F2.
    - In step 3 in Appendix W.
- Updated the information about the installation of CMI Schema in Appendix D.
- Updated the sript to update the system user in Appendix G.
- Updated the command to update MySQL root user's password for standalone server in step 3a in Appendix H.
- Updated the command to update MySQL root user's password for failover setup in step 1a in Appendix H.
- Updated the E5MSConfigurationScript.sh script in step 4 in APPENDIX P.
- Added Appendix AD to list the steps to exchange the keys between the local and remote setup.
- Added Appendix B to list the steps to set the debug logs ON/OFF.
- Added Appendix T to list the steps to set up Eagle passwords for Eagle Alarm Severity pop-up.
- Added the Upgrade Procedure (Standalone/Failover Server) chapter to list the steps to perform the upgrade procedure on standalone server.
- Replaced instances of STOP SLAVE with STOP REPLICA and RESET MASTER with RESET BINARY LOGS AND GTIDS in Appendix F.
- Replaced SHOW SLAVE STATUS \G; with SHOW REPLICA STATUS \G; in steps 25 and 26 in Appendix F.
- Updated the expected output for the MySQL commands on the primary and standby servers in steps 23 and 24 respectively in Appendix F.
- Removed the step to take a backup of the OCEEMS database on the PRIMARY system in Appendix F.
- Updated the expected output in steps 5, 13, 14, 18, 19, and 26 in Appendix F1.
- Updated step 4 and its expected output in Appendix F1.
- Updates step 12 and its expected output in Appendix F1.
- Updated step 4 and its expected output in Appendix F2.
- Updated the expected output in steps 11, 12, 22, 26, and 34 in Appendix F2.
- Updated the title of Appendix R from INSTALLATION OF JAVA RUNTIME FOR OCEEMS to INSTALLATION OF JAVA DEVELOPMENT KIT FOR OCEEMS and the version of Java Development Kit in the section.
- Updated the software package versions in Appendix AA.
- Updated the package versions in the Package Requirements section in Appendix AB.

TABLE OF CONTENTS

List of Tables

1.0 INTRODUCTION

Release 47.0 of Oracle® Communications EAGLE Element Management System (hereafter referred to as “OCEEMS”) is a major release of OCEEMS product after the release 46.6. Existing customers, who are at release 46.3 or 46.5 can upgrade to release 46.6. Additionally, customers can also directly install release 46.6 on their systems.

OCEEMS release 47.0. has fixes for many must-fix bugs and various enhancements such as Oracle Linux uplift to version 8.8, MySQL uplift to version 8.4, and support for Java 17, TLS v1.3, and SNMPv3. This release also introduces features such as savelogs, Automatic Prune Binary Logs, and ryslog on OCEEMS.

1.1 PURPOSE AND SCOPE

This document is a reference for the installation and upgrade procedure of release 47.0 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 47.0 Install/Upgrade Guide
[4] OCEEMS 47.0 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 mistakes 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

Note: OCEEMS is not an engineered system and ORACLE does not provide the Hardware or Operating System as a bundled package with OCEEMS. Both Hardware and Operating System (Oracle Linux) are owned and maintained by the customer. The customer installs and maintains the operating system. And the customer needs to download Oracle Linux OS from OSDC as explained in Appendix AC. Also, the customer should apply security patches time to time when the Operating System vendor comes with security updates.

Customers are responsible for installing/maintaining/upgrading Hardware and Operating System (Oracle Linux 8). They need to download the Oracle Linux OS from OSDC as explained in Appendix AC: Download Oracle linux from OSDC. Also, they should make sure to use the latest updates of Oracle Linux 8. The operating system updates need to be applied frequently.

Note:

- For any support on the Oracle Linux installation/upgrade/security patch updates, customers should contact Oracle Linux Support.
- EMS also works with similar version of RHEL as that of Oracle Linux (OL 8). For any support on the RHEL installation/upgrade/security patch updates, customers should contact RHEL Support.

Release 47.0 of OCEEMS is tested on the following platforms and OS –

Virtual Machine (VM):

Following is the **minimum** configuration on which different types of OCEEMS have been successfully tested.

OCEEMS Configuration	Number of Element (Eagle/LSMS/EPAP) Managed	Logical Host CPUs	Memory (RAM)	Hard Disk
Small	4	2	8 GB	500GB
Medium	20	4	16 GB	500GB
Large	50	4	16 GB	500GB

Note: Different customers will have different loads from their managed System (Eagles). The above table is for reference only. VMs with the above resources have been tested with typical load explained below.

Following is the typical load and CPU usage observed in the lab:

OCEEMS Configuration	Number of Element (Eagle/LSMS/EPAP) managed	Measurement File Load	Alarm Load	CPU Usage	Memory Usage
Small	4	26 measurement files/hour	3600 Alarms/hour	<10%	5.4 GB used/ 2.6 GB free
Medium	20	26 measurement files/hour	10800 Alarms/hour	<10%	11 GB used/ 5 GB free
Large	50	26 measurement files/hour	10800 Alarms/hour	<10%	12 GB/ 4 GB free

Note:
Looking at the fact that the CPU usage is less than 10%, the increase of the measurement file load should be handled by the above configuration easily. As a thumb rule, if customers see the CPU usage shooting to 60% in their environment in a day to day operation, they should consider adding more CPUs to the VM as a precaution.
If customers are using Reporting Studio, it is advised to increase the CPU and memory as per their report size and database size, typically, double the resources if they are using Reporting Studio.

The following table lists the Oracle Linux and Java versions tested with the EMS releases:

EMS Release	Oracle Linux Version	Java Version
46.6.2	7.2	1.8.0-161 (64 bit)
46.6.4 47.0	7.8 8.8	1.8.0-261 (64 bit) Java HotSpot(TM) 64-Bit Server VM (build 17+35-LTS-2724, mixed mode, sharing)

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**.

Following is a typical disk space allocation on a Lab Server, which has 1200GB Hard disk space available. Note that 1.1 TB out of 1.2 TB is allocated to "/" partition.

```
[root@pc9091801 ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        126G     0  126G   0% /dev
tmpfs           126G     0  126G   0% /dev/shm
tmpfs           126G  2.1G  124G   2% /run
tmpfs           126G     0  126G   0% /sys/fs/cgroup
/dev/sda2       1.1T  127G  974G  12% /
tmpfs            26G     0   26G   0% /run/user/1007
/tmpfs           26G     0   26G   0% /run/user/1005
tmpfs            26G     0   26G   0% /run/user/0
```

Following is a typical disk space allocation on a Lab Machine, which has 500GB Hard disk space available. Note that 450GB out of 500GB is allocated to "/" partition.

```
[root@EMS ~]# df -h
Filesystem          Size  Used Avail Use% Mounted on
devtmpfs            3.7G     0  3.7G   0% /dev
tmpfs               3.8G     0  3.8G   0% /dev/shm
tmpfs               3.8G  407M  3.4G  11% /run
tmpfs               3.8G     0  3.8G   0% /sys/fs/cgroup
/dev/mapper/ol-root  450G   35G  416G   8% /
/dev/mapper/ol-home  4.0G  726M  3.3G  18% /home
/dev/sda1           1014M  280M  735M  28% /boot
tmpfs               762M  1.2M  761M   1% /run/user/42
```

Note: If /tmp is mounted as separate partition make sure enough space is available in /tmp partition/directory.

1.4.3 Software Package Requirements

1.4.3.1 Prerequisite packages

Following are some of the rpms/packages missing under Oracle Linux 8.8 and are required to be present in the server. Install these rpms before moving ahead with the installation of OCEEMS 47.0.

'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 8.8. This package is required during OCEEMS installation.

'unzip' command must be installed as it is required during installation of i-net Clear Reports.

'PHP' package should be install on the system to use the EAGLE OCEEMS decoupling feature.

For LDAP authentication, a suitable LDAP client should be installed on the OCEEMS machine. A TLS connection should be tested with the LDAP server before enabling LDAP authentication from OCEEMS. As mentioned in FRS, for our testing purpose we have used OpenLDAP server and client. For any other LDAP server, LDAP client should be configured on OCEEMS server and tested from command line before using LDAP Authentication on OCEEMS.

sssd package should also be installed on the OCEEMS server where the LDAP client must be configured. Steps to configure LDAP client are prsenet in APPENDIX Z, APPENDIX Z.2 and APPENDIX Z.3.

Note: Without all these rpms in place, installation will fail. Make sure to install 64 bit version of the rpms as the Oracle Linux 8.8 is 64 bit.

1.4.3.2 Java Runtime

Note: The Java version in this section corresponds to EMS 47.0. For EMS 47.0, use Java version as follows:
java version "17" 2021-09-14 LTS

Java(TM) SE Runtime Environment (build 17+35-LTS-2724)

Java HotSpot(TM) 64-Bit Server VM (build 17+35-LTS-2724, mixed mode, sharing)

Oracle Java (TM) SE Runtime Environment (build 17+35-LTS-2724) should be available on the system and JAVA_HOME should be set properly for running OCEEMS server. Follow the steps mentioned in Appendix R irrespective of Java (TM) SE Runtime Environment (build 17+35-LTS-2724) is installed in the system or not.

Note: OCEEMS 46.6.4 is tested with JRE 1.8.0_261. It may not work properly with other Java versions (major or minor).

Note: OCEEMS 46.6.2 is tested with JRE 1.8.0_161. It may not work properly with other Java versions (major or minor).

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 Required Packages/Libraries

Package	EMS 47.0 is tested with the following versions	Comments
bc	1.07.1-5.el8.x86_64	
lsof	4.93.2-1.el8.x86_64	
libaio	0.3.112-1.el8.x86_64	
unzip	6.0-46.0.1.el8.x86_64	
php	7.2.24-1.module+el8.2.0+5510+6771133c.x86_64	Only required if we want to use the 'Decoupling EMS from Eagle' feature
php-xml	7.2.24-1.module+el8.2.0+5510+6771133c.x86_64	Only required if we want to use the 'Decoupling EMS from Eagle' feature
wget	1.19.5-11.0.1.el8.x86_64	Only required if we want to use the 'Decoupling EMS from Eagle' feature
php-posix (php-process)	5.4.16-48	Only required if we want to use the 'Decoupling EMS from Eagle' feature
libssh2 (extn for php)	libssh2-1.9.0-20200917	Only required if we want to use the 'Decoupling EMS from Eagle' feature in SSH mode
ssh2 (extn for php)	ssh2-1.2	Only required if we want to use the 'Decoupling EMS from Eagle' feature in SSH mode
openldap openldap-client	2.4.46-18.el8.x86_64	Only required if we want to use LDAP Authentication in OCEEMS
sssd sssd-ldap sssd-krb5-common sssd-nfs-idmap sssd-common sssd-ipa sssd-client sssd-ad sssd-proxy sssd-kcm sssd-common-pac sssd-krb5 python3-sssdconfig	2.8.2-2.0.1.el8.x86_64	Only required if we want to use LDAP Authentication in OCEEMS

Jdk (java) 1.8.161 only	17-17-ga.x86_64 (EMS 47.0)	
openssh openssh-server openssh-clients	8.0p1-17.el8.x86_64	
telnet telnet-server	0.17-76.el8.x86_64	
vsftpd	3.0.3-36.el8.x86_64	
iptables iptables-services iptables-utils iptables-devel	1.8.4-24.0.1.el8.x86_64	

1.4.3.6 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 –
    - In case of fresh installation of OCEEMS, customer shall configure ftp path "/opt/E5-MS/measurement/csvinput" on EAGLE.
    - 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 47.0, 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 7.1.4.1.9 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 and above, 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 24-05-22 17:13:31 MST  EAGLE 47.1.0.0.0-79.32.0
 chg-ftp-serv:ipaddr=10.248.10.21:app=meas:path="/opt/E5-
      MS/measurement/csvinput":login=ems1
 Command entered at terminal #19.
;


Enter Password :


 tekelecstp 24-05-22 17:19:30 MST EAGLE  47.1.0.0.0-79.32.0
 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
```

1.4.10 Requirements for connection between Active and Standby systems

The connectivity speed between the Active and Standby server should not be less than 100 Mb/s. This is required to ensure that all the database and file sync between the server is properly done.

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® Edge Version 125.0.2535.51 (Official build) (64-bit) or later Mozilla Firefox® Version 115.11.0 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 (TM) SE Runtime Environment (build 17+35-LTS-2724) installed and the browser of choice should have Java enabled.

Note: The Java version in this section corresponds to EMS 47.0. For EMS 46.6.4, use Java version [Java Runtime 1.8.0_261 (64 bit)]. For EMS 46.6.2, use Java version 1.8.0-161 (64 bit). 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 -

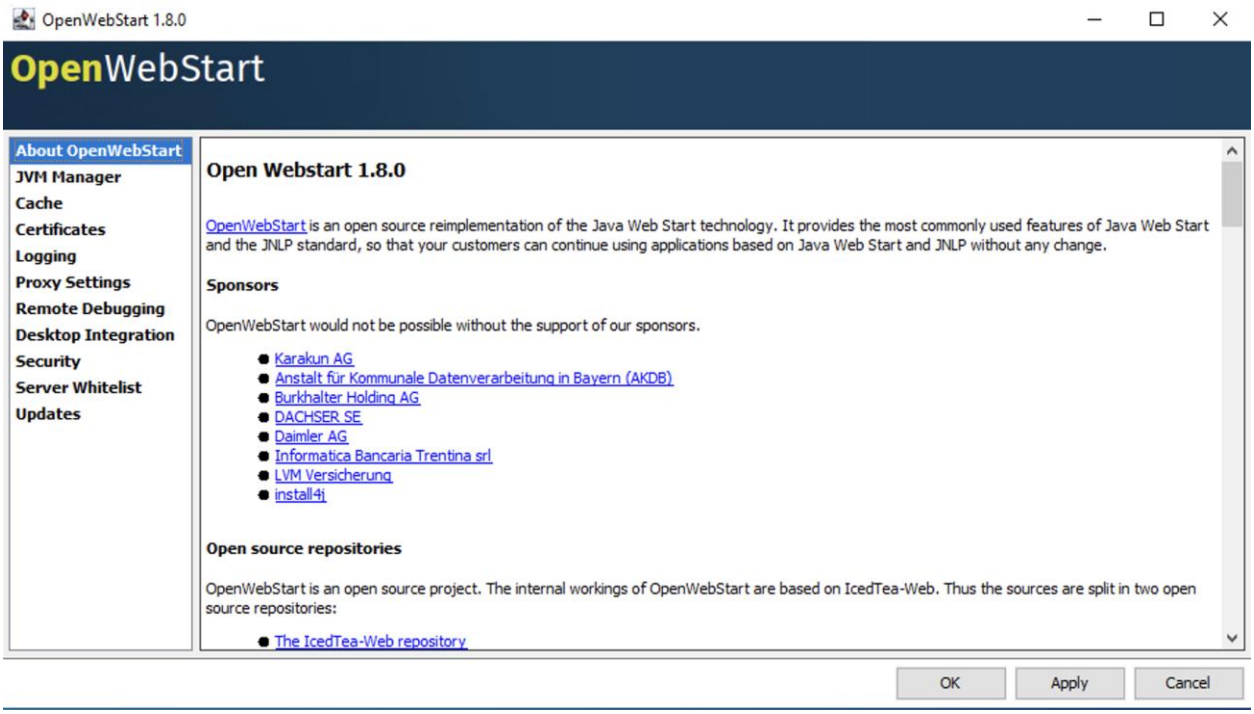
  ```
  10.248.10.25      oceemspri
  10.248.10.21      oceemssec
  ```

1.5.3 OpenWebStart Configuration

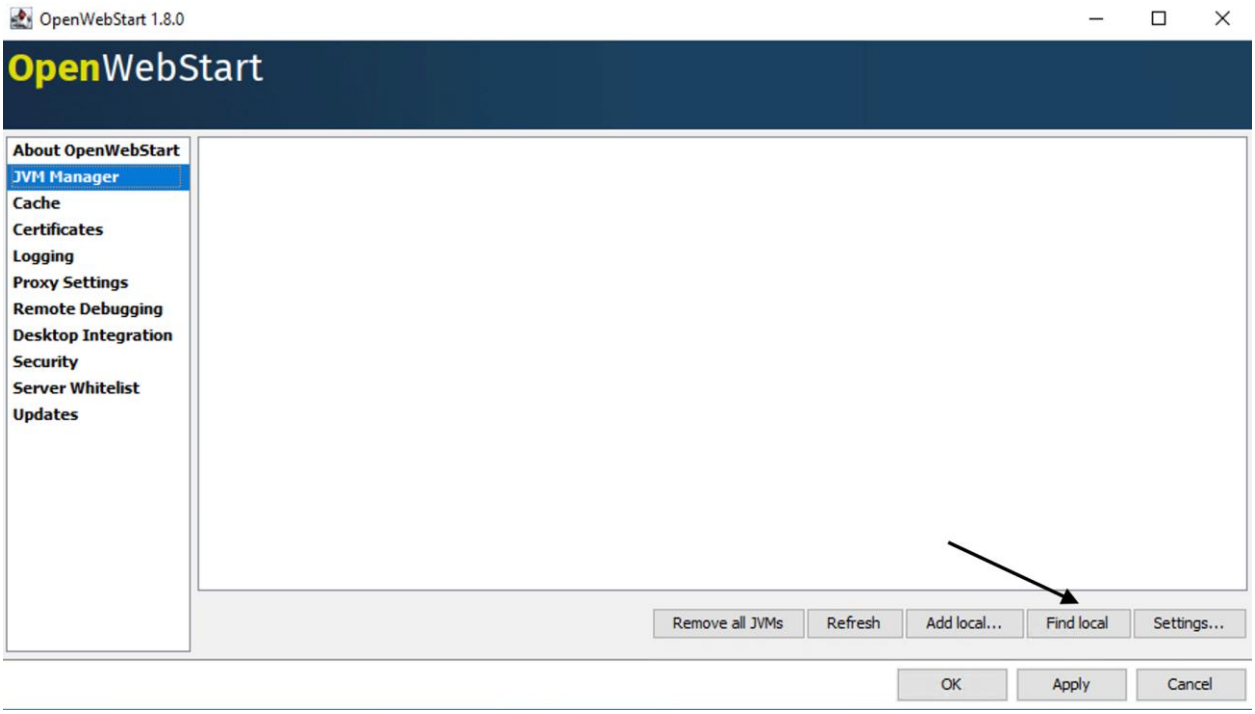
Perform the following steps for OpenWebStart Configuration:

Note: Customers should follow the instructions below and install Open Webstart in their windows machines to open the OCEEMS GUI.

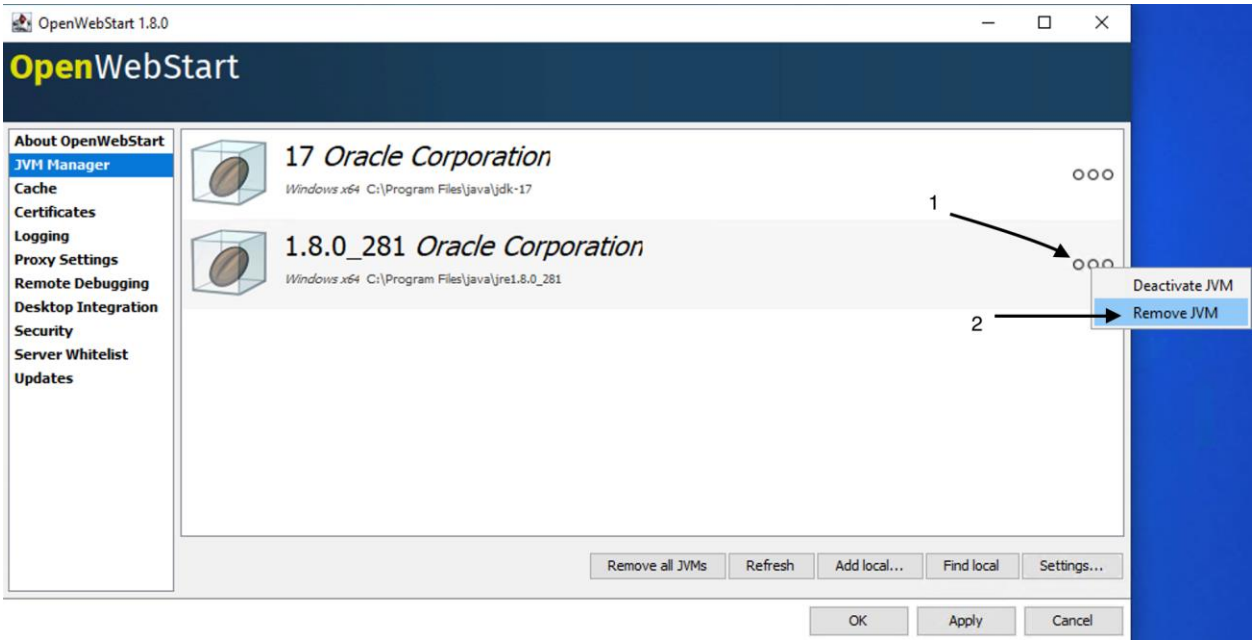
1. Download OpenWebSetart Software from https://github.com/karakun/OpenWebStart/releases/tag/v1.9.0. Either download OpenWebStart _windows-x32_1_9_0 for 32 Bit or OpenWebStart _windows-x64_1_9_0 for 64 Bit.
2. Install the downloaded `.exe` file.
3. Go to search bar and enter OpenWebStart Settings. Click the OpenWebStart Settings icon. The following screen appears.

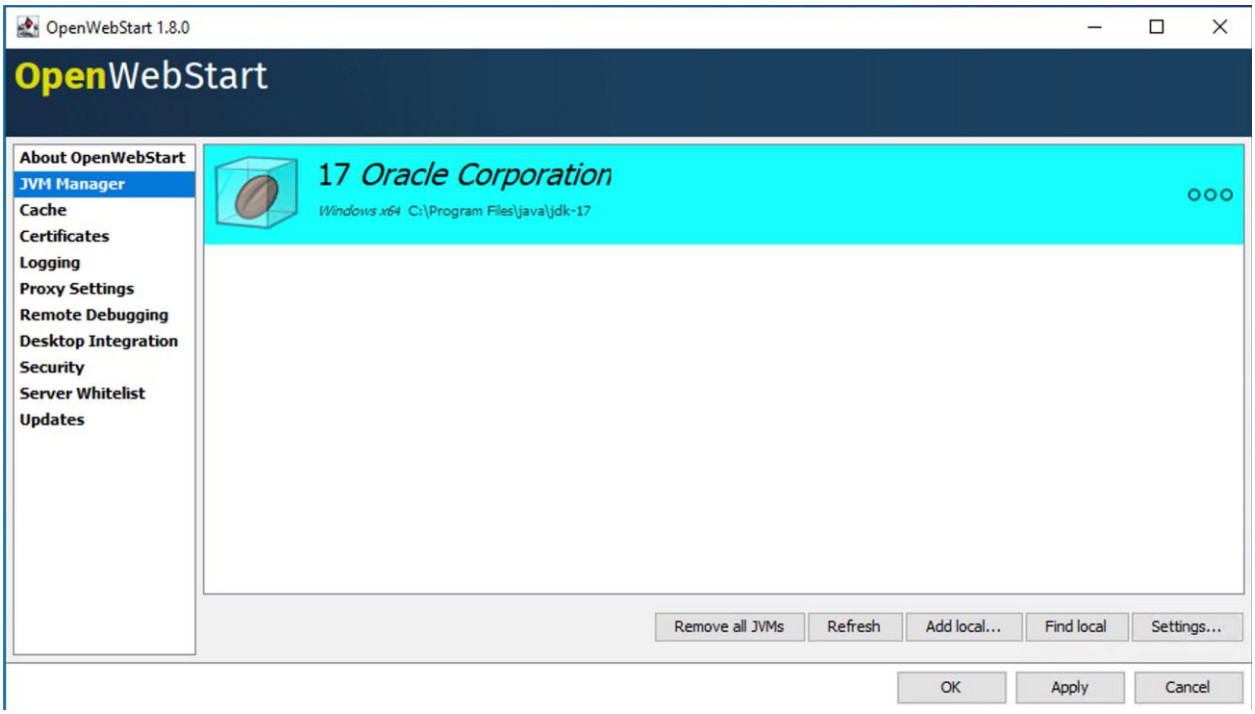


4. Click **JVM Manager** on the left pane.
5. Click **Find Local** button.

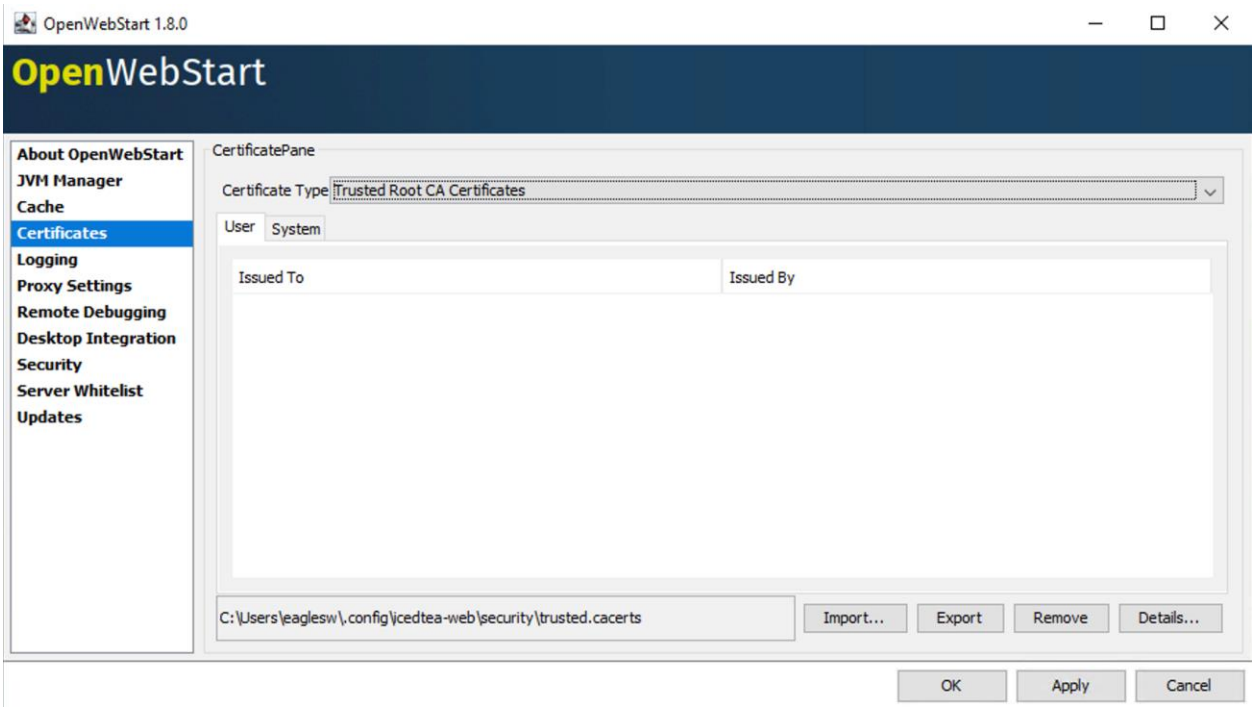


6. Remove other listed JDKs and retain JDK-17.

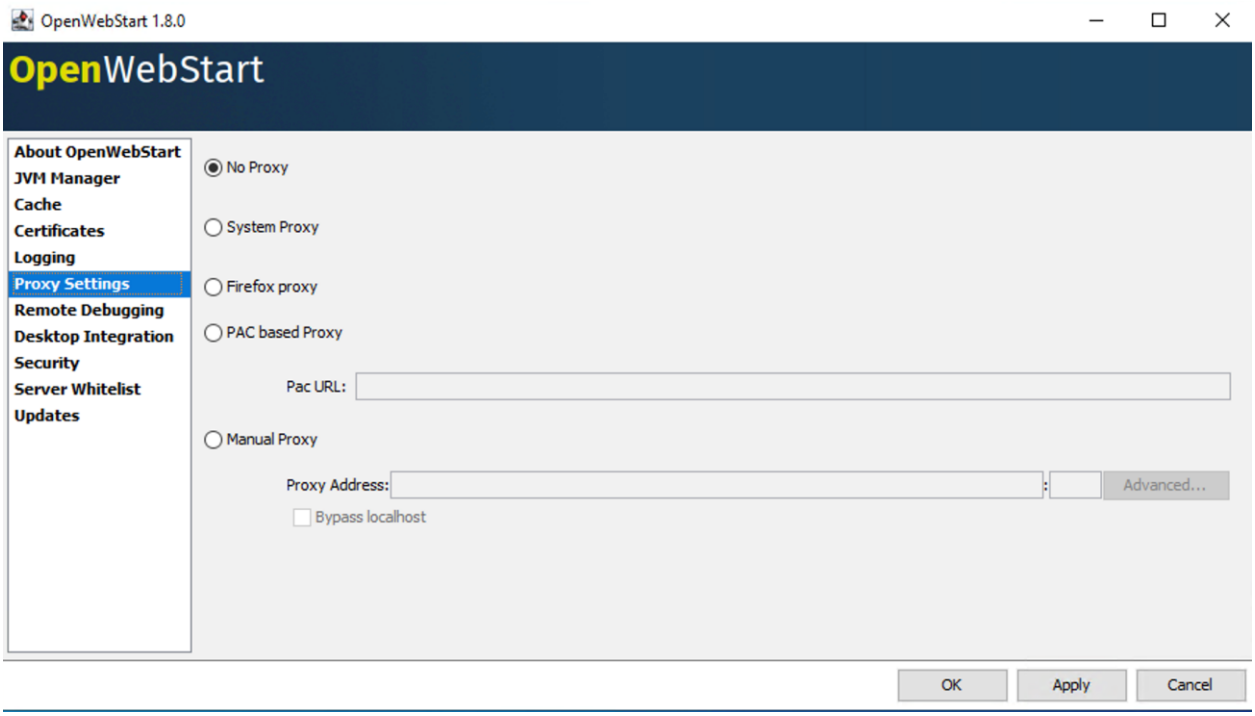




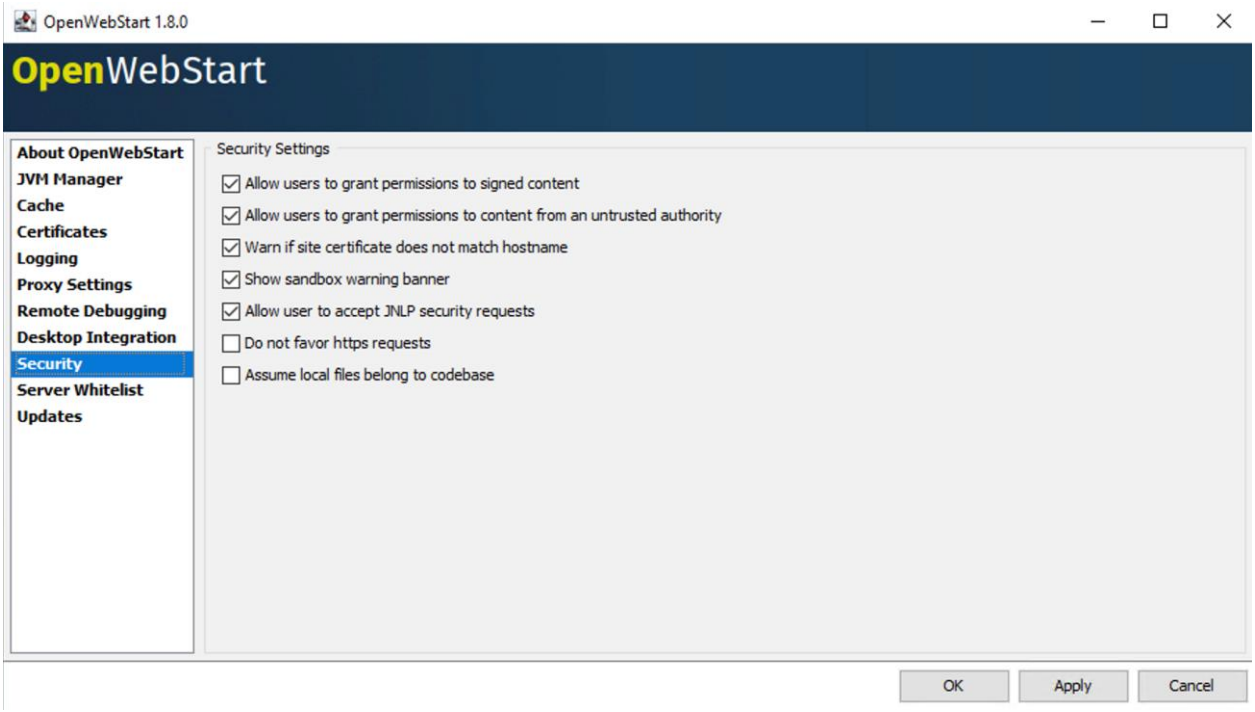
7. Click **Apply**.
8. Check rest tab (No change whose screenshot is not provided) settings one by one as per below screen shots.
9. Select **Certificates** on the left pane and select the **Certificate Type** as shown below.



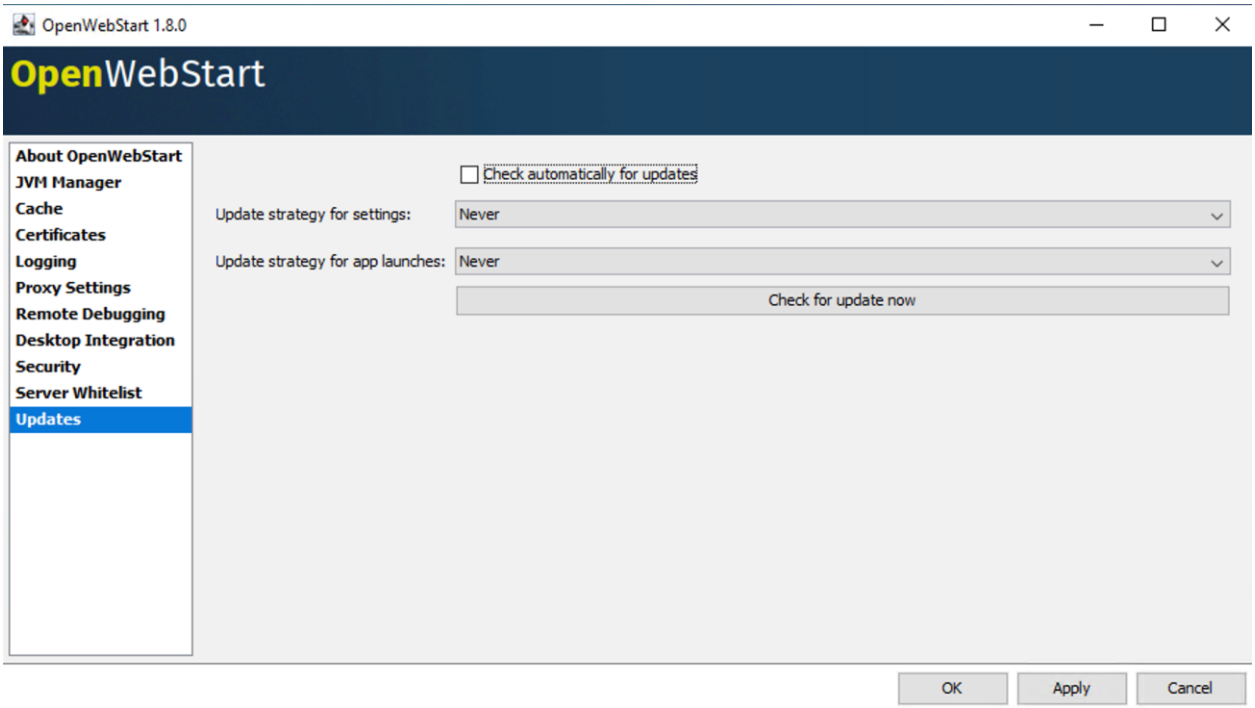
10. Click **Apply**.
11. Select **Proxy Settings** on the left pane and select **No Proxy** as shown below.



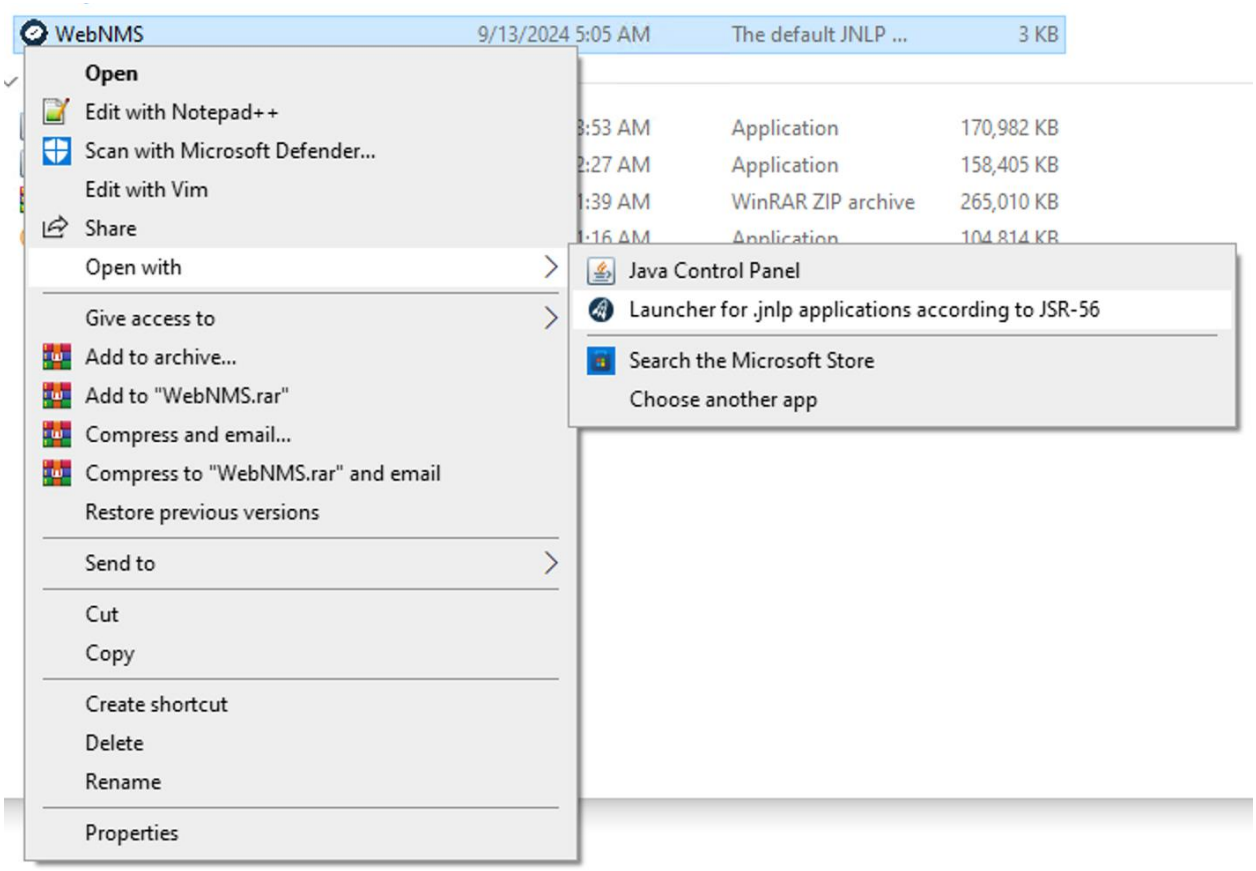
12. Click Apply.
13. Select **Security** on the left pane and select the security settings as shown below.



14. Click **Apply**.
15. Select **Updates** on the left pane and select never from drop-down for **Update strategy for settings** and **Update strategy for app launches** fields.



16. Click **Apply**.
17. Open EMS GUI.
    a) To launch EMS Jnlp, search for WebNMS application, right click the WebNMS icon and select **open with Launcher for .jnlpapplications according to JSR-56** as shown below.



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. Installation/upgrade of Reporting Studio 47.0 should be done using document [3] after OCEEMS R47.0 has been installed/upgraded.

1.7 OCEEMS Installation/Upgrade Overview

1.7.1 Installation Phases for StandAlone OCEEMS Server

Note: This case is for first time installation of OCEEMS 47.0.

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	Cummulative		
Prerequisite	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 47.0 where there is Active-Standby Failover setup.

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	Cummulative		
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/FAILOVER Server)

Note: In OCEEMS release 47.0, OS upgrade is required.

Phase	Elapsed Time (Minutes)		Activity	Procedure
	This Step	Cummulative		
Upgrade	240	240	OS Upgrade OCEEMS application Upgrade	Upgrade Procedure (STANDALONE/FAILOVER Server)
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

2.0 INSTALLATION PROCEDURE (STANDALONE SERVER)

Purpose	Requirements	Time Required
Installation of OCEEMS	1. Admin (root) login of target OCEEMS server 2. OCEEMS 47.0 RPM copied onto the target OCEEMS server. If OCEEMS iso is on an external media, then it should be mounted to the target OCEEMS server. Refer 7.1.4.1.23 for details. 3. Login credentials of the non-root user created for OCEEMS 4. Password of MySQL root user.	1 Hour

Note: On Both servers, verify the permission of the directory set in the variable outputDirectory in the /Tekelec/WebNMS/conf/tekelec/common.config file. The directory should be owned by the Non-root admin user and the permission should be 775.

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	Log in 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 <Path to OCEEMS 47.0 RPM>`
		
		`# rpm -ivh E5-MS-47.0.0.0.0-470.0.1.x86_64.rpm`
		`Verifying...`
		`################################## [100%]`
		`Preparing...`
		`################################## [100%]`
		`Updating / installing...`

```
   1:E5-MS-47.0.0.0.0-470.0.1
################################## [100%]

Creating mailbox file: File exists

Starting MySQL...

bin/mysqld_safe: line 520: my_print_defaults: command not
found

bin/mysqld_safe: line 526: my_print_defaults: command not
found

2024-05-22T11:09:21.591105Z mysqld_safe Logging to
'/Tekelec/WebNMS/mysql/data/EMS4.err'.

2024-05-22T11:09:21.635752Z mysqld_safe Starting mysqld
daemon with databases from /Tekelec/WebNMS/mysql/data

MySQL started.

Performing MySQL upgrade to fix any tablespace issue.

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

Checking if update is needed.

Checking server version.

Running queries to upgrade MySQL server.

Upgrading system table data.

Checking system database.

mysql.columns_priv                                OK

mysql.component                                   OK

mysql.db                                          OK

mysql.default_roles                               OK

mysql.engine_cost                                 OK

mysql.func                                        OK

mysql.general_log                                 OK

mysql.global_grants                               OK

mysql.gtid_executed                               OK

mysql.help_category                               OK

mysql.help_keyword                                OK

mysql.help_relation                               OK

mysql.help_topic                                  OK

mysql.innodb_ddl_log                              OK

mysql.innodb_dynamic_metadata                     OK

mysql.innodb_index_stats                          OK

mysql.innodb_table_stats                          OK

mysql.password_history                            OK

mysql.plugin                                      OK

mysql.procs_priv                                  OK

mysql.proxies_priv                                OK

mysql.role_edges                                  OK

mysql.server_cost                                 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 The sys schema is already up to date (version 1.6.0). Checking databases. sys.sys_config OK Upgrade process completed successfully. Checking if update is needed. mysql: [Warning] Using a password on the command line interface can be insecure. mysql: [Warning] Using a password on the command line interface can be insecure. Shutting down MySQL... mysqladmin: [Warning] Using a password on the command line interface can be insecure. OCEEMS installation completed. 2024-05-22T11:09:31.510389Z mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/EMS4.pid ended
9	Move to "/Tekelec/WebNMS/bin/" directory by issuing the given command.	# cd /Tekelec/WebNMS/bin/
10	Execute the UniqueIDLinux.sh script to generate a Unique Machine ID for the system using the MAC ID of the system. Note down the Unique Machine ID generated by the script.	# sh UniqueIDLinux.sh Your Unique Machine ID is **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/TAC/SWOPS team.	`Successfully send the` Unique Machine ID.
12	Oracle PS/TAC/SWOPS 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 FIREWALL** should be opened for proper functioning of OCEEMS.	`Successfully open the ports that are required to be opened.`
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 47.0 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 is because on first startup, it shows the OCEEMS license agreement and needs manual inputs regarding licensing.
		`$ sh startnms.sh`
		
		`<Messages given in` LOG MESSAGES ON FIRST STARTUP OF OCEEMS SERVER AFTER INSTALLATION `are displayed. Keep pressing enter key each time message "Press Enter to continue..." is shown on screen>`
		
		`Do you accept the LICENSE AGREEMENT (y/n)`
		
		`y`
		
		`******* REGISTRATION *******`
		
		`HOST NAME IS EMS4`
		
		`Press t to start the product in Evaluation mode`
		
		`1 to provide the User Name and License File path`
		
		`e 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 Alert`
		
		`Created table ANNOTATION`
		
		`Created table CORBANode`
		
		`Created table CRITERIAPROPERTIES`

		Created table Event Created table GMapSymbol Created table GroupTable Created table IpAddress Created table ManagedGroupObject Created table ManagedObject Created table MapContainer Created table MapDB Created table MapGroup Created table MapLink Created table MAPPEDPROPERTIES Created table MapSymbol Created table MAPUSERPROPS 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 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 tek_scheduler_task Created table Tek_Secu_MapUsergrpCmdClass Created table Tek_Secu_MapUserGrpEagleNode Created table Tek_Secu_PasswordConfig Created table Tek_Secu_UserInfo Created table TL1Interface Created table TL1Node Created table TopoObject

		Created table ObjectTypes Created table USERTABLE Created table PORTS Created table EAGLE_GPL_Info 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

		<Messages given in **LOG MESSAGES ON STARTING OCEEMS SERVER** are displayed on console>
23	Launch a new session on the OCEEMS machine and login using the non-root user.	Successful launch of a new session with non-root user.
24	Move to /Tekelec/WebNMS/bin directory by issuing the given command.	$ cd /Tekelec/WebNMS/bin/
25	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.	$ sh installE5MSSchema.sh Please enter MySql password: <**password**> <Messages given in **LOG MESSAGES ON INSTALLATION OF OCEEMS SCHEMA** are displayed on console>
26	Stop the OCEEMS server using the given command. **Note**: Restart of the server is required to populate CMI data on OCEEMS GUI.	$ service e5msService stop Stopping OCEEMS server... Warning: Using a password on the command line interface can be insecure. MySql server to be stopped Done. <Messages given in **LOG MESSAGES ON STOPPING OCEEMS SERVER** are displayed on console>
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 / 2024-05-22T11:31:29.243534Z mysqld_safe Logging to '/Tekelec/WebNMS/mysql/data/EMS4.err'. 2024-05-22T11:31:29.273170Z mysqld_safe Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data mysql: [Warning] Using a password on the command line interface can be insecure. 2024-05-22T11:31:35.887356Z mysqld_safe mysqld from pid file /Tekelec/WebNMS/mysql/data/EMS4.pid ended /<Messages given in **LOG MESSAGES ON STARTING OCEEMS SERVER** are displayed on console>
28	Perform these Key Exchange steps on both the servers (Server 1 and 2).	Follow these steps to exchange keys between the local setup (where we open EMS GUI) and the standalone setup. (Appendix AD)

29	Procedure Complete	This procedure is complete.

Note: Follow the steps outlined in the "Procedure to Create OCEEMS SSL Certificate" to generate the necessary SSL certificate for HTTPS-based web access for the OCEEMS client. This procedure should be repeated if you encounter a "Transport Exception Error" when opening the GUI.

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 47.x 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 5. The server (IP) hostname should be same in '/etc/hostname' and '/etc/hosts', for both Primary and Secondary servers	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	Log in 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	Log in as non-root user on server 2 and use the procedure given in **PROCEDURE TO CREATE OCEEMS SSL CERTIFICATE** to	`Successful execution of the procedure`

	generate SSL certificate needed for HTTPS based access for OCEEMS. During the certificate creation in server 2, please provide the **same keystore password** as used in the certificate creation for server 1 in step 3.	
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 EMS4`
		
		`Press t to start the product in Evaluation mode`
		
		`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 Alert Created table ANNOTATION Created table CORBANode Created table CRITERIAPROPERTIES Created table Event Created table GMapSymbol Created table GroupTable Created table IpAddress Created table ManagedGroupObject Created table ManagedObject Created table MapContainer Created table MapDB Created table MapGroup Created table MapLink Created table MAPPEDPROPERTIES Created table MapSymbol Created table MAPUSERPROPS 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 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 tek_scheduler_task

		Created table Tek_Secu_MapUsergrpCmdClass Created table Tek_Secu_MapUserGrpEagleNode Created table Tek_Secu_PasswordConfig Created table Tek_Secu_UserInfo Created table TL1Interface Created table TL1Node Created table TopoObject Created table ObjectTypes Created table USERTABLE Created table PORTS Created table EAGLE_GPL_Info 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 <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. **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>** <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.
	
	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 EMS4
		
		Press t to start the product in Evaluation mode
		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>** 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	Perform these Key Exchange steps on both the servers (server 1 and 2).	Follow these steps to exchange keys between the local setup (where we open EMS GUI) and the standalone setup. Refer to Appendix AD.
15	Procedure Complete	This procedure is complete.

4.0 UPGRADE PROCEDURE (STANDALONE/FAILOVER SERVER)

1. **Log in to target machine using administrator (root) login.**

Note : The Backup will be taken from Primary Server.

2. **Take a backup of the system. Save the backup created. This will be used after OS upgrade. Make sure to**
   run the Backup script from the non-root admin user(emsadmuser) that was created during the ems installation. (In case of failover setup, please take backup only from the Primary Server)

   Commands:
   ```
   $ cd /Tekelec/WebNMS/bin/backup/
   $ sh BackupDB.sh -d <backup_directory>
   ```
   Note: Make sure to transfer the backup to remote server before proceeding to next step.

3. **Install Oracle Linux 8.8 on the machine.**
   ```
   [root@EMS3 ~]# cat /etc/os-release
   NAME="Oracle Linux Server"
   VERSION="8.8"
   ID="ol"
   ID_LIKE="fedora"
   VARIANT="Server"
   VARIANT_ID="server"
   VERSION_ID="8.8"
   PLATFORM_ID="platform:el8"
   PRETTY_NAME="Oracle Linux Server 8.8"
   ANSI_COLOR="0;31"
   CPE_NAME="cpe:/o:oracle:linux:8:8:server"
   HOME_URL="https://linux.oracle.com/"
   BUG_REPORT_URL="https://bugzilla.oracle.com/"

   ORACLE_BUGZILLA_PRODUCT="Oracle Linux 8"
   ORACLE_BUGZILLA_PRODUCT_VERSION=8.8
   ORACLE_SUPPORT_PRODUCT="Oracle Linux"
   ORACLE_SUPPORT_PRODUCT_VERSION=8.8
   [root@EMS3 ~]#
   ```

4. **Java Version:**
   Install java : 17.x
   Copy java to your machine. Preferably the following rpm. jdk-17_linux-x64_bin.rpm

   Install command
   ```
   rpm –ivh jdk-17_linux-x64_bin.rpm
   ```

   Logs :
   ```
   [root@EMS4 ~]# rpm -ivh jdk-17_linux-x64_bin.rpm
   warning: jdk-17_linux-x64_bin.rpm: Header V3 RSA/SHA256 Signature, key ID
   ec551f03: NOKEY
   Verifying...                          ################################# [100%]
   Preparing...                          ################################# [100%]
   Updating / installing...
      1:jdk-17-2000:17-ga                ################################# [100%]
   ```

```
[root@EMS4 ~]#
```

5. **Add java to the path**

```
[root@EMS4 ~]# cd /usr/java/
[root@EMS4 java]# ll
total 0
lrwxrwxrwx.  1 root root  16 Mar  7 02:46 default -> /usr/java/latest
drwxr-xr-x. 10 root root 120 Mar  7 02:46 jdk-17
lrwxrwxrwx.  1 root root  16 Mar  7 02:46 latest -> /usr/java/jdk-17
[root@EMS4 java]#
```

6. **Create one custom.sh file at path : "/etc/profile.d"**

   Add below line and save:

```
export JAVA_HOME=/usr/java/jdk-17
export PATH=$JAVA_HOME/bin:$PATH
```

7. Exit the session and re-login to the VM.

8. **Install one MySQL 8 package.**

For MySQL 8 one package needs to be installed.
Command: **yum install ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm**

Logs:

```
[root@EMS4 ~]# yum install ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm
Last metadata expiration check: 2:53:23 ago on Thu 07 Mar 2024 12:01:03 AM EST.
Can not load RPM file: ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm.
Could not open: ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm
```

Note: If you face any error during the installation of the package use the underlying command.

```
[root@EMS4 ~]# yum install ncurses-compat-libs
Last metadata expiration check: 2:57:58 ago on Thu 07 Mar 2024 12:01:03 AM EST.
Dependencies resolved.
Package                                  Architecture            Version                                   Repository
Size
====================================================================================================
Installing:
 ncurses-compat-libs                      x86_64                  6.1-10.20180224.el8                       ol8_baseos_latest
328 k
Upgrading:
 ncurses                                  x86_64                  6.1-10.20180224.el8                       ol8_baseos_latest
387 k
 ncurses-base                             noarch                  6.1-10.20180224.el8                       ol8_baseos_latest
81 k
 ncurses-libs                             x86_64                  6.1-10.20180224.el8                       ol8_baseos_latest
334 k

Transaction Summary
Install  1 Package
Upgrade  3 Packages

Total download size: 1.1 M
Is this ok [y/N]: y
Downloading Packages:
(1/4): ncurses-base-6.1-10.20180224.el8.noarch.rpm                                                          172 kB/s |
81 kB     00:00
(2/4): ncurses-compat-libs-6.1-10.20180224.el8.x86_64.rpm                                                   522 kB/s |
328 kB     00:00
(3/4): ncurses-6.1-10.20180224.el8.x86_64.rpm                                                               602 kB/s |
387 kB     00:00
(4/4): ncurses-libs-6.1-10.20180224.el8.x86_64.rpm                                                          1.4 MB/s |
334 kB     00:00
Total                                                                                                       1.6 MB/s |
1.1 MB     00:00
Oracle Linux 8 BaseOS Latest (x86_64)                                                                       3.0 MB/s |
3.1 kB     00:00
Importing GPG key 0xAD986DA3:
 Userid     : "Oracle OSS group (Open Source Software group) <build@oss.oracle.com>"
```

```
 Fingerprint: 76FD 3DB1 3AB6 7410 B89D B10E 8256 2EA9 AD98 6DA3
 From       : /etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
Is this ok [y/N]: y
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :
1/1
  Upgrading        : ncurses-base-6.1-10.20180224.el8.noarch
1/7
  Upgrading        : ncurses-libs-6.1-10.20180224.el8.x86_64
2/7
  Upgrading        : ncurses-6.1-10.20180224.el8.x86_64
3/7
  Installing       : ncurses-compat-libs-6.1-10.20180224.el8.x86_64
4/7
  Cleanup          : ncurses-6.1-9.20180224.el8.x86_64
5/7
  Cleanup          : ncurses-libs-6.1-9.20180224.el8.x86_64
6/7
  Cleanup          : ncurses-base-6.1-9.20180224.el8.noarch
7/7
  Running scriptlet: ncurses-base-6.1-9.20180224.el8.noarch
7/7
  Verifying        : ncurses-compat-libs-6.1-10.20180224.el8.x86_64
1/7
  Verifying        : ncurses-6.1-10.20180224.el8.x86_64
2/7
  Verifying        : ncurses-6.1-9.20180224.el8.x86_64
3/7
  Verifying        : ncurses-base-6.1-10.20180224.el8.noarch
4/7
  Verifying        : ncurses-base-6.1-9.20180224.el8.noarch
5/7
  Verifying        : ncurses-libs-6.1-10.20180224.el8.x86_64
6/7
  Verifying        : ncurses-libs-6.1-9.20180224.el8.x86_64
7/7

Upgraded:
ncurses-6.1-10.20180224.el8.x86_64               ncurses-base-6.1-10.20180224.el8.noarch               ncurses-libs-6.1-
10.20180224.el8.x86_64
Installed:
  ncurses-compat-libs-6.1-10.20180224.el8.x86_64

Complete!
[root@EMS4 ~]#
[root@EMS4 ~]#

Confirm the required pkg :
[root@EMS4 ~]#
[root@EMS4 ~]# rpm -qa | grep ncurses-compat-libs
ncurses-compat-libs-6.1-10.20180224.el8.x86_64
```

9. Copy the EMS 47 rpm to your machine using scp or any other method.
10. Install the EMS 47 rpm as per the Installation Guide section 2 for standalone system and section 3 for failover system.

Note-1: For Standalone EMS follow step 11 to 18 and done (skip 19 to 29).

Note-2: For Failover EMS (skip 11 to 18) follow steps from 19 to 29.

Note-3:

- **In this procedure whenever server1 is referenced, it refers to Primary/Active Server when the upgrade process is initiated.**
- **In this procedure whenever server2 is referenced, it refers to Standby/Secondary Server when the upgrade process is initiated.**

Note 6: The step 19-24 and 26 are to be run on both the servers (Primary and Secondary in the respective order). **Make sure that you run step 25 only on the Primary Server (Server1). **

11. **Make sure keystore.type has value "jks" in java.security file in folder "/usr/java/jdk-17/conf/security"**

    If not, make the required change.

    keystore.type=jks

12. **Copy the Backup of the Older EMS Release.**

    Copy the backup of the older EMS release to the /tmp directory.

    ```
    $ cp <old_Backup_file> /tmp
    ```

13. **After coping backup, Run the following commands: (these commands need to be run from the root user)**

    ```
    $ cd /Tekelec/WebNMS/bin/
    $ ./updateConf_46.6.sh <backup_directory>
    ```

14. **Ensure Proper Ownership and Permissions for the Backup Directory**

    Ensure that the backup directory has ownership as emsadmuser:emsadm.

    Check with cmd: `ls -ltrh`

    Expected output:

    ```
    drwxrwx---. 4 emsadmuser emsadm      31 Feb 26 13:10 users
    drwxrwx---. 3 emsadmuser emsadm      20 Feb 26 13:10 classes
    drwxrwx---. 2 emsadmuser emsadm    4096 Feb 26 13:10 reportingStudio
    drwxrwx---. 2 emsadmuser emsadm      32 Feb 26 13:10 html
    drwxrwx---. 2 emsadmuser emsadm      35 Feb 26 13:10 defaultconf
    drwxrwx---. 3 emsadmuser emsadm    4096 Feb 26 13:11 conf
    -rwxrwx---. 1 emsadmuser emsadm 1177857 Feb 26 13:11 E5MS_Database_BackUp.sql
    ```

    Note: Backup files must have emsadmuser:emsadm as user:group and 770 permissions. If not use the following commands (run from root user)

    ```
    $ chmod -R 770 <backup_directory>
    $ chown -R emsadmuser:emsadm <backup_directory>
    ```

15. **Stop e5ms service (from the non root user)**

    ```
    [emsadmuser@EMS2 backup]$ service e5msService stop
    ```

16. **Restore the DB (from the non root user)**

    Navigate to the backup directory and execute the restore script:

    ```
    $ cd /Tekelec/WebNMS/bin/backup/
    $ sh RestoreDB.sh <path_to_backup_directory>/E5MS_Database_BackUp.sql
    ```

    On prompted please enter "y".

    Please expect the following logs:

```
[emsadmuser@EMS2 backup]$ sh RestoreDB.sh /tmp/bkp_ems1/E5MS_Database_BackUp.sql

WARNING! Attempting to restore the data using current backup!!! This will result in loosing your current data(users,categories,scripts etc.
i.e other than backup content) created after backup !!!Exit and take backup if current data is needed !!! Do you want to continue with
restore [y/n] ?
y
cp: cannot stat '/tmp/bkp_ems1/commandManagerScripts/*': No such file or directory
cp: cannot stat '/tmp/bkp_ems1/linkUtilizationScripts/*': No such file or directory

Script will attempt to restore OCEEMS database from the dump file: /tmp/bkp_ems1/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/CmiParameters.conf
/Tekelec/WebNMS/conf/tekelec/ContinentZonalMap.xml
/Tekelec/WebNMS/conf/tekelec/EagleCardNameNumMap.xml
/Tekelec/WebNMS/conf/tekelec/InventoryCommands.txt
/Tekelec/WebNMS/conf/tekelec/ModulesConf.xml
/Tekelec/WebNMS/conf/tekelec/NbiParameters.conf
/Tekelec/WebNMS/conf/tekelec/common.config
/Tekelec/WebNMS/conf/tekelec/fault.properties
/Tekelec/WebNMS/conf/tekelec/lui.properties
/Tekelec/WebNMS/conf/tekelec/lui_template_script.txt
/Tekelec/WebNMS/conf/tekelec/reporting.properties
/Tekelec/WebNMS/conf/tekelec/security.properties
/Tekelec/WebNMS/conf/tekelec/server_conf.properties
/Tekelec/WebNMS/conf/tekelec/tekmeas.conf
/Tekelec/WebNMS//Tekelec/WebNMS/users
-/Tekelec/WebNMS//Tekelec/WebNMS/users/guest
/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/HomePageLayout.xml
/Tekelec/WebNMS/users/guest/Tree.xml
/Tekelec/WebNMS/users/guest/TreeOperations.xml
/Tekelec/WebNMS/users/guest/alertsmenu.xml
/Tekelec/WebNMS/users/guest/clientparameters.conf
/Tekelec/WebNMS/users/guest/framemenu.xml
/Tekelec/WebNMS/users/guest/frameoptions.xml
/Tekelec/WebNMS/users/guest/increments.conf
/Tekelec/WebNMS/users/guest/maptoolbar.dtd
/Tekelec/WebNMS/users/guest/maptoolbar.xml
/Tekelec/WebNMS/users/guest/mibmenu.xml
/Tekelec/WebNMS/users/guest/panelmenubar.dtd
/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/state
/Tekelec/WebNMS/users/guest/state/dummy.txt
/Tekelec/WebNMS/users/guest/sysadminmenu.xml
/Tekelec/WebNMS/users/guest/tl1browsermenu.xml
/Tekelec/WebNMS/users/guest/toolbar.dtd
/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/listmenus
/Tekelec/WebNMS/users/guest/listmenus/dummy.txt
/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/mapmenus
/Tekelec/WebNMS/users/guest/mapmenus/dummy.txt
/Tekelec/WebNMS//Tekelec/WebNMS/users/root
/Tekelec/WebNMS//Tekelec/WebNMS/users/root/mapmenus
/Tekelec/WebNMS/users/root/mapmenus/dummy.txt
/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/alertsmenu.xml
/Tekelec/WebNMS/users/root/clientparameters.conf
/Tekelec/WebNMS/users/root/framemenu.xml
/Tekelec/WebNMS/users/root/frameoptions.xml
/Tekelec/WebNMS/users/root/increments.conf
/Tekelec/WebNMS/users/root/maptoolbar.dtd
/Tekelec/WebNMS/users/root/TreeOperations.xml
/Tekelec/WebNMS/users/root/AudioInfo.xml
/Tekelec/WebNMS/users/root/FramesInfo.conf
/Tekelec/WebNMS/users/root/HomePageLayout.xml
/Tekelec/WebNMS/users/root/Tree.xml
/Tekelec/WebNMS/users/root/maptoolbar.xml
/Tekelec/WebNMS/users/root/mibmenu.xml
/Tekelec/WebNMS/users/root/panelmenubar.dtd
/Tekelec/WebNMS/users/root/sysadminmenu.xml
/Tekelec/WebNMS/users/root/tl1browsermenu.xml
/Tekelec/WebNMS/users/root/toolbar.dtd
/Tekelec/WebNMS//Tekelec/WebNMS/users/root/listmenus
/Tekelec/WebNMS/users/root/listmenus/dummy.txt
/Tekelec/WebNMS//Tekelec/WebNMS/reportingStudio
/Tekelec/WebNMS/reportingStudio/AlarmSummary_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDate.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration_WithSeverity.rpt
/Tekelec/WebNMS/reportingStudio/Total_Duration_LinkSet_Inactivity.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration_WithSeverity_UAM_Number.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_Top10_PerCount.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_Top10_PerSeverity.rpt
/Tekelec/WebNMS/reportingStudio/All_Alarms.rpt
/Tekelec/WebNMS/reportingStudio/All_Events.rpt
/Tekelec/WebNMS/reportingStudio/CardReport_withErlang_PercentUtilization.rpt
/Tekelec/WebNMS/reportingStudio/Resources_Top10_PerCount.rpt
/Tekelec/WebNMS/reportingStudio/CardReport_withErlang_PercentUtilization_WithDateFilter.rpt
/Tekelec/WebNMS/reportingStudio/Duration_Link_Failure_And_Outage.rpt
/Tekelec/WebNMS/reportingStudio/EventSummary_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDate.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration_WithSeverity.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration_WithSeverity_UAM_Number.rpt
/Tekelec/WebNMS/reportingStudio/Inventory_AllCards.rpt
/Tekelec/WebNMS/reportingStudio/Inventory_OOSCards.rpt
/Tekelec/WebNMS/reportingStudio/LinkReport_withErlang_PercentUtilization.rpt
/Tekelec/WebNMS/reportingStudio/Resources_Top10_PerSeverity.rpt
/Tekelec/WebNMS/reportingStudio/LinkReport_withErlang_PercentUtilization_WithDateFilter.rpt
/Tekelec/WebNMS/reportingStudio/LinkSetReport_withErlang_PercentUtilization.rpt
```

```
/Tekelec/WebNMS/reportingStudio/LinkSetReport_withErlang_PercentUtilization_WithDateFilter.rpt
/Tekelec/WebNMS/reportingStudio/Measurement_Systot_STP.rpt
/Tekelec/WebNMS/reportingStudio/Message_Flow_SCTP_IPSG.rpt
/Tekelec/WebNMS/reportingStudio/Message_Flow_SCTP_IP_ASSOCIATION.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_Each_Linkset.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_IDP_Prepaid.rpt
/Tekelec/WebNMS/reportingStudio/SCCP_MSG_Processed_Per_LinkSet.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_Of_LinkSet_Above_Threshold.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_Of_Link_Above_Threshold.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_On_Each_Link.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_SRI.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_utilization_IMEI_Message.rpt
/Tekelec/WebNMS/conf/log4j.xml
/Tekelec/WebNMS/conf/FailOver.xml
/Tekelec/WebNMS/defaultconf/usernamePassword.conf
/Tekelec/WebNMS/conf/securitydbData.xml
/Tekelec/WebNMS/conf/clientparameters.conf
/Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml
/Tekelec/WebNMS/classes/hbnlib/secondary/hibernate.cfg.xml
/Tekelec/WebNMS/conf/transportProvider.conf
/Tekelec/WebNMS/conf/trapport.conf
/Tekelec/WebNMS/conf/NmsProcessesBE.conf
/Tekelec/WebNMS/conf/serverparameters.conf
/Tekelec/WebNMS/conf/SmartUpdateManager.xml
/Tekelec/WebNMS/html/NMSSocketPort.html
All the files & directories specified in the FILES_TO_RESTORE tag are successfully restored
\

OCEEMS successfully restored.
[emsadmuser@EMS2 backup]$
```

17. Perform the procedure to create OCEEMS SSL certificate detailed in Appendix J.

18. **Start e5ms service**

```
[emsadmuser@EMS2 backup]$ service e5msService start
```

19. **Make sure keystore.type has value "jks" in java.security file in folder "usr/java/jdk-17/conf/security".**

If not make the required change.

`keystore.type=jks`

20. **Copy the Backup of the Older EMS Release(this backup must be taken on the Primary Setup).**

Copy the backup of the older EMS release to the /tmp directory.

```
$ cp <old_Backup_file> /tmp
```

21. **After coping backup, Run the following commands: (these commands need to be run from the root user).**

```
$ cd /Tekelec/WebNMS/bin/
$ ./updateConf_46.6.sh <backup_directory>
```

22. **Ensure Proper Ownership and Permissions for the Backup Directory.**

Ensure that the backup directory has ownership as emsadmuser:emsadm.

Check with cmd: `ls -ltrh`

Expected output:

```
drwxrwx---. 4 emsadmuser emsadm      31 Feb 26 13:10 users
drwxrwx---. 3 emsadmuser emsadm      20 Feb 26 13:10 classes
drwxrwx---. 2 emsadmuser emsadm    4096 Feb 26 13:10 reportingStudio
drwxrwx---. 2 emsadmuser emsadm      32 Feb 26 13:10 html
drwxrwx---. 2 emsadmuser emsadm      35 Feb 26 13:10 defaultconf
drwxrwx---. 3 emsadmuser emsadm    4096 Feb 26 13:11 conf
-rwxrwx---. 1 emsadmuser emsadm 1177857 Feb 26 13:11 E5MS_Database_BackUp.sql
```

Note: Backup files must have emsadmuser:emsadm as user:group and 770 permissions. If not use the following commands (run from root user)

```
$ chmod -R 770 <backup_directory>
```

```
$ chown -R emsadmuser:emsadm <backup_directory>
```

23. **Stop the e5ms Service on current Standby Server (Server 2).**

Note: Make sure to stop e5msService of current standby server first. (from non-root user)

Run the following command:

```
$ service e5msService stop
```

24. **Stop e5ms Service on current Primary Server (Server 1) (from non root user)**

Run the following command:

```
$ service e5msService stop
```

25. **Restore the Database on the Server 1 (these commands are to be run from non root user)**

Note: Use backup taken (Step 2) from the primary server (server 1).

Navigate to the backup directory and execute the restore script:

```
$ cd /Tekelec/WebNMS/bin/backup/
$ sh RestoreDB.sh <path_to_backup_directory>/E5MS_Database_BackUp.sql
```

On prompted please enter “y”.

Please expect the following logs:

```
[emsadmuser@EMS2 backup]$ sh RestoreDB.sh /tmp/bkp_ems1/E5MS_Database_BackUp.sql

WARNING! Attempting to restore the data using current backup!!! This will result in loosing your current data(users,categories,scripts etc.
i.e other than backup content) created after backup !!!Exit and take backup if current data is needed !!! Do you want to continue with
restore [y/n] ?
y
cp: cannot stat '/tmp/bkp_ems1/commandManagerScripts/*': No such file or directory
cp: cannot stat '/tmp/bkp_ems1/linkUtilizationScripts/*': No such file or directory

Script will attempt to restore OCEEMS database from the dump file: /tmp/bkp_ems1/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/CmiParameters.conf
/Tekelec/WebNMS/conf/tekelec/ContinentZonalMap.xml
/Tekelec/WebNMS/conf/tekelec/EagleCardNameNumMap.xml
/Tekelec/WebNMS/conf/tekelec/InventoryCommands.txt
/Tekelec/WebNMS/conf/tekelec/ModulesConf.xml
/Tekelec/WebNMS/conf/tekelec/NbiParameters.conf
/Tekelec/WebNMS/conf/tekelec/common.config
/Tekelec/WebNMS/conf/tekelec/fault.properties
/Tekelec/WebNMS/conf/tekelec/lui.properties
/Tekelec/WebNMS/conf/tekelec/lui_template_script.txt
/Tekelec/WebNMS/conf/tekelec/reporting.properties
/Tekelec/WebNMS/conf/tekelec/security.properties
/Tekelec/WebNMS/conf/tekelec/server_conf.properties
/Tekelec/WebNMS/conf/tekelec/tekmeas.conf
/Tekelec/WebNMS//Tekelec/WebNMS/users
-/Tekelec/WebNMS//Tekelec/WebNMS/users/guest
/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/HomePageLayout.xml
/Tekelec/WebNMS/users/guest/Tree.xml
/Tekelec/WebNMS/users/guest/TreeOperations.xml
/Tekelec/WebNMS/users/guest/alertsmenu.xml
/Tekelec/WebNMS/users/guest/clientparameters.conf
/Tekelec/WebNMS/users/guest/framemenu.xml
/Tekelec/WebNMS/users/guest/frameoptions.xml
/Tekelec/WebNMS/users/guest/increments.conf
/Tekelec/WebNMS/users/guest/maptoolbar.dtd
/Tekelec/WebNMS/users/guest/maptoolbar.xml
/Tekelec/WebNMS/users/guest/mibmenu.xml
/Tekelec/WebNMS/users/guest/panelmenubar.dtd
/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/state
/Tekelec/WebNMS/users/guest/state/dummy.txt
/Tekelec/WebNMS/users/guest/sysadminmenu.xml
/Tekelec/WebNMS/users/guest/tl1browsermenu.xml
/Tekelec/WebNMS/users/guest/toolbar.dtd
/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/listmenus
/Tekelec/WebNMS/users/guest/listmenus/dummy.txt
/Tekelec/WebNMS//Tekelec/WebNMS/users/guest/mapmenus
```

```
/Tekelec/WebNMS/users/guest/mapmenus/dummy.txt
/Tekelec/WebNMS//Tekelec/WebNMS/users/root
/Tekelec/WebNMS//Tekelec/WebNMS/users/root/mapmenus
/Tekelec/WebNMS/users/root/mapmenus/dummy.txt
/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/alertsmenu.xml
/Tekelec/WebNMS/users/root/clientparameters.conf
/Tekelec/WebNMS/users/root/framemenu.xml
/Tekelec/WebNMS/users/root/frameoptions.xml
/Tekelec/WebNMS/users/root/increments.conf
/Tekelec/WebNMS/users/root/maptoolbar.dtd
/Tekelec/WebNMS/users/root/TreeOperations.xml
/Tekelec/WebNMS/users/root/AudioInfo.xml
/Tekelec/WebNMS/users/root/FramesInfo.conf
/Tekelec/WebNMS/users/root/HomePageLayout.xml
/Tekelec/WebNMS/users/root/Tree.xml
/Tekelec/WebNMS/users/root/maptoolbar.xml
/Tekelec/WebNMS/users/root/mibmenu.xml
/Tekelec/WebNMS/users/root/panelmenubar.dtd
/Tekelec/WebNMS/users/root/sysadminmenu.xml
/Tekelec/WebNMS/users/root/tl1browsermenu.xml
/Tekelec/WebNMS/users/root/toolbar.dtd
/Tekelec/WebNMS//Tekelec/WebNMS/users/root/listmenus
/Tekelec/WebNMS/users/root/listmenus/dummy.txt
/Tekelec/WebNMS//Tekelec/WebNMS/reportingStudio
/Tekelec/WebNMS/reportingStudio/AlarmSummary_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDate.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration_WithSeverity.rpt
/Tekelec/WebNMS/reportingStudio/Total_Duration_LinkSet_Inactivity.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_SpecificDuration_WithSeverity_UAM_Number.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_Top10_PerCount.rpt
/Tekelec/WebNMS/reportingStudio/Alarms_Top10_PerSeverity.rpt
/Tekelec/WebNMS/reportingStudio/All_Alarms.rpt
/Tekelec/WebNMS/reportingStudio/All_Events.rpt
/Tekelec/WebNMS/reportingStudio/CardReport_withErlang_PercentUtilization.rpt
/Tekelec/WebNMS/reportingStudio/Resources_Top10_PerCount.rpt
/Tekelec/WebNMS/reportingStudio/CardReport_withErlang_PercentUtilization_WithDateFilter.rpt
/Tekelec/WebNMS/reportingStudio/Duration_Link_Failure_And_Outage.rpt
/Tekelec/WebNMS/reportingStudio/EventSummary_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDate.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration_WithSeverity.rpt
/Tekelec/WebNMS/reportingStudio/Events_SpecificDuration_WithSeverity_UAM_Number.rpt
/Tekelec/WebNMS/reportingStudio/Inventory_AllCards.rpt
/Tekelec/WebNMS/reportingStudio/Inventory_OOSCards.rpt
/Tekelec/WebNMS/reportingStudio/LinkReport_withErlang_PercentUtilization.rpt
/Tekelec/WebNMS/reportingStudio/Resources_Top10_PerSeverity.rpt
/Tekelec/WebNMS/reportingStudio/LinkReport_withErlang_PercentUtilization_WithDateFilter.rpt
/Tekelec/WebNMS/reportingStudio/LinkSetReport_withErlang_PercentUtilization.rpt
/Tekelec/WebNMS/reportingStudio/LinkSetReport_withErlang_PercentUtilization_WithDateFilter.rpt
/Tekelec/WebNMS/reportingStudio/Measurement_Systot_STP.rpt
/Tekelec/WebNMS/reportingStudio/Message_Flow_SCTP_IPSG.rpt
/Tekelec/WebNMS/reportingStudio/Message_Flow_SCTP_IP_ASSOCIATION.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_Each_Linkset.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_IDP_Prepaid.rpt
/Tekelec/WebNMS/reportingStudio/SCCP_MSG_Processed_Per_LinkSet.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_Of_LinkSet_Above_Threshold.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_Of_Link_Above_Threshold.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_On_Each_Link.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_Utilization_SRI.rpt
/Tekelec/WebNMS/reportingStudio/Percentage_utilization_IMEI_Message.rpt
/Tekelec/WebNMS/conf/log4j.xml
/Tekelec/WebNMS/conf/FailOver.xml
/Tekelec/WebNMS/defaultconf/usernamePassword.conf
/Tekelec/WebNMS/conf/securitydbData.xml
/Tekelec/WebNMS/conf/clientparameters.conf
/Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml
/Tekelec/WebNMS/classes/hbnlib/secondary/hibernate.cfg.xml
/Tekelec/WebNMS/conf/transportProvider.conf
/Tekelec/WebNMS/conf/trapport.conf
/Tekelec/WebNMS/conf/NmsProcessesBE.conf
/Tekelec/WebNMS/conf/serverparameters.conf
/Tekelec/WebNMS/conf/SmartUpdateManager.xml
/Tekelec/WebNMS/html/NMSSocketPort.html
All the files & directories specified in the FILES_TO_RESTORE tag are successfully restored
\

OCEEMS successfully restored.
[emsadmuser@EMS2 backup]$
```

26. **Create OCEEMS SSL Certificate (on Server 1)**

Follow the procedure detailed in **Appendix J**.

NOTE: The steps 19-24 and 26 are to be run on both the servers (primary and secondary in the respective order). **Make sure that you run step 25 only on the Primary Server (Server1). **

27. **Start the e5ms Service on primary Server (Server 1)**.
Run the following command to restart the service:
```
$ service e5msService restart
```

28. **Start the e5ms Service on Standby Server (Server 2)**.
Note: Start Server 2 only when Server 1 is fully up. (Server may take several minutes to completely start e5msService depending on the number of connected eagles.)
Run the following command to restart the service:
```
$ service e5msService restart
```

This procedure is now complete.

Note: Follow the steps outlined in the "Procedure to Create OCEEMS SSL Certificate" to generate the necessary SSL certificate for HTTPS-based web access for the OCEEMS client. This procedure should be repeated if you encounter a "Transport Exception Error" when opening the GUI.

5.0 EMS FAILOVER UPGRADE

In this procedure, the user needs to first break the failover setup to upgrade one instance at a time to standalone. Perform the following steps to break the replication between the failover setups and upgrade them one by one. Refer to primary active server as Server1 and secondary standby server as Server2.

Note:

- Servers named as per the status of the servers when starting the upgrade procedure.
- You can find the replication user from the "show slave status \G;" command on the mate setup. It can be found corresponding to Master_User in the output. Note down the values from the respective mate setups and they will be used later when <replication_user> is mentioned in the below steps.

```
Master_Host: e5ms1
Master_User: primary
Master_Port: 3306
```

5.1 Upgrade Server 2 as Standalone

1. Perform the steps below on Server 2 to break replication (Perform all the steps from the root user).

    - Run the following after logging in to mysql

```
[emsadmuser@EMS5 bin]$ cd /Tekelec/WebNMS/bin/
[emsadmuser@EMS5 bin]$ cd /Tekelec/WebNMS/mysql/bin/
[emsadmuser@EMS5 bin]$ ./mysql -uroot -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 561
Server version: 5.6.38-log MySQL Community Server (GPL)

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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>
```

Run the following commands on mysql:

stop slave;
reset master;
reset slave all;

```
CHANGE MASTER TO MASTER_HOST=' ', MASTER_PORT=0, MASTER_USER='', MASTER_PASSWORD='',
MASTER_LOG_FILE='', MASTER_LOG_POS=0;
```

select User from mysql.user where User<>"root" and Host="localhost";
SELECT User, Host FROM mysql.user WHERE User = '<replication_user>';
DROP USER '<replication_user>'@'localhost';
DROP USER '<replication_user>'@'<server1_hostname>';
SHOW slave STATUS;

Note: Make sure that when checking slave status we get the following output. (Wait for some time after running the drop user commands to get the desired output from show slave status).

Examples of the commands are given below:

```
mysql> stop slave;
Query OK, 0 rows affected (0.00 sec)
mysql> reset master;
Query OK, 0 rows affected (0.01 sec)
mysql> reset slave all;
Query OK, 0 rows affected (0.01 sec)
mysql> CHANGE MASTER TO MASTER_HOST=' ', MASTER_PORT=0, MASTER_USER='', MASTER_PASSWORD='',
MASTER_LOG_FILE='', MASTER_LOG_POS=0;
Query OK, 0 rows affected, 2 warnings (0.02 sec)
mysql> select User from mysql.user where User<>"root" and Host="localhost";
+-------------+
|      User     |
+-------------+
| secReplUser |
+-------------+
1 row in set (0.01 sec)

mysql> SELECT User, Host FROM mysql.user WHERE User = 'secReplUser';
+-------------+-----------+
|      User.   |       Host.  |
+-------------+-----------+
| secReplUser |        ems4   |
| secReplUser | localhost |
+-------------+-----------+
2 rows in set (0.00 sec)

mysql> DROP USER 'secReplUser'@'localhost';
Query OK, 0 rows affected (0.00 sec)
mysql> DROP USER 'secReplUser'@'ems4';
Query OK, 0 rows affected (0.00 sec)
mysql> show slave status;
Empty set (0.00 sec)
```

Note: Make sure that when checking slave status we get the following output:

```
mysql> SHOW slave STATUS;
Empty set (0.00 sec)
```

In case you are not getting the above output then please run the following command again and retry showing slave status;

```
mysql> reset slave all;
Query OK, 0 rows affected (0.01 sec)

mysql> SHOW slave STATUS \G;
Empty set (0.00 sec)

ERROR:
No query specified
```

- Replace the hostname value in the given statement in the below file with the 'localhost' as shown below -

  $ vim /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml

  Change

  <property name="connection.url">jdbc:mysql://<hostname of primary server>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>

  As

  <property name="connection.url">jdbc:mysql://localhost/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>

- Remove Server 1 and Server 2 entry from the host file below. (Make sure to run this command from the root user.)

```
$ ls -l /etc/hosts
-rw-r--r--. 1 root root 196 Mar 4 03:47 /etc/hosts
```

- Stop e5msService using the below command(run this command from non-root user):

```
$ service e5msService stop
```

- Stop Mysql using stopMysql.sh and give the password.

```
$ cd /Tekelec/WebNMS/bin/
$ sh stopMySQL.sh
Enter password:
NOTE: Run this command to check whether mysql is running or not. If you get the
following error, it is shut down properly, this is just to make sure that the mysql
services are properly stopped.
[emsadmuser@EMS5 bin]$ ./stopMySQL.sh
Enter password:
bin/mysqladmin: connect to server at 'localhost' failed
error: 'Can't connect to local MySQL server through socket '/tmp/mysql.sock' (2)'
Check that mysqld is running and that the socket: '/tmp/mysql.sock' exists!
[emsadmuser@EMS5 bin]$
```

- Make sure that the server-id = 1 is present in startMysql.sh. If not, make the following changes.

```
$ cd /Tekelec/WebNMS/bin/
$ vim startMysql.sh
```

  - Before:

```
bin/mysqld_safe --defaults-file=$MYSQL_HOME/e5ms_defaults.cnf --
innodb_file_per_table=1 --server-id=2 --binlog-do-db=WebNmsDB --
binlog-format=MIXED --binlog-ignore-db=mysql --log-slave-updates --
log-bin=/Tekelec/WebNMS/mysql/data/log-bin --relay-
log=/Tekelec/WebNMS/mysql/data/relay-bin --slave-skip-
errors=1032,1050,1054,1060,1061,1062,1065,1146,1396&
```

  - After:

```
bin/mysqld_safe --defaults-file=$MYSQL_HOME/e5ms_defaults.cnf --
innodb_file_per_table=1 --server-id=1 --binlog-do-db=WebNmsDB --
binlog-format=MIXED --binlog-ignore-db=mysql --log-slave-updates --
log-bin=/Tekelec/WebNMS/mysql/data/log-bin --relay-
log=/Tekelec/WebNMS/mysql/data/relay-bin --slave-skip-
errors=1032,1050,1054,1060,1061,1062,1065,1146,1396&
```

- Restart e5msService(run this command from the non-root user).

```
$ service e5msService restart
```

Note: Wait for a few minutes till the server starts as a standalone machine.

After performing all the above steps, please verify that the Server 1 entry has been removed from the BEFailOver table in mysql.

2. Steps to verify the BEFailOver table. Run the following command:

```
[emsadmuser@EMS4 bin]$ cd /Tekelec/WebNMS/mysql/bin/
[emsadmuser@EMS5 bin]$ ./mysql -u root -p WebNmsDB -e "SELECT * FROM
BEFailOver;"
Enter password:
+---------------+-----------+-----------------+-----------+------------+-
-----------------+
| HOSTADDRESS   | NMSBEPORT | RMIREGISTRYPORT | LASTCOUNT | SERVERROLE |
STANDBYSERVERNAME |
```

```
+---------------+-----------+-----------------+-----------+------------+-
-----------------+
| 10.75.136.244 |      2000 |            1099 |         2 | PRIMARY    |
NULL             |
+---------------+-----------+-----------------+-----------+------------+-
-----------------+
[emsadmuser@EMS5 bin]$
```

3. Take a backup of the system. Save the backup created. This will be used after OS upgrade. Make sure to run the Backup script from the non-root user that was created during the ems installation.

```
$ cd /Tekelec/WebNMS/bin/backup/
$ sh BackupDB.sh -d <backup_directory>
Note: Make sure to transfer the backup to remote server before proceeding to the next
step.
```

4. Install Oracle Linux 8.8 on the machine.

```
$ cat /etc/os-release NAME="Oracle Linux Server" VERSION="8.8"
ID="ol"
ID_LIKE="fedora" VARIANT="Server" VARIANT_ID="server" VERSION_ID="8.8"
PLATFORM_ID="platform:el8" PRETTY_NAME="Oracle Linux Server 8.8" ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:oracle:linux:8:8:server" HOME_URL="https://linux.oracle.com/"
BUG_REPORT_URL="https://bugzilla.oracle.com/"
ORACLE_BUGZILLA_PRODUCT="Oracle Linux 8" ORACLE_BUGZILLA_PRODUCT_VERSION=8.8
ORACLE_SUPPORT_PRODUCT="Oracle Linux" ORACLE_SUPPORT_PRODUCT_VERSION=8.8
```

5. Install java : 17.x

   Copy java to your machine. Preferably the following rpm. jdk-17_linux-x64_bin.rpm

```
$ rpm -ivh jdk-17_linux-x64_bin.rpm
warning: jdk-17_linux-x64_bin.rpm: Header V3 RSA/SHA256 Signature, key ID ec551f03: NOKEY
Verifying...   ################################# [100%]
Preparing...   ################################# [100%]
Updating / installing...
1:jdk-17-2000:17-ga    ################################# [100%]
```

   Add java to the path

```
# cd /usr/java/
# ll
total 0
lrwxrwxrwx. 1 root root 16 Mar 7 02:46 default -> /usr/java/latest
drwxr-xr-x. 10 root root 120 Mar 7 02:46 jdk-17
lrwxrwxrwx. 1 root root 16 Mar 7 02:46 latest -> /usr/java/jdk-17
```

   Create one custom.sh file at path : “/etc/profile.d”

   Add below line and save:

export JAVA_HOME=/usr/java/jdk-17 export PATH=$JAVA_HOME/bin:$PATH

6. Exit the session and re-login to the VM.
7. Install one MySQL 8 package.

   For MySQL 8 one package needs to be installed.

   Command: yum install ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm

   Logs:

```
# yum install ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm Last metadata expiration check: 2:53:23 ago on Thu 07 Mar 2024
12:01:03 AM EST. Can not load RPM file: ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm.
Could not open: ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm
Note: If you face any error during the installation of the package use the underlying command. [root@EMS4 ~]# yum install ncurses-
compat-libs
Last metadata expiration check: 2:57:58 ago on Thu 07 Mar 2024 12:01:03 AM EST.
Dependencies resolved.
Package   Architecture      Version     Repository Size
================================================================================
==================
Installing:
ncurses-compat-libs 328 k
Upgrading: ncurses  x86_64
```

```
x86_64    6.1-10.20180224.el8
6.1-10.20180224.el8 ol8_baseos_latest
ol8_baseos_latest
387 k
ncurses-base        noarch    6.1-10.20180224.el8 ol8_baseos_latest
81 k
ncurses-libs        x86_64    6.1-10.20180224.el8 ol8_baseos_latest
334 k
Transaction Summary Install 1 Package
Upgrade 3 Packages
Total download size: 1.1 M Is this ok [y/N]: y Downloading Packages:
(1/4): ncurses-base-6.1-10.20180224.el8.noarch.rpm          172 kB/s | 81
kB        00:00
(2/4): ncurses-compat-libs-6.1-10.20180224.el8.x86_64.rpm   522 kB/s | 328 kB   00:00
(3/4): ncurses-6.1-10.20180224.el8.x86_64.rpm     602 kB/s | 387
kB        00:00

(4/4): ncurses-libs-6.1-10.20180224.el8.x86_64.rpm          1.4 MB/s | 334 kB   00:00
Total     1.6 MB/s | 1.1 MB 00:00
Oracle Linux 8 BaseOS Latest (x86_64)   3.0 MB/s | 3.1 kB 00:00
Importing GPG key 0xAD986DA3:
Userid    : "Oracle OSS group (Open Source Software group) <build@oss.oracle.com>" Fingerprint: 76FD 3DB1 3AB6 7410 B89D B10E 8256
2EA9 AD98 6DA3
From      : /etc/pki/rpm-gpg/RPM-GPG-KEY-oracle Is this ok [y/N]: y
Key imported successfully Running transaction check Transaction check succeeded. Running transaction test Transaction test succeeded.
Running transaction
Preparing :          1/1
Upgrading : ncurses-base-6.1-10.20180224.el8.noarch 1/7
Upgrading : ncurses-libs-6.1-10.20180224.el8.x86_64 2/7
Upgrading : ncurses-6.1-10.20180224.el8.x86_64 3/7
Installing          : ncurses-compat-libs-6.1-10.20180224.el8.x86_64 4/7
Cleanup   : ncurses-6.1-9.20180224.el8.x86_64 5/7
Cleanup   : ncurses-libs-6.1-9.20180224.el8.x86_64 6/7
Cleanup   : ncurses-base-6.1-9.20180224.el8.noarch 7/7
Running scriptlet: ncurses-base-6.1-9.20180224.el8.noarch 7/7
Verifying : ncurses-compat-libs-6.1-10.20180224.el8.x86_64 1/7
Verifying : ncurses-6.1-10.20180224.el8.x86_64 2/7
Verifying : ncurses-6.1-9.20180224.el8.x86_64 3/7
Verifying : ncurses-base-6.1-10.20180224.el8.noarch 4/7
Verifying : ncurses-base-6.1-9.20180224.el8.noarch 5/7
Verifying : ncurses-libs-6.1-10.20180224.el8.x86_64 6/7
Verifying : ncurses-libs-6.1-9.20180224.el8.x86_64 7/7
Upgraded:
ncurses-6.1-10.20180224.el8.x86_64      ncurses-base-6.1-10.20180224.el8.noarch ncurses-libs-6.1- 10.20180224.el8.x86_64
Installed:
ncurses-compat-libs-6.1-10.20180224.el8.x86_64 Complete!
```

Confirm the required pkg:

```
$ rpm -qa | grep ncurses-compat-libs ncurses-compat-libs-6.1-
10.20180224.el8.x86_64
```

8. Copy the EMS 47 rpm to your machine using scp or any other method.

9. Install the EMS 47 rpm as per the Installation Guide section 2 for standalone system.

10. Make sure keystore.type has value “jks” in java.security file in folder *“/usr/java/jdk-17/conf/security”*
    If not make the required change.
    keystore.type=jks

11. After successful installation, copy the backup of the older version of EMS release (46.6), taken in step 3 of this section to /tmp directory.
    Run the following command on the server(run this from root user):
    Commands:
    $ cd /Tekelec/WebNMS/bin/
    $ ./updateConf_46.6.sh <backup_directory>

12. Make sure that the backup directory has ownership as emsadmuser:emsadm group and user.
    drwxrwxr-x. 10 emsadmuser emsadm 191 May 28 12:58 Backup_emsadmuser

Note: Backup files must be having emsadmuser:emsadm group:user and 770 permission.

$ ls -ltrh total 1.5M
drwxrwx---. 3 emsadmuser emsadm 20 May 6 04:39 classes
drwxrwx---. 3 emsadmuser emsadm 18 May 6 04:39 commandManagerScripts
drwxrwx---. 3 emsadmuser emsadm 4.0K May 6 04:39 conf
drwxrwx---. 2 emsadmuser emsadm 35 May 6 04:39 defaultconf
-rwxrwx---. 1 emsadmuser emsadm 1.5M May 6 04:39 E5MS_Database_BackUp.sql
drwxrwx---. 2 emsadmuser emsadm 32 May 6 04:39 html
drwxrwx---. 2 emsadmuser emsadm 40 May 6 04:39 linkUtilizationScripts
drwxrwx---. 2 emsadmuser emsadm 4.0K May 6 04:39 reportingStudio
drwxrwx--- . 8 emsadmuser emsadm 83 May 6 04:39 users

13. Stop e5ms service
    $ service e5msService stop

14. Restore the DB (run this from the non-root user)
    $ cd /Tekelec/WebNMS/bin/backup/
    $ sh RestoreDB.sh <path of the backup directory>/E5MS_Database_BackUp.sql

15. Perform the procedure to create OCEEMS SSL certificate detailed in Appendix J.

16. Start e5ms service.
    $ service e5msService start

This procedure is now complete on Server 2.

5.2 Upgrade Server 1 as Standalone

1. Perform the steps below on Server 1 to break replication (Perform all the steps from the root user).

   - Run the following after logging in to mysql

```
[emsadmuser@EMS5 bin]$ cd /Tekelec/WebNMS/bin/
[emsadmuser@EMS5 bin]$ cd /Tekelec/WebNMS/mysql/bin/
[emsadmuser@EMS5 bin]$ ./mysql -uroot -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 561
Server version: 5.6.38-log MySQL Community Server (GPL)

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owners.

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

mysql>
```

Run the following commands on mysql:

```
stop slave;
reset master;
reset slave all;
CHANGE MASTER TO MASTER_HOST=' ', MASTER_PORT=0, MASTER_USER='', MASTER_PASSWORD='',
MASTER_LOG_FILE='', MASTER_LOG_POS=0;
```

```
select User from mysql.user where User<>"root" and
Host="localhost";
SELECT User, Host FROM mysql.user WHERE User =
'<replication_user>';
DROP USER '<replication_user>'@'localhost';
DROP USER '<replication_user>'@'<server2_hostname>';
SHOW slave STATUS;
```

Note: While checking the slave status, you must see the following output:

mysql> SHOW slave STATUS;
Empty set (0.00 sec)

In case you are not getting the above output then please run the following command again and retry showing slave status;

```
mysql> reset slave all;
Query OK, 0 rows affected (0.01 sec)

mysql> SHOW slave STATUS \G;
Empty set (0.00 sec)

ERROR:
No query specified
```

- Replace the hostname value in the given statement in the below file with the 'localhost' as shown below -

  $ vim /Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml

  Change

  <property name="connection.url">jdbc:mysql://<hostname of primary server>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>

  As

  <property name="connection.url">jdbc:mysql://localhost/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>

- Remove Server 1 and Server 2 entry from the following host file. (Perform this step this from the root user.)

```
$ ls -l /etc/hosts
-rw-r--r--. 1 root root 196 Mar 4 03:47 /etc/hosts
```

- Stop e5msService using the below command:

```
$ service e5msService stop
```

- Stop Mysql using stopMysql.sh and enter the password.

```
$ cd /Tekelec/WebNMS/bin/
$ sh stopMySQL.sh
Enter password:
NOTE: Run this command to check whether mysql is running or not. If you get the
following error, it is shut down properly, this is just to make sure that the mysql
services are properly stopped.
[emsadmuser@EMS5 bin]$ ./stopMySQL.sh
Enter password:
bin/mysqladmin: connect to server at 'localhost' failed
error: 'Can't connect to local MySQL server through socket '/tmp/mysql.sock' (2)'
Check that mysqld is running and that the socket: '/tmp/mysql.sock' exists!
[emsadmuser@EMS5 bin]$
```

- Make sure that the server-id = 1 is present in startMysql.sh. If not, make the following changes.

```
$ cd /Tekelec/WebNMS/bin/
$ vim startMysql.sh
```

- Before:

```
bin/mysqld_safe --defaults-file=$MYSQL_HOME/e5ms_defaults.cnf --
innodb_file_per_table=1 --server-id=1 --binlog-do-db=WebNmsDB --
binlog-format=MIXED --binlog-ignore-db=mysql --log-slave-updates --
log-bin=/Tekelec/WebNMS/mysql/data/log-bin --relay-
log=/Tekelec/WebNMS/mysql/data/relay-bin --slave-skip-
errors=1032,1050,1054,1060,1061,1062,1065,1146,1396&
```

- After:

```
bin/mysqld_safe --defaults-file=$MYSQL_HOME/e5ms_defaults.cnf --
innodb_file_per_table=1 --server-id=1 --binlog-do-db=WebNmsDB --
binlog-format=MIXED --binlog-ignore-db=mysql --log-slave-updates --
log-bin=/Tekelec/WebNMS/mysql/data/log-bin --relay-
log=/Tekelec/WebNMS/mysql/data/relay-bin --slave-skip-
errors=1032,1050,1054,1060,1061,1062,1065,1146,1396&
```

- Restart e5msService.

$ service e5msService restart

Note: Wait for few minutes till the server starts as a standalone machine.

After performing all the above steps, verify that the Server 2 entry has been removed from the BEFailOver table in mysql.

2. Steps to verify the BEFailOver table. Run the following commands:

```
[emsadmuser@EMS4 bin]$ cd /Tekelec/WebNMS/mysql/bin/
[emsadmuser@EMS5 bin]$ ./mysql -u root -p WebNmsDB -e "SELECT * FROM
BEFailOver;"
Enter password:
+---------------+-----------+-----------------+-----------+------------+-
-----------------+
| HOSTADDRESS   | NMSBEPORT | RMIREGISTRYPORT | LASTCOUNT | SERVERROLE |
STANDBYSERVERNAME |
+---------------+-----------+-----------------+-----------+------------+-
-----------------+
| 10.75.136.244 |      2000 |            1099 |         2 | PRIMARY    |
NULL              |
+---------------+-----------+-----------------+-----------+------------+-
-----------------+
[emsadmuser@EMS5 bin]$
```

3. Take a backup of the system. Save the backup created. This will be used in case of failure and after OS upgrade. Make sure to run the backup script from the non-root user that was created during the ems installation.

```
$ cd /Tekelec/WebNMS/bin/backup/
$ sh BackupDB.sh -d <backup_directory>
```

Note : Make sure to transfer the backup to remote server before proceeding to next step.

4. Install Oracle Linux 8.8 on the machine.

```
$ cat /etc/os-release NAME="Oracle Linux Server" VERSION="8.8"
ID="ol"
ID_LIKE="fedora" VARIANT="Server" VARIANT_ID="server" VERSION_ID="8.8"
PLATFORM_ID="platform:el8" PRETTY_NAME="Oracle Linux Server 8.8" ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:oracle:linux:8:8:server" HOME_URL="https://linux.oracle.com/"
BUG_REPORT_URL="https://bugzilla.oracle.com/"
```

```
ORACLE_BUGZILLA_PRODUCT="Oracle Linux 8" ORACLE_BUGZILLA_PRODUCT_VERSION=8.8
ORACLE_SUPPORT_PRODUCT="Oracle Linux" ORACLE_SUPPORT_PRODUCT_VERSION=8.8
```

5. Install java: 17.x

   Copy java to your machine. Preferably the following rpm. jdk-17_linux-x64_bin.rpm

```
$ rpm -ivh jdk-17_linux-x64_bin.rpm
warning: jdk-17_linux-x64_bin.rpm: Header V3 RSA/SHA256 Signature, key ID ec551f03: NOKEY
Verifying...   ################################# [100%]
Preparing...   ################################# [100%]
Updating / installing...
1:jdk-17-2000:17-ga    ################################# [100%]
```

   Add java to the path

   # cd /usr/java/
   # ll
   total 0
   lrwxrwxrwx. 1 root root 16 Mar 7 02:46 default -> /usr/java/latest
   drwxr-xr-x. 10 root root 120 Mar 7 02:46 jdk-17
   lrwxrwxrwx. 1 root root 16 Mar 7 02:46 latest -> /usr/java/jdk-17

   Create one custom.sh file at path : "/etc/profile.d"

   Add below line and save:

   export JAVA_HOME=/usr/java/jdk-17 export PATH=$JAVA_HOME/bin:$PATH

6. Exit the session and log in again to the VM.
7. Install one MySQL 8 package.

   For MySQL 8 one package needs to be installed.

   Command: yum install ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm

   Logs:

```
# yum install ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm Last metadata expiration check: 2:53:23 ago on Thu 07 Mar 2024
12:01:03 AM EST. Can not load RPM file: ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm.
Could not open: ncurses-compat-libs-6.1-9.20180224.el8.x86_64.rpm
Note: If you face any error during the installation of the package use the underlying command. [root@EMS4 ~]# yum install ncurses-
compat-libs
Last metadata expiration check: 2:57:58 ago on Thu 07 Mar 2024 12:01:03 AM EST.
Dependencies resolved.
Package   Architecture      Version     Repository Size
================================================================================
====================
Installing:
ncurses-compat-libs 328 k
Upgrading: ncurses  x86_64
x86_64    6.1-10.20180224.el8
6.1-10.20180224.el8 ol8_baseos_latest
ol8_baseos_latest
387 k
ncurses-base        noarch    6.1-10.20180224.el8 ol8_baseos_latest
81 k
ncurses-libs        x86_64    6.1-10.20180224.el8 ol8_baseos_latest
334 k
Transaction Summary Install 1 Package
Upgrade 3 Packages
Total download size: 1.1 M Is this ok [y/N]: y Downloading Packages:
(1/4): ncurses-base-6.1-10.20180224.el8.noarch.rpm          172 kB/s | 81
kB        00:00
(2/4): ncurses-compat-libs-6.1-10.20180224.el8.x86_64.rpm   522 kB/s | 328 kB   00:00
(3/4): ncurses-6.1-10.20180224.el8.x86_64.rpm     602 kB/s | 387
kB        00:00

(4/4): ncurses-libs-6.1-10.20180224.el8.x86_64.rpm          1.4 MB/s | 334 kB   00:00
Total     1.6 MB/s | 1.1 MB 00:00
Oracle Linux 8 BaseOS Latest (x86_64)   3.0 MB/s | 3.1 kB 00:00
Importing GPG key 0xAD986DA3:
Userid    : "Oracle OSS group (Open Source Software group) <build@oss.oracle.com>" Fingerprint: 76FD 3DB1 3AB6 7410 B89D B10E 8256
2EA9 AD98 6DA3
From      : /etc/pki/rpm-gpg/RPM-GPG-KEY-oracle Is this ok [y/N]: y
Key imported successfully Running transaction check Transaction check succeeded. Running transaction test Transaction test succeeded.
Running transaction
Preparing :         1/1
Upgrading : ncurses-base-6.1-10.20180224.el8.noarch 1/7
Upgrading : ncurses-libs-6.1-10.20180224.el8.x86_64 2/7
Upgrading : ncurses-6.1-10.20180224.el8.x86_64 3/7
Installing          : ncurses-compat-libs-6.1-10.20180224.el8.x86_64 4/7
```

```
Cleanup   : ncurses-6.1-9.20180224.el8.x86_64 5/7
Cleanup   : ncurses-libs-6.1-9.20180224.el8.x86_64 6/7
Cleanup   : ncurses-base-6.1-9.20180224.el8.noarch 7/7
Running scriptlet: ncurses-base-6.1-9.20180224.el8.noarch 7/7
Verifying : ncurses-compat-libs-6.1-10.20180224.el8.x86_64 1/7
Verifying : ncurses-6.1-10.20180224.el8.x86_64 2/7
Verifying : ncurses-6.1-9.20180224.el8.x86_64 3/7
Verifying : ncurses-base-6.1-10.20180224.el8.noarch 4/7
Verifying : ncurses-base-6.1-9.20180224.el8.noarch 5/7
Verifying : ncurses-libs-6.1-10.20180224.el8.x86_64 6/7
Verifying : ncurses-libs-6.1-9.20180224.el8.x86_64 7/7
Upgraded:
ncurses-6.1-10.20180224.el8.x86_64      ncurses-base-6.1-10.20180224.el8.noarch ncurses-libs-6.1- 10.20180224.el8.x86_64
Installed:
ncurses-compat-libs-6.1-10.20180224.el8.x86_64 Complete!
```

Confirm the required pkg:

```
$ rpm -qa | grep ncurses-compat-libs ncurses-compat-libs-6.1-
10.20180224.el8.x86_64
```

8. Copy the EMS 47 rpm to your machine using scp or any other method.

9. Install the EMS 47 rpm as specified in section 2 for standalone system.

This procedure is now complete on Server 1.

1.1 Connect Upgraded Server 2 and Upgraded Server 1 as Failover

Perform the following steps to make Failover setup:

Follow steps 1-3 on Server 1 only.

1. Make sure keystore.type has value “jks” in java.security file in folder *"/usr/java/jdk-17/conf/security”*

   If not make the required change.

   keystore.type=jks

2. After successful installation, take the backup of the already upgraded standalone machine (Server 2 done in section 1) and copy the backup directory to Server 1‘s /tmp directory.

3. Make sure that the backup directory has ownership as emsadmuser:emsadm group and user.

   drwxrwxr-x. 10 emsadmuser emsadm 191 May 28 12:58 Backup_emsadmuser

Note: Backup files must have emsadmuser:emsadm group:user and 770 permission.

```
$ ls -ltrh total 1.5M
drwxrwx---. 3 emsadmuser emsadm 20 May 6 04:39 classes
drwxrwx---. 3 emsadmuser emsadm 18 May 6 04:39
commandManagerScripts
drwxrwx---. 3 emsadmuser emsadm 4.0K May 6 04:39 conf
drwxrwx---. 2 emsadmuser emsadm 35 May 6 04:39 defaultconf
-rwxrwx---. 1 emsadmuser emsadm  1.5M May 6 04:39
E5MS_Database_BackUp.sql
drwxrwx---. 2 emsadmuser emsadm 32 May 6 04:39 html
drwxrwx---. 2 emsadmuser emsadm 40 May 6 04:39
linkUtilizationScripts
```

```
drwxrwx---. 2 emsadmuser emsadm 4.0K May 6 04:39
reportingStudio
drwxrwx--- . 8 emsadmuser emsadm 83 May 6 04:39 users
```

4. Stop e5msService using the below command on both servers.

$ service e5msService stop

Imp. Note: The steps below are making Server 2 as Primary and Server 1 as Standby.

5. On both the servers, update the system's 'hosts' file to add the DNS entries for both primary and standby servers. (Do this from the root user)
   On CentOS, the hosts file is placed in '/etc' directory.
   Sample entries -

10.248.10.25 e5ms1

10.248.10.21 e5ms2

Note: Primary and Standby 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.

6. 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.
7. Perform the steps in section F.1 to setup replication between the servers. **Make sure to make Server 2 as primary.**
8. Restore the backup DB created in Step 2 of this section on Server 1 (Standby) (Do this using the non-root user).

```
$ cd /Tekelec/WebNMS/bin/backup/
$ sh RestoreDB.sh <path of the backup
directory>/E5MS_Database_BackUp.sql
```

9. (Do this on both the servers) Replace the 'localhost' value in the given statement in

/Tekelec/WebNMS/classes/hbnlib/hibernate.cfg.xml

file with the hostname of the respective server as shown below -
Change

```
<property
name="connection.url">jdbc:mysql://localhost/WebNmsDB?dumpQueriesOnException=true&amp;jd
bcCompliantTruncation=false</property>
```

As

```
<property name="connection.url">jdbc:mysql://<hostname of
server>/WebNmsDB?dumpQueriesOnException=true&amp;jdbcCompliantTruncation=false</property
>
```

10. Perform the procedure to create OCEEMS SSL certificate detailed in Appendix J on both the setups.
11. Start e5ms service on Server 2 (Primary) first and wait for few minutes by the time it is successfully up.

    $ service e5msService start

12. Now start the service on Server 1(Standby).

    $ service e5msService start

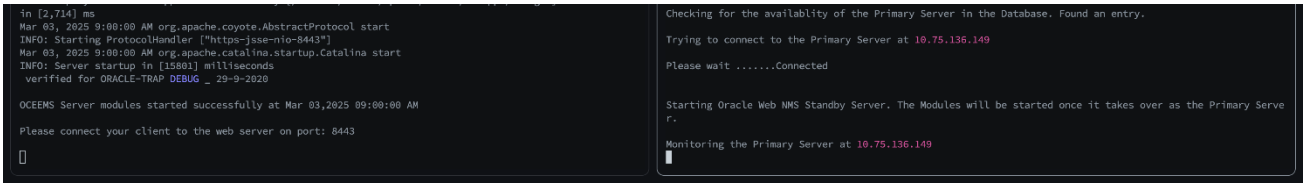

Fig: (Left Side) Primary Server | (Right Side) Standby Server

6.0 UPGRADE OCEEMS LICENSE

Perform the following steps for the OCEEMS License upgrade:

Purpose	Requirements	Time Required
Upgrading license of OCEEMS	1. Log in credentials of the root user on the target OCEEMS server. 2. OCEEMS 47 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	Log in to target machine using the root user.	Successful Login
2	Switch user to non-root user. Check the status of OCEEMS server.	`$ service e5msService status`

3	Shut down 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	Switch back to root user and change directory to /Tekelec/WebNMS/bin.	`$ cd /Tekelec/WebNMS/bin`

6	Run the E5MSUpgrade.sh script and provide 1 as an input, 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'.
		`$ 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/Re47/OCEEMSLicense47.xml`
		
		`OCEEMS license upgrade is in progress... License upgrade done.`

7	Perform this step only if customer needs to run OCEEMS using a non-root user, else move to step 9. Execute updatePrivilegesForUser.sh	`# 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	Log out 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.

7.0 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 7.1 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.

7.1 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.

7.1.1 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**.

7.1.2 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.

7.1.3 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.

7.1.4 Status of restore

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

8. BAREMETAL TO VM MIGRATION

7.1 Migration with Same IP

1. Perform the steps 1-14 in Chapter 4.0 - UPGRADE PROCEDURE (STANDALONE/FAILOVER SERVER).
2. Backup Directory Navigation:

   a. Navigate to the folder where the backup is copied. (Example: /tmp/backup/).

3. Run the following command using root user:

   sed -i 's/< BM IP >/< VM IP >/g' E5MS_Database_BackUp.sql

   Note: Here both IPs should be the same.

4. Log in as non-root user(emsadmuser).
5. Stop e5ms service.

   [emsadmuser@EMS2 backup]$ service e5msService stop

6. Restore the DB.
   a. cd /Tekelec/WebNMS/bin/backup/
   b. sh RestoreDB.sh <copied backup path used in step 14>/E5MS_Database_BackUp.sql
   c. Perform the procedure to create OCEEMS SSL certificate detailed in Appendix J.
   d. Start e5ms service
      $ service e5msService start

This procedure is now complete.

7.2 Migration with Different IP

1. Perform steps 1 - 14 from **Chapter 4.0 - UPGRADE PROCEDURE (STANDALONE/FAILOVER SERVER)** with the following adjustments:
   1. **Important:** Make sure to read the Notes.
2. **Backup Directory Navigation:**
   1. Navigate to the folder where the backup is copied. (Example: /tmp/backup/).

Note: Run the above command on primary server only.

3. **Update IP in Backup:**
   1. For Standalone:
      - Run the following command to update the old IP to the new IP of the VM:

        ```
        sed -i 's/old_IP/new_IP/g' E5MS_Database_BackUp.sql
        ```

   2. For failover (Ensure the correct new primary and secondary IPs):
      - Update the primary IP:

```
sed -i 's/old_primary_IP/new_primary_IP/g'
E5MS_Database_BackUp.sql
```

- Update the secondary IP:

```
sed -i 's/old_secondary_IP/new_secondary_IP/g'
E5MS_Database_BackUp.sql
```

Note: Run the above commands on the primary server only.

- **Stop e5msService on Secondary then Stop the service on Primary**

  [emsadmuser@EMS2 backup]$ service e5msService stop

- **Restore DB Primary Server**
  Note: It's not required to restore on secondary server.

  [emsadmuser@EMS2 ~]$ cd /Tekelec/WebNMS/bin/backup/

  [emsadmuser@EMS2 backup]$ sh RestoreDB.sh /E5MS_Database_BackUp.sql

- **Run E5MSConfigurationScript.sh**

  Note: Perform this on the primary server first and then on the secondary server.

- **Perform the procedure to create OCEEMS SSL certificate detailed in Appendix J on primary as well secondary server.**

  Note: Perform this on the primary server first and then on the secondary server.

- **Start the current EMS Service on the primary server first and wait until the service is up. Once primary is up, then start the secondary service.**

  [emsadmuser@EMS2 backup]$ service e5msService start

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.

7.1.4.1.1 LOG MESSAGES ON FIRST STARTUP OF OCEEMS SERVER AFTER INSTALLATION

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


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13.2 This Agreement (including any addenda hereto signed by both parties) represents the entire agreement of the parties with respect to the subject matter of this Agreement and supersedes all previous communications, representations, understandings and agreements, either oral or written, between the parties with respect to said subject matter.

Press Enter to continue...

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Press Enter to continue...

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"Updates" mean a Minor Release identified by the change in the digit to the right of the first and subsequent decimal places reading from left to right in a Zoho Corp. product

```
release number. For instance, in Zoho Corp. Product Release X.a and X.b.c - a, b, and c
are Updates or Minor Releases.


"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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PLEASE READ THE ASSOCIATED COPYRIGHT FILE FOR INFORMATION ON THIRD PARTY SOFTWARE BUNDLED
ALONG WITH THIS PRODUCT.

Do you accept the LICENSE AGREEMENT   (y/n)

y
```

7.1.4.1.2 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
47.0.0.0 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
```

7.1.4.1.3 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
```

7.1.4.1.4 LOG MESSAGES ON INSTALLATION OF OCEEMS SCHEMA

```
The CMI Schema will be installed as per the Eagle Release entered.

Press 'Enter' if you want to proceed with the Default Eagle Release(47.0) or
Enter the Eagle Release from the below available Eagle CMI Schemas in OCEEMS:
46.3.0
46.5.0
46.6.0

47.0
Eagle CMI Path is: /Tekelec/WebNMS/bin/schema/cmi/eagle47.0.0
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!
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!
```

7.1.4.1.5 [EMSADMUSER@EMS2 BIN]$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: 463.15.0
Installed OCEEMS rpm version: 463
Current OCEEMS rpm version is lower than the version supporting MySQL 5.6.38.
MySQL version in use is lower than 5.6.38, 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_463.15.0/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_463.15.0/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_463.15.0/E5MS_Database_BackUp.sql


OCEEMS dump file provided by you is:
/var/upgrade/Backup_463.15.0/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 466.5.0 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 R46.6 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.
```

7.1.4.1.6 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 R47.x 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	Log in in 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	On the PRIMARY system, add the following parameters to the /Tekelec/WebNMS/bin/startMySQL.sh script on the mysqld_safe line: -- auto-increment-increment=2 -- auto-increment-offset=1	`bin/mysqld_safe --defaults-file=$MYSQL_HOME/e5ms_defaults.cnf --auto-increment-increment=2 --auto-increment-offset=1 --replicate-same-server-id=0 --mysql-native-password=ON --innodb_file_per_table=1 --server-id=1 --binlog-do-db=WebNmsDB --binlog-format=MIXED --binlog-ignore-db=mysql --log-slave-updates --log-`

	--replicate-same-server-id=0 --mysql-native-password=ON Also, add in 1051 to the -slave-skip-errors line	bin=/Tekelec/WebNMS/mysql/data/log-bin --relay-log=/Tekelec/WebNMS/mysql/data/relay-bin --slave-skip-errors=1032,1050,1051,1054,1060,1061,1062,1065,1146,1396&

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 -u root -p Enter password: Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 1688 Server version: 8.0.3-rc-log MySQL Community Server (GPL) Copyright (c) 2000, 2017, 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.
8	Execute the following commands in mysql: STOP REPLICA; RESET BINARY LOGS AND GTIDS;	Successful Execution of step
9	Log in to the standby OCEEMS server using the non-root user configured for OCEEMS.	-
10	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&jdbcCompliantTruncation=false</property> As – <property name="connection.url">jdbc:mysql://<hostname of standby server>/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property> e.g. <property name="connection.url">jdbc:mysql://e5ms2/WebNmsDB?dumpQueriesOnException=true&jdbcCompliantTruncation=false</property>
11	Move to directory /Tekelec/WebNMS/bin.	$ cd /Tekelec/WebNMS/bin
12	On the STANDBY system, add the following parameters to the /Tekelec/WebNMS/bin/startMySQL.sh script on the mysqld_safe line: --auto-increment-increment=2 -- auto-increment-offset=2 --replicate-same-server-id=0 --mysql-native-password=ON Also, ensure --server-id=2 after --innodb_file_per_table=1 Also, add in 1051 to the --slave-skip-errors line	bin/mysqld_safe --defaults-file=$MYSQL_HOME/e5ms_defaults.cnf --auto-increment-increment=2 --auto-increment-offset=2 --replicate-same-server-id=0 --mysql-native-password=ON --innodb_file_per_table=1 --server-id=2 --binlog-do-db=WebNmsDB --binlog-format=MIXED --binlog-ignore-db=mysql --log-slave-updates --log-bin=/Tekelec/WebNMS/mysql/data/log-bin --relay-log=/Tekelec/WebNMS/mysql/data/relay-bin --slave-skip-errors=1032,1050,1051,1054,1060,1061,1062,1065,1146,1396&
13	On the STANDBY SYSTEM, remove the auto.cnf file. rm /Tekelec/WebNMS/mysql/data/auto.cnf file	$ rm /Tekelec/WebNMS/mysql/data/auto.cnf Successful Execution of step
14	Start MySQL server by invoking startMySQL.sh script.	$ sh startMySQL.sh # bin/safe_mysqld: line 199: my_print_defaults: command not found bin/safe_mysqld: line 204: my_print_defaults: command not found nohup: redirecting stderr to stdout Starting mysqld daemon with databases from /Tekelec/WebNMS/mysql/data
15	Move to '/Tekelec/WebNMS/mysql/bin' directory.	$ cd /Tekelec/WebNMS/mysql/bin
16	Connect to the MySQL client by executing MySQL in	# ./mysql -u root -p Enter password:

	'/Tekelec/WebNMS/mysql/bin' directory. Provide the password for MySQL root user when prompted.	Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 1688 Server version: 8.0.3-rc-log MySQL Community Server (GPL) Copyright (c) 2000, 2017, 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.
17	Execute the following commands in mysql: STOP REPLICA; RESET BINARY LOGS AND GTIDS;	Successful execution of step
18	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 the GRANT REPLICATION SLAVE command.	CREATE USER IF NOT EXISTS 'root'@'<primary server hostname>' IDENTIFIED WITH mysql_native_password BY '<primary server's mysql root user password>'; GRANT ALL PRIVILEGES ON *.* TO 'root'@'<primary server hostname>'; ALTER USER 'root'@'<primary server hostname>' IDENTIFIED WITH mysql_native_password BY '<primary server's mysql root user password>'; CREATE USER IF NOT EXISTS 'root'@'<standby server hostname>' IDENTIFIED WITH mysql_native_password BY '<standby server's mysql root user password>'; GRANT ALL PRIVILEGES ON *.* TO 'root'@'<standby server hostname>'; ALTER USER 'root'@'<standby server hostname>' IDENTIFIED WITH mysql_native_password BY '<standby server's mysql root user password>'; CREATE USER '<primary replication user>'@'localhost' IDENTIFIED WITH mysql_native_password BY '<primary replication user password>'; CREATE USER '<primary replication user>'@'<standby server hostname>' IDENTIFIED WITH mysql_native_password BY '<primary replication user password>';

		GRANT REPLICATION SLAVE ON *.* TO '<primary replication user>'@'<standby server's hostname>' ; FLUSH PRIVILEGES;
19	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.	CREATE USER IF NOT EXISTS 'root'@'<primary server hostname>' IDENTIFIED WITH mysql_native_password BY '<primary server's mysql root user password>'; GRANT ALL PRIVILEGES ON *.* TO 'root'@'<primary server hostname>'; ALTER USER 'root'@'<primary server hostname>' IDENTIFIED WITH mysql_native_password BY '<primary server's mysql root user password>'; CREATE USER IF NOT EXISTS 'root'@'<standby server hostname>' IDENTIFIED WITH mysql_native_password BY '<standby server's mysql root user password>'; GRANT ALL PRIVILEGES ON *.* TO 'root'@'<standby server hostname>'; ALTER USER 'root'@'<standby server hostname>' IDENTIFIED WITH mysql_native_password BY '<standby server's mysql root user password>'; CREATE USER '<standby replication user>'@'localhost' IDENTIFIED WITH mysql_native_password BY '<standby replication user password>'; CREATE USER '<standby replication user>'@'<primary server hostname>' IDENTIFIED WITH mysql_native_password BY '<standby replication user password>'; GRANT REPLICATION SLAVE ON *.* TO '<standby replication user>'@'<primary server hostname>' ; FLUSH PRIVILEGES;
20	Run SHOW BINARY LOG 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 BINARY LOG 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)
21	Run SHOW BINARY LOG STATUS command on the MySQL prompt on standby server.	mysql>SHOW BINARY LOG STATUS; +----------------+----------+--------------+-------------------+ | File | Position | Binlog_Do_DB | Binlog_Ignore_DB | Executed_Gtid_Set |

	Note the values for columns 'File' and 'Position'. Let us call them StandbyLogFile and StandbyLogPosition to be used later in the procedure.	+----------------+----------+--------------+-------------------+ | log-bin.000004 | 545 | WebNmsDB | mysql | | +----------------+----------+--------------+-------------------+ 1 row in set (0.00 sec)
22	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 REPLICATION SOURCE TO SOURCE_HOST='<standby server hostname>', SOURCE_PORT=3306, SOURCE_USER='<standby replication user>', SOURCE_PASSWORD='<standby replication user password>', SOURCE_LOG_POS=<StandbyLogPosition>, SOURCE_LOG_FILE='<StandbyLogFile>'; START REPLICA;
23	Execute the two MySQL commands on the standby server. In the command, replace the values for <PrimaryLogPosition> and <PrimaryLogFile> noted earlier in this procedure.	CHANGE REPLICATION SOURCE TO SOURCE_HOST='<primary server hostname>', SOURCE_PORT=3306, SOURCE_USER='<primary replication user>', SOURCE_PASSWORD='<primary replication user password>', SOURCE_LOG_POS=<primaryLogPosition>, SOURCE_LOG_FILE='<primaryLogFile>'; START REPLICA;
24	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 REPLICA 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)
25	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 REPLICA 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)
26	On primary server, log in to OCEEMS database and create a DUMMY table. After creation, verify that it has been created successfully by using `SHOW TABLES` command.	# ./mysql -u root -p Enter password: Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 1688 Server version: 8.0.3-rc-log MySQL Community Server (GPL) Copyright (c) 2000, 2017, 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> create Database WebNmsDB; 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;
27	On standby server, login to OCEEMS database and verify that the DUMMY is present by using SHOW TABLES command.	# ./mysql -u root -p Enter password: Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 1688 Server version: 8.0.3-rc-log MySQL Community Server (GPL) Copyright (c) 2000, 2017, 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;
28	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)
29	On primary server, verify that the DUMMY table no more exists in OCEEMS database using SHOW TABLES command.	mysql> SHOW TABLES;
30	On the PRIMARY SERVER, update the /Tekelec/WebNMS/conf/NmsProcesses BE.conf file to set the CLEAN_DATA_INTERVAL to 7	#java com.adventnet.nms.poll.Collector [CLEAN_DATA_INTERVAL num_days] [STATUS_POLL_PING_RETRIES num] [STATUS_POLL_SNMP_RETRIES num] [DATA_COLLECTION_SNMP_RETRIES num] [MAX_OIDS_IN_ONE_POLL num] [CUSTOMIZED_DATA_COLLECTOR classname] [POLLING_POLICY_CUSTOMIZER classname] [DEBUGGING_MODE true/false] [SEND_MULTIPLE_REQUEST true/false] [STATUS_POLL_QUERY_INTERVAL milliseconds] [DATA_COLLECTION_QUERY_INTERVAL milliseconds] [AUTHORIZATION true/false] [PASS_THRO_ALL_POLLING_OBJECTS true/false] [RECOVER_DELETED_PDATAS true/false] [BULK_INSERT_INTERVAL seconds] [MAX_ALLOWABLE_INSERT num] [STATUS_POLL_DELAY seconds] [DATA_COLLECTION_SNMP_TIMEOUT seconds] [DATA_COLLECTION_STARTUP_DELAY seconds] [STATUS_POLL_TXN_TIMEOUT milliseco

		nds] PROCESS com.adventnet.nms.poll.Collector ARGS MAX_OIDS_IN_ONE_POLL 15 AUTHORIZATION true CLEAN_DATA_INTERVAL 7 DATA_COLLECTION_QUE RY_INTERVAL 120000 PASS_THRO_ALL_POLLING_OBJECTS true
31	On the STANDBY SERVER, update the /Tekelec/WebNMS/conf/NmsProcesses BE.conf file to set the CLEAN_DATA_INTERVAL to 9	#java com.adventnet.nms.poll.Collector [CLEAN_DATA_INTERVAL num_days] [STATUS_POLL_PING_RE TRIES num] [STATUS_POLL_SNMP_RETRIES num] [DATA_COLLECTION_SNMP_RETRIES num] [MAX_OIDS_IN_O NE_POLL num] [CUSTOMIZED_DATA_COLLECTOR classname] [POLLING_POLICY_CUSTOMIZER classname] [D EBUGGING_MODE true/false] [SEND_MULTIPLE_REQUEST true/false] [STATUS_POLL_QUERY_INTERVAL mi lliseconds] [DATA_COLLECTION_QUERY_INTERVAL milliseconds] [AUTHORIZATION true/false] [PASS_ THRO_ALL_POLLING_OBJECTS true/false] [RECOVER_DELETED_PDATAS true/false] [BULK_INSERT_INTER VAL seconds] [MAX_ALLOWABLE_INSERT num] [STATUS_POLL_DELAY seconds] [DATA_COLLECTION_SNMP_T IMEOUT seconds] [DATA_COLLECTION_STARTUP_DELAY seconds] [STATUS_POLL_TXN_TIMEOUT milliseco nds] PROCESS com.adventnet.nms.poll.Collector ARGS MAX_OIDS_IN_ONE_POLL 15 AUTHORIZATION true CLEAN_DATA_INTERVAL 9 DATA_COLLECTION_QUE RY_INTERVAL 120000 PASS_THRO_ALL_POLLING_OBJECTS true
32	On Both servers, verify the permission of the directory set in the variable outputDirectory in the /Tekelec/WebNMS/conf/tekelec/common.config file. The directory should be owned by the Non-root admin user and the permission should be 775.	Successful Verification.
33	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 R47.0, 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	Log 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	On the PRIMARY system, take a backup of the OCEEMS database
	
	emsadmuser@oceems1:[/Tekelec/WebNMS/bin/backup]$./BackupDB.sh
		`Checking whether enough space is present on server for upgrade`
		`Please wait! OCEEMS Backup is in progress...`
		…
		
		`OCEEMS Backup is completed.`

4	On the PRIMARY system, add the following parameters to the /Tekelec/WebNMS/bin/startMySQL.sh script on the mysqld_safe line: --auto-increment-increment=2 -- auto-increment-offset=1 --replicate-same-server-id=0 --mysql-native-password=ON Also, add in 1051 to the -slave-skip-errors line	`bin/mysqld_safe --defaults-file=$MYSQL_HOME/e5ms_defaults.cnf --auto-increment-increment=2 --auto-increment-offset=1 --replicate-same-server-id=0 --innodb_file_per_table=1 --server-id=1 --binlog-do-db=WebNmsDB --binlog-format=MIXED --binlog-ignore-db=mysql --log-slave-updates --log-bin=/Tekelec/WebNMS/mysql/data/log-bin --relay-log=/Tekelec/WebNMS/mysql/data/relay-bin --slave-skip-errors=1032,1050,1051,1054,1060,1061,1062,1065,1146,1396&`
5	Start MySQL by invoking the startMySQL.sh script.	`$ sh startMySQL.sh`
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.	`# ./mysql -u root -p`
		`Enter password:`
		`Welcome to the MySQL monitor.  Commands end with ; or \g.`
		`Your MySQL connection id is 1688`

	Provide the password for MySQL root user when prompted.	Server version: 8.0.3-rc-log MySQL Community Server (GPL) Copyright (c) 2000, 2017, 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.
8	Execute the following commands in mysql: STOP REPLICA; RESET BINARY LOGS AND GTIDS;	Successful Execution of step.
9	Log 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.	-
10	Move to directory /Tekelec/WebNMS/bin.	$ cd /Tekelec/WebNMS/bin
11	On the STANDBY system, add the following parameters to the /Tekelec/WebNMS/bin/startMySQL.sh script on the mysqld_safe line: --auto-increment-increment=2 -- auto-increment-offset=2 --replicate-same-server-id=0 Also, add --server-id=2 after --innodb_file_per_table=1 Also, add in 1051 to the --slave-skip-errors line	bin/mysqld_safe --defaults-file=$MYSQL_HOME/e5ms_defaults.cnf --auto-increment-increment=2 --auto-increment-offset=1 --replicate-same-server-id=0 --mysql-native-password=ON --innodb_file_per_table=1 --server-id=1 --binlog-do-db=WebNmsDB --binlog-format=MIXED --binlog-ignore-db=mysql --log-slave-updates --log-bin=/Tekelec/WebNMS/mysql/data/log-bin --relay-log=/Tekelec/WebNMS/mysql/data/relay-bin --slave-skip-errors=1032,1050,1051,1054,1060,1061,1062,1065,1146,1396&
12	On the STANDBY SYSTEM, remove the auto.cnf file. rm /Tekelec/WebNMS/mysql/data/auto.cnf file	$ rm /Tekelec/WebNMS/mysql/data/auto.cnf Successful Execution of step
13	Start MySQL server by invoking startMySQL.sh script.	$ sh startMySQL.sh
14	Move to '/Tekelec/WebNMS/mysql/bin' directory.	$ cd /Tekelec/WebNMS/mysql/bin
15	Take backup of database and configuration files on the primary server and restore them on the	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

	standby server. This is to ensure that both the databases are in-sync before failover setup.	**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 the standby server, and ONLY ON THE STANDBY SERVER, DO THE FOLLOWING:`
		`$ cd /Tekelec/WebNMS/bin`
		`$ ./reinitialize_nms.sh MODE ALL`
		
		f. 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`

16	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>`

17	Move to 'Tekelec/WebNMS/bin' directory and start MySQL by executing startMySQL.sh script.
	
	After MySQL is started, Move to '/Tekelec/WebNMS/mysql/bin' directory and connect to the MySQL client. Provide the password for MySQL 'root' user when prompted.
		`$ cd /Tekelec/WebNMS/bin`
		
		`$ sh startMySQL.sh`
		
		`$ cd /Tekelec/WebNMS/mysql/bin`
		
		`# ./mysql -u root -p`
		`Enter password:`
		`Welcome to the MySQL monitor. Commands end with ; or \g.`
		`Your MySQL connection id is 1688`

		Server version: 8.0.3-rc-log MySQL Community Server (GPL) Copyright (c) 2000, 2017, 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.
18	Execute the following commands in mysql: STOP REPLICA; RESET BINARY LOGS AND GTIDS;	Successful Execution of step.
19	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>';
20	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>'
21	Remove all the replication users and create a new replication user to establish replication by executing the given MySQL commands.	select User from mysql.user where User<>"root" and Host="localhost"; This command will give a list of replication users. Delete them one by one using the following command: drop user <username>@localhost; Create a new replication user to establish replication: CREATE USER '<primary replication user>'@'localhost' IDENTIFIED BY '<primary replication user password>';

		Eg: select User from mysql.user where User<>"root" and Host="localhost"; +-----------+ | User | +-----------+ | secondary | | stand | | standby | +-----------+ 3 rows in set (0.00 sec) mysql> drop user secondary@localhost; Query OK, 0 rows affected (0.00 sec) mysql> drop user stand@localhost; Query OK, 0 rows affected (0.00 sec) mysql> drop user standby@localhost; Query OK, 0 rows affected (0.00 sec) CREATE USER 'primary'@'localhost' IDENTIFIED BY '<password>';
22	Execute the two MySQL commands. Replace the values given in <> by actual values.	CREATE USER '<primary replication user>'@'<standby server hostname>' IDENTIFIED WITH mysql_native_password BY '<primary replication user password>'; GRANT REPLICATION SLAVE ON *.* TO '<primary replication user>'@'<standby server's hostname>' ; FLUSH PRIVILEGES;
23	On standby server, check if replication slave privilege for standby replication user is present for primary host by executing the given query.	show grants for '<standby replication user>'@'<primary server hostname>';
24	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>'

25	Remove all the replication users and create a new replication user to establish replication by executing the given MySQL commands.	`select User from mysql.user where User<>"root" and Host="localhost";`
		
		This command will give a list of replication users. Delete them one by one using the following command:
		`drop user <username>@localhost;`
		
		Create a new replication user to establish replication:
		`CREATE USER '<standby replication user>'@'localhost' IDENTIFIED BY '<standby replication user password>';`
		
		Eg:
		`select User from mysql.user where User<>"root" and Host="localhost";`
		`+-----------+`
		`| User |`
		`+-----------+`
		`| secondary |`
		`| stand |`
		`| standby |`
		`+-----------+`
		`3 rows in set (0.00 sec)`
		
		`mysql> drop user secondary@localhost;`
		`Query OK, 0 rows affected (0.00 sec)`
		
		`mysql> drop user stand@localhost;`
		`Query OK, 0 rows affected (0.00 sec)`
		
		`mysql> drop user standby@localhost;`
		`Query OK, 0 rows affected (0.00 sec)`
		
		`CREATE USER 'standby'@'localhost' IDENTIFIED BY '<password>';`

26	Execute the two MySQL commands. Replace the values given in <> by actual values.	`CREATE USER '<standby replication user>'@'<primary server hostname>' IDENTIFIED WITH mysql_native_password BY '<standby replication user password>';`
		
		`GRANT REPLICATION SLAVE ON *.* TO '<standby replication user>'@'<primary server hostname>' ;`
		
		`FLUSH PRIVILEGES;`

27	Run SHOW BINARY LOG 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 BINARY LOG 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)
28	Run SHOW BINARY LOG 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 BINARY LOG 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)
29	Execute the three MySQL commands on the primary server. In the command, use the values for <StandbyLogPosition> and <StandbyLogFile> noted earlier in this procedure.	STOP REPLICA;; CHANGE REPLICATION SOURCE TO SOURCE_HOST='<standby server hostname>', SOURCE_PORT=3306, SOURCE_USER='<standby replication user>', SOURCE_PASSWORD='<standby replication user password>', SOURCE_LOG_POS=<StandbyLogPosition>, SOURCE_LOG_FILE='<StandbyLogFile>'; START REPLICA;
30	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 REPLICA; CHANGE REPLICATION SOURCE TO SOURCE_HOST='<primary server hostname>', SOURCE_PORT=3306, SOURCE_USER='<primary replication user>', SOURCE_PASSWORD='<primary replication user password>', SOURCE_LOG_POS=<primaryLogPosition>, SOURCE_LOG_FILE='<primaryLogFile>'; START REPLICA;
31	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 REPLICA 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)
32	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 REPLICA 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)
33	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 -u root -p Enter password: Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 1688 Server version: 8.0.3-rc-log MySQL Community Server (GPL) Copyright (c) 2000, 2017, Oracle and/or its affiliates. All rights reserved. Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

		Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.mysql> USE WebNmsDB; Reading table information for completion of table and column names You can turn off this feature to get a quicker startup with -A Database changed mysql> CREATE TABLE DUMMY(dummy_column VARCHAR(100)); Query OK, 0 rows affected (0.21 sec) mysql> SHOW TABLES;
34	On standby server, login to OCEEMS database and verify that the DUMMY is present by using SHOW TABLES command.	./mysql -uroot -p<password> Warning: Using a password on the command line interface can be insecure. Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 125 Server version: 5.6.31-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> create WebNmsDB; 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;
35	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)
36	On primary server, verify that the DUMMY table no more exists in OCEEMS database using SHOW TABLES command.	mysql> SHOW TABLES;
37	On the PRIMARY SERVER, update the	#java com.adventnet.nms.poll.Collector [CLEAN_DATA_INTERVAL num_days] [STATUS_POLL_PING_RE

	/Tekelec/WebNMS/conf/NmsProcesses BE.conf file to set the CLEAN_DATA_INTERVAL to 7	TRIES num] [STATUS_POLL_SNMP_RETRIES num] [DATA_COLLECTION_SNMP_RETRIES num] [MAX_OIDS_IN_ONE_POLL num] [CUSTOMIZED_DATA_COLLECTOR classname] [POLLING_POLICY_CUSTOMIZER classname] [DEBUGGING_MODE true/false] [SEND_MULTIPLE_REQUEST true/false] [STATUS_POLL_QUERY_INTERVAL milliseconds] [DATA_COLLECTION_QUERY_INTERVAL milliseconds] [AUTHORIZATION true/false] [PASS_THRO_ALL_POLLING_OBJECTS true/false] [RECOVER_DELETED_PDATAS true/false] [BULK_INSERT_INTERVAL seconds] [MAX_ALLOWABLE_INSERT num] [STATUS_POLL_DELAY seconds] [DATA_COLLECTION_SNMP_TIMEOUT seconds] [DATA_COLLECTION_STARTUP_DELAY seconds] [STATUS_POLL_TXN_TIMEOUT milliseconds] PROCESS com.adventnet.nms.poll.Collector ARGS MAX_OIDS_IN_ONE_POLL 15 AUTHORIZATION true CLEAN_DATA_INTERVAL 7 DATA_COLLECTION_QUERY_INTERVAL 120000 PASS_THRO_ALL_POLLING_OBJECTS true
38	On the STANDBY SERVER, update the /Tekelec/WebNMS/conf/NmsProcesses BE.conf file to set the CLEAN_DATA_INTERVAL to 9	#java com.adventnet.nms.poll.Collector [CLEAN_DATA_INTERVAL num_days] [STATUS_POLL_PING_RETRIES num] [STATUS_POLL_SNMP_RETRIES num] [DATA_COLLECTION_SNMP_RETRIES num] [MAX_OIDS_IN_ONE_POLL num] [CUSTOMIZED_DATA_COLLECTOR classname] [POLLING_POLICY_CUSTOMIZER classname] [DEBUGGING_MODE true/false] [SEND_MULTIPLE_REQUEST true/false] [STATUS_POLL_QUERY_INTERVAL milliseconds] [DATA_COLLECTION_QUERY_INTERVAL milliseconds] [AUTHORIZATION true/false] [PASS_THRO_ALL_POLLING_OBJECTS true/false] [RECOVER_DELETED_PDATAS true/false] [BULK_INSERT_INTERVAL seconds] [MAX_ALLOWABLE_INSERT num] [STATUS_POLL_DELAY seconds] [DATA_COLLECTION_SNMP_TIMEOUT seconds] [DATA_COLLECTION_STARTUP_DELAY seconds] [STATUS_POLL_TXN_TIMEOUT milliseconds] PROCESS com.adventnet.nms.poll.Collector ARGS MAX_OIDS_IN_ONE_POLL 15 AUTHORIZATION true CLEAN_DATA_INTERVAL 9 DATA_COLLECTION_QUERY_INTERVAL 120000 PASS_THRO_ALL_POLLING_OBJECTS true
39	On Both servers, verify the permission of the directory set in the variable outputDirectory in the /Tekelec/WebNMS/conf/tekelec/common.config file. The directory should be owned by the Non-root admin user and the permission should be 775.	Successful Verfication.
40	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
```

7.1.4.1.7 PROCEDURE TO UPDATE SYSTEM USER AND PASSWORD IN OCEEMS

Run the /Tekelec/WebNMS/bin/E5MSConfigurationScript.sh script to update the system user and its password for OCEEMS.

```
[emsadmuser@pc9091801 bin]$ 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. emsadmuser): emsadmuser
Enter 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
```

7.1.4.1.8 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. Log in to MySQL using root user and its current password –
   ```
   # ./mysql -u root -p
   Enter password:
   Welcome to the MySQL monitor.  Commands end with ; or \g.
   Your MySQL connection id is 1688
   Server version: 8.0.3-rc-log MySQL Community Server (GPL)

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

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

```
# ./mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 1688
Server version: 8.0.3-rc-log MySQL Community Server (GPL)

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```

    b. `Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.`
    `STOP REPLICA;`
    c. `RESET REPLICA;`
    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.

7.1.4.1.9 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'.
```

7.1.4.1.10 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.
```

7.1.4.1.11 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)	Conf9ig 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.

7.1.4.1.12 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
   ```

7.1.4.1.13UPDATING XML CHANGES IN OCEEMS DATABASE

In R47.0, “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
```

7.1.4.1.14SETTING 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.

7.1.4.1.15PURPOSE 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

7.1.4.1.16 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) Run the E5MSConfigurationScript.sh script to update the newly created user in OCEEMS. Provide the highlighted inputs as required.

```
[emsadmuser@pc9091801 bin]$ 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. emsadmuser): e5msuser
Enter 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
```

7.1.4.1.17LOG 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.
```

7.1.4.1.18INSTALLATION OF JAVA DEVELOPMENT KIT FOR OCEEMS

Note: The Java version in this section corresponds to EMS 47.0.0. For EMS 46.6.2, use Java version 1.8.0-161 (64 bit).

Java Development Kit package jdk-17-17-ga (64-bit) is required to run OCEEMS application.

Note: OCEEMS 47.0.0is tested with jdk17-17-ga. It may not work properly with other Java versions (major or minor).

Note: OCEEMS 47.0.0 is tested with jdk17-17-ga. It may not work properly with other Java versions (major or minor)

The following sections describe the steps needed for intsllation of JRE on the system as required by OCEEMS.

1.1.1 Installation of JDK 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 46.6 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_261-amd64, then the statement in 'custom.sh' shall be -
   export JAVA_HOME=/usr/java/jdk1.8.0_261-amd64/jre

   Note: The Java version in this section corresponds to EMS 46.6.4. For EMS 46.6.2, use Java version 1.8.0-161 (64 bit).

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_261-amd64/jre

Note: The Java version in this section corresponds to EMS 46.6.4. For EMS 46.6.2, use Java version 1.8.0-161 (64 bit).

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 1.8.0_261 should be installed** - In case the JAVA_HOME variable set on the system points to a version of Java that is lower than 1.8.0_261, 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.

   Note: The Java version in this section corresponds to EMS 46.6.4. For EMS 46.6.2, use Java version 1.8.0-161 (64 bit).

   Note: OCEEMS 46.6.4 is tested with JRE 1.8.0_261. It may not work properly with other Java versions (major or minor).

   Note: OCEEMS 46.6.2 is tested with JRE 1.8.0_161. It may not work properly with other Java versions (major or minor).

1.1.4 Java verification on OCEEMS server startup

After successful installation/upgrade to OCEEMS release 46.6, 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 1.8.0_261 should be installed** - If the Java version pointed to by the JAVA_HOME variable is not as per OCEEMS recommendation (i.e. 1.8.0_261) 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.

   Note: The Java version in this section corresponds to EMS 46.6.4. For EMS 46.6.2, use Java version 1.8.0-161 (64 bit).

   Note: OCEEMS 46.6.4 is tested with JRE 1.8.0_261. It may not work properly with other Java versions (major or minor).

   Note: OCEEMS 46.6.2 is tested with JRE 1.8.0_161. It may not work properly with other Java versions (major or minor).

7.1.4.1.19IPV6 SUPPORT ON OCEEMS

OCEEMS R47.0 can support EPAP version 17 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).

7.1.4.1.20 SET UP EAGLE PASSWORDS FOR EAGLE ALARM SEVERITY POP-UP

Perform the following steps to set up Eagle passwords for Eagle alarm severity pop-up:

1. From the emsadmuser (non-root admin user), go to the path `/Tekelec/WebNMS/bin` and run the following command:

```
[root@EMS5 bin]# cd /Tekelec/WebNMS/bin/
```

2. Run the following command and enter the details as displayed in the following image.

```
[root@EMS5 bin]# ./encryptEaglesInfo.sh
```

Note: Make sure to add all the Eagles' details together.

```
[root@EMS5 bin]# ./encryptEaglesInfo.sh
Enter Mysql Password:
-----------------------------------------------------
Enter the number of eagles present:2
Enter Name for Eagle1: tklc1110801
Enter Username for Eagle1: eagle
Enter Password for Eagle1:
-----------------------------------------------------
Enter Name for Eagle2: tklc1170501
Enter Username for Eagle2: eagle
Enter Password for Eagle2:
-----------------------------------------------------
[root@EMS5 bin]#
```

3. Open the EMS GUI and click any eagle card in the Network Map tree. A pop-up will appear as follows:

```
C:\WINDOWS\system32\cmd.exe
EagleAlarmSeverity
 This Utility will display the alarms and the severity that are present in the Eagle.
 It will take around 20-60 seconds to fetch details.
Connecting to Eagle via EMS server...
mysql: [Warning] Using a password on the command line interface can be insecure.
mysql: [Warning] Using a password on the command line interface can be insecure.


**************************** EAGLE Information ****************************

Eagle Name: tklc1110801
IPSM: 10.75.146.194
# Host 10.75.146.194 found: line 1
/root/.ssh/known_hosts updated.
Original contents retained as /root/.ssh/known_hosts.old
Warning: Permanently added '10.75.146.194' (RSA) to the list of known hosts.
Connection closed by foreign host.
Connection to 10.75.146.194 closed by remote host.
Eagle connected successfully, continuing...

****************************** EAGLE DETAILS ******************************
Entity Name                          CARD  TYPE       PST        Severity
tklc1110801_Frame1_Shelf1_Slot1_Card    1101  SLIC       IS-NR      NA
tklc1110801_Frame1_Shelf1_Slot5_Card    1105  SLIC       IS-NR      Major
tklc1110801_Frame1_Shelf1_Slot9_Card    1109  HIPR2      IS-NR      NA
tklc1110801_Frame1_Shelf1_Slot10_Card   1110  HIPR2      IS-NR      NA
tklc1110801_Frame1_Shelf1_Slot13_Card   1113  E5MCAP     IS-NR      NA
tklc1110801_Frame1_Shelf1_Slot14_Card   1114  E5TDM      IS-NR      Minor
tklc1110801_Frame1_Shelf1_Slot15_Card   1115  E5MCAP     IS-NR      NA
tklc1110801_Frame1_Shelf1_Slot16_Card   1116  E5TDM      IS-NR      NA
tklc1110801_Frame1_Shelf1_Slot17_Card   1117  E5MDAL     OOS-MT     Critical

************************************ * ************************************

Press any key to continue . . .
```

7.1.4.1.21MY 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.

7.1.4.1.22LOCATE 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.

7.1.4.1.23PROCEDURE TO MOUNT OCEEMS ISO FILE

To proceed with OCEEMS 47.0 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-
46.6.0.0.0_466.4.0.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-xr-xr-x    1 root root      9862 May 30 09:44 RPMUpgrade_46.5.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) Run the 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, perform following steps:

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

# ./mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 1688
Server version: 8.0.3-rc-log MySQL Community Server (GPL)

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reserved.

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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> 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	Log in to target machine using administrator (root) login.	-
2	Move to /Tekelec/WebNMS/bin	# cd /Tekelec/WebNMS/bin
3	Run emsUninstall.sh	# ./emsUninstall.sh Shutdown OCEEMS server... mysql: [Warning] Using a password on the command line interface can be insecure. MySql server to be stopped Done. WARNING:Clean scripts and categories if still present at the /opt/E5-MS/commandManager/scripts Do you want to continue(y/n):y Uninstalling E5-MS Preparing packages... E5-MS-47.0.0.0.0-470.0.1.x86_64 warning: file /Tekelec/WebNMS/state/traps/dummy.txt: remove failed: No such file or directory warning: file /Tekelec/WebNMS/provisioningresults/dummy.txt: remove failed: No such file or directory warning: file /Tekelec/WebNMS/mysql/data/mysql/slow_log_196.sdi: remove failed: No such file or directory warning: file /Tekelec/WebNMS/mysql/data/mysql/general_log_195.sdi: remove failed: No such file or directory warning: file /Tekelec/WebNMS/mysql/data/log-bin.000002: remove failed: No such file or directory warning: file /Tekelec/WebNMS/mysql/data/log-bin.000001: remove failed: No such file or directory warning: file /Tekelec/WebNMS/mysql/data/ibtmp1: remove failed: No such file or directory warning: file /Tekelec/WebNMS/Certs/server.cer: remove failed: No such file or directory

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. https://<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.

APPENDIX Z. CONFIGURATION OF OPENLDAP CLIENT

OpenLDAP version 2.4.46 client/server configuration is tested and used in this Appendix.

LDAP client and server must have same date and time. Preferably sync'ed via same NTP server.

Users must be configured in LDAP server and the same users need to be created in OCEEMS GUI/Client as well.

S. No.	Step	Expected Output/Commands
1	Add the LDAP server details in "/etc/hosts" on client for name resolution, if server name is used instead of IP address.	# vim /etc/hosts Add the ldap server details at the end of this file as shown in the example below: 10.75.137.0 oceems23 ldap.oceems.com
2	Install Prerequisites Packages.	# yum install -y openldap-clients nss-pam-ldapd **Note**: Check if "/etc/sssd" folder is created or not. If created, then continue, else run the following command: **yum install sssd***
3	Stop and disable firewall in client machine	# systemctl stop firewalld # systemctl disable firewalld #cd /etc/openldap/ #makdir "cacerts"
4	Copy certificates and key form LDAP server to the client machine.	# root@<Ldapserver IP>:/etc/openldap/certs/*.pem cacerts/ For example: scp root@10.75.137.0:/etc/openldap/certs/*.pem cacerts/ ldapkey.pem 100% 1704 1.0MB/s 00:00 ldap.pem 100% 1407 1.0MB/s 00:00 **Note**: Verify certificate and key is copied to the client machine: # ll cacerts/ total 8 -rw-r--r--. 1 root root 1704 Jul 5 03:38 ldapkey.pem -rw-------. 1 root root 1407 Jul 5 03:38 ldap.pem

5	Move to openldap folder	#cd /etc/openldap
6	Check the content.	drwxr-xr-x. 2 root root 6 Jul 2 19:07 certs -rw-r--r--. 1 root root 900 Jul 2 19:07 ldap.conf drwxr-xr-x. 2 root root 26 Jul 5 02:58 schema
7	Edit ldap.conf folder and the the Ldap server details at end of the file.	# vim ldap.confAdd the following: TLS_CACERTDIR /etc/openldap/cacerts TLS_CACERT /etc/openldap/cacerts/ldap.pem URI ldap://ldap.oceems.com BASE dc=oceems, dc=com
8	Save and exit the file.	Save and exit.
9	Run the following command.	#echo "TLS_REQCERT allow" >> /etc/openldap/ldap.conf
10	Edit file “/etc/nslcd.conf” and add below lines at the end of this files	#vim /etc/nslcd.conf Update the following: uri ldap://127.0.0.1/ -> uri ldap://ldap.oceems.com base dc=example, dc=com - > base dc=oceems, dc=com
11	Save and exit the file.	Save and exit.
12	Run the following command.	# echo "tls_reqcert allow" >> /etc/nslcd.conf
13	Navigate to foleder “/etc/sssd/”	**Note**: • This step is followed if below file does not exist. • Check the content of the file i.e. matches the below data. #cd /etc/sssd Make file sssd.conf

		touch sssd.conf Add the following line: [sssd] config_file_version = 2 services = nss, pam, autofs domains = default [nss] homedir_substring = /home [pam] [domain/default] id_provider = ldap autofs_provider = ldap auth_provider = ldap chpass_provider = ldap ldap_uri = ldap://ldap.oceems.com ldap_search_base = dc=oceems,dc=com ldap_id_use_start_tls = True ldap_tls_cacertdir = /etc/openldap/cacerts cache_credentials = True ldap_tls_reqcert = allow [autofs] **Note**: 1. Check ldapserver details as per available LDAP server. 2. Bold details need to be checked carefully.
14	Change the permissions on the /etc/sssd/sssd.conf file:	# chmod 600 /etc/sssd/sssd.conf
15	Update the configurations by running below command:	# authconfig --enableldaptls --update
16	Navigate to "/etc/authselect/"	#cd /etc/authselect/ Edit the file as below. vim user-nsswitch.conf Update below lines: passwd: files sss system -> ldap files sss systemd shadow: files sss. -> ldap files sss group: files sss system -> ldap files sss systemd
17	Run command "authselect apply-changes" to apply changes.	Example: #authselect apply-changes Changes were successfully applied. Note: 1. Check "nsswitch.conf" is update after running above command: 2. Open the file and go to end of the file check change below line: a. shadow: ldap files sss

18	Run these commands.	#service nslcd restart
		#service sssd restart
		
		Logs:
		[root@EMS4 authselect] # service nslcd restart
		Redirecting to /bin/systemctl restart nslcd.service
		[root@EMS4 authselect] #
		[root@EMS4 authselect]# service sssd restart
		Redirecting to /bin/systemctl restart sssd.service
		[root@EMS4 authselect] #
		19. Confirm LDAP is configured correctly by running command:
		
		Confirmation 1:
		Id <ldapserver username>
		Logs:
		[root@EMS4 authselect] # id ldapuser1
		uid=1001(ldapuser1) gid=1001(ldapuser1) groups=1001(ldapuser1)
		[root@EMS4 authselect] #
		Note: Bold output is coming means LDAP server is configured successfully.
		
		Confirmation 2:
		Log in to the VM machine using LDAP username and password:

19	Add the LDAP certificate to Java Keystore. For this, the default java keystore password will be required.	# $JAVA_HOME/bin/keytool -importcert -file -keystore $JAVA_HOME/lib/security/cacerts -alias "" Eg: # $JAVA_HOME/bin/keytool -importcert -file /etc/openldap/cacerts/ldap.pem -keystore $JAVA_HOME/lib/security/cacerts -alias "Tekelec" **Note**: This cmd will ask for password and the password is “changeit”.
20	Add the LDAP certificate to OCEEMS keystore. The password required here would be the one used for creating OCEEMS certificate which is provided during the certificate creation (E5MSCertificateCreationScr)	$JAVA_HOME/bin/keytool -import -keystore /Tekelec/WebNMS/conf/Truststore.truststore -alias Tekelec -file -storepass "" -noprompt Eg: $JAVA_HOME/bin/keytool -import -keystore /Tekelec/WebNMS/conf/Truststore.truststore -alias Tekelec -file /etc/openldap/cacerts/ldap.pem -storepass "" -noprompt

APPENDIX Z.2. ENABLING/DISABLING LDAP AUTHENTICATION

Enabling LDAP Authentication

Go to /Tekelec/WebNMS/bin and run the following script:

```
$ sh configureLDAPAuth.sh


This script will be used to enable/disable LDAP server authetication on OCEEMS


Do you want to enable(E)/disable(D) LDAP authentication on OCEEMS?(E/D):E


Please enter URL of the LDAP server (eg: ldap://ldap.example.com):
ldap://ldap.deepak.com


Please enter the OU(Organization Unit) that will be used for OCEEMS on the LDAP
server (eg: People): People


Base DN is configured while configuring LDAP Client. It can be viewed using
'authconfig-tui' command...
Please enter the Base DN used to configure LDAP (eg: dc=example,dc=com):
dc=deepak,dc=com


Setting up LDAP server, please wait...


LDAP based authetication has been enabled, the OCEEMS service needs to be
restarted for changes to take effect.



Do you want to restart OCEEMS service now?(Y/N): Y
```

Disabling LDAP Authentication

Go to /Tekelec/WebNMS/bin and run the following script:

```
$ sh configureLDAPAuth.sh


This script will be used to enable/disable LDAP server authentication on OCEEMS


Do you want to enable(E)/disable(D) LDAP authentication on OCEEMS?(E/D):D


LDAP based authentication has been disabled, the OCEEMS service needs to be
restarted for changes to take effect.


Do you want to restart OCEEMS service now?(Y/N): y
```

APPENDIX Z.3 CONFIGURATION OF OPENLDAP CLIENT FOR FAILOVER SETUP

A working Failover Setup (with Primary and Standby server) must be availaible for enabling the LDAP Authentication. Users must be configured in LDAP server and the same users need to be created in OCEEMS GUI/Client as well.

S. No.	Steps	Expected Output/Commands
1	Launch OCEEMS Client on the Primary Server and create the same user as that is available on the LDAP server. The User should belong to the Admin Group. For. E.g. If a user named 'ldapuser1' is available on the LDAP server, then create a user 'ldapuser1' in OCEEMS belonging to Admin group.	`Successful Creation of User.`
2	Login to Primary Server with root user	`Successful Login`
3	Configure the LDAP Authentication in the Primary Server by following the Steps in APPENDIX Z.	`Successful Execution of Steps`
4	Enable the LDAP Authentication in the Primary Server by following the section A.1 section in APPENDIX Z.2 In A.1, the configureLDAPAuth.sh script will ask for **restarting the OCEEMS service**, **Enter 'n' or 'N'**. (**Note**: If you need to disable LDAP Authentication, follow the section A.2 in APPENDIX Z.2 and when asked for **restarting the OCEEMS service**, **Enter 'n' or 'N'**)	`Successful Execution of Steps`
5	Configure the LDAP Authentication in Secondary Server by following the Steps in APPENDIX Z .	`Successful Execution of Steps`
6	Enable the LDAP Authentication in the Secondary Server by following the section A.1 in APPENDIX Z.2 In A.1, the configureLDAPAuth.sh script will ask for **restarting the OCEEMS service**, **Enter 'n' or 'N'**. (**Note**: If you need to disable LDAP Authentication, follow the section A.2 in APPENDIX Z.2 and when asked for **restarting the OCEEMS service**, **Enter 'n' or 'N'**)	`Successful Execution of Steps`

7	On Primary Server, shutdown OCEEMS server by issuing the command.	`# service e5msService stop`
		`Stopping OCEEMS server...`
		`MySql not stopped for failover`
		`Done.`

8	On detecting shutdown of Primary Server, Secondary Server 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
9	Start OCEEMS server on Primary Server. 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
10	Now the Primary and Secondary servers have been switched. Repeat the Steps from 7 to 9.	Successful execution of steps
11	Lauch OCEEMS client in the Primary Server and login with the LDAP user created in step 1 e.g. 'ldapuser1'. Enter the password that is configured in the LDAP server for the above user.	Successful login through LDAP user
12	Close the OCEEMS client on Primary Server	Successful closure of client
13	Execute the Steps from 7 to 9. The Primary and Secondary servers will be switched.	Success execution of steps
14	Launch OCEEMS client in the Primary Server (which was Secondary server earlier) and login with the LDAP user created in step 1 e.g. 'ldapuser1'. Enter the password that is configured in the LDAP server for the above user.	Successful login through LDAP user

APPENDIX Z.4 CONFIGURE SENDING DEVICE TIMESTAMP IN NMS TRAPS

OCEEMS users can configure whether to send device timestamp or OCEEMS timestamp in the NMS traps by changing a property value in server_conf.properties file at /Tekelec/WebNMS/conf/tekelec path.

To proceed with making the above configuration changes, follow the steps given below:

1. Go to /Tekelec/WebNMS/conf/tekelec/ where server_conf.properties file is present

   cd /Tekelec/WebNMS/conf/tekelec/

2. Open server_conf.properties file

3. If device timestamp needs to be sent in the traps, then set “SendDeviceTimeStampWithTraps” property value as true.

4. If OCEEMS timestamp needs to be sent in the traps, then set “SendDeviceTimeStampWithTraps” property value as false.

Default value of the property :
SendDeviceTimeStampWithTraps=false

New value of the property :
SendDeviceTimeStampWithTraps=true

Note: Server restart is required for above changes to reflect.

APPENDIX AA. DECOUPLING OF COMMAND MANAGER INTERFACE (CMI) FROM EAGLE

The following packages should be installed on the server for running this feature:

- PHP (php-7.2.24-1) (yum install php)
- DOM extension (PHP-XML) (php-xml-7.2.24-1) (yum install php-xml)
- Wget (wget-1.19.5-11.0.1) (yum install wget)
- PHP-Posix (php-process) (php-process-5.4.16-48) (yum install php-posix)
- PHP SSH2 extension must be installed on the OCEEMS server. The server should have internet access to install the required packages.

Please refer to the following instructions for installation of PHP extension SSH2.

The following packages should be installed on the server for installing PHP SSH2 extension/module:

- Gcc compliler (gcc-8.5.0-22.0.1)
- Openssl-devel (openssl-devel-1.1.1k-12)
- Make (make-4.2.1-11)
- Php-devel (php-devel-7.2.24-1)

S. No.	Steps	Expected Output/Commands

1	Go to the specified directory
	"cd /usr/local/src"
	Download the extension package
	wget https://www.libssh2.org/snapshots/libssh2-1.9.0-20200917.tar.gz
	Untar / Unzip the extension package and enter the directory
	Configure with providing path to php-config
	Run its compilation and installation
		`tar -zxvf libssh2-1.6.0.tar.gz`
		`cd libssh2-1.6.0`
		`./configure --with-php-config=/usr/local/bin/php-config`
		`make`
		`make install`

2	Go to the specified directory
	"cd /usr/local/src"
	Download the extension package
	wget http://pecl.php.net/get/ssh2-0.12.tgz
	Untar / Unzip the extension package and enter the directory
	Run phpize
	Configure with providing path to ssh2
	Run its compilation and installation
		`tar -zxvf ssh2-0.12.tgz`
		`cd ssh2-0.12`
		`phpize`
		`./configure --with-ssh2`
		`make`
		`make install`

3	Check if SSH2 extension is loaded by executing the given command	`php -m | grep ssh2` `Expected output : ssh2`

	Note: If the output is blank, activate it in your PHP config file (php.ini): extension=ssh2.so	

APPENDIX AB. OCEEMS ON VIRTUAL MACHINE

VM Instance

OCEEMS has been tested on Oracle Linux 8.8 based Virtual machine.

Configuration

Different configurations of OCEEMS have different resource requirement as mentioned in Interface User Guide, Section - Hardware and Software Requirements.
Following is the configuration of the virtual machine test setup:

- vCPU – 4
- RAM – 16 GB
- Disk size – 500 GB

Package Requirement

Following packages are needed to be installed on the OL 8.8 based VM:

Package	Version
bc	1.07.1-5
lsof	4.93.2-1
libaio	0.3.112-1
unzip	6.0-46.0.1
php	7.2.24
php-xml	7.2.24
wget	1.19.5-11.0.1
php-posix	7.2.24
libssh2 (extn for php)	1.9.0-20200603
ssh2 (extn for php)	1.2
openldap	
sssd	2.9.1-4.0.1
Jdk (java)	17
openssh	8.0p1-19.0.1
telnet	0.17-76
vsftpd	3.0.3-36
iptables	1.8.5-11.0.1

Procedure to Create Virtual Machine for OCEEMS

- **Virt command to create Virtual Machine on host machine based on Oracle Linux 8.8:**

  virt-install --virt-type kvm --hvm --connect qemu:///system --network bridge=br0,model=virtio --cdrom /home/V1035444-01.iso --disk path=/home/EMS1.disk,size=500,sparse=no,bus=ide --name EMS1 --autostart --boot cdrom,hd --ram 8000 --vcpus 2 --graphics vnc --os-variant rhel6.8

  Note: The following arguments are to be provided to the **virt-install** command:

  Virtualization mode:
  --virt-type kvm --hvm --connect qemu:///system

  Network interfaces:
  --network bridge=<bridge_name>,model=virtio

CD Drive:
--cdrom <tpd_iso_file>

Disk:
--disk path=<disk_file>,size=<disk_size>,sparse=no,bus=ide

VM NAME:
--name <vm_name>

RAM:
--memory <ram_size>

CPU:
--vcpus <cpu_count>,cpuset=<cpu_set>

Display:
--graphics vnc

VM optimization:
--os-variant rhel6.0

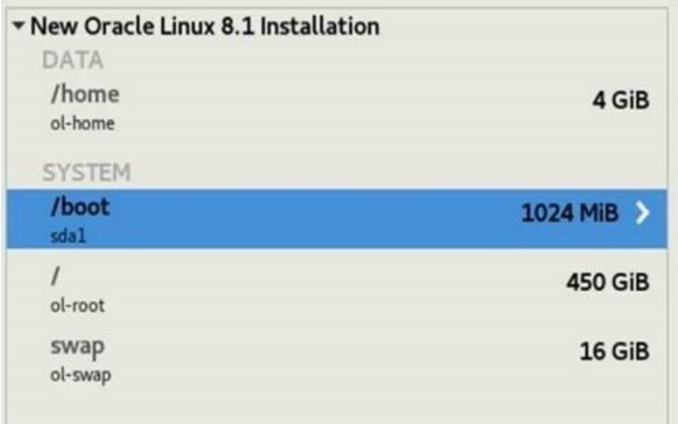


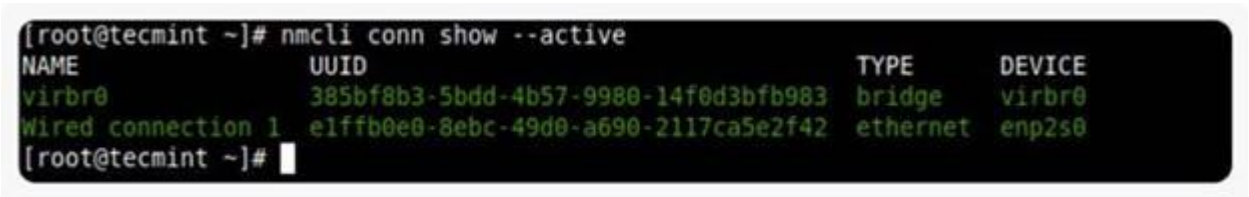
Figure 1: Default directory structure of VM with 500GB Disk:

- **Creating Bridge between Host and Virtual Machine on Host Machine:**

  Setting up a Network Bridge Using nmcli Tool:

  1. List the active network connections on the test system by running the following nmcli command:

     # nmcli conn show –active



2. Create a network bridge interface by using the following nmcli command:

   # **nmcli conn add type bridge con-name br0 ifname br0**

```
[root@tecmint ~]# nmcli conn add type bridge con-name br0 ifname br0
Connection 'br0' (2f03943b-6fb5-44b1-b714-a755660bf6eb) successfully added.
[root@tecmint ~]#
```

   Create Network Bridge Interface

3. Add the Ethernet interface as a portable device to the bridge (br0) connection by using the following command:

   # **nmcli conn add type Ethernet slave-type bridge con-name bridge-<br0> ifname <Ethernet-name> master bro**

   Where , Ethernet name (Eno1) - Host machine IP is assigned

4. Bring up or activate the bridge connection using the **connection name** by using the following command:

   # **nmcli conn up br0**

```
# nmcli conn up br0
```

5. Deactivate or bring down the **Ethernet** by using the following command:

   # **nmcli conn down <Ethernet-name>**

APPENDIX AC: DOWNLOAD ORACLE LINUX FROM OSDC

Perform the following steps to download Oracle Linux from OSDC:

1. Login to OSDC (https://edelivery.oracle.com/osdc/faces/Home.jspx).
2. Type Oracle Linux in the search box and click Search.
3. Select the required Oracle Linux version, for example, for OCEEMS 47.0, select DLP: Oracle Linux 8.8 (Oracle Linux).
4. Add to the cart and click the Continue button.
5. Select and download the required iso.

APPENDIX AD: EXCHANGE KEYS BETWEEN LOCAL SETUP AND THE REMOTE SETUP

Perform the following steps to exchange the keys between local setup(where we open EMS GUI) and the Remote Setup:

Run this on the Local Setup:

1. PS C:\Users\ORACLE> ssh-keygen -t rsa -b 2048

Generating public/private rsa key pair.
Enter file in which to save the key (C:\Users\ORACLE/.ssh/id_rsa): **C:\Users\ORACLE/.ssh/ems136149**
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:\Users\ORACLE/.ssh/ems136149
Your public key has been saved in C:\Users\ORACLE/.ssh/ems136149.pub
The key fingerprint is:
SHA256:WqfV6jtnTdRopSmD9MSFm0ZjXDdDsWTFvg8ElN0GApI username@user
The key's randomart image is:

```
+---[RSA 2048]----+
|       ...=o*=@=|
|       E.. @.+.O|
|        . * = X |
|         ..B B o|
|       S o..*  .|
|      o + .  o. |
|     . . .  o ..|
|        .. o . .|
|         o=     |
+----[SHA256]-----+
```

2. PS C:\Users\ORACLE> **cat .\.ssh\ems136149.pub**

It will display the key. For example: Lets refer this as **copied_public_key**

```
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQC7PBVtE1NhDECNl1nHzuvA1BHwnBbzfxjgO4ogqwjdcKn9i3ChzxLHQZifVqNRN4CvVcp4bQfsVUeVOkeX
1mSmt14xnFQhN8dACzEsjPSfVSJCnRFFSA2D+eSpsPiKyQeNwcHxIeFdYpTOTrwR4yCAhwIKNYjdjPe1GGcCvx6CTDLvcVK2AMl7L3pypWUysq2liqE0lshc
4rnxS7uNhc4uPiKGy1TzT7ny04kphXBxb2YHU12uSRAwpX1zo/kgU8/oRjtFzQ7Y5YlZ1DXw5nF5oigwpQvz4BQDEsAR6eiUZTfNTkP6ClSLYJ7R9ZxO2UiH
pusSwqyMVkl4e57fykFH dhriteshbhagat@dhribhag
```

Run this on the remote setup.

3. **vim ~/.ssh/authorized_keys**
4. **echo "copied_public_key" >> ~/.ssh/authorized_keys**
   Replace "copied_public_key" with the actual content you copied earlier.
5. **chmod 700 ~/.ssh**
6. **chmod 600 ~/.ssh/authorized_keys**

Try the following on the Local Setup:
>> ssh username@RemoteSetup
Try connecting to the remote host using SSH. If everything is set up correctly, you should be able to connect without being prompted for a password.

○ SET DEBUG LOGS ON/OFF

Perform the following steps to set the debug logs on/off:

1. From the emsadmuser (non-root admin user), use the following command:

setDebugMode ON: for switching debug mode on
setDebugMode OFF: for switching debug mode off

[root@EMS3 ~]# [root@EMS3 ~]# setDebugMode -help
Usage: /usr/local/bin/setDebugMode <ON|OFF> -> Will make the EMP application debug mode ON/OFF