

# Software Installation for Virtual and Cloud Deployment

Ericsson Dynamic Activation 1

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## INSTALLATION INSTRUCTION

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# 1 Introduction

This document contains instructions regarding how to install Ericsson Dynamic Activation (EDA) in virtualized and cloud deployments.

## 1.1 Typographic Conventions

Typographic conventions are described in the document *Library Overview*, Reference [1].

For information about abbreviations used throughout this document, see *Glossary of Terms and Acronyms*, Reference [2].

## 1.2 Prerequisites

The following are the prerequisites to make full use of this document:

- Make sure to check the Delivery Report before using this document. The Delivery Report contains information about known problems, limitations and exceptions related to the system software that will be installed. It can contain complementary instructions and information, that may prevent system failure and damage.
- To get an overview of the system and deployment scenarios, see *Product Overview*, Reference [12].
- The documents *Customer Questionnaire for Virtual and Cloud Deployment*, Reference [7], and *Parameter List for Virtual Deployment*, Reference [8] or *Parameter List for CEE Deployment*, Reference [9] are available with all values of the installation parameters.





## 2 Installation Process

This section gives an overview of the whole installation process.

The Table 1 lists the installation steps, including an estimation of the time needed to perform them.

*Table 1 Installation Process*

Installation Step	Time Estimation
Preparing deployment files <sup>(1)</sup>	About 30 minutes. For details, see Section 3.3 on page 5.
Deploy Virtual Machines	Less than 30 minutes. For details, see Section 3.3 on page 5.
Backup	For details, see <i>Backup and Restore Guideline for Virtual and Cloud Deployment</i> , Reference [5]

*(1) Not valid for Cloud deployment using ECEE or OpenStack.*







## 3 Installation

This section covers how to install the software to be used for Dynamic Activation.

### 3.1 Prerequisites for Installing Dynamic Activation

This section lists the Dynamic Activation installation prerequisites:

- For VMware deployment, make sure to have the EDA System VMWare SW deliverable accessible.
- For Kernel-based Virtual Machine (KVM), Ericsson Cloud Execution Environment (ECEE) or OpenStack deployment, make sure to have the EDA System KVM&Cloud SW deliverable accessible.
- Make sure to have a valid Dynamic Activation 1 license in Ericsson License Information System (ELIS).
- If a Validator Plug-in is to be used (optional), make sure to have the HSS Validator Plug-in software accessible.

Contact [Ericsson support](#) for details about the applicable HSS Validator Plug-in version.

### 3.2 Guidelines for the Readers

- All VMs in an installation have a type name. The type name is always node-n, for example node-1, node-2, node-3.
- The name of the VM as seen by KVM/VMware ESXi/ECEE/OpenStack, does not have to be the same as the type name, neither does the actual hostname of the VM.
- The type name gives an indication of what services that are configured, and that are executing on the VM.

Node-1, node-2, and node-3 possess individual, unique configuration data, and must be on different KVM/VMware ESXi/ECEE/OpenStack hosts, to achieve high-availability characteristics.

- The load-balancers are not running on all VMs. They are only on node-1 and node-2.
- Node-4 and onwards, are all identical when it comes to which services that are configured and activated.



## 3.3 Deploying Virtual Machines

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### Attention!

For commercial deployment by using KVM and VMware ESXi, it is mandatory to set up external block storage for nodes 1-3, see section **Set up Persistent Block Storage on VMs** in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].

In ECEE deployment, ephemeral disk is used. In OpenStack deployment, ephemeral disk is used by instance and cinder volume is used by Cassandra.

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**Note:** The following needs to be performed for every added Virtual Machine (VM).

**If using KVM, make sure:**

- That the host system meets the prerequisites described in *Requirements on Virtualization and Cloud Infrastructure*, Reference [3].
- That the network bridge interfaces are configured as described in *Network Description and Configuration for Virtual and Cloud Deployment*, Reference [6].
- That the Dynamic Activation `<Software_Package>.tar.gz` (EDA System KVM&Cloud SW) is available on the host file system.
- That the KVM host is time synchronized through NTP.
- That the `libvirt` management tools are available on the KVM host.

For more information, see *Requirements on Virtualization and Cloud Infrastructure*, Reference [3].

- That the `genisoimage` rpm is installed on each host.

For more information, see *Requirements on Virtualization and Cloud Infrastructure*, Reference [3].

For KVM deployment, continue with Section 3.3.1 on page 7.

**If using VMware ESXi, make sure:**

- That the host system meets the prerequisites described in *Requirements on Virtualization and Cloud Infrastructure*, Reference [3].
- That the virtual network interfaces are configured as described in *Network Description and Configuration for Virtual and Cloud Deployment*, Reference [6].



- That the VMware ESXi host is time synchronized through NTP.
- That the `<Software_Package>.ova` (EDA System VMWare SW) is available on the host file system.

For VMware ESXi deployment, continue with Section 3.3.1 on page 7.

**If using ECEE, make sure:**

- There is a working ECEE being used for deployment
- That all required variables needed from ECEE is gathered.
- User and password to ECEE (Atlas GUI) are available.
- That the Dynamic Activation `<Software_Package>.tar.gz` (EDA System KVM&Cloud SW) is available on the host file system.

For ECEE Cloud deployment, continue with Section 3.3.2 on page 17.

**If using OpenStack, make sure:**

- There is a working OpenStack being used for deployment
- That all required variables needed from OpenStack is gathered.
- User and password to OpenStack GUI are available.
- That a flavor is created in OpenStack.
- That a floating network is created in OpenStack.
- That the Dynamic Activation `<Software_Package>.tar.gz` (EDA System KVM&Cloud SW) is available on the host file system.

For OpenStack Cloud deployment, continue with Section 3.3.3 on page 21.

### 3.3.1 Deploying Dynamic Activation in Virtualized Environment

This section describes how to install Dynamic Activation in virtualized deployment

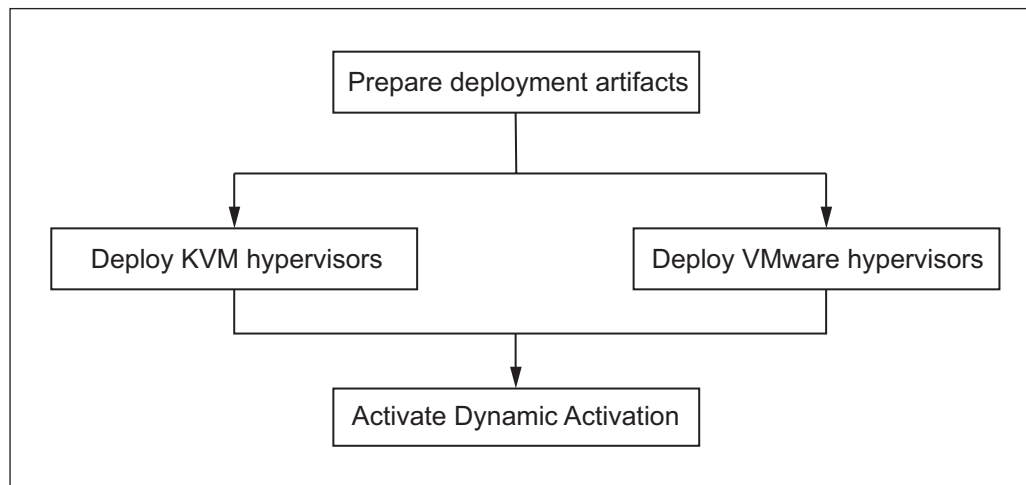


Figure 1 Workflow of Virtualization Deployment

### 3.3.1.1 Preparing Deployment Artifacts

When the prerequisites specified in Section 3.3 on page 5 are met, continue with the following step-list:

1. Download and start the EDA Deployment Manager:

- Save the zip file, [EDA\\_Deployment\\_Manager.zip](#) to, for example a local area on a local machine
- Unpack the zip file.
- Double-click the .jar file.

**Note:** Requires Oracle's JAVA version 1.8.0\_71 or higher. The file is about 600 KB in size.

If not having Oracle's JAVA version 1.8.0\_71 or later, there is a possibility to create an Oracle JAVA independent .bat file and run the tool. To create such file:

**Note:** This alternative works only on windows.

- 1 Download (do not install) the appropriate Oracle JRE tar.gz file for the machine that the EDA Deployment Manager tool will be run from, and store it in the same folder as where the ActivationDeploymentArtifactManager.jar file was unpacked.

- 2 In the same directory, create the EDA\_DeploymentManager.bat file, with the following content:

```
<Path to java.exe file in downloaded JRE> -jar
ActivationDeploymentArtifactManager.jar
```



## 2. Fill in the required generic values.

Start by filling in the values that are shared by all VMs:

### Example, Generic values shared by all VMs

The screenshot shows the 'Deployment Schema' configuration window with the following settings:

Configuration Item	Value
Cluster Mode	Cluster
Load-balancer	EDA provided
Target Hypervisor	KVM/libvirt
Separate traffic and O&M	No
Time Zone	Europe/Stockholm
O&M Netmask (combined = incl. traffic)	255.255.255.0
Traffic Netmask	
Private Netmask	255.255.255.0
Virtual Router ID	76
OSS IP (optional)	
Domain (optional)	
O&M VIPv4 (combined = incl. traffic)	10.64.10.10
-----> IPv6 (optional)	2001:db8:db01:10::100
Traffic VIPv4	
-----> IPv6 (optional)	
Private VIPv4	192.168.0.100
-----> IPv6 (optional)	2001:db8:db01:192::100
DNS Primary IP	10.64.50.250
DNS Secondary IP (optional)	10.64.50.251
NTP Primary IP	10.64.50.252
NTP Secondary IP (optional)	10.64.50.253
O&M Bridge (combined = incl. traffic)	br1296
Traffic Bridge	
Private Bridge	br0
O&M Gateway IPv4	10.64.10.1
-----> IPv6 (optional)	2001:db8:db01:10::1
Traffic Gateway IPv4	
-----> IPv6 (optional)	

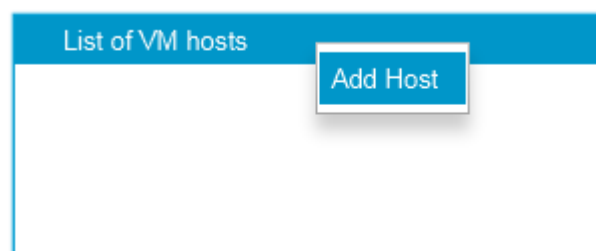
At the bottom right, there is a button labeled 'Generate Hypervisor Artifacts'.

## 3. Add hosts.

Add a host entry for each hypervisor that will host Dynamic Activation VMs.

To add a host, right-click on **List of VM hosts** and select **Add Host**:

### Add Host



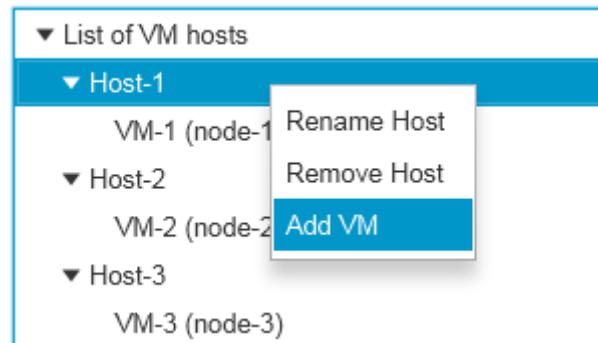
## 4. Add VMs to the hosts.



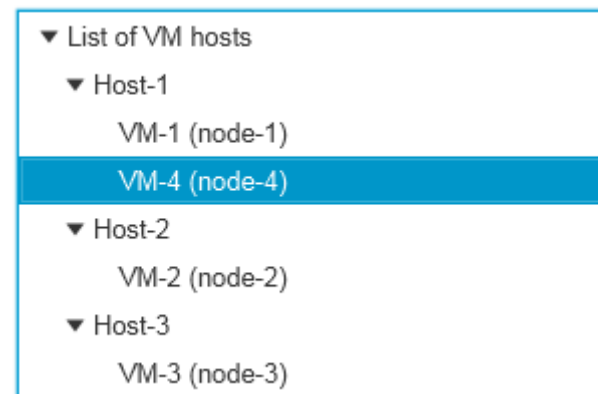
Add a VM entry for each VM that will be deployed under their respective host, where they are supposed to be hosted.

To add a VM, right-click on a host, for example **Host-1** and select **Add VMs**:

**Example, Add VM - Before configuration:**



**Example, Add VM - After configuration:**



5. Fill in the VM-specific data:

**Note:** Parameters Number of vCPUs per VM, Amount of RAM (GB), # of vCPUs (0 = default) and Amount of RAM (GB) (0 = default) are not applicable if the chosen target hypervisor is VMware.



#### Example, VM-specific data

VM ID  
 ?

VM Host Name  
 ?

# of vCPUs (0 = default)  
 ?

Amount of RAM (GB) (0 = default)  
 ?

O&M IPv4 (combined = incl. traffic)  
 ?

-----> IPv6 (optional)  
 ?

Traffic IPv4  
 ?

-----> IPv6 (optional)  
 ?

Private IPv4  
 ?

-----> IPv6 (optional)  
 ?

6. After adding the wanted hosts, their respective VMs, and entering all the required generic values, click the **Generate Hypervisor Artifacts** button, see example in Figure 2. Store the generated artifacts (`bootstrap.iso`) on, for example an empty directory on a local machine.

#### Example Configuration of EDA Deployment Manager

**Note:** Parameters Number of vCPUs per VM, Amount of RAM (GB), # of vCPUs (0 = default) and Amount of RAM (GB) (0 = default) are not applicable if the chosen target hypervisor is VMware.



The screenshot displays the 'Deployment Schema' window of the EDA Deployment Manager. It features a 'Help' button in the top right corner. The interface is organized into several sections:

- Cluster Mode:** A dropdown menu set to 'Cluster'.
- Load-balancer:** A dropdown menu set to 'EDA provided'.
- Target Hypervisor:** A dropdown menu set to 'KVM/libvirt'.
- Separate traffic and O&M:** A dropdown menu set to 'No'.
- Time Zone:** A dropdown menu set to 'Europe/Stockholm'.
- Network Configuration:** Fields for O&M VIPv4 (10.64.10.10), Traffic VIPv4 (optional), Private VIPv4 (192.168.0.100), DNS Primary IP (10.64.50.250), DNS Secondary IP (optional) (10.64.50.251), NTP Primary IP (10.64.50.252), NTP Secondary IP (optional) (10.64.50.251), O&M Bridge (combined = incl. traffic) (br1296), Traffic Bridge, Private Bridge (br0), O&M Gateway IPv4 (10.64.10.1), and Traffic Gateway IPv4 (optional).
- VM Default Values:** A section containing a list of VM hosts (Host-1, Host-2, Host-3) and their respective VMs (VM-1 to VM-6). For each VM, fields for VM ID, VM Host Name, # of vCPUs (0 = default), Amount of RAM (GB) (0 = default), O&M IPv4 (combined = incl. traffic), Traffic IPv4, and Private IPv4 are provided.
- Buttons:** A 'Generate Hypervisor Artifacts' button is located at the bottom right.

Figure 2 EDA Deployment Manager

7. From the EDA Deployment Manager tool, save the updated deployment schema file, .ds, on an appropriate storage area. This file can, for example be used for future cluster expansion.

**Note:** If there is a need or desire to deploy a virtualized Dynamic Activation cluster in an unsupported configuration, it is still possible to generate artifacts using the EDA Deployment Manager (possibly with some dummy values), and then manipulate the generated artifacts before deployment.

The main artifact to focus on is the `user-data` file for each VM, which as the name suggests, contains user-data. It is possible to add own user commands too, as well as modifying existing ones, before deployment.

8. If using KVM, continue with Section 3.3.1.2 on page 12.

If using VMware ESXi, continue with Section 3.3.1.3 on page 13.

### 3.3.1.2

#### Deploying Hypervisor Artifacts - KVM

The following instruction is used to deploy Dynamic Activation:





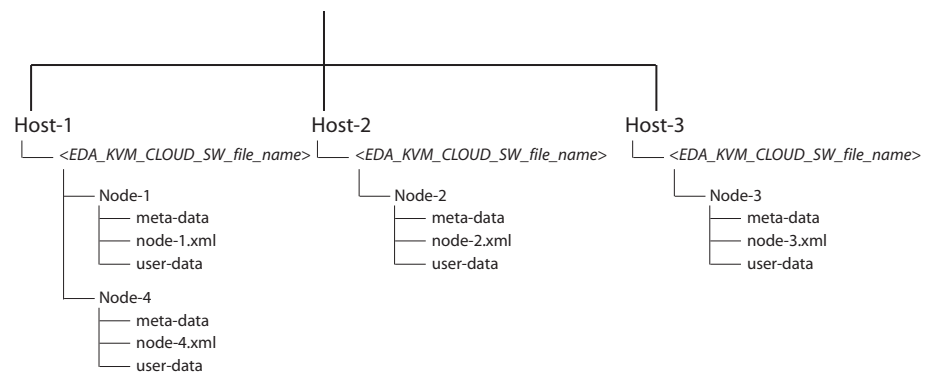
1. Create one folder on each KVM host that will hold deployment artifacts as well as the images for each VM.

**Note:** Make sure that there is enough disk space. The space required is at least 61 GB times (\*) the number of VMs that will be running on that specific host.

2. Copy or move all node-n folders to their respective KVM host.

**Note:** The folders themselves need to be copied, not just their content.

**For example:**



3. On all KVM hosts, extract the `<Software_Package>.tar.gz` file (EDA System KVM&Cloud SW) on the same folder as where the node-n folders were previously stored, see section **Preparing Deployment Artifacts** Step 6:

```
# tar xvf <Software_Package>.tar.gz
```

4. On all KVM hosts where the node-n folders reside, run the `deploy.sh` script, contained in the extracted (EDA System KVM&Cloud SW) file, to define and start all VMs:

```
# KVM/deploy.sh
```

**Note:** Depending on the host performance and number of VMs in the cluster, the deployment process can vary in time to complete. Verify that all processes are operational with the command in Step 2, Section 3.3.1.4 on page 14.

5. Continue with Section 3.3.1.4 on page 14.

### 3.3.1.3

### Deploying Hypervisor Artifacts - VMware

This section includes instructions on how to create a template, that will be used to deploy a Dynamic Activation cluster.



1. Unpack the `<Software_Package>.ova` file (EDA System VMWare SW) that was delivered with the Dynamic Activation deliverable.
2. In VMware vSphere, upload the `bootstrap.iso` files that were created with EDA Deployment Manager in Step 6, to a datastore that is connected to each hypervisor.

**Note:** There is one specific `bootstrap.iso` for each VM.

3. In VMware vSphere, go to Deploy OVF Template and follow the vSphere instructions.

Use the following settings:

- Disk format - Thin Provisioning
- Connect the VM's internal interface to the internal network
- Connect the VM's external OAM interface to the external OAM network

4. Deploy OVF template.

**Note:** Choose to **NOT** start the VM.

5. Configure CPU and Memory resources according to the resource planning of the Dynamic Activation system. Refer to *Requirements on Virtualization and Cloud Infrastructure*, Reference [3].
6. Convert the VM created in Step 3, to a template.
7. Use the template created in Step 6, and create the desired amount of VMs. The amount should be the same as the number of VMs created in the EDA Deployment Manager tool.
8. For all VMs, connect each `bootstrap.iso` to the virtual CD/DVD.
9. If traffic separation is used between OAM and Provisioning, add a Network adapter to node-1 and node-2, and bind it to the Traffic/Provisioning network.
10. It is strongly recommended to create an Affinity rule, saying that node-1, node-2, and node-3 cannot be placed on the same host.
11. Power on all created VMs.
12. Continue with Section 3.3.1.4 on page 14.

#### 3.3.1.4 Activating Dynamic Activation

**Note:** Make sure all VMs are deployed on respective physical host before proceeding with the following instruction.



1. Log in as root on node-1 and run the following command to make sure that all configurations are completed (the total changes are 0 for all nodes in the cluster):

**Note:** If running the command too early, a password prompt may appear. This means that the puppet configuration is not finished with the distribution of the SSH keys. Also, the following may appear: `/var/lib/puppet/state/last_run_summary.yaml` does not exist yet. Keep running the command until all changes are 0 and the output `/var/lib/puppet/state/last_run_summary.yaml` does not exist yet does not appear.

```
# for host in $(grep 'node-' /etc/hosts | awk
'{print $1}'); do ssh "$host" "grep -A1 changes
/var/lib/puppet/state/last_run_summary.yaml"; done
```

Example of a successful output in a three node cluster:

```
changes:
  total: 0
changes:
  total: 0
changes:
  total: 0
```

2. Check that all processes are running (UP) on all VMs:

```
# 3ppmon status --host all
```

All processes must have status UP or, if the process is not supposed to run on the node, have a dash (-).

3. Obtain the license locking codes for the system.

From the master VM (type name node-1):

```
# /var/log/installfiles/<Prod_Number>-<Version>/ema
licenseCodes
```

**Output:**



```
INFO - *** Locking codes for <node-1>:
INFO - ***
Sentinel RMS Development Kit 8.6.2.0053 Host Locking Code Inform
Copyright (C) 2015 SafeNet, Inc.
```

```
Locking Code 1      : 2008-*15J 2JTH NXAK S4MY
Locking Code 1 (Old Style) : 2008-2DA0B
```

```
INFO - *** Locking codes for <node-2>:
INFO - ***
Sentinel RMS Development Kit 8.6.2.0053 Host Locking Code Inform
Copyright (C) 2015 SafeNet, Inc.
```

```
Locking Code 1      : 2008-*1Q4 V7H2 7Q88 53NM
Locking Code 1 (Old Style) : 2008-C5D4C
```

4. Provide all Locking Code for the Ericsson License Information System (ELIS) and get the license file.
5. Transfer (SFTP) the license file to `/var/log/installfiles/` on the master VM (type name node-1), and rename the file to `license.txt`. This will automatically install all license files when running the `/ema deploy -p EMA` script.

**Note:** It is possible to proceed with the installation without installing the licenses at this stage. If this is the case, the licenses need to be manually installed at a later occasion. For detailed information on how to manually install the licenses, see section **License Administration** in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].

6. Install Dynamic Activation software:

Both **Resource Activation** and **Resource Configuration** will be installed.

Run the following command from node-1:

```
# /var/log/installfiles/<Prod_Number>-<Version>/ema deploy
-p EMA
```

7. From node-1, run the following command to check that no errors exist and that all bindings are OK:

```
# bootloader.py node status --host all
```

8. Change password for the root account on all VMs in the cluster. Execute the following command on all nodes:



```
# passwd
```

When Dynamic Activation is successfully installed, continue with Section 3.3.5 on page 29.

### 3.3.2 Deploying Dynamic Activation in Cloud - ECEE

This section describes how to install Dynamic Activation in cloud deployment by using ECEE.

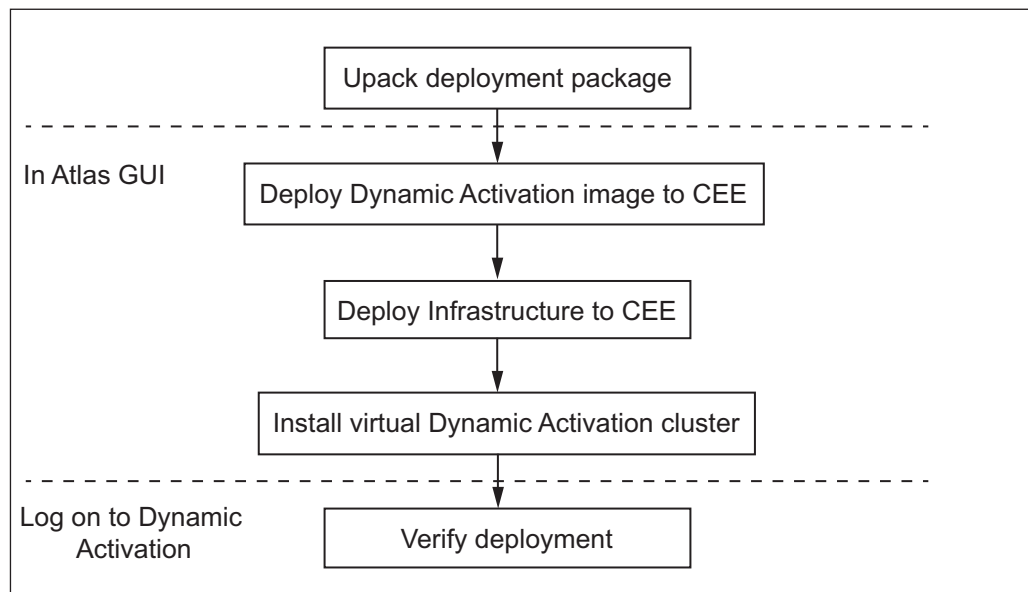


Figure 3 Workflow of Deployment in ECEE

#### 3.3.2.1 Unpack Deployment Package

1. Make sure that the deployment package `<Software_Package>.tar.gz` (EDA System KVM&Cloud SW) is available.
2. Unpack the deployment package (EDA System KVM&Cloud SW) to a location that can be reached from ECEE::

```
# tar -xzf <Software_Package>.tar.gz
```

The following files are unpacked:

- `CXP-<version>.qcow2` – Dynamic Activation image file
- CEE folder that contains:
  - `vEDA_infrastructure.yaml`
  - `vEDA_single.yaml`



- `vEDA_cluster.yaml`
- `vEDA_cluster_without_anti_affinity_rules.yaml`
- `vEDA_expansion.yaml` (used for system expansion, not installation)

### 3.3.2.2 Deploy Image

Use Atlas to deploy Dynamic Activation image.

1. Log on to Atlas as a user with correct rights.
2. Choose **Compute > Images > Create Image**.
3. Enter an image name, and select **Image File** from the **Image Source** drop-down list.
4. Use **Choose File** to select the `CXP-<version>.qcow2` file that was unpacked in Section 3.3.2.1 on page 17.
5. Click **Create Image**, and wait until the image is created.
6. Choose **Compute > Images**, and check the image:
  - **Status** must be *Active*

### 3.3.2.3 Deploy Infrastructure

Use Atlas to deploy Dynamic Activation Infrastructure.

1. Log on to Atlas as a user with correct rights.
2. Upload the infrastructure template.

**Note:** The infrastructure template needs to be uploaded only once. If it was uploaded before and is launched, go to Step 3.

- a. Choose **Orchestration > Catalog**, click **Upload**.
- b. Enter an application name.
- c. In **Type**, select **HOT**.
- d. In **Application Source** drop-down list, select **From File**, and then use **Choose File** to select the `vEDA_infrastructure.yaml` file that were unpacked in Section 3.3.2.1 on page 17, and then click **Upload**.
- e. Choose **Orchestration > Catalog**, select the created application name, and click **Launch**, and then **Next**.
- f. Set the following configurations:



- **A Stack Name**
  - The password of the logged in user
  - Management/provisioning network address
  - Management network gateway
  - Public Management DHCP net pool start
  - Public Management DHCP net pool end
  - `VlanId` that is configured in CMXes for the management network
  - Internal network address
- g. Click **Launch**, and wait until the stack is launched.

---

### Attention!

Only one Dynamic Activation infrastructure template can be launched at a time. Launching multiple infrastructure templates causes deployment failures.

---

- h. In **Orchestration > Stacks**, check the created stack:
- **Status** must be `Create Complete`
3. Upload the Dynamic Activation deployment template.
- a. Choose **Orchestration > Catalog**, and click **Upload**.
  - b. Enter an application name.
  - c. In **Type**, select **HOT**.
  - d. In **Application Source** drop-down list, select **From File**, and then use **Choose File** to select either of the following that were unpacked in Section 3.3.2.1 on page 17.
    - `vEDA_cluster.yaml` – for commercial deployment
    - `vEDA_single.yaml` – one VM instance in single deployment, for non-commercial usage
    - `vEDA_cluster_without_anti_affinity_rule.yaml` – Three VM instances (node-1 ~ node-3) deployment on the same underlying server, for non-commercial usage



**Note:** Both non-commercial deployments have fully functionality of Dynamic Activation system, but limit capacities.

- e. Click **Upload**, and wait until the file is uploaded.
- f. In **Orchestration > Catalog**, check the application:
  - **Status** must be *Active*

#### 3.3.2.4 Install Virtual Dynamic Activation Cluster

Use ECEE GUI Atlas to install virtual Dynamic Activation cluster.

1. Log on to Atlas as a user with correct rights.
2. In **Orchestration > Catalog**, ensure that the application for deployment created in Section 3.3.2.3 on page 18 is in *Active* status.
3. Click **Launch**, and then **Next**.
4. Set the following configurations:
  - **A Stack Name**
  - The password of the logged in user
  - Name of instance/hostname
  - **VRID** of the vEDA cluster

**Note:** The **VRID** must be unique when there are several vEDA deployments in the same subnet.

5. In **Name of the vEDA image** drop-down list, select the image created in Section 3.3.2.2 on page 18.
6. In **vEDA flavor** drop-down list, select a flavor name.

**Note:** The first part of the flavor name is the same as the stack name created in Section 3.3.2.3 on page 18.
7. Set the **ephemeral size**, which specifies the size (in GB) of Cassandra database.
8. In **Number of vEDA instances in addition to the minimum 3 mandatory vEDA instances**, add the number of additional nodes to the minimum three nodes (node-1, node-2 and node-3, which are mandatory for commercial use).

**Note:** For information on how to determine the number, refer to *Requirements on Virtualization and Cloud Infrastructure*, Reference [3].





9. Set the following configurations:
  - Time zone of the VM
  - NTP server IP
  - DNS server IP
10. Click **Launch**, and wait until all VM instances are launched.
11. Choose **Orchestration > Stacks**, select the created stack name, and then:
  - Choose **Events** tab to check:
    - **Status** must be `Create Complete`
    - **Status Reason** must be `Stack CREATE completed successfully`
  - Choose **Overview** tab to find:
    - Node-1 and node-2 external IP addresses
    - VIP external/provisioning traffic

### 3.3.2.5 Verify Dynamic Activation Cloud Deployment

It takes approximate 10 minutes to finish deploying Dynamic Activation in CEE environment.

To verify the deployment, do as follows:

1. Log on as `root` user (password `rootroot`) to all created VM instances by using SSH.
 

**Note:** Node-1 and node-2 external IP addresses can be found in Step 11. Node-3 can be logged on from node-1 by using SSH.
2. Change the `root` user password.
 

```
# passwd
```
3. From the master VM (with type name node-1), check the log file located in `/var/log/cloud-init.log` and look for the text:
 

```
"Deploy of package EMA finished!"
```
4. Check the network setup. For instructions, refer to section **Network Setup Check** in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].

When Dynamic Activation is deployed successfully in Cloud, continue with Section 3.3.4 on page 26.

### 3.3.3 Deploying Dynamic Activation in Cloud - OpenStack

This section describes how to install Dynamic Activation in cloud deployment by using OpenStack newton.

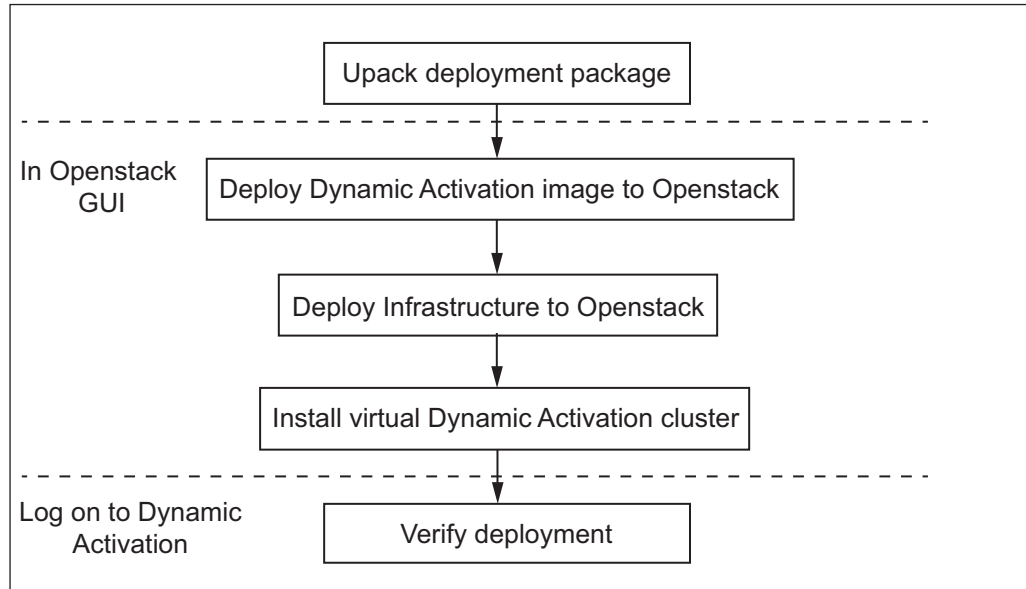


Figure 4 Workflow of Deployment in OpenStack

#### 3.3.3.1 Unpack Deployment Package

1. Make sure that the deployment package `<Software_Package>.tar.gz` (EDA System KVM&Cloud SW) is available.
2. Unpack the deployment package (EDA System KVM&Cloud SW):

```
# tar -xzf <Software_Package>.tar.gz
```

The following files are unpacked:

- `CXP<version>.qcow2` – Dynamic Activation image file
- OpenStack folder that contains:
  - `vEDA_infrastructure.yaml`
  - `vEDA_single.yaml`
  - `vEDA_cluster.yaml`
  - `vEDA_cluster_without_anti_affinity_rules.yaml`
  - `vEDA_expansion.yaml` (used for system expansion, not installation)



3. Store the Dynamic Activation image file and the OpenStack folder to a location that can be reached from OpenStack.

### 3.3.3.2 Deploy Image

Use OpenStack GUI to deploy Dynamic Activation image.

1. Log on to OpenStack GUI as a user with correct rights.
2. Choose **Compute > Images > Create Image**.
3. Enter a name in the **Image Name** box.
4. In the **File** section click on the **Browse...** button to select the `CXP<version>.qcow2` file that was unpacked in Section 3.3.3.1 on page 22.
  - a. In **Format** section, choose **QCOW2-QEMU** emulator.
  - b. Set **Image Sharing** to **Private**
5. Click **Create Image**, and wait until the image is created.
6. Choose **Compute > Images**, and check the image:
  - **Status** must be `Active`

### 3.3.3.3 Deploy Infrastructure

Use the OpenStack GUI to deploy Dynamic Activation Infrastructure.

1. Log on to the OpenStack GUI as a user with correct rights.
2. Upload the infrastructure template.
  - a. Choose **Orchestration > Stacks**, click **Launch Stack**.
  - b. Enter an application name.
  - c. In **Template Source** drop-down list, select **File**, and then use **Choose File** to select the `veda_infrastructure.yaml` file that were unpacked in Section 3.3.3.1 on page 22, and then click **Next**.
  - d. Set the following configurations:
    - **A Stack Name**
    - The password of the logged in user
    - Name of provider Network
    - Management/provisioning network address
    - Internal network address



- e. Click **Launch**, and wait until the stack is launched.

---

---

### Attention!

Only one Dynamic Activation infrastructure template can be launched at a time. Launching multiple infrastructure templates causes deployment failures.

---

---

- f. In **Orchestration > Stacks**, check the created stack:
  - **Status** must be `Create Complete`

#### 3.3.3.4 Install Virtual Dynamic Activation Cluster

Use the OpenStack GUI to install virtual Dynamic Activation cluster.

1. Log on to the OpenStack GUI as a user with correct rights.
2. Upload the Dynamic Activation deployment template.
  - a. Choose **Orchestration > Stacks**, and click **Launch Stack**.
  - b. In **Template Source** drop-down list, select **File**, and then use **Choose File** in the **Template File** area to select either of the following that were unpacked in Section 3.3.3.1 on page 22.
    - `vEDA_cluster.yaml` – for commercial deployment
    - `vEDA_single.yaml` – one VM instance in single deployment, for non-commercial usage
    - `vEDA_cluster_without_anti_affinity_rule.yaml` – Three VM instances (node-1 ~ node-3) deployment on the same underlying server, for non-commercial usage
  - Note:** Both non-commercial deployments have fully functionality of Dynamic Activation system, but limit capacities.
  - c. Click **Next**
  - d. Set the following configurations:
    - **A Stack Name**
    - The password of the logged in user
    - VM hostname prefix
    - Name of provider Network



- Dynamic Activation cluster `VRID`
- Note:** The `VRID` must be unique when there are several vEDA deployments in the same subnet.
- In the **Name of the vEDA image** box, enter the name of the image created in Section 3.3.3.2 on page 23.
  - In **flavor** drop-down list, select a flavor name.
  - Choose in what **Availability Zone** the vEDA cluster will be deployed in.
  - Set the **volume size**, which specifies the size (in GB) of Cassandra database.
  - In **Number of vEDA instances in additional to the minimum 3 mandatory vEDA instances**, add the number of additional nodes to the minimum three nodes (node-1, node-2 and node-3, which are mandatory for commercial use).
- Note:** For information on how to determine the number, refer to *Requirements on Virtualization and Cloud Infrastructure*, Reference [3].
- Set the following configurations:
    - VM time-Zone
    - NTP server IP
    - DNS server IP
3. Click **Launch**, and wait until all VM instances are launched.
  4. Choose **Orchestration > Stacks**, click on the created stack name and then:
    - Choose **Events** tab to check:
      - **Status** must be `Create Complete`
      - **Status Reason** must be `Stack CREATE completed successfully`
    - Choose **Overview** tab to find:
      - Floating IP for external/provisioning traffic/GUI, node-1 and node-2

### 3.3.3.5 Verify Dynamic Activation OpenStack Cloud Deployment

It takes approximate 10 minutes to finish deploying Dynamic Activation in OpenStack environment.

To verify the deployment, do as follows:



1. Log on as `root` user (password `rootroot`) to all created VM instances by using SSH.

**Note:** Node-1 and Node-2 external IP addresses can be found in Step 4.

2. Change the `root` user password.

```
# passwd
```

3. From the master VM (with type name `node-1`), check the log file located in `/var/log/cloud-init.log` and look for the text:

```
"Deploy of package EMA finished!"
```

4. Check the network setup. For instructions, refer to section **Network Setup Check** in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].

When Dynamic Activation is deployed successfully in OpenStack Cloud, continue with Section 3.3.4 on page 26.

### 3.3.4 Installing Licenses (Only ECEE and OpenStack)

After the Dynamic Activation software installation (on ECEE or OpenStack), perform the following procedure to install the licenses:

1. Login to the master VM (with type name `node-1`), where the Sentinel license server resides.
2. Obtain the `Locking Code` from both `node-1` and `node-2`, on which the license server is installed:

```
# cd /opt/sentinel/bin
```

```
# ./echoid
```

#### Example Printout

```
Sentinel RMS Development Kit 8.6.2.0053 Host Locking Code Information Utility  
Copyright (C) 2014 SafeNet, Inc.
```

```
Locking Code 1 : 2008-*1MS LHEN 9GMR X8EQ  
Locking Code 1 (Old Style) : 2008-BA44D
```




---

## Caution!

The `echoid` command needs to be run in the `/opt/sentinel/bin/` directory. Otherwise the license provided for the Ericsson License Information System (ELIS) will not work.

---

3. If using a High Availability (HA) solution, login to the backup VM (with type name node-2), and repeat Step 2 to obtain the locking codes.
4. Provide all `Locking Code` for the ELIS and get the license file.
5. Make sure that the license server is started:

```
# 3ppmon startlserv
```

6. Set the environment variable `LSHOST` to the license server:

```
# export LSHOST=localhost
```

7. Import the licenses from the license file.

The licenses can be imported either from a file or from the string found in the file.

### Example of License

```
13 FAT1022833/5 Ni LONG NORMAL NETWORK EXCL 100000 INFINITE KEYS
15 NOV 2013 11 NOV 2016 NO SHR SLM_CODE 1 NON_COMMUTER NO_GRACE NO_OVERDRAFT
CL_ND_LCK_NON_REDUNDANT AB99F208,FB97E2008 NO_HLD 5 M2M_Start,
PS_T,FzJ:wrGlhYlTlWOoaZ3VyN5wPBlaJd4HVM505BvjFWZAcemFO1DYYtplY:y90yLgTU2Vw2Z7C1x
FWRupieI93p#AID=fe665bf5-a24a-4c3c-910b-e882f41cb146
```

**Note:** The license string cannot contain any word-wrapping and the whole string needs to be on a single line for Sentinel™ to be able to read it.

Install the Dynamic Activation license from a string:

**Note:** Install the Dynamic Activation license file on both the master VM (with type name node-1), and backup VM (with type name node-2). Perform Step 5 to Step 7 on both nodes.

```
# cd /opt/sentinel/bin
```

```
# ./lslic -A "<license_string>"
```

### Example Printout



```
# ./lslic -A /home/actadm/license-design

Sentinel RMS Development Kit 8.6.2.0053
License Addition/Deletion Utility
Copyright (C) 2014 SafeNet, Inc.
License code
13 FAT1022833/5 Ni LONG NORMAL NETWORK EXCL 100000 INFINITE_KEYS
 15 NOV 2013 11 NOV 2016 NO_SHR SLM_CODE 1 NON_COMMUTER NO_GRACE NO_OVERDRAFT
CL_ND_LCK NON_REDUNDANT AB99F208,FB97E2008 NO_HLD 5 M2M_Start,_
PS_T,fzJ:wrGhYlTlW0oaZ3VyN5wPB1aJd4HVM505BvjfWZAcemFO1DYYtplY:y90yLgTU2Vw2Z7C1x
FWRupieI93p#AID=fe665bf5-a24a-4c3c-910b-e882f41cb146
```

or

Install the Dynamic Activation license from a file.

Transfer (SFTP) the license file to /tmp on both the master VM (type name node-1), and backup VM (with type name node-2):

```
# cd /opt/sentinel/bin

# ./lslic -F /tmp/<file_name>
```

### Example of License

```
Sentinel RMS Development Kit 8.6.2.0053
License Addition/Deletion Utility
Copyright (C) 2014 SafeNet, Inc.
License code
13 FAT1022833/5 Ni LONG NORMAL NETWORK EXCL 100000 INFINITE_KEYS
 15 NOV 2013 11 NOV 2016 NO_SHR SLM_CODE 1 NON_COMMUTER NO_GRACE NO_OVERDRAFT
CL_ND_LCK NON_REDUNDANT AB99F208,FB97E2008 NO_HLD 5 M2M_Start,_
PS_T,fzJ:wrGhYlTlW0oaZ3VyN5wPB1aJd4HVM505BvjfWZAcemFO1DYYtplY:y90yLgTU2Vw2Z7C1x
FWRupieI93p#AID=fe665bf5-a24a-4c3c-910b-e882f41cb146
```

8. Verify on the localhost, that a license is installed on both nodes:

```
# /opt/sentinel/bin/lsmom localhost
```

**Note:** Make sure that the response does not contain:

```
There is no license in the server
```

9. For the new license to take effect, an update on the Dynamic Activation applications needs to be performed in the Dynamic Activation GUI.

- 1 Log on to the Dynamic Activation web GUI using HTTP:

```
https://<VIP-OAM-IP>:8383/management
```

For more information, refer to *User Guide for Resource Activation*, Reference [10].

- 2 Go to System >Licenses





- 3 Click the update arrow for the related Dynamic Activation feature to load the license on the system.

### 3.3.5 Installing HSS Validator Plug-in (Optional)

This section contains information on how to install the HSS Validator Plug-in. It is only applicable for User Data Consolidation (UDC) provisioning installations.

**Note:** Make sure to have the correct Plug-in available.

If the file to download has `.tgz` as filename extension, it needs first to be unzipped, and then zipped again as `tar.gz` before renaming it.

The file needs to have the name `<name>-<R-state>.tar.gz`, for example `HssProvisioningValidator-R4A.tar.gz`. If it does not, it needs to be renamed.

The correct `<R-state>` version is found in the `tar.gz` file, on `.jar` level.

1. Copy the HSS Validator Plug-in software to the `/home/bootloader/repository/` directory on node-1.
2. Change owner and group of `HssProvisioningValidator-<R-state>.tar.gz` by running the following command.

```
# chown actadm:activation /home/bootloader/repository/H
ssProvisioningValidator-R4A.tar.gz
```

**Note:** In this example, `<R-state>` is R4A.

3. From node-1, repeat the following command for all nodes in the cluster, to add the plug-in as submodule.

```
# bootloader.py submodule add -n <HSS Plugin>.tar.gz -t
lib-ext -p dve-application --host <hostname>
```

`<hostname>` is the hostname of the node to which the submodule is being added.

4. From node-1, repeat the following command for all nodes in the cluster, one by one, to activate the plug-in as submodule:

```
# bootloader.py node activate --host <hostname>
```

`<hostname>` is the hostname of the node to which the submodule is being activated.

### 3.3.6 Creating Administrative Users

Create non-root users for administering purposes, such as log file reading, process monitoring, managing Dynamic Activation processes, installation of



modules, and more. For information on how to create administrative users, see section **Users > Create Administrative User** in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].

### 3.3.7 SSL Configuration (Optional)

For information on how to configure SSL, follow the instructions in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].

### 3.3.8 Configurations

Before Dynamic Activation is fully operational, the different application services need to be configured. Refer to *Configuration Manual for Resource Activation*, Reference [11].

For information on how to import the default NE groups and routing methods to the Dynamic Activation system, refer to **Load Default NE Groups and Routing Methods** in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].

### 3.3.9 Modify Notification Rules (Optional)

For HSS and DAE provisioning, the application notification rules files need to be deployed to Dynamic Activation in order to send the notification message to the relevant FE. The application notification rules file needs to be retrieved from each application.

For more information, see section **Notification Rules File Administration** in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].

### 3.3.10 Set Initial License Counters

**Note:** This section is only valid when migrating subscribers from monolithic NEs to User Data Consolidation (UDC).

For more information, refer to *License Counter Management*, Reference [13].

### 3.3.11 External OpenID Connect Provider Configuration (Optional)

For information on how to configure External OpenID Connect Provider, follow the instructions in *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].



## 4 SNMP Configuration

The SNMP configuration is automatically handled when providing correct OSS IP address in the `EDA Deployment Manager` tool.

For information on how to change trap destination, see *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].





## 5 Update and Rollback of Dynamic Activation on Virtualized Deployment

An update is an upgrade of all RPMs and modules on the current system to a newer software version, for example update the software to a new Correction Package (CP) or Product Customization Package (PC) level.

**Note:** Check the **Delivery Report** for details about supported update paths. Contact [Ericsson support](#) for further instructions.

The update is proceeded node by node without downtime. If any previously modified configuration files are affected by the update, they may need to be modified again.

To see if a configuration file is replaced in platform RPMs, and where the backup of the original file is placed, look in the `/home/actadm/config/log/config.log` file. Search for `<date> [INFO] Replacing <file> with new config file, and <date> [INFO] Backing up <file> to <file>.`

To see if a configuration file is replaced in the common and provisioning logic modules, and where the backup of the original file is placed, look in the `/home/bootloader/config/module_config_files/log/config.log` file. Search for `<config file> replaced due to new original file, old file renamed to <config file>.save`

**Note:** New provisioning features need to be configured. For instructions, refer to *Configuration Manual for Resource Activation*, Reference [11].

### 5.1 Preparations

#### Backup VMs:

To support seamless rollback of the VMs, a backup of the VM disks is mandatory before an update.

Before proceeding to Section 5.2 on page 34, refer to *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4] and *Backup and Restore Guideline for Virtual and Cloud Deployment*, Reference [5] for more information about backing up VMs.

**Note:** The backup procedure should be done for all the VMs in the cluster before proceeding to Section 5.2 on page 34.

#### Backup Cassandra:



When update an Dynamic Activation system, back up the Cassandra by following the instructions described in *Backup and Restore Guideline for Virtual and Cloud Deployment*, Reference [5].

### **Copy the Software Package** (EDA System Base SW):

On the first node, node-1, as user `root`:

---

---

### **Caution!**

Make sure there is enough free disk-space (4 GB minimum) in `/var/log/`, to be able to copy and untar the new tar file.

---

---

1. Transfer the software to the `/var/log/installfiles` directory on node-1.

2. Change directory:

```
# cd /var/log/installfiles/
```

3. Untar the software (EDA System Base SW):

```
# tar -zxf <Software_Package>.tar.gz
```

## **5.2 Update Instructions**

To update all nodes in the cluster at the same time, resulting in downtime, follow the steps in Section 5.2.1 on page 34. To update the cluster node by node, without any downtime, follow the steps in Section 5.2.2 on page 35.

### **5.2.1 All Nodes with Downtime**

The fastest way to update the whole cluster is to update all nodes at the same time, resulting in downtime.

---

---

### **Attention!**

Make sure all traffic is down. Ongoing traffic will cause inconsistency.

---

---

**Note:** The update needs to be performed from the first node (node-1), as user `root`.

1. Update the cluster:



```
# cd /var/log/installfiles/<Prod_Number>-<Version>
```

```
# ./ema update --host all
```

The following is prompted:

```
Warning: Updating all nodes at the same time means
that ongoing provisioning will fail.Are you sure you
want to continue? (y/n)
```

Enter **y** and press **Enter**

2. Run CAI3G test traffic.

Run test traffic to verify the updated nodes. If traffic does not work as expected, perform a rollback.

### 5.2.2 Node by Node without Downtime

**Note:** The instructions for updating cluster node by node is not supported for Resource Configuration.

Start with updating node-1. Verify that the updated nodes work as expected by executing traffic on test ports. After verification, enable the nodes to take regular traffic, and then update the rest of the nodes.

During update, node-1 is temporarily disabled from regular traffic. This can cause some performance decrease.

**Note:** The update needs to be performed from the first node (node-1), as user `root`.

1. Set the Services to only register test services when activated on node-1:

```
# bootloader.py config set --parameter @REGISTER_SERV
ICES@ --value false
```

```
# bootloader.py config set --parameter @REGISTER_TEST_S
ERVICES@ --value true
```

2. Go to `/var/log/installfiles/<Prod_Number>-<Version>` and update node-1:

```
# cd /var/log/installfiles/<Prod_Number>-<Version>
```

```
# ./ema update --host node-1
```

3. Check that all processes are running on the updated node (node-1).

From node-1, run the following commands:

```
# 3ppmon status --host node-1
```



```
# bootloader.py node status --host node-1
```

4. Run CAI3G test traffic.

Run test traffic on test ports (8888, 8989) to verify the that node-1 are working properly.

5. Set the Services to register real services when activated:

```
# bootloader.py config remove --parameter @REGISTER_S  
SERVICES@
```

```
# bootloader.py config remove --parameter @REGISTER_TES  
T_SERVICES@
```

6. Restart the services on node-1 so that it can take regular traffic:

```
# bootloader.py node activate --host node-1
```

7. When node-1 is updated, repeat steps Step 2 - Step 3 for the rest of the nodes in the cluster.

**Note:** Make sure to replace `--host <nodeId>` with the Id for the node that is currently being updated, for example node-2, node-3 and so on.

8. When all nodes in the cluster are updated, the update to a new software level is completed.

## 5.3 Rollback Instructions

The rollback procedure rolls back Dynamic Activation to the software level that was installed before the last update.

For information on how to back up and restore VMs, see *Backup and Restore Guideline for Virtual and Cloud Deployment*, Reference [5].





## 6 Backup

When the system is installed and properly configured, make a full backup to be able to revert to the original state when needed. Create a full backup as described in *Backup and Restore Guideline for Virtual and Cloud Deployment*, Reference [5].





## Reference List

### Ericsson Documents

- [1] *Library Overview*, 18/1553-CSH 109 628 Uen
- [2] *Glossary of Terms and Acronyms*, 0033-CSH 109 628 Uen
- [3] *Requirements on Virtualization and Cloud Infrastructure*, 2/2135-CSH 109 628 Uen
- [4] *System Administrators Guide for Virtual and Cloud Deployment*, 3/1543-CSH 109 628 Uen
- [5] *Backup and Restore Guideline for Virtual and Cloud Deployment*, 6/1553-CSH 109 628 Uen
- [6] *Network Description and Configuration for Virtual and Cloud Deployment*, 1/1551-CSH 109 628 Uen
- [7] *Customer Questionnaire for Virtual and Cloud Deployment*, 2/1057-CSH 109 628 Uen
- [8] *Parameter List for Virtual Deployment*, 3/1057-CSH 109 628 Uen
- [9] *Parameter List for CEE Deployment*, 6/1057-CSH 109 628 Uen
- [10] *User Guide for Resource Activation*, 1/1553-CSH 109 628 Uen
- [11] *Configuration Manual for Resource Activation*, 2/1543-CSH 109 628 Uen
- [12] *Product Overview*, 1550-CSH 109 628 Uen
- [13] *License Counter Management*, 1/197 21-CSH 109 628 Uen
- [14] *Hardening Guideline for Virtual and Cloud Deployment*, 2/154 43-CSH 109 628 Uen