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XFAYAHA FAYAZ AHAMMAD		1/153 72-APR 901 0578 Uen		
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Raghavendra Rao Tadepalli	ERAGTAD	2017-11-30	U	

VNF-LCM Installation Instructions

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1 Introduction

This document describes how to Deploy or Install Virtual Network Function Life Cycle Manager(VNF-LCM) application in any one of Cloud Infrastructures listed below .

- Ericsson Cloud Manager (ECM)
  or
- Ericsson Cloud Execution Environment (CEE)
  or
- Openstack
- VMware vCloud Director (VCD).

2 Scope

This document covers the following procedures:

- Deploying the VNF-LCM
- Configuring the VNF-LCM
- Verifying the VNF-LCM

The deployment procedure is written for creating a **Stack or Virtual Application** using a Heat Orchestration Template(HOT) or Open Virtualization Format (OVF) respectively.

3 Target Group

This document is intended for personnel deploying and configuring the VNF-LCM.

4 Prerequisites

The following sections outline the prerequisites necessary to deploy the VNF-LCM

Note: Read the entire document before starting the deployment of the VNF Life Cycle Manager

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Table 1

Software	Release Version
OSS-RC	16B or Higher
ECM	17.0
CEE	R6.4
CEE Atlas	R6.4
Openstack	Mitaka
VCD	8.10

1. Software version requirements as listed in above Table-1

2. Minimum resource requirements for VNF-LCM stack:

   - Two vCPUs,4GB RAM and 20GB disk for both vnflaf-services and vnflaf-db VMs.
   - 1 Gbps network link
   - 120 GB of ephemeral storage or persistent block storage (such as Cinder storage) (Not Applicable for VCD).

   VNF-LCM doesn't really depend on any specific type of hardware resource. The requirements stated above are for virtual resources. The hardware type specifications fall under the scope of cloud infrastructure specifications. Below points are not applicable for VCD.

3. A quorum of two or more active compute hosts should be present per active vCIC instance in the CEEdeployment. These compute nodes should have enough resources as stated above for a single VNF-LCM stack.

4. It is assumed that the target CEE setup has Telemetry Ceilometer Metering service v2 running.

5. If Cinder volumes are to be used as storage types for the VMs, then Cinder BlockStorage v2 service is expected to be running on the target cloud setup.

6. VNF-LCM creates all VNF's within a single tenant space, and hence a tenant and a tenant user has to be created in Atlas/Openstack with required privileges to create the VNFs and the VNF-LCM instance itself. One or more users are required to be created within this Tenant. Tenant Users can have mainly 2 roles in Atlas/Openstack .i.e. either member role or an administrative role. Users with Administrative role can add/activate/deactivate/delete tenant users additionally along with the other permission of Tenant User.

For VNF-LCM, you will have to create a user within the Tenant, the user can have either a member role or an administrative role. The Tenant name, Tenant user name and password details are input parameters to the VNF-LCM installation procedure. If the tenant user is changed in Atlas/Openstack , the system administrator will have to manually update the details in VNF-LCM (the system administrator guide provides steps to update them).

4.1 User

The person who performs VNF-LCM deployment is required to have solid knowledge of following areas:

- Ericsson Cloud Manager (ECM) or Ericsson Cloud Execution Environment (CEE) or Openstack or VMware vCloud Director (VCD)
- Ericsson OSS-RC
- UNIX® or Linux

4.2 Access

The following access information is required to deploy the VNF-LCM:

- Access to target cloud GUI Dashboards.
- Rights to manage cloud virtual resources like Virtual Networks, Images, Stacks, Volumes, Blockstorage and Virtual Applications.

5 VNF-LCM Install overview

OSS-RC with VNF-LCM is an hybrid deployment, that is, VNF-LCM is deployed in the cloud while the OSS-RC applications continue to be a physical deployment.
VNF-LCM deployment in the cloud consists of two Virtual Machines that use RedHat Linux as the guest operating system:

5.1 Overview

- VNFLAF-Services
  - This VM consists of the JBoss application server, where VNF-LCM Services and VNF-LCM workflows are deployed.
  - The static UI components are deployed in Apache httpd server.
- VNFLAF-DB
  - This VM is for VNF Lifecycle Manager’s database (PostgresSQL).

6 NFS server configurations

Note: Skip this step if persistence storage like Cinder or Block Storage available in targeted Cloud Infrastructure managers.

Context Description:
Create folder and share it over NFS

Prerequisites:

- NexentaStor Storage service
- Acess and rights to create & share a folder inNexentsStor
- At least free space of 120 GB available in Nexenta target volume

Expected Result:
Folder shared in NexentaStor over NFS to CIDR where VNF-LCM is to be deployed

Steps:

1. Create a NFS share in NFS server

   Below is an example of how a folder to be shared and properties to be assigned if storage system is **NexentaStor**

   Command to create a folder:

```
nmc@XEPAY90704:/$ create folder
Folder pathname :  HA_VOL/VNF_LAF
NAME USED AVAIL REFER MOUNTED QUOTA DEDUP COMPRESS
HA_VOL/VNF_LAF 144K 13.7T 144K yes none off on
```

2. Make sure that the NFS server is shared to and reachable from the Subnet created in Step 4 of preinstall section.

   Example command to share a folder and properties to be assigned:

```
nmc@XEPAY90704:/$ share folder HA_VOL/VNF_LAF
Option ?  nfs
Auth Type :  sys
Anonymous :  true
Anonymous Read-Write :  true
Read-Write :
Read-Only :
Root :  root@<CIDR of External subnet attached to
VNF-LCM in cloud>
Recursive :  true
Added NFS share for folder 'HA_VOL/VNF_LAF'
It is recommended to set 'nbmand' property to 'on', to
enforce mandatory cross-protocol share reservations and
byte-range locking in a mixed NFS/CIFS environment
nbmand :  on
```

```
For 'nbmand' property change to take an effect,
the folder 'HA_VOL/VNF_LAF' needs to be remounted.
Unmounting and mounting the folder again may cause a
temporary loss of client connections
Note that you can do remounting manually, at a later
time.  Proceed to remount the folder?  Yes
```

7 Preparations for Deployment in ECM

Note: Skip this section if VNF-LCM deployment is planned in CEE Atlas or Openstack or VCD.

To deploy VNF-LCM resources in ECM, download the required Media, upload correspondent QCOW images and Heat Templates using ECM GUI as follows

7.1 Download VNF-LCM Media for ECM

Context Description:
Download the required media to deploy in ECM

Prerequisites:

- Access to http://gask2web.ericsson.se
- FTP server to download the media
- At least free space of 3 GB available

Expected Result:
VNF-LCM media content extracted and ready to be used for deployment

Steps:

1. Download the Latest VNF-LCM Virtual Deployment Media Package for ECM from http://gask2web.ericsson.se, using Product number 19090-CXP9032641.
   The downloaded package name will be similar to 19090-CXP9032641 _Ux_<Rev>.tar

2. Extract the VNF-LCM Media to get the files for the installation
   # **tar -xvf 19090-CXP9032641_Ux_<Rev>.tar**

   The installation instructions uses the extracted files described in the following table.

Filename	Description
cloud-init-services	Cloud Init for vnflaf-services VM's first boot

Filename	Description
cloud-init-db	Cloud Init for vnflaf-db VM's first boot
vnflcm-ecm-heat-template-static-cinder-env.yaml	Environment file with all input parameters for vApp if HOT file is vnflcm-ossrc-ecm-heat-template-static-cinder.yaml
vnflcm-ecm-heat-template-static-nfs-env.yaml	Environment file with all input parameters for vApp if HOT file is vnflcm-ossrc-ecm-heat-template-static-nfs.yaml
vnflcm-ecm-heat-template-dualstack-static-cinder-env.yaml	Environment file with all input parameters for vApp if HOT file isvnflcm-ossrc-ecm-heat-template-dualstack-static-cinder.yaml
vnflcm-ecm-heat-template-dualstack-static-nfs-env.yaml	Environment file with all input parameters for vApp if HOT file is vnflcm-ossrc-ecm-heat-template-dualstack-static-nfs.yaml
vnflcm-ecm-heat-template-static-cinder.yaml	HOT file , contains definition of parameters and virtual resources required for VNF-LCM deployment
vnflcm-ecm-heat-template-static-nfs.yaml	HOT file , contains definition of parameters and virtual resources required for VNF-LCM deployment
vnflcm-ecm-heat-template-dualstack-static-cinder.yaml	HOT file , contains definition of parameters and virtual resources required for VNF-LCM deployment
vnflcm-ecm-heat-template-dualstack-static-nfs.yaml	HOT file , contains definition of parameters and virtual resources required for VNF-LCM deployment
ERICrhelvnflafimage_CXP9032490-<Version>.qcow2	The Virtual Machine (VM) image for vnflaf-services.
ERICrhelpostgresimage_CXP9032491-<Version>.qcow2	The Virtual Machine (VM) image for vnflaf-db.

7.2 Upload QCOW Images to ECM

Context Description:
Learn how to upload the QCOW images extracted from VNF-LCM media to ECM Dashboard

Prerequisites:
Tenant and Tenant User roles

Expected Result:
The uploaded image is listed and in an Active state on the Images Overview page of ECM Dashboard

Steps:

1. Login to ECM17.0 UI Dashboard
2. Click the **Resources** drop down menu from the navigation bar
3. Select **Images**, the **Image List** is displayed listing all the existing images
4. Click **Create** and select **From File** from the menu that opens

   The *Create Image* window is displayed
5. Click **Select File**
   The *File Selection* page is displayed.
6. Select the file and click **Open**.
   The *File Selection* page is dismissed and the *Create Image* From File page is displayed with the selected Image file and the Image name field is populated with a default name that can be changed.
7. Enter information in the fields for the image

Field	Description
Image Name	The name of the image in Ericsson Cloud Manager. Provide a descriptive and unique name of this image in the Image Name field. Populated by default with the same name as the selected filename
Enforce unique name across all tenants	Select Yes for the slider in order to enforce unique name. When this option is selected, the system validates that the name is unique when you click Start or OK. If the name is not unique, an error message is displayed. Change the image name and try to process the image again
Available For	The Available For option is only available to users with the provider administrator role. Select Tenant ECM Only or All Tenants as required
Description	Description of the image

8. Click **Start** to begin the upload and wait for the Order to complete.

When the process finishes, the message Image created successfully is displayed

9. Click the checkbox next to the image uploaded to transfer

10. Click **Manage** and **select Transfer Image to more VIM Zones** from the menu that opens

    Note: Only images in the list with *Transferable* set to **Yes** can be transferred

11. Select the **VIM Zone or VIM Zones** where image needs to be transferred.

    Note: It is mandatory to transfer image to CEE VIM Zone

12. Click **OK** and wait for the Order to Complete.

13. Repeat above steps for all the VM images

7.3 Upload VNF-LCM Heat Template to ECM

Context Description:
Learn how to upload VNF-LCM Heat Template to ECM

Prerequisites:
Tenant and Tenant User roles.

Expected Result::
VNF-LCM package uploaded and available for use in ECM Packages Database

Steps:
At this point it is needed to select a HOT file according to the pre-requisites met with your environment. Refer below table to decide upon package to be uploaded to ECM.

Once the package is selected refer section *Create (Upload) a HOT Package* of ECM User Guide and upload it

Table 2

VNF-LCM HOT Package File Name	**Meets Requirements**				
	External Network	Internal Network	Fixed IP for VM(s)	Cinder	NFS
vnflcm-ecm-heat-template-static-cinder.yaml	IPv4	IPv4	yes	yes	no
vnflcm-ecm-heat-template-static-nfs.yaml	IPv4	IPv4	yes	no	yes

VNF-LCM HOT Package File Name	Meets Requirements				
vnflcm-ecm-heat-template-dualstack-static-cinder.yaml	Dual	Dual	yes	yes	no
vnflcm-ecm-heat-template-dualstack-static-nfs.yaml	Dual	Dual	yes	no	yes

7.4 Create VDC in ECM

Note: Skip this section if a Virtual Data Center is already created or existing

Context Description:
Create a Virtual Data center in ECM

Prerequisites:

- Tenant access and space in ECM

Expected Result:
New VDC created for VNF-LCM deployment

Steps:
To create a Virtual Data Center, execute the steps listed in section Create a Virtual Data Center of **ECM User Guide**

7.5 Create VN in ECM

Note: Skip this section if a Virtual Network is already created or existing

Context Description:
Create a Virtual Network (VN) in planned Virtual Data center of ECM

Prerequisites:

- Tenant access and space in ECM

Expected Result:
A VN created for VNF-LCM to reach OSS-RC setup

Steps:

This network needs to be created in the same VCD where VNF-LCM is planned to be deployed. *This network will be used for external connectivity to clients and vise versa*

Note: Subnet should have atleast /28 CIDR

To create a Virtual Network , refer section *Working with Virtual Networks* in **ECM User Guide**

7.6 Create Block Storage in ECM

Skip this section if external Storage type is NFS

7.6.1 Procedure Overview

Context Description:
Create Block Storage in ECM

Prerequisites:
Tenant and Tenant User roles.
Available storage 120 GB or more in ECM.

Expected Result :
Block Storage created, its resource ID collected and active for VNF-LCM to use it

7.6.2 Steps

1. Log on to ECM UI Dashboard.
2. Click on **Assets** tab, and select the **Virtual Data Centers** option from the drop down.
3. In **Virtual Data Centers** List page, select the VDC where VNF-LCM deployment has been planned.
4. Navigate to the **Block Storage** tab.
5. Click on **Create** button to create Block Storage for VNF-LCM vApp
6. On the **Create BSV** wizard, fill in **Asset Type** as **Block Storage** and fill in planned VDC Name
7. Click on button **Next**.
8. On the **Select Offer** window, choose a sample offer for block storage.
9. On the **Choose VIM Zone** window, choose the appropriate VIM Zone for Block Storage.
10. On the **Enter Attributes** window, input mandatory details for parameters **Block Storage Name** and **Disk Size**.
11. Click **Submit Order** and wait for the Block Storage to be available in **Active** state.

7.7 Parameters Table for ECM deployment

Collect inputs for all the parameters listed in below Table

7.7.1 Parameters

Table 3

Parameter	Description	Default Value
Services_vm_HostName	Custom hostname for vnflaf-services VM	vnflaf-services
servicesImage	Name of VNF-LCM-services VM image uploaded ERICrhelvnflafimage_CXP9032490-<Version> to VIM dashboard.	ERICrhelvnflafimage_CXP9032490-<Version>
services_flavor	Flavor to use for VNF-LCM-services VM.	
DB_vm_HostName	Custom hostname for vnflaf-db VM	vnflaf-db
dbImage	Name of VNF-LCM-db VM image uploaded ERICrhelpostgresimage_CXP9032491-<Version> to VIM dashboard.	ERICrhelpostgresimage_CXP9032491-<Version>
db_flavor	Flavor to use for VNF-LCM-db VM.	
storageType	For the 'Backup and Restore' feature VNF-LCM needs external storage. Possible values: **Cinder** or **NFS**	
cinder_volume_id	Resource ID of pre-created Cinder Volume/Block storage Ignore this if storage type is NFS	23554cad-f3bb-4dbe-8483-d15757763f80

nfsServerIp	IP address of NFS server where a folder was pre-created as part of section “NFS Server Configuration” Ignore this if Storage Type is Cinder	
sharedFilesystemPath	Path of files system shared from above NFS server	
ip_version	IP Version of external subnet. Allowed values - 4/6/Dual Possible Input1: **4**- If external network's subnet is of IPv4 only Possible Input2: **6** - If external network has got subnet of IPv6 only Possible Input3: **Dual** - If external network has got subnets of IPv6 and IPv4	4
external_net_id	Resource Id of Pre created external network. If not exists, create it now.	3ccb890a-b4ce-475c-ac48-507d5066f2fb
externalSubnetCidr	IP address range of IPv4 or IPv6 subnet of above external network. If not existing create it now and make the subnet externally routed towards OSSRC. Example - 131.160.162.0/24	
external_subnet_gateway	Gateway address of above subnet	
external_ip_for_services_vm	An IP address from above subnet for vnflaf-services VM	

external_ip_for_db_vm	An IP address from above subnet for vnflaf-db VM	
internalSubnetCidr	Provide a network size in CIDR notation for VNF-LCM Hot template to create a subnet Input IPv4 CIDR if ip_version is 4 Input IPv6 CIDR if ip_version is 6 Input IPv6 CIDR if ip_version is Dual	172.16.100.0/28
internal_subnet_gateway	Gateway address for internal subnet for VNF-LCM HOt template to create	
internal_ip_for_db_vm	IP address for vnflaf-db VM from network internalSubnetCidr for intra communication	
internal_ip_for_services_vm	IP address for vnflaf-services VM from network internalSubnetCidr for intra communication	
ossType	Allowed input: OSSRC	
ossMasterHostName	Host name of the Live master server of RC	masterservice

ossMasterHostIP	IP address of above OSS master server. Make sure this IP is accessible to network which is provided for parameter **externalSubnetCidr** Input IPv4 if ip_version is 4 Input IPv6 if ip_version is 6 Input IPV4 or IPv6 if ip_version is Dual	
ossNotificationServiceIP	IP address of the Host where notification service of OSS is running. Refer parameter table in Installation Guide to find the description. Example - 10.140.23.40	
ossNotificationServiceHost	Host name of the Host where notification service of OSS is running. Refer parameter table in Installation Guide to find the description. Example - notificationservice	notificationservice
ossUserName	Authorized user for VNF-LCM to transfer ARNE files to OSS master Example: nmsadm	

ossGatewayHost1	OSS setup primary UAS host IP address This host will be the gateway host for launching VNF-LCM UI using OEX launcher Input IPv4 if ip_version is 4 Input IPv6 if ip_version is 6 Input IPV4 or IPv6 if ip_version is Dual	
ossGatewayHost2	OSS setup secondary UAS host IP address. If secondary host does not exist please input Ip address of primary UAS host itself This host will be the gateway host for launching VNF-LCM UI using OEX launcher Input IPv4 if ip_version is 4 Input IPv6 if ip_version is 6 Input IPV4 or IPv6 if ip_version is Dual	

Below are the parameters inputs to be filled in if any **dualstack** HOT template has been chosen for VNF-LCM deployment

Table 4

Parameter	**Description**	**Default Value**
external_ipv4_subnet_ gateway	Gateway address of IPv4 subnet of external network	

external_ipv4_subnet_cidr	Network size of IPv4 subnet for external connectivity	
external_ipv4_for_services_vm	An IPv4 address from above CIDR for vnflaf-services VM	
external_ipv4_for_db_vm	An IPv4 address from above CIDR for vnflaf-db VM	
external_ipv6_subnet_cidr	Network size of IPv6 subnet for external connectivity	
external_ipv6_subnet_gateway	Gateway address of IPv6 subnet of external network	
external_ipv6_for_services_vm	An IPv6 address from above CIDR for vnflaf-services VM	
external_ipv6_for_db_vm	An IPv6 address from above CIDR for vnflaf-services VM	
internal_ipv4_subnet_cidr	Any Class-B IPv4 address range of IPv4 subnet for internal network to be created. Example - 172.16.100.0/28	
internal_ipv4_subnet_gateway	Internal IPv4 subnet gateway address for internal netwrok to be created . Example - 172.16.100.1	
internal_ipv4_for_db_vm	Internal IPv4 address for the vnflaf-db VM. Example - 172.16.100.2	
internal_ipv4_for_services_vm	Internal IPv4 address for the vnflaf-services VM. Example - 172.16.100.3	
internal_ipv6_subnet_cidr	IP address range of Ipv6 subnet for internal network to be created. Example - fd5b:1fd5:8295:5339::/64	

internal_ipv6_subnet_gateway	Internal IPv6 subnet gateway address for internal netwrok to be created . Example - fd5b:1fd5:8295:5339::1	
internal_ipv6_for_db_vm	Internal IPv6 address for the vnflaf-db VM. Example - fd5b:1fd5:8295:5339::5	
internal_ipv6_for_services_vm	Internal IPv6 address for the vnflaf-services VM. Example - fd5b:1fd5:8295:5339::6	

7.8 Update Environment files

7.8.1 Update Environment files

Context Description:
Learn how to update environment file of VNF-LCM

Prerequisites:
A file editor and ECM parameters input

Expected Result:
Edited the corresponding environment file for the package uploaded and ready to use.

Steps:

Info: Below table lists the mapping environment file for the HOT package

Table 5

VNF-LCM HOT Package File Name	Environment file Name
vnflcm-ecm-heat-template-static-cinder.yaml	vnflcm-ecm-heat-template-static-cinder-env.yaml
vnflcm-ecm-heat-template-static-nfs.yaml	vnflcm-ecm-heat-template-static-nfs-env.yaml
vnflcm-ecm-heat-template-dualstack-static-cinder.yaml	vnflcm-ecm-heat-template-dualstack-static-cinder-env.yaml
vnflcm-ecm-heat-template-dualstack-static-nfs.yaml	vnflcm-ecm-heat-template-dualstack-static-nfs-env.yaml

Steps:

- Open selected environment file in any text editor

- Update inputs for all the parameters at the right hand side of parameter entry. That is after **:**

  Syntax: <Parameter Name>: <Update your input here>
  Example:
  dbImage: ERICrhelpostgresimage_CXP9032491-2.3.3

  Note: It is mandatory to provide values for all the parameters.

- Save the updated file.

8 Deploy VNF-LCM vAPP in ECM

Note: Refer to section Deploy VNF-LCM Stack in CEE if VNF-LCM deployment is planned using CEE Atlas Dashboard

8.1 Procedure Overview

Context Description:
Learn how to deploy the VNF-LCM vApp in ECM

Prerequisites:
A Tenant and a Tenant User users have to be created in ECM with required privileges to create the VNFs and the VNF-LCM instance itself.
Environment file ready with all the inputs for vApp

Expected Result :
Succesfully deployed VNF-LCM vApp in ECM

8.2 Steps

1. Login to ECM17.0 UI

2. Select **Resources** menu and click on **Packages** . The **Package List** page displays

3. Select the VNF-LCM HOT package uploaded to create the VAPP. The **Package Detail** page displays

4. Click **Deploy** in the action bar.
   – The Asset Type is already set to **Virtual Application**.
   – The *Offer Source* is already set to **Package Offer**.

5. Select the created or planned **VDC Name** from the drop-down

6. Click **Next**.

7. Click the **package offer** to use for your VAPP, and click **Next**

8. The **Manage Characteristics** is displayed, Click **Next**
9. Select the **VIM zone** where you want to deploy the offer
10. Click **Next**
11. Enter a unique **name** for the VAPP and any optional attributes on the **Basic Information** tab.
12. Click the **Configuration** tab.
13. In **Configuration Files** section Click on **Add More Files** of action bar. The file browser opens.
14. Select the file **cloud-init-db** and click **open**
15. In **Configuration Files** section Click on **Add More Files** of action bar. The file browser opens.
16. Select the file **cloud-init-services** and click **open**
17. In **Environment Files** section Click on **Add More Files** of action bar. The file browser opens.
18. Select the **environment file** updated with parameter inputs and click **open**
19. Click **Submit Order**

Monitor the status of submitted order in orders tab, wait until it is completed. A successfully completed order will show the Virtual Application status as Active in **Virtual Application** tab in the VDC. Once the VAPP is in active state VM will take about 10 to 15 minutes to make the VNF-LCM framework ready with initial configuration.

9 Preparations for Deployment in CEE or Openstack

Note: Skip this section if VNF-LCM deployment is planned in ECM

To deploy VNF-LCM resources in CEE or Openstack, download the required Media, upload correspondent QCOW images and Heat Templates using Atlas or Openstack dashboard as follows

9.1 Download VNF-LCM Media

Context Description:
Download the required media to deploy in Atlas or Openstack

Prerequisites:

- Access to http://gask2web.ericsson.se
- FTP server to download the media. Ideal server for this purpose is MWS server of OSS-RC
- At least free space of 3 GB available in FTP server

Expected Result:
VNF-LCM media content extracted and ready to be used for deployment

Steps:

1. Download the Latest VNF-LCM Virtual Deployment Media Package from http://gask2web.ericsson.se, using Product number 1/19090-CXP9029683 The downloaded package name will be similar to 1_19090-CXP9029683 _Ux_<Rev>.tar

2. Extract the VNF-LCM Media to get the files for the installation
   # **`tar -xvf 1_19090-CXP9029683_Ux_<Rev>.tar`**

   The installation instructions uses the extracted files described in the following table.

Table 6

Filename	Description
vnflaf-heat-template-static-cinder.yaml	Atlas/Openstack heat template file , contains definitions of VNF Virtual Application resources. Storage type is Cinder.
vnflaf-heat-template-static-nfs.yaml	Atlas/Openstack heat template file , contains definitions of VNF Virtual Application resources. Storage type is NFS.
vnflaf-heat-template-dualstack-static-cinder.yaml	Atlas/Openstack dualstack heat template file , contains definitions of VNF Virtual Application resources. Storage type is Cinder.
vnflaf-heat-template-dualstack-static-nfs.yaml	Atlas/Openstack dualstack heat template file , contains definitions of VNF Virtual Application resources. Storage type is NFS.
ERICrhelvnflafimage_CXP9032490-<Version>.qcow2	The Virtual Machine (VM) image for VNF-LCM-services.
ERICrhelpostgresimage_CXP9032491-<Version>.qcow2	The Virtual Machine (VM) image for VNF-LCM-db.

9.2 Upload QCOW Images to Atlas or Openstack

Context Description:
Learn how to upload the QCOW images extracted from VNF-LCM media to Atlas or Openstack Dashboard

Prerequisites:
Tenant and Tenant User roles

Expected Result:
The uploaded image is listed and in an Active state on the Images page of Atlas or Openstack Dashboard

Steps:

1. Log on to the Atlas/Openstack dashboard.
2. Select a **project**.
3. Click on **Images**.
4. Click on **Create Image** button as shown in below screenshot.
5. Enter the **Name, description(optional), Image source, Format** as shown in the below screenshot. Leave all the other fields as they are in the screenshot.

   Select Image source as **Image File**. Browse and open the ERICrhelvnflafimage_CXP9032490-<Version>.qcow2 image extracted in section
6. Click on **Create Image** to upload the image

Wait until Image is uploaded successful, new images shall be listed in Images table.

Repeat above steps to upload ERICrhelpostgresimage_CXP9032491-<Version>.qcow2 also

9.3 Choose VNF-LCM Heat Template for Atlas or Openstack

Context Description:
Choose a VNF-LCM HOT file which meets the site requirements

Prerequisites:
VNF-LCM media extracted.

Expected Result::
VNF-LCM package for your requirements identified for deployment of VNF-LCM

Steps:

At this point it is needed to select a HOT file according to the pre-requisites met with your environment. Refer below table to decide upon package to be uploaded to Atlas or Openstack.

Table 7

VNF-LCM HOT Package File Name	**Meets Requirements**				
	External Network	Internal Network	Fixed IP for VM(s)	Cinder	NFS
vnflaf-heat-template-static-cinder.yaml	IPv4	IPv4	yes	yes	no
vnflaf-heat-template-static-nfs.yaml	IPv4	IPv4	yes	no	yes
vnflaf-heat-template-dualstack-static-cinder.yaml	Dual	IPv6	yes	yes	no
vnflaf-heat-template-dualstack-static-nfs.yaml	Dual	IPv6	yes	no	yes

9.4 Create Cinder Volume

Context Description:
Create Cinder Volume in Atlas or Horizon UI

Prerequisites:
Tenant and Tenant User roles.
Available volume capacity 120 GB or more in target cloud environment

Expected Result :
Cinder volume created, its resource ID collected and active for VNF-LCM to use it

Steps:

1. Log on to Atlas Dashboard or Horizon Dashboard with Tenant User credentials.

2. Navigate to Project view

3. Click the option **Volumes** from **Compute** category on the left panel.

4. On tab **Volumes**, click button **Create Volume**.

5. On the **Create Volume** popup, fill in Volume Name, Description, and Volume Source as "No source Empty Volume". Fill in Type, Size and Availability Zone, and click on button **Create Volume**.

9.5 Parameters Table for CEE or Openstack

Collect inputs for all the parameters listed in below Table

9.5.1 Parameters

Table 8

Parameter	Description	Default Value
Services_vm_HostName	Custom hostname for vnflaf-services VM	vnflaf-services
servicesImage	Name of VNF-LCM-services VM image uploaded ERICrhelvnflafimage_CXP9032490-<Version> to VIM dashboard.	ERICrhelvnflafimage_CXP9032490-<Version>
services_flavor	Flavor to use for VNF-LCM-services VM.	
DB_vm_HostName	Custom hostname for vnflaf-db VM	vnflaf-db
dbImage	Name of VNF-LCM-db VM image uploaded ERICrhelpostgresimage_CXP9032491-<Version> to VIM dashboard.	ERICrhelpostgresimage_CXP9032491-<Version>
db_flavor	Flavor to use for VNF-LCM-db VM.	
storageType	For the 'Backup and Restore' feature VNF-LCM needs external storage. Possible values: **Cinder** or **NFS**	
cinder_volume_id	Resource ID of pre-created Cinder Volume/Block storage Ignore this if storage type is NFS	23554cad-f3bb-4dbe-8483-d15757763f80

nfsServerIp	IP address of NFS server where a folder was pre-created as part of section “NFS Server Configuration” Ignore this if Storage Type is Cinder	
sharedFilesystemPath	Path of files system shared from above NFS server	
ip_version	IP Version of external subnet. Allowed values - 4/6/Dual Possible Input1: **4**- If external network's subnet is of IPv4 only Possible Input2: **6** - If external network has got subnet of IPv6 only Possible Input3: **Dual** - If external network has got subnets of IPv6 and IPv4	4
external_net_id	Resource Id of Pre created external network. If not exists, create it now.	3ccb890a-b4ce-475c-ac48-507d5066f2fb
externalSubnetCidr	IP address range of IPv4 or IPv6 subnet of above external network. If not existing create it now and make the subnet externally routed towards OSSRC. Example - 131.160.162.0/24	
external_subnet_gateway	Gateway address of above subnet	
external_ip_for_services_vm	An IP address from above subnet for vnflaf-services VM	

external_ip_for_db_vm	An IP address from above subnet for vnflaf-db VM	
internalSubnetCidr	Provide a network size in CIDR notation for VNF-LCM Hot template to create a subnet Input IPv4 CIDR if ip_version is 4 Input IPv6 CIDR if ip_version is 6 Input IPv6 CIDR if ip_version is Dual	172.16.100.0/28
internal_subnet_gateway	Gateway address for internal subnet for VNF-LCM HOt template to create	
internal_ip_for_db_vm	IP address for vnflaf-db VM from network internalSubnetCidr for intra communication	
internal_ip_for_services_vm	IP address for vnflaf-services VM from network internalSubnetCidr for intra communication	
ossType	Allowed input: OSSRC	
ossMasterHostName	Host name of the Live master server of RC	masterservice

ossMasterHostIP	IP address of above OSS master server. Make sure this IP is accessible to network which is provided for parameter **externalSubnetCidr** Input IPv4 if ip_version is 4 Input IPv6 if ip_version is 6 Input IPV4 or IPv6 if ip_version is Dual	
ossNotificationServiceIP	IP address of the Host where notification service of OSS is running. Refer parameter table in Installation Guide to find the description. Example - 10.140.23.40	
ossNotificationServiceHost	Host name of the Host where notification service of OSS is running. Refer parameter table in Installation Guide to find the description. Example - notificationservice	notificationservice
ossUserName	Authorized user for VNF-LCM to transfer ARNE files to OSS master Example: nmsadm	

ossGatewayHost1	OSS setup primary UAS host IP address This host will be the gateway host for launching VNF-LCM UI using OEX launcher Input IPv4 if ip_version is 4 Input IPv6 if ip_version is 6 Input IPV4 or IPv6 if ip_version is Dual	
ossGatewayHost2	OSS setup secondary UAS host IP address. If secondary host does not exist please input Ip address of primary UAS host itself This host will be the gateway host for launching VNF-LCM UI using OEX launcher Input IPv4 if ip_version is 4 Input IPv6 if ip_version is 6 Input IPV4 or IPv6 if ip_version is Dual	

Below are the parameters inputs to be filled in if any **dualstack** HOT template has been chosen for VNF-LCM deployment

Table 9

Parameter	**Description**	**Default Value**
external_ipv4_subnet_ gateway	Gateway address of IPv4 subnet of external network	

external_ipv4_subnet_cidr	Network size of IPv4 subnet for external connectivity	
external_ipv4_for_services_vm	An IPv4 address from above CIDR for vnflaf-services VM	
external_ipv4_for_db_vm	An IPv4 address from above CIDR for vnflaf-db VM	
external_ipv6_subnet_cidr	Network size of IPv6 subnet for external connectivity	
external_ipv6_subnet_gateway	Gateway address of IPv6 subnet of external network	
external_ipv6_for_services_vm	An IPv6 address from above CIDR for vnflaf-services VM	
external_ipv6_for_db_vm	An IPv6 address from above CIDR for vnflaf-services VM	
internal_ipv4_subnet_cidr	Any Class-B IPv4 address range of IPv4 subnet for internal network to be created. Example - 172.16.100.0/28	
internal_ipv4_subnet_gateway	Internal IPv4 subnet gateway address for internal netwrok to be created . Example - 172.16.100.1	
internal_ipv4_for_db_vm	Internal IPv4 address for the vnflaf-db VM. Example - 172.16.100.2	
internal_ipv4_for_services_vm	Internal IPv4 address for the vnflaf-services VM. Example - 172.16.100.3	
internal_ipv6_subnet_cidr	IP address range of Ipv6 subnet for internal network to be created. Example - fd5b:1fd5:8295:5339::/64	

internal_ipv6_subnet_gateway	Internal IPv6 subnet gateway address for internal netwrok to be created . Example - fd5b:1fd5:8295:5339::1	
internal_ipv6_for_db_vm	Internal IPv6 address for the vnflaf-db VM. Example - fd5b:1fd5:8295:5339::5	
internal_ipv6_for_services_vm	Internal IPv6 address for the vnflaf-services VM. Example - fd5b:1fd5:8295:5339::6	

10 Deploy VNF-LCM in CEE or Openstack

10.1 Procedure Overview

Note: Refer to section Deploy VNF-LCM Stack in ECM if VNF-LCM deployment is planned using ECM

Context Description:
Learn how to deploy the VNF-LCM stack in Atlas or Openstack

Prerequisites:
A Tenant and a Tenant User users have to be created in Atlas or Openstack with required privileges to create the VNFs and the VNF-LCM instance itself.
A Virtual Network(VN) with an IPv4 or IPv6 or both subnets which can connect to oss-rc physical servers
All inputs listed in parameters table collected and ready to use

Expected Result :
Successfully deployed VNF-LCM stack in Atlas or Openstack

10.2 Procedure Steps

1. Log on to the Atlas/Openstack dashboard.
2. Select a project.
3. Click **Stacks** category.
4. Click on **Launch Stack** button.
5. Choose *Template Source* as **File**. Then browse a heat template which is chosen as per site requirements in preparations section and click **Open**.

6. Click on **Next** button.

7. Enter a Name for Stack. **Provide values for the input parameters** .

8. After inputting values for all the parameters, click on **Launch** button.

   Wait until Stack creation is completed. A successfully completed order will show the Stack status as **Create Complete** .

Post the status **Create Complete** of stack, VNF-LCM takes about 10 to 15 minutes to configure VM with all provided inputs

11 Preparations for deployment in VCD

Follow the preparations described in this section before deploying the VNF-LCM software.

11.1 Media Requirements

Context Description:

Download the Latest VNF-LCM package for VCD.

Prerequisites:

1.Access to Software Gateway.

2.Atleast 3GB free space needed for downloading the package

Expected Result:

Package should be downloaded and ready for deployment

Steps:

i. Download the Latest VNF-LCM package from http://gask2web.ericsson.se using Product number 19090-CXP9033935.

Table 10 VNF-LCM Virtual Deployment Media Package.

Software Package	Filename
VNF-LCM Virtual Deployment Media Package for VCD8.10.	19090-CXP9033935_Ux_<Revision >.tar

The VNF-LCM Virtual Deployment Media Package contains the files listed in Table 2.

ii. Extract the downloaded media file.

Use below command, if you are extracting the media in Unix file system.

$tar -xvf 19090-CXP9033935_Ux_<Revision>.tar.

Table 11 Content of VNF-LCM Virtual Deployment Media Package 19090-CXP9033935_Ux_<Revision>.tar.

Filename	Description
vnflaf_2vm_vcd.ovf	Open Virtualization Format (OVF) file, contains metadata of VNF Virtual Application. Storage type is BSV
ERICrhelvnflafimage_CXP9032490-<Version>.vmdk	The Virtual Machine (VM) image for vnflaf-services.
ERICrhelpostgresimage_CXP9032491-<Version>.vmdk	The Virtual Machine (VM) image for vnflaf-db.

12 Deploy VNF-LCM in VCD environment

The following sections describe how to deploy the VNF-LCM in the VCD8.10. The deployment procedure can differ for other VCD versions.

12.1 Pre-install

Context Description:

Identification of Datacentres and Virtual Network.

Prerequisites:

Credentials for VCD with system administrator rights.

Expected Result:

User should be able to identify the Datacenters and Virtual Network for deployment.

Steps:

1. Login to VCD using Firefox web browser with your credentials.

   Note: Login as **"sys-admin"** user type for getting access to all the features.

2. Identify existing Datacenter for VNF-LCM in VCD 8.10 Environment by following the steps.

a) Click on "Manage & Monitor" in the System tab.

b) Click on "Organizations" option. This will display the available Organizations.

c) Double click on the specific Organization.

d) Click on the "Administration".

e) Click on "Virtual Datacenters" on the left panel. The window that opens will display all the existing Virtual Datacenters.

3. Identify existing Virtual network for VNF-LCM by following the steps

   a) Click on "Manage & Monitor" in the System tab.

   b) Click on "Organizations" option. This will display the available Organizations.

   c) Double click on the specific Organization.

   d) Click on Administration.

   e) Click on "Virtual Datacenters" on the left panel.

   f) Double click on the specific VDC.

   g) Select "Org VDC Networks" tab. which will display all your Networks.

   Note: This network needs to be available in the same datacenter where VNF-LCM is planned to be deployed. This network will be used for external connectivity to clients and vice versa.

12.2 Upload VNF-LCM OVA to Packages in VCD

You can use either of the two below methods to upload your OVA into VCD, whichever is preferred:

Context Description:

For uploading the OVA to VCD for deployment.

Prerequisites:

Credentials for VCD with system administrator rights.

Expected Result:

VApp template must be present in the specified catalog.

Steps:

1. Using VCD dashboard.

   a) Click on "Manage & Monitor" in the System tab.

   b) Click on "Organizations" option. This will display the available Organizations.

   c) Double click on the specific Organization.

   d) Click on "Catalog" button.

   e) Select "My Organization's Catalog" from the left panel.

   f) Click on PLUS symbol in the Catalog section to add a new Catalog providing required details

   g) Once the Catalog has been created, Double click on the specific Catalog.

   h) Click on the UPLOAD icon available in the "VApp Templates" section and Upload your OVF package as VApp Template and click "Upload".

2. Use the ovftool command line utility (see VMWare documentation of the tool).

Example 1

```
<path>/ovftool.exe --allowExtraConfig --acceptAllEulas
"c:\<full path to .ova>" "vcloud://<user>:<password>@<host>?
org=<org>&vappTemplate=<template>&catalog=<catalog>&vdc=<vdc>"

<user> : A vCD user with system administrator rights
         in organization.
<password> : Password of user defined.
<host> : Hostname of vCD server.
<org> : Organization used.
<catalog> : Name of template created in Catalog.
<vdc> : Organization VDC.

After completion the template should be available
 in Catalog defined in vCD.
```

12.3 Deploy the VNF-LCM OVF package using the VCD GUI

Context Description:

Steps to create a VNF-LCM Virtual Application using the uploaded OVF package.

Prerequisites:

1.Credentials for VCD with system administrator rights.

2.VApp template must be present in the Catalog.

Expected Result:

VApp should be deployed.

Steps:

1. Deploying an OVA to in VCD.

   a) Click on "Manage & Monitor" in the System tab.

   b) Click on "Organizations" option. This will display th available Organizations.

   c) Double click on the specific Organization.

   d) Click on "My Cloud".

   e) Select "vApps" from the left panel.

   f) Click on the PLUS icon to add vApp from your Catalog

   Note: You have to provide your vApps details in the opening window. The first Tab is to select your vApp template.

   g) Select "My Organization's Catalogs" from the drop down list for "Look in" and click on "All Templates".

   h) Select your preferred Template from the available list or obtain our Template using the dynamic search option. Then click "Next".

   i) Give Name and Description for your vApp.

   j) Select the Virtual Datacenter for your vApp from the drop down list of available Virtual Datacenters. And click "Next".

   k) Select the Storage Policy for the VMs that your going to create using the Template and click "Next".

   l) Select the Networks to which each of your VMs need to be get connected. Available Network will be shown in the Drop down list. And click "Next".

   m) This window reflects the details of your No of CPUs, Memory and Hard disk space needed for the VMs. leave the default values as it is And click "Next".

   n) Review all your details that has been provided for your vApp and **leave the Checkbox " Power on vAPP after this wizard finished " unchecked as it is** And click "Finish".

2. Modifying the configuration of the VMs.

a) Double click on the deployed vApp.

b) Click on "Virtual Machines".

c) Right click on the VM which is need to be configured.

d) Select "Properties".

e) You can modify your different configurations for the VM in the window opened (IP address, Disk space etc.).

Description	Default Value
IP Version of Network subnets. Allowed values - v4 or v6	4
IP address range of IPv4/Ipv6 subnet of external network. Example - 10.148.14.0/25 or 2001:1b70:6207:2b::/64	
Gateway of IPv4/Ipv6 subnet of external network. Example - 10.148.14.1 or 2001:1b70:6207:2b:0:3522:0:1	
External IPv4/IPv6 address for the vnflaf VM. Example - 192.168.10.11 or 2001:1b70:6207:2b::5	
Any Class-B IP address range of IPv4 subnet Or IP address range of Ipv6 subnet for internal network to be created. Example - 172.16.100.0/28 or fd5b:1fd5:8295:5339::/64	
Internal subnet gateway address for internal network. Example - 172.16.100.1 or fd5b:1fd5:8295:5339::1	
Internal IPv4 or IPv6 address for the vnflaf-db VM. Example - 172.16.100.2 or fd5b:1fd5:8295:5339::5	
Internal IPv4 or IPv6 address for the vnflaf-services VM. Example - 172.16.100.3 or fd5b:1fd5:8295:5339::6	
External storage type to be used for Backup and Restore. Allowed values - local	local
Assign a custom host name for VNFLCM VM.	vnflaf-services OR vnflaf-db
A custom hostname to be given to VNFLCM-services VM.	vnflaf-services

Internal IPv4 or IPv6 address for the vnflaf-db VM. Example - 172.16.100.2 or fd5b:1fd5:8295:5339::5	
The custom host name assigned for VNFLCM-db VM.	vnflaf-db
Cloud Manager type. Possible values - VCD. This input will be used by VNFLCM to prepare the environment to execute workflows.	VCD
IPv4/IPv6 address of Cloud Manager Example - 141.137.212.29 or 2001:1b70:6207:26:0:309:0:99d1	
The tenant ID in Cloud Manager to be used by VNFLCM to create the VNFs. Example - vnf005-ossrc	
The endpoint URL of the Cloud Manager Rest Interface, Required by VNFLCM to make REST/HTTP calls to Cloud Manager. Example - https://vcd.vnf005.local/api	
Host name of Cloud Manager. Example - vcd.vnf005.local	
The User Name in Cloud Manager to be used by VNFLCM to create the VNFs.	
Type of OSS.	OSSRC
OSSRC Live Admin server host name for VNF(s) to be connected. Example - masterservice	
OSSRC Admin server host IPv4/IPv6 for VNF(s) to be connected. Example - 131.160.162.195 or 2001:1b70:6207:27:0:309:0:99d1	
Authorized user of OSSRC Server for VNF handling. Example - vnflaf	nmsadm
Authorized user of OSSRC Server for VNF handling. Example - vnflaf	nmsadm

OSSRC UAS Host1 IPv4/IPv6 address. Example - 192.168.0.6 or 2001:1b70:6207:28:0:309:0:99d1	
OSSRC UAS HOST2 IPv4/IPv6 address. Example - 192.168.0.7 or 2001:1b70:6207:29:0:309:0:99d1	

Note: It is mandatory to provide values for all the parameters. if any parameters are not known or not applicable, you must provide dummy values. Particularly, don't leave the **OSS fields** blank.if so, then the network setup will fail and product will not work.

Note: The input for parameter **ip_version** would configure VM interfaces with selected version only. Hence make sure that below parameters are of selected version (IPv4/IPv6):
Parameters: cloudManagerIpAddress, ossRcMasterHostIP, ossRcUasHost1IP, ossRcUasHost2IP, nfsServerIp(if Storagetype is NFS), internalSubnetCidr, internal_subnet_gateway, externalSubnetCidr, external_subnet_gateway, external_ip_for_services_vm and external_ip_for_db_vm

3. Double Click vAPP-->Right Click vAPP Name-->Click Start and monitor vAPP Status. It will show the status as running

13 Post Installation Verification

Context Description:
Once vnflaf-Services and vnflaf-db VMs are online, verify that all their services are running and accessible.

Prerequisites:

Successfully deployed VNF-LCM stack or vApp

Expected Result:
VNF-LCM VMs and their services are in running state and ready to use

13.1 Set Initial Passwords

Context Description:
Update passwords for user accounts in VNF-LCM VMs

Prerequisites:

- Successfully installed VNF-LCM Stack or vApp
- Passwords of user accounts cloudManagerUser and OSSRC user

Expected Result:
Initial passwords for user accounts updated

Steps:

1. Log on to vnflaf-db VM as cloud-user using external IP assigned or from VM console. For the first login use the default password **passw0rd**, and when prompted input a new password

2. Log on to vnflaf-services VM as cloud-user using external IP assigned or from VM console. For the first login use the default password **passw0rd**, and when prompted input a new password

3. Successful update of cloud-user account password would logout automatically, so log on again with updated password

4. Switch to root user with default password **passw0rd**
   ```
   # [cloud-user@vnflaf-services ~]$ su - root
   ```

5. Due to security reasons VNF-LCM stores passwords of OSS-RC user accounts in encrypted format. This step describes step involved to update VNF-LCM with user account's password. Run below command to update an OSS account password. When prompted input password of OSS user account nmsadm
   ```
   # [root@vnflaf-services ~]# vnflcm oss passwd
   ```

13.2 Verify Status of VNF-LCM Setup in vnflaf-db VM

Context Description:
Verify that all the services are running.

Prerequisites:
root user credentials

Expected Result:
The service postgresql92-postgresql is in running state

Steps:

1. Logon to vnflaf-db VM as cloud-user using the external IP assigned to VM and run below command

   ```
   #ssh cloud-user@vnflaf-db
   ```

2. Switch to root user with default password **passw0rd**
   ```
   # [cloud-user@vnflaf-services ~]$ su - root
   ```

3. Verify status of the service:

   ```
   #service postgresql92-postgresql status
   ```

Example:
#[root@vnflaf-db ~]**service postgresql92-postgresql status**
postmaster (pid 1525) is running...

4. If the service is in stopped state activate it:

   #**service postgresql92-postgresql start**

13.3 Verify Status of VNF-LCM Setup in vnflaf-services VM

Context Description:
Verify that all the services are running.

Prerequisites:
root user credentials

Expected Result:
The service httpd and jboss are in running state

Steps:

1. Login to VNFLAF-services VM using the public IP assigned or using VM Console from Atlas/Openstack UI

   Note: Public IP can be found in **Instances** page.

2. Check if httpd service is running using below command

   #**service httpd status**

   If the service is in stopped state activate it:

   #**service httpd start**

3. Check if JBOSS service is running using below command

   #**service jboss status**

   If the service is in stopped state activate it:

   #**service jboss start**

4. Navigate to deployments directory

   # **cd /ericsson/3pp/jboss/standalone/deployments**

5. Check if all the files(.war and .ear) are deployed successfully. The directory should contain .deployed files corresponding to each .war and .ear files as shown in below screenshot.

```
[root@vnflaf-services ~]# cd /ericsson/3pp/jboss/standalone/deployments/
[root@vnflaf-services deployments]# ls -l
total 28320
-rwxr-xr-x. 1 jboss_user jboss  1458982 Feb  5  2016 camunda-engine-rest-7.2.8-ee.war
-rw-r--r--. 1 jboss_user jboss       32 Feb  5  2016 camunda-engine-rest-7.2.8-ee.war.deployed
-rwxr-xr-x. 1 jboss_user jboss 16523654 Feb  5  2016 camunda-.war
-rw-r--r--. 1 jboss_user jboss       12 Feb  5  2016 camunda-.war.deployed
-rwxr-xr-x. 1 jboss_user jboss   218695 Mar 28 12:23 PlatformIntegrationBridge-ear-3.7.1.ear
-rw-r--r--. 1 jboss_user jboss       39 Mar 28 12:23 PlatformIntegrationBridge-ear-3.7.1.ear.deployed
-rwxr-xr-x. 1 jboss_user jboss    21054 Mar 28 12:23 service-framework-rar-3.37.2.rar
-rw-r--r--. 1 jboss_user jboss       32 Mar 28 12:23 service-framework-rar-3.37.2.rar.deployed
-rwxr-xr-x. 1 jboss_user jboss  3833898 Mar 28 12:23 vnflaf-autostart-service-ear-1.1.6.ear
-rw-r--r--. 1 jboss_user jboss       38 Mar 28 12:23 vnflaf-autostart-service-ear-1.1.6.ear.deployed
-rwxr-xr-x. 1 jboss_user jboss  6643164 Mar 28 12:23 vnflaf-oss-rc-fm-adapter-deploy-ear-1.1.4.ear
-rw-r--r--. 1 jboss_user jboss       45 Mar 28 12:23 vnflaf-oss-rc-fm-adapter-deploy-ear-1.1.4.ear.deployed
-rwxr-xr-x. 1 jboss_user jboss    80140 Mar 28 12:23 vnflcm-nbi-rest-1.0.14.war
-rw-r--r--. 1 jboss_user jboss       26 Mar 28 12:23 vnflcm-nbi-rest-1.0.14.war.deployed
-rwxr-xr-x. 1 jboss_user jboss    56621 Mar 28 12:23 vnflcm-service-ear-1.0.25.ear
-rw-r--r--. 1 jboss_user jboss       29 Mar 28 12:23 vnflcm-service-ear-1.0.25.ear.deployed
-rwxr-xr-x. 1 jboss_user jboss    31286 Mar 28 12:23 wfs-jee-ear-2.10.18.ear
-rw-r--r--. 1 jboss_user jboss       23 Mar 28 12:23 wfs-jee-ear-2.10.18.ear.deployed
-rwxr-xr-x. 1 jboss_user jboss    66557 Mar 28 12:23 wfs-rest-api-2.10.18.war
-rw-r--r--. 1 jboss_user jboss       24 Mar 28 12:23 wfs-rest-api-2.10.18.war.deployed
[root@vnflaf-services deployments]#
```

13.4 Update VNF-LCM with Default VIM

Context Description:
Update VNF-LCM with default VIM (Virtual Infrastructure Manager) for NFV use cases

Prerequisites:
A healthy and running VNF-LCM
Ready with supported VIM details

Expected Result:
VIM and its details updated in VNF-LCM and ready to execute NFV use cases

Steps:

Refer the section **VNF-LCM CLI Admin** from VNF-LCM System Admin Guide and update default VIM.

14 Update OSS-RC with VNF-LCM

Context Description:
Configure Primary UAS host with vnflaf-services VM external IP to launch the VNF-LCM application from OEX Launcher

Prerequisites:
A healthy and running VNF-LCM
All post-install verification steps executed successfully
OSSRC DNS server login credentials.
OMSAS OSSRCserver login credentials

Expected Result:
VNF-LCM application launch from OEX should work

14.1 Steps:

1. Configure VNFLAF-Services as a DNS client in OSSRC DNS server

   DNS must be reconfigured before proceeding further. Refer section `DNS configuration to add clients` in OSS-RC Initial Installation for Enhanced Deployment on HP HW.
   Expected output: External IP of VNFLAF-Services VM must be accessible and resolvable as **vnflafhost**

   Verify above activity as follows in DNS server or any OSSRC client server
   #**nslookup vnflafhost**

2. Applying VNF-LCM software Licensing

   VNF-LCM require a Sentinel license to be enabled. For details of applications and how to install the license, refer to the License Key Administration in OSS-RC

   Note: This application will not run unless the Sentinel license is set up. Please ensure Software supply has provided all purchased licenses.

   Verification: Availability of license can be verified on OSSRC live Admin server as follows
   Execute command: # **/opt/Sentinel/bin/lsmon | egrep -i "vnf|CXC4011979"**
   Expected Output:

   ```
   #/opt/Sentinel/bin/lsmon | egrep -i "vnf|CXC4011979"
   |- Feature name :  "CXC4011979"
   |- Public vendor information :  VNF_Lifecycle_Automati
   on_Framework_CORE_optional_feature
   ```

3. Install OSS-RC CA signed SSL certificate

   VNF-LCM require an SSL certificate issued by OSS-RC CA authority. Execute the below steps to obtain certificate and install it in VNF-LCM

   - Login to vnflaf-services VM as *root* user and generate Certificate Signing Request (CSR). This CSR has to be submitted to OSS-RC CA certification authority (OMSAS). Below command will prompt for a series of queries please input as per site's requirement

     # **/usr/bin/openssl req -new -sha1 -key /etc/ssl/cer ts/vnflafhost.key -out /tmp/vnflaf-services.csr**

     Sample Output:

     ```
     [root@vnflaf-services ~]#/usr/bin/openssl req
     -new -sha1 -key /etc/ssl/certs/vnflafhost.key -out
     /tmp/vnflaf-services.csr
     Country Name (2 letter code) [XX]:US
     State or Province Name (full name) []:State
     ```

```
Locality Name (eg, city) [Default City]:City
Organization Name (eg, company) [Default Company
Ltd]:Org Ltd
Organizational Unit Name (eg, section) []:OSS
Common Name (eg, your name or your server's
hostname) []:vnflaf-services
Email Address []:
Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:
An optional company name []:
```

- Copy the CSR file to OMSAS server of OSS-RC

  # scp /tmp/vnflaf-services.csr root@<IP of OMSAS server>:/tmp/

- Logon to OMSAS server as user *caas* and generate SSL certificate

  # /opt/ericsson/cadm/bin/pkiAdmin cred ext_ws generate -csr /tmp/vnflaf-services.csr -cert /tmp/vnflaf-services.crt

- Copy the generated certificate to vnflaf-services VM as *cloud-user* user

  # su - root

  # scp /tmp/vnflaf-services.crt cloud-user@<External IP of vnflaf-services VM>:/tmp/

- Logon to vnflaf-services VM as *root* user and install the new certificate (.crt)

  # cp /tmp/vnflaf-services.crt /etc/ssl/certs/vnflaf host.crt

- Restart httpd service on vnflaf-services VM

  # service httpd restart

4. Launch VNF-LCM UI home page

   Note: VNF UI page is tested and verified in 31.1 and higher versions of Firefox.

   This page can be accessed from Unix Application Server (UAS) of OSS-RC from OSS Explorer (OEX) GUI . Follow below mentioned steps.

   - Launch the **OEX GUI** from OSS
   - Go to **Tools**

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Approved (Document resp)	Checked	Date	Rev	Reference
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- Select **VNF Lifecycle Manager** this option will launch Firefox browser with **VNF-LCM Home page**

- Successful deploy of **VNF Lifecycle Manager** displays *No workflows deployed* on the VNF-LCM UI page

Congratulations, VNF-LCM deployment is successful

15 Glossary

CEE/Openstack	Cloud Execution Environment
CMDB	Cloud Management Database
VM	Virtual Machine
VNF-LCM	VNF Life Cycle Manager

16 References

[1] *VNF-LCM System Admin Guide, 1543-APR 901 0578, Click here*

[2] *OSS-RC Product Documentation, Click here*

[3] *ECM CPI Documentation, Click here*

[4] *CEE Product Documentation, Click here*

[5] *Atlas/Openstack CEE Documentation, Click here*

[6] *Atlas/Openstack CEE End Use Guide, Click here*

[7] *Product Documentation for Red Hat OpenStack Platform, Click here*

[8] *CEE Openstack Admin User Guide Click here*

[9] *License Key Administration in OSS-RC Click here*