

CSCF VNF Lifecycle Management

Call Session Control Function

USER GUIDE

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1 Introduction

This document describes system administration tasks performed in the VNF Lifecycle Manager (VNF-LCM). The VNF-LCM provides a workflow execution environment and a web-based application for managing VNF lifecycle procedures.

VNF lifecycle procedures are realized by executing ordered sequences of steps, called workflows. Each workflow must be provided with VNF-specific input parameters during execution.

This document covers the following workflow-based lifecycle management procedures:

- Instantiate VNF
- Upgrade VNF
Note: This is not supported in the current release.
- Scale-out VNF
- Scale-in VNF
- Heal VNF
Note: This is not supported in the current release.
- Terminate VNF

1.1 Prerequisites

This section describes the prerequisites which must be fulfilled before the Call Session Control Function (CSCF) can be installed.

1.1.1 Hardware and Software

The following hardware (virtual and physical) and software is required:

- The software delivery package including vIMS workflows and the VNF-LCM scripts is available.
Note: If vIMS workflows from another VNF is used in the same VNF-LCM, use the highest version that is included in one of the Virtual Network Function (VNF) packages.
- VNF-LCM is available using either Operations Support System, Radio and Core (OSS-RC) or Ericsson Network Manager (ENM).



- One of the following Virtual Infrastructure Managers (VIMs) is used:
 - OpenStack Mitaka or newer
 - CEE R6 or newer

- The VIM is configured in VNF-LCM:

The VIM configuration in VNF-LCM can be checked with the `vnflcm vim list` command. For more information on VIM configuration, refer to *VNF-Lifecycle Manager System Administration Guide, 1543-APR 901 0578 Uen*.

- The version of the used VNF-LCM is v18.02 (the VNF Lifecycle Automation Framework (VNF-LAF) image is 4.0.12) or higher.



2 Onboarding

To prepare for workflow-based VNF operations using VNF-LCM:

1. Decompress `cscf-workflow-pack.tar.gz`.

```
cd /home/cloud-user
```

```
tar -zxvf cscf-workflow-pack.tar.gz
```

2. Install the vIMS workflows bundles:

- a. Log on to `vnflaf-services` VM as `cloud-user` and switch to root user.
- b. Verify that the bundle is not already installed by running the List command.

```
wfmgr bundle list
```

If the version of `vIMSWorkflows` is older than the version included in the `CSCF Workflow Pack` `cscf-workflow-pack.tar.gz`, install the newer version.

- c. Install the workflow bundle package by running the install command.

```
wfmgr bundle install --package=\
<workflow_bundle_rpm_file_path>
```

The following example assumes that the rpm file is downloaded and placed under `/tmp` folder.

```
[root@vnflaf-services tmp]# wfmgr bundle install
--package=ERICvIMSWorkflows_CXP9034675_1-0.1.9.rpm
Validating package...
Package validation successful
VNF Laf services will not be available for few minutes
Stopping jboss: [ OK ]
Preparing... ##### [100%]
RPM PostRemove
1:ERICvIMSWorkflows_CXP90##### [100%]
Installing package...
Rpm installed
Starting jboss...
Starting jboss: [ OK ]
Validating deployment
Successfully deployed workflows
Package ERICvIMSWorkflows_CXP9034675_1-0.1.9.rpm successfully installed
```

3. Create a directory for the VNF-specific files in `/vnflcm-ext/backups/workflows/vnfd` and decompress `CSCF Workflow` scripts `CXP9034662_1-<version>*.tar.gz`:

```
mkdir /vnflcm-ext/backups/workflows/vnfd/\
<VNFType__VNFFVersion>
```

```
cd /vnflcm-ext/backups/workflows/vnfd/\
<VNFTType__VNFFVersion>
```

```
tar -zxvf /home/cloud-user/\
CXP9034662_1-<version>*.tar.gz
```

Note: Follow the naming convention: VNF type and VNF version separated by __.

4. In /vnflcm-ext/backups/workflows/vnfd/<VNFTType__VNFFVersion>, create a configurations subdirectory with write permission for the jboss_user, and a child directory for each VNF configuration, and copy the VNF configuration and pdb_bundle.zip for application configuration to the child directory:

```
mkdir /vnflcm-ext/backups/workflows/vnfd/\
<VNFTType__VNFFVersion>/configurations
```

```
cd /vnflcm-ext/backups/workflows/vnfd/\
<VNFTType__VNFFVersion>/configurations/<VNF configuration>
```

```
cp -r /home/cloud-user/<VNF configuration> .
```

```
chown -r jboss_user /vnflcm-ext/backups/workflows\
/vnfd/ <VNFTType__VNFFVersion>/configurations
```

```
cp -r /home/cloud-user/<pdb file name>.zip .
```

Note: Each directory in configurations contains an env.yaml environment file and configuration files evip_cli.txt for eVIP, ss7.conf for SS7, and pdb_bundle.zip for application configuration. Multiple bundle files can be used for the configuration. These files are used for different VNF instantiation, depending on, for example, network needs. The evip_cli.txt and ss7.conf files contains VNF-specific configuration, if needed.

5. Upload the HOT template and the scaling template into the /vnflcm-ext/backups/workflows/vnfd/<VNFTType__VNFFVersion> directory.

```
cp -r /home/cloud-user/main.yaml /vnflcm-ext/backups/\
workflows/vnfd/<VNFTType__VNFFVersion>
```

```
cp -r /home/cloud-user/vcscf_hot_PLs.yaml /vnflcm-ext/\
backups/workflows/vnfd/<VNFTType__VNFFVersion>
```

6. If the SSH key is not available yet, create it using the ssh-keygen -t rsa command.
7. Add the private SSH key to the /home/jboss_user/.ssh/ folder and the public SSH key in the configuration directory /vnflcm-ext/backups/workflows/vnfd/<VNFTType__VNFFVersion>/configurations/<instance>.



Note: The public key must be added in the configuration directory for each instance.

8. Verify the structure of the `/vnflcm-ext/backups/workflows/vnfd/<VNFType__VNFFVersion>` directory is as follows:

```
`-- vCSCF__<x.y>
    |-- configurations
    |   |-- instance_config_1
    |       |-- <pdb file name>.zip
    |       |-- env.yaml
    |       |-- id_rsa.pub
    |       |-- evip_cli.txt
    |       |-- ss7.conf
    |-- main.yaml
    |-- vcscf_hot_PLs.yaml
    |-- lcmScripts
```



3 Procedures

These sections describe how to perform LCM operations.

VNF-LCM procedures uses workflow instances. Figure 1 shows an example of a workflow instance, where workflow progress can be tracked in the Workflow Diagram view. The **Workflow Diagram** only represents stages of the various procedures. Operations that are performed in the Task view.

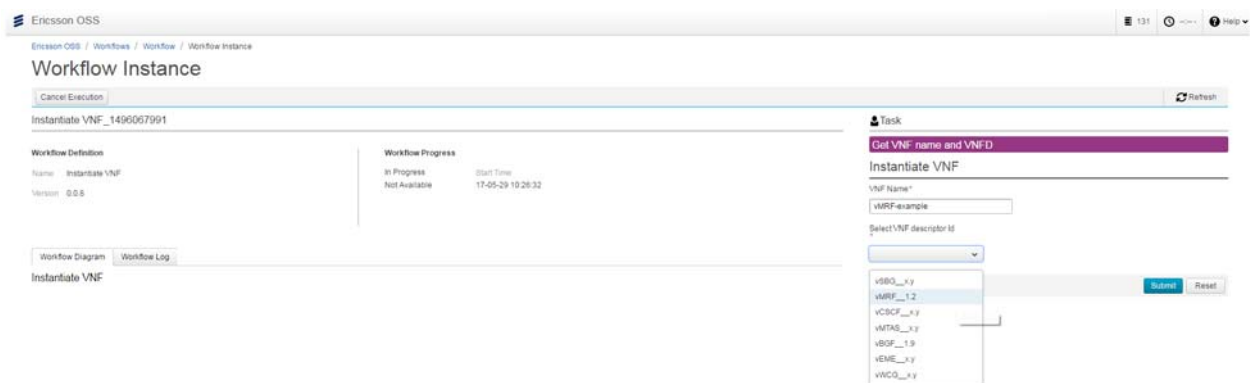
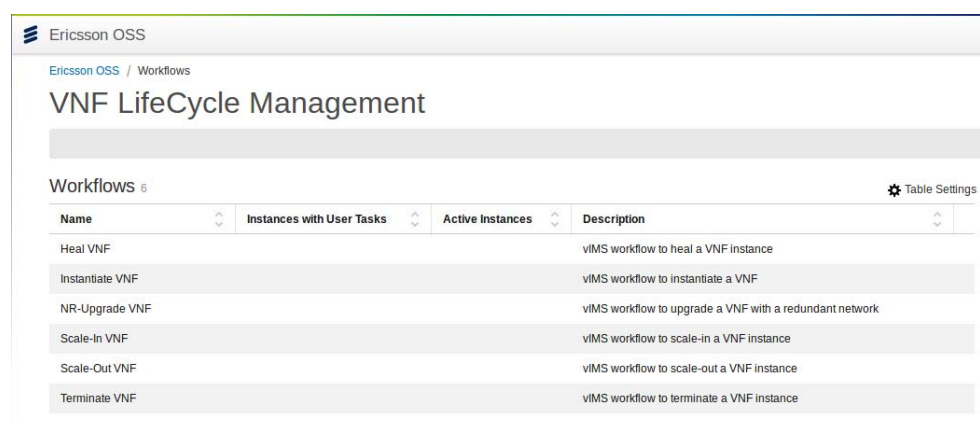


Figure 1 Workflow Instance Overview

3.1 Instantiate VNF

To instantiate a VNF using VNF-LCM:

1. In the VNF-LCM **Workflows** screen, select **Instantiate VNF**, and click **Start a New Instance**.



2. On the **Start a Workflow** screen, fill out the **Instance Name** field, and click **Submit**.



3. Select the newly created workflow from the **Instance Activity** panel.
4. On the **Workflow Instance** screen, add **VNF Name** and **VNF Instance Description**, select VNF to instantiate, and click **Submit**.

Note: The **VNF Name** is also used as the Heat stack name. It is not recommended to add version information in this field, as the name is unchanged after VNF upgrades. The **Select VNF descriptor Id** field displays VNF releases available for VNF instantiation in the `/vnflcm-ext/backups/ workflows/vnfd/` directory.

Task

Get VNF name and VNFD

Instantiate VNF

VNF name*

VNF instance description*

Select VNF descriptor ID*

☐ Add Network Element in ENM/OSS-RC

5. On the **Select VIM** screen, select the VIM to be used, and click **Submit**.



Task

Select VIM

Select VIM:

cba-104 ▼

Submit

Reset

6. On the **Select Tenant** screen, select the tenant to be used, and click **Submit**.

Task

Select Tenant

Select Tenant

admin ▼

Submit

Reset

7. On the **Provide Zone & Region Info** screen, specify the needed parameters, and click **Submit**.

Note: This step is optional, leave the fields blank if none of these parameters is needed.



Task

Provide Zone & Region Info

Zone And Region Details

cloud region id.

cloud zone id.

cloud vim zone name.

cloud vim zone info id.

Submit

Reset

- On the **Get Instance Configuration** screen, select a VNF configuration to instantiate, and click **Submit**.

Note: The **Select Configuration for the VNF instance** field displays VNF configurations available for instantiation in the `/vnflcmext/backups/workflows/vnfd/<VNFTType__VNFVersion>/configurations` directory.

Task

Get Instance Configuration Data

Get instance configuration

Select configuration for the VNF instance *

vCSCF-CBA-104



Submit

Reset



3.2 Upgrade VNF

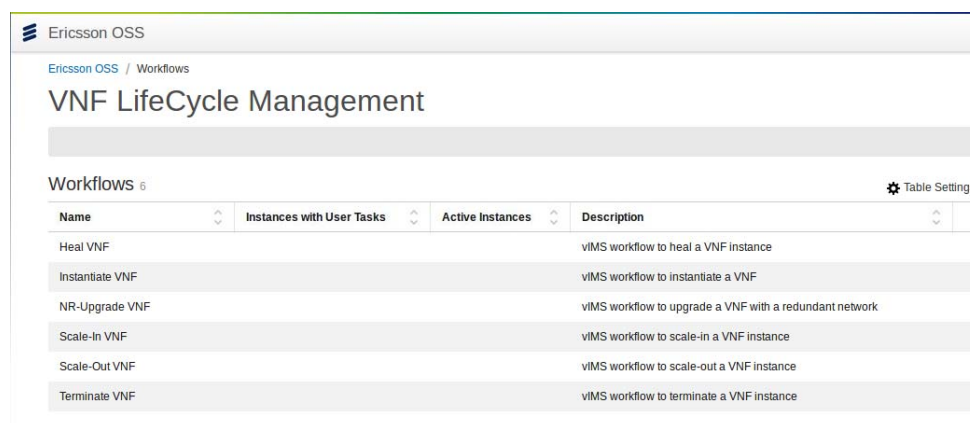
This is not supported in the current release.

3.3 Scale-out VNF

Continue with this procedure only if the VNF to be scaled-out is instantiated using the VNF-LCM.

To scale-out a VNF using VNF-LCM:

1. In the VNF-LCM **Workflows** screen, and select **Scale-Out VNF**, and click **Start a New Instance**



Name	Instances with User Tasks	Active Instances	Description
Heal VNF			vIMS workflow to heal a VNF instance
Instantiate VNF			vIMS workflow to instantiate a VNF
NR-Upgrade VNF			vIMS workflow to upgrade a VNF with a redundant network
Scale-In VNF			vIMS workflow to scale-in a VNF instance
Scale-Out VNF			vIMS workflow to scale-out a VNF instance
Terminate VNF			vIMS workflow to terminate a VNF instance

2. On the **Start a Workflow** screen, fill out the **Instance Name** field, and click **Submit**.
3. Select the newly created workflow from the **Instance Activity** panel.
4. On the **Workflow Instance** screen, select the VNF to be scaled out, specify the number of VMs to be added to the VNF, and click **Submit**.

Task

Collect user data for Scale-Out

Scale-Out VNF instance

Scale-Out Data

Select VNF instance*

vCSCF

Number of additional VMs*

2

Submit

Reset

Result:

The VNF instance is scaled-out, new VMs are added to the cluster.

3.4 Scale-in VNF

Continue with this procedure only if the VNF to be scaled-in is instantiated using the VNF-LCM.

To scale-in a VNF using VNF-LCM:

1. In the VNF-LCM, click **Start a Workflow**, and select **Scale-In VNF**, and click **Start a New Instance**.

Ericsson OSS			
Ericsson OSS / Workflows			
VNF LifeCycle Management			
Workflows 6 Table Settings			
Name	Instances with User Tasks	Active Instances	Description
Heal VNF			vIMS workflow to heal a VNF instance
Instantiate VNF			vIMS workflow to instantiate a VNF
NR-Upgrade VNF			vIMS workflow to upgrade a VNF with a redundant network
Scale-In VNF			vIMS workflow to scale-in a VNF instance
Scale-Out VNF			vIMS workflow to scale-out a VNF instance
Terminate VNF			vIMS workflow to terminate a VNF instance



2. On the **Start a Workflow** screen, fill out the **Instance Name** field, and click **Submit**.
3. Select the newly created workflow from the **Instance Activity** panel.
4. On the **Workflow Instance** screen, select the VNF to be scaled in, specify the number of VMs to be removed from the VNF, and click **Submit**.

Task

Collect user data for Scale-In

Scale-In VNF instance

Scale-In Data

Select VNF instance*

vCSCF ▼

Number of VMs to Scale-In*

2

Submit

Reset

5. On the **Collect extra parameters** screen, specify the needed parameters, and click **Submit**.

Note: This step is optional, leave the fields blank if none of these parameters is needed.

Task

Collect extra parameters

Input additional parameters for workflow

Scale in type

Optional: List of VM UUIDs to scale-in

The following optional scale-in parameters are available:

- VM locking method, that is, graceful or forceful.
- VM UUIDs to scale in.

The VNF instance is scaled-in, the specified number of VMs is removed from the cluster.

Note: If any UUID was specified in Step 5, the VMs with the specified UUID are removed, otherwise VMs with the highest index.

3.5 Terminate VNF

Continue with this procedure only if the VNF to be terminated is instantiated using the VNF-LCM.

To terminate a VNF using VNF-LCM:

1. In the VNF-LCM **Workflows** screen, select **Terminate VNF**, and click **Start a New Instance**.



Ericsson OSS

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VNF LifeCycle Management

Workflows 6 Table Settings

Name	Instances with User Tasks	Active Instances	Description
Heal VNF			vIMS workflow to heal a VNF instance
Instantiate VNF			vIMS workflow to instantiate a VNF
NR-Upgrade VNF			vIMS workflow to upgrade a VNF with a redundant network
Scale-In VNF			vIMS workflow to scale-in a VNF instance
Scale-Out VNF			vIMS workflow to scale-out a VNF instance
Terminate VNF			vIMS workflow to terminate a VNF instance

- On the **Start a Workflow** screen, fill out the **Instance Name** field, and click **Submit**.
- Select the newly created workflow from the **Instance Activity** panel.
- On the **Workflow Instance** screen, select the VNF to terminate, termination options, and click **Submit**.

Task

Collect user data for Terminate

Terminate VNF instance

Termination data

Select VNF instance*

vCSCF

Termination type:

Graceful

Graceful termination timeout (sec)

-1

Submit

Reset



Graceful	The VMs in the cluster are gracefully locked, the VNF instance gradually stops processing traffic. The VNF is terminated after the expiration of the graceful termination period.
Forceful	The VNF is terminated immediately, all ongoing traffic is lost. This option must be confirmed on the next screen, as it stops all traffic.
Graceful termination timeout (sec)	The graceful termination timeout value defines after how many seconds the VNF is terminated when graceful termination has been applied but there is still ongoing traffic. Default value: -1, meaning that there is no graceful termination period, that is, the VNF is terminated only after all VMs stopped processing traffic.

The VMs in the cluster are terminated with the method selected in Step 4, the VNF instance stops processing traffic, and is terminated.

3.6 Heal VNF

This is not supported in the current release.



4 Troubleshooting

For an unsuccessful workflow execution, find the following information on the cause of the failure:

- In the Jboss Server log: `/ericsson/3pp/jboss/standalone/log/server.log`

It is recommended to increase the log level from INFO to DEBUG during troubleshooting of an unsuccessful workflow execution. For information on how to change log level, refer to *VNF-Lifecycle Manager System Administration Guide, 1543-APR 901 0578 Uen*.

- In the system log: `/var/log/messages`
- In the **Workflow Log** tab

If the **Workflow Log** tab reports `Authentication failed`, there is an error regarding the SSH key. For repairing the SSH key between the VNF-LCM and the CSCF, refer to Section *Check SSH Key for Authentication* in *CSCF Troubleshooting Guideline*.

Provide the logs to Ericsson support if a problem cannot be solved.