

# MTAS VNF Life Cycle Management Guide

## MTAS

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### USER GUIDE

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# 1 Introduction

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

In this document, the term “vMTAS” refers to the product and the term “MTAS” refers to the MTAS application, independent of being deployed in a native or virtual environment.

This document covers the following workflow-based life cycle management procedures:

- Instantiate VNF
- Scale-out VNF
- Scale-in VNF
- Terminate VNF

## 1.1 Prerequisites

This section describes the prerequisites which must be fulfilled before the MTAS can be installed.

### 1.1.1 Hardware and Software

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

- The software delivery package (so called MTAS Workflow pack) including vIMS workflow bundle, and the MTAS LCM scripts is available.
- VNF-LCM is available using either Operations Support System for Radio and Core (OSS-RC) or Ericsson Network Manager (ENM).
- Openstack Mitaka (or newer) release-based cloud environment is used.
- The following parameters for authentication are configured in VNF-LCM:
  - cloudBaseURL
  - cloudTenantId
  - cloudUserName
  - VIM password



For more information on these parameters and how to configure them, refer to the VNF-LCM documentation.

- The version of the LAF Services image used is 3.1.4, or higher.



## 2 Onboarding

This section describes how to prepare for workflow-based VNF operations using VNF-LCM. Performing this procedure is a prerequisite for life cycle operations.

**Note:** The following commands are to be executed on the VNF-LCM's Services VM.

1. Decompress the vMTAS workflow pack `CXP9034815_1-<R-state>.tar.gz` where `<R-state>` defines the revision state of the package.

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

```
tar -zxvf CXP9034815_1-<R-state>.tar.gz
```

2. Install the vIMS workflow bundle:

- 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 vMTAS Workflow Pack `CXP9034815_1-<R-state>.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 placed under `/tmp` folder.

```
[root@vnflaf-services tmp]# wfmgr bundle install
--package=ERICvIMSWorkflows_CXP9034675_1-0.1.13.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_1-0.1.13.rpm successfully installed
```



3. Decompress vMTAS LCM scripts CXP9034788\_1-<R-state>.tar.gz where <R-state> defines the revision state of the package:

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

cd /vnflcm-ext/backups/workflows/vnfd/\
<VNFType__ VNFVersion>

tar -zxvf /home/cloud-user/CXP9034788_1-<R-state>.tar
.gz
```

**Note:** Follow the naming convention: VNF type and VNF version separated by \_\_.

4. In /vnflcm-ext/backups/workflows/vnfd/<VNFType\_\_ VNFVersion>, create a configurations subdirectory and a child directory for each VNF configuration (that is, VNF instance), and copy the VNF configuration to the child directory:

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

mkdir /vnflcm-ext/backups/workflows/vnfd/\
<VNFType__ VNFVersion>/configurations/<VNF_1 configuration>

cd /vnflcm-ext/backups/workflows/vnfd/\
<VNFType__ VNFVersion>/configurations/<VNF_1 configuration>

cp -r /home/cloud-user/<VNF_1 configuration> .
```

**Note:** Each directory in configurations contains a VNF instance specific env.yaml environment (HOT) file, configuration files evip\_cli.txt for eVIP, ss7.conf for SS7, and pdb\_bundle.zip for application configuration. Each directory also contains id\_rsa.pub public key of the VNF-LCM's jboss\_user. The files evip\_cli.txt, ss7.conf, and pdb\_bundle.zip are optional.

5. Upload the HOT template and the scaling template into the /vnflcm-ext/backups/workflows/vnfd/<VNFType\_\_ VNFVersion> directory.

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

cp -r /home/cloud-user/hot_scaling.yaml /vnflcm-ext/\
backups/workflows/vnfd/<VNFType__ VNFVersion>
```

6. If the SSH key is not available yet for jboss, create it using the following commands:

```
su jboss_user
```





```
ssh-keygen -t rsa
```

```
exit
```

**Note:** The use of encrypted private keys is not supported in the current release (that is, do not use passphrase)

7. Copy the public SSH key into the configuration directory of VNF instance

```
cp /home/jboss_user/.ssh/id_rsa.pub /vnflcm-ext/backups
/workflows/vnfd/<VNFTType__VNFVersion>\
/configurations/<VNF_1 configuration>/
```

**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/<VNFTType\_\_VNFVersion> directory is as follows:

```
`-- vMTAS__<x.y>
   |-- configurations
   |   |-- instance1_config
   |       |-- env.yaml
   |       |-- id_rsa.pub
   |       |-- evip_cli.txt*
   |       |-- ss7.conf*
   |       |-- instance1_pdb_bundle.zip*
   |-- main.yaml
   |-- hot_scaling.yaml
   |-- lcmScripts
```

The files marked with \* are optional.



## 3 Procedures

These sections describe how to perform LCM operations. VNF-LCM procedures utilize workflow instances.

Figure 1 shows the example of a workflow instance, where workflow progress can be tracked in the **Workflow Diagram** view. Boxes in the Workflow Diagram only represent current stages of the various procedures, operations are performed in the Task view.

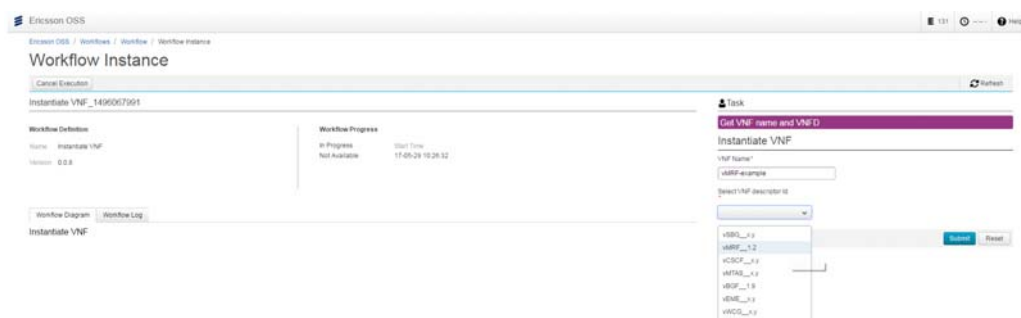


Figure 1 Workflow Instance Overview

### 3.1 Instantiate VNF

This section describes how to instantiate a VNF using VNF-LCM.

**Note:** In case the HEAT stack has to be updated manually, make sure that the `--tags` argument is used during the stack update, otherwise the VNF does not show up in the **Workflow Instance** screen.

Use the following command on a stack created using the VNF-LCM to find out what value to set the `--tags` argument to:

```
heat --os-tenant-name <tenant name> stack-show <MTAS
stack name i.e. name of VNF> | grep -A 2 tags
```

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



Ericsson OSS			
Ericsson OSS / Workflows			
Workflows 4			
Name	Instances with User Tasks	Active Instances	Description
Instantiate VNF			vIMS workflow to instantiate a VNF
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, add **VNF Name**, select VNF to instantiate, and click **Submit**.

**Note:** The Select VNF descriptor Id field displays VNF configurations available for instantiation in the /vnflcm-ext/backups/workflows/vnfd/ directory.

Task

Get VNF name and VNFD

Instantiate VNF

VNF Name\*

vMRF-12

Select VNF descriptor Id

vCSCF\_\_x.y

vWCG\_\_x.y

vEME\_\_x.y

vMRF\_\_1.2

vMTAS\_\_x.y

vSBG\_\_x.y

vBGF\_\_1.9

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\*

example\_config\_1

example\_config\_2

example\_config\_3

Submit Reset

**Result:**

The VNF is instantiated, it starts handling traffic after all configuration data is provided.

## 3.2 Scale-out VNF

This section describes how to scale-out a VNF using VNF-LCM.

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

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

Ericsson OSS

Ericsson OSS / Workflows

Workflows 4

Name	Instances with User Tasks	Active Instances	Description
Instantiate VNF			vIMS workflow to instantiate a VNF
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. 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\*

VMRF-12

Number of additional VMs\*

2

Submit

Reset

### Result:

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

## 3.3 Scale-In VNF

This section describes how to scale-in a VNF using VNF-LCM.

To gracefully scale-in a node, the system status must meet the following conditions:

- The system has sufficient memory. If the system has insufficient memory, the “DBS, Memory Limit Reached” alarm appears. For more information, refer to *DBS, Memory Limit Reached*.
- One of the following CM parameters is in TRUE state:

```
ManagedElement=1,MtasFunction=MtasFunction,MtasSupportFunctions=0,
CarSelApplication=CarrierSelect,CarSelDialedStringAnalysisTable=0,
carSelDialedStringAnalysisTableSynchronization
ManagedElement=1,MtasFunction=MtasFunction,MtasSupportFunctions=0,
CarSelApplication=CarrierSelect,CarSelCarrierTable=0,
carSelCarrierTableSynchronization
ManagedElement=1,MtasFunction=MtasFunction,MtasSupportFunctions=0,
NumAnaApplication=NumberAnalysis,NumAnaLocalCallTable=0,
numAnaLocalCallTableSynchronization
ManagedElement=1,MtasFunction=MtasFunction,MtasSupportFunctions=0,
NumberNormalisation=NumberNormalisation,
numberNormalisationTableSync
```

For more information, refer to *MTAS Troubleshooting Guideline*.

To gracefully scale-in a VNF, continue with this procedure only if the VNF to be scaled-in is instantiated using the VNF-LCM:

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



Ericsson OSS			
Ericsson OSS / Workflows			
Workflows 4			
Name	Instances with User Tasks	Active Instances	Description
Instantiate VNF			vIMS workflow to instantiate a VNF
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**.
- 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\*

VMRF-12

Number of VMs to Scale-In\*

1

Submit Reset

### Result:

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

## 3.4 Terminate VNF

This section describes how to terminate a VNF using VNF-LCM.

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

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

Ericsson OSS			
Ericsson OSS / Workflows			
Workflows 4			
Name	Instances with User Tasks	Active Instances	Description
Instantiate VNF			vIMS workflow to instantiate a VNF
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 and click **Submit**.

Task

Collect user data for Terminate

Terminate VNF instance

Termination Data

Select VNF instance \*

vMRF-12

Termination type:

Graceful

Graceful termination timeout (sec)

-1

Submit

Reset

## Graceful

The VNF instance is gracefully locked (by setting `mtasFunctionAdministrativeState` to `SHUTTING DOWN (2)`), it gradually stops processing traffic. The VNF is terminated after the expiration of the graceful termination period or even earlier when all ongoing sessions have stopped on the node.

## 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 the VNF stopped processing traffic.



**Result:**

The VNF instance is terminated. In case of Graceful termination, the VNF instance stops processing traffic gracefully and then is terminated.





## 4 Logging

In case of an unsuccessful workflow execution find more information on the cause of the failure:

- In the **Workflow Log** view
- 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 the unsuccessful Workflow execution. More information on the procedure can be found in VNF-LCM documentation.