

CUDB VNF Lifecycle Management

User Guide

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1 Introduction

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

The workflows are ordered sequences of steps for automating common use cases of the VNFs. A workflow provides a means to orchestrate simple and complex sequences of manual or automated tasks.

1.1 Purpose and Scope

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

- Instantiate vCUDB system.
- Terminate vCUDB system.
- vCUDB Upgrade Preparation.
- Upgrade vCUDB system.

Note: Application Schema update is not included.

All manual preparation steps that must be executed by Ericsson personnel are out of the scope of this document. See [Prerequisites](#) on page 4 for more information.

The Instantiate vCUDB system is not applicable for vCUDB system expansions.

Note: A Virtualized CUDB node is referred to as a vCUDB VNF instance throughout the document.

1.2 Revision Information

Rev. A

Initial release.

Rev. B

Other than editorial changes, this document has been updated as follows:

- Updated vCUDB terminology throughout the document.



- [Hardware and Software](#) on page 4: Updated description.
- [Procedures](#) on page 9: Updated [Figure 1](#).
- [Instantiate vCUDB System](#) on page 9: Updated note.
- [Instantiate vCUDB System Prerequisites](#) on page 9: Updated license file name, directory structure, and description. Updated [Figure 2](#).
- [Instantiate vCUDB VNF](#) on page 11: Removed Substep 8 in [Step 7 in Section 3.1.2.1](#). Updated [Step 2 in Section 3.1.2.1](#).
- [Terminate vCUDB VNF](#) on page 14: Updated [Step 3 in Section 3.2.1](#).

Rev. C

Other than editorial changes, this document has been updated as follows:

- [Purpose and Scope](#) on page 1: Updated description.
- [Prerequisites](#) on page 4: Updated description.
- [Hardware and Software](#) on page 4: Updated the list of virtual and physical hardware and software.
- [Configuration Files](#) on page 5: Added as a new section.
- [Instantiate Configuration Files](#) on page 5: Added as a new section.
- [Other Requirements](#) on page 5: Added as a new section.
- [Onboard](#) on page 7: Updated the CUDB Workflow pack installation step list with `/home/cloud-user` folder name.
- [Procedures](#) on page 9: Added note.
- [Instantiate vCUDB System Prerequisites](#) on page 9: Removed reference and added note.

Rev. D

Other than editorial changes, this document has been updated as follows:

- [Purpose and Scope](#) on page 1: Updated the list of procedures.
- [Prerequisites](#) on page 4: Updated description.
- [Hardware and Software](#) on page 4: Updated the list of virtual and physical hardware and software.
- [Upgrade Configuration Files](#) on page 5: Added as new section.



- [Other Requirements](#) on page 5: Updated the list of aspects.
- [Onboard](#) on page 7: Updated section title.
- [Procedures](#) on page 9: Updated [Figure 1](#) showing the example of VNF Lifecycle Management. Removed note.
- [Instantiate vCUDB System Prerequisites](#) on page 9: Updated section title. Updated [Figure 2](#) caption to Final Structure Directory for Instantiate vCUDB System.
- [Start a New Instance](#) on page 11: Updated figure in [Step 2 in Section 3.1.2.1](#).
- [Execute Steps](#) on page 13: Removed step list. Added figure.
- [vCUDB Upgrade Preparation](#) on page 16: Added as new section.
- [vCUDB Upgrade Preparation Prerequisites](#) on page 17: Added as new section. Added [Figure 3](#).
- [vCUDB Upgrade Preparation Steps](#) on page 18: Added as new section.
- [vCUDB Upgrade System](#) on page 21: Added as new section.
- [vCUDB Upgrade System Prerequisites](#) on page 21: Added as new section.
- [vCUDB Upgrade VNF Steps](#) on page 21: Added as new section.
- [Troubleshooting](#) on page 25: Updated the list of options in the case of failure.
- [Appendix: General Considerations when Upgrading](#) on page 26: Added as new section.

1.3 Target Groups

This document is intended for CUDB Operator.

For some of the actions described in the document, Ericsson personnel must be contacted as:

CUDB Administrator

The CUDB Administrator prepares configuration files, needed preparation steps and certain troubleshooting tasks.

Cloud Administration

The Cloud Administrator is the cloud service provider who executes required actions on the cloud infrastructure.



1.4 Typographic Conventions

Typographic conventions can be found in the following document:

- [Typographic Conventions](#)

1.5 Prerequisites

This section describes the prerequisites that must be fulfilled before executing any of the workflows.

CUDB Administrator and/or Cloud Administrator user must execute all initial steps included in the manual procedures to provide system preparation and configuration files needed to run the workflow-based lifecycle management procedures and, in case of upgrade, to be able to have all preparations ready from upgrade documentation.

1.5.1 Hardware and Software

The following virtual and physical hardware and software are required:

- Software delivery package (CUDB Workflow pack).
- VNF-LCM release is Media build version 3.5.3 or higher.
- VNF-LCM up and running using Ericsson Network Management System (NMS), either Operations Support System for Radio and Core (OSS-RC) or Ericsson Network Manager (ENM).

For example, in case of OSS-RC, to check the correct functioning of VNF-LCM, follow the steps defined in the Post Installation Verification section of VNF-LCM CEE/Openstack Installation Instructions, , in the OSS-RC documentation.

Note: The Virtualized Infrastructure Manager (VIM) connection information in VNF-LCM framework has to be configured. This information is used by the workflows to connect to VIM and perform operations. Add as many VIMs as needed to VNF-LCM framework and add as many tenants as needed to the previously added VIM. Refer to the VNF-LCM CLI Admin section of VNF-Lifecycle Manager System Administration Guide, in the OSS-RC documentation.

- VNF-LCM disk must be properly dimensioned and the available size must be sufficient to execute the workflows.
- Any extra file not mentioned in that document must be stored in VNF-LCM under `/vnflcm-ext/` directory to prevent the disk from getting full where workflows are executed.



- Virtual infrastructure must be prepared for vCUDB deployment, according to the manual installation instruction.

1.5.2 Configuration Files

1.5.2.1 Instantiate Configuration Files

Contact CUDB Administrator to obtain the following files, after all initial steps included in the installation instruction for vCUDB are executed:

- All schema files required
- License files named `license-key-file.xml`
- `sql` files
- `sqlList.txt` file
- `fixed-entries-pl.ldif` file
- `heat_template` file named `main.yaml`
- `environment_template` file named `env.yaml`
- `scaling_template` file named `DS_scaling.yaml`
- Initial configuration model file named `CudbOamModel_Instances_config_imm.xml`

1.5.2.2 Upgrade Configuration Files

Contact CUDB Administrator to obtain the following files, after all preparations are ready from upgrade documentation:

- License files named `CUDB_LKF_<cudb_node_id>` and fingerprint file named `lm_fingerprint_<cudb_node_id>` in case the vCUDB software version is previous to 1.10.

Note: `_<cudb_node_id>` corresponds to the `cudbLocalNodeId/`
`cudbRemoteNodeId` defined in the CUDB configuration model for each CUDB node of the system.

- Upgrade package named `CUDB_PACKAGE_x86_64-CXP`.
- `preventive_Was.tar`, if available.

1.5.3 Other Requirements

Contact CUDB Administrator regarding the following aspects:



- If vCUDBs are already installed, ensure that property tags included in the stacks are "vCUDB". If not, update them as the following:

Select the appropriate stack for updating and update the "vCUDB" tag, if needed.

For example::

```
source <openrc>
heat stack-list
heat stack-update -x --tags "vCUDB" <stack_name>
```

- In the case of instantiate:
 - If the vCUDB system consists of more than 10 vCUDB VNFs, add multiple SITE_VIP IPs in a live vCUDB VNF.
 - When instantiation is finished, change image in System Controllers.
- In the case of upgrade:
 - If upgrade preparation steps fail during workflow execution.
 - If upgrade steps fail during workflow execution.
 - If upgrade is not performed again after executing an automatic fallback, the system needs to be fully restored to previous CUDB software version.
 - If vCUDB base software version is previous to 1.12, to enable VM evacuation support in Cloud Execution Environment (CEE).



2 Onboard

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

For more information on installing workflows, refer to the Workflow Bundle Administration section of *VNF-Lifecycle Manager System Administration Guide* document in the OSS-RC documentation.

Execute the following commands on the VNF-LCM Services Virtual Machine (VM):

Steps

1. Connect to VNF-LCM:

```
ssh cloud-user@<VNFLAF-services_ip>
```

2. Copy the CUDB Workflow pack CUDB_VNFLCM_WORKFLOWS-CXP9040847.tar file into /home/cloud-user directory.

3. Decompress the CUDB Workflow pack CUDB_VNFLCM_WORKFLOWS-CXP9040847.tar

```
[cloud-user@vnflaf-services ~]$ tar -xvf
CUDB_VNFLCM_WORKFLOWS-CXP9040847.tar
```

4. Install the CUDB Workflow pack:

- a. Switch to root user on vnflaf-services VM:

```
[cloud-user@vnflaf-services ~]$ su - root
```

```
[root@vnflaf-services ~]#
```

- b. Verify that the pack is not installed, by running the list command:

```
rpm -qa |grep ERICvCUDb
```

- c. Uninstall the previous version, if there is one, and take the input data from the previous printout:

```
# wfmgr bundle uninstall --package=<Name> --
version=<Version>
```

- d. To install the Workflow pack, run the **install** command. The rpm file is located in the /home/cloud-user folder by default.

```
# wfmgr bundle install --package=/home/cloud-user/
<workflow_bundle_rpm_file>
```



The expected output must be similar to the below example:

Example

```
----->
-----
package_name          | pre_install  | install    | post_install  |      →
  message |
----->
-----
| ERICvCUDb_CXP9035445-1.9.20-1.noarch.rpm | success  | success | success  | package →
installation successful |
----->
-----
```

For more information on the output of the command, go
to `/var/log/wfmgr-cli-log/logfile.log`.



3 Procedures

This section describes how to perform LCM operations. VNF-LCM procedures use workflow instances.

Launch VNF-LCM from web browser:

`http://<vnflaf-services_ip>/index.html#workflows`

Figure 1 shows the example of VNF Lifecycle Management, where the workflow is shown.

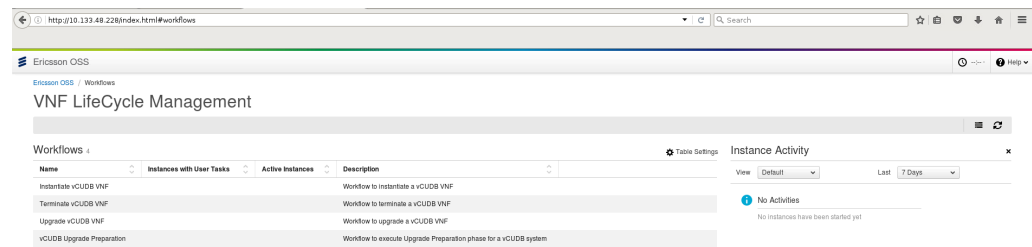


Figure 1 Workflow Overview

3.1 Instantiate vCUDB System

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

This workflow is used to install a vCUDB node in a CUDB system.

Note: To have an installed a vCUDB system replicating among its vCUDB nodes, this workflow must be executed several times and it has to be launched consecutively without waiting for one VNF to finish before launching the next one (one workflow per each VNF comprising the vCUDB system running in parallel).

If a vCUDB system consists of more than 10 vCUDB VNFs, once the instantiations are finished, add multiple SITE_VIP IPs in a live CUDB node.

3.1.1 Instantiate vCUDB System Prerequisites

The following configuration files for one vCUDB system must be available:

— Per vCUDB system:

- CUDB and application schemas: <Schema1> <Schema2>, . . . , and <SchemaN>



- SQLs: <SQL1> <SQL2>, ..., <SQLN> , sqlList.txt and fixed-entries-pl.ldif

Note: These files must be placed into the common_config directory.

— Per vCUDB VNF:

- env.yaml: Use the default values supplied in environment_template or populate with customized parameters. Rename the file to env.yaml. Contains the required parameters.
- main.yaml: HOT file. Rename heat_template file.
- DS_scaling.yaml: Rename scaling_template, scaling out and scaling in template.

Note: This file must be placed into the configurations/<VNF-CUDB-name> directory.

- Rename licenses files to license-key-file.xml
- Rename initial configuration model to CudbOamModel_Instances_config_imm.xml

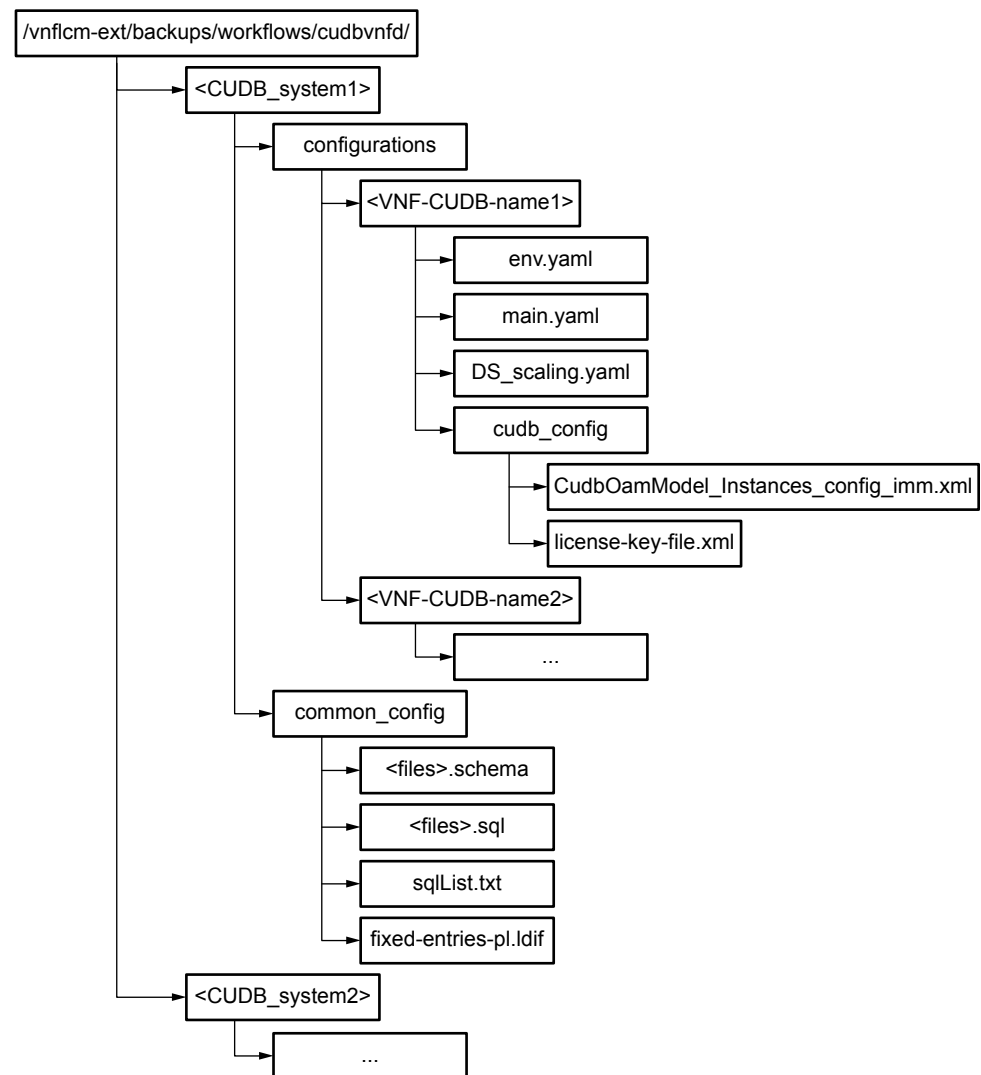
Note: This file must be placed into the configurations/<VNF-CUDB-name>/cudb_config directory.

All the previous files must go under /vnflcm-ext/backups/workflows/cudbvnfd directory.

Note: Remember that all files must have permission to be executed by jboss at least. If it is not the case, change it as follows:

```
cd /vnflcm-ext/backups/workflows/cudbvnfd
chown -R jboss_user:jboss *
```

The final structure directory is created manually as shown in [Figure 2](#).



... - Structure is repeated both in <VNF-CUDb-nameX> and in <CUDb_systemX>.

Figure 2 Final Structure Directory for Instantiate vCUDb System

Note: Different vCUDb systems can be defined. Select one during instantiation of a VNF. Moreover, one vCUDb system consists of one or several VNFs, that is, CUDb nodes.

All configuration files must be placed manually in the corresponding directories.

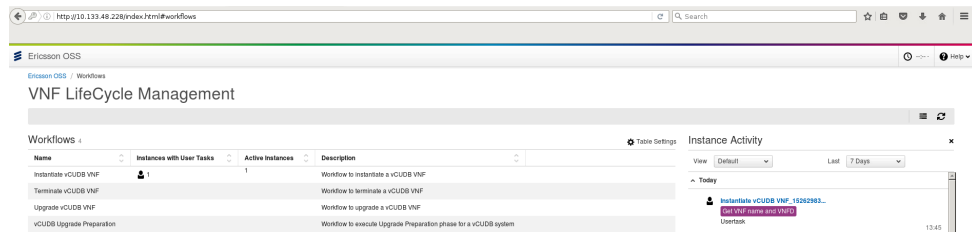
3.1.2 Instantiate vCUDb VNF

3.1.2.1 Start a New Instance



Steps

1. In the VNF-LCM Workflows screen, select **Instantiate vCUDB VNF** and click **Start a New Instance**.
2. **Instance Name** field is filled out, click **Submit**.



3. Select the newly-created workflow from the **Instance with User Tasks** panel, and click on the man icon.
4. On the **Workflow Instance** screen, add VNF Name, select VNF descriptor ID to instantiate, and click **Submit**.

The Select VNF descriptor ID field displays VNF configurations available for instantiation in the `/vnflcm-ext/backups/workflows/cudbvnf/d/` directory.

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



Get Instance Configuration Data

Get Instance Configuration

Select Configuration for the VNF instance*

cudb_2_1plus1

cudb_1_standalone

VNF_21

cudb_1_1plus1

Submit

Reset

The **Select Configuration for the VNF instance** field displays VNF configurations available for instantiation in the `/vnflcmext/backups/workflows/cudbvnf/vCUDB_1/configurations` directory.

Refresh the web page.

6. On the **Select VIM** screen, select a VIM, and click **Submit**.



Task

Select VIM

Select VIM:

7. On the **Select Tenant** screen, select a Tenant, and click **Submit**.

Task

Select Tenant

Select Tenant

CUDB-VNF22

CUDB-VNF21

Result: On the **Workflow Instance** screen, click on **Workflow Diagram** and **Workflow Log** to see the progress.

Note: Refresh the web page from time to time.

8. When instantiation is finished, change the image in the System Controllers, contact CUDB Administrator.

3.1.2.2

Execute Steps

The workflow log shows the ongoing execution steps. The expected progress information output must be similar to the following example:



INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.AddFixedEntries
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.StartDbReplication
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.RunCudbRemoteTrust
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.WaitForRemoteNodesInstallation
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.RunCudbSwBackup
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.InitDbStep.RestartLdapFes
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.InitDbStep.CheckStoresStatus
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.InitDbStep.ApplyInitialConfigC2L
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.InitDbStep.ApplyInitialConfig
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.InitDbStep.OrderStoresReady
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.InitDbStep.PrepareStores
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.InitDbStep.OrderStoresMaintenance
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.InitDbStep.OrderStoresInitialize
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.GetCudbSdInfo
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.CheckHaState
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.RestartServices
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.ConfigureSnmpV2
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.CudbInstallThirdStep
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.ConfigureDscp
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.ConfigureSnmpV3
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.CudbInstallSecondStep
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.ReconfigureEvipInvCUDB
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.CudbInstallFirstStep
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.ExecutePartTool
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.RegenerateClusterConf
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.WaitForCmwStatusOk
INFO	LCM Script Execution	Finished Install Step AutomatedInstall.Steps.WaitForLdeNodes
INFO	LCM Script Execution	Copied configuration to SC_2_1
INFO	Post-Instantiation	Starting PostInstantiation Phase Execution.

3.2 Terminate vCUDB System

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

This workflow can be used to decommission a vCUDB system and free the resources by executing it consecutively on each VNF comprising the vCUDB system.

3.2.1 Terminate vCUDB VNF



Steps

1. In the **VNF-LCM Workflows** screen, select **Terminate vCUBD VNF**, and click **Start a New Instance**.
2. **Instance Name** field is filled out, click **Submit**.
3. Select the newly-created workflow from the **Active Instances** panel and click on the man icon.

The screenshot shows the 'Workflow' page for 'Terminate vCUBD VNF' in the Ericsson OSS interface. The page includes a 'Start a New Instance' button and a 'Refresh' button. Below this, there is a 'Workflow Definition' section with the name 'Terminate vCUBD VNF' and a description 'Workflow to terminate a vCUBD VNF'. To the right, the 'Active Instances' section shows 1 instance, 1 task, 0 incidents, and 0 completed instances. At the bottom, the 'Workflow Instances' table lists one instance: 'Terminate vCUBD VNF_1' with a status of 'In Progress' and a start date of '2018-03-19 14:43:05'.

Instance Name	Active Tasks	Progress	Status	Start Date	End Date
Terminate vCUBD VNF_1	1	Not Available	In Progress	2018-03-19 14:43:05	

Result: Traffic stops after VNF is terminated. On the **Workflow Instances** screen, click on **Workflow Diagram** and **Workflow Log** to see the progress.

Note: Refresh the web page.

4. On the **Select VIM** screen, select a VIM, and click **Submit**.

Task

Select VIM

Select VIM:

Submit

Reset

5. On the **Select Tenant** screen, select a Tenant, and click **Submit**.



Task

Select Tenant

Select Tenant

6. On the **Workflow Instances** screen, select the VNF to terminate, and click **Submit**.

Task

Collect user data for Terminate

Terminate VNF instance

Termination Data

Select VNF instance*

Forceful termination: If VNF is forcefully terminated, all ongoing traffic will be lost. This option must be confirmed on the next screen.

Result: The VNF instance is terminated. On the **Workflow Instances** screen, click on **Workflow Diagram** and **Workflow Log** to see the progress.

Note: Refresh the web page.

3.3 vCUDb Upgrade Preparation

This section describes how to execute upgrade preparation for a vCUDb system using VNF-LCM. This workflow is used to prepare vCUDb system for upgrade execution and execute different health checks to verify that the system is working properly before executing upgrade. To execute upgrade preparation phase on a vCUDb system, this workflow must be executed only once for the system on chosen VNF. Operations executed in this workflow are system-level operations.

Before starting the upgrade preparation workflow execution, see [Appendix: General Considerations when Upgrading](#) on page 26 for more information about the upgrade procedure.



Note: The troubleshooting of the upgrade workflow is not within the scope of this document. In case of failure, please contact CUDB Administrator.

3.3.1 vCUDB Upgrade Preparation Prerequisites

The following configuration files for one vCUDB system must be available:

— Per vCUDB system:

- upgrade package named `CUDB_PACKAGE_x86_64-CXP`
- `preventive_WAs.tar`, if available.

— Per vCUDB node:

- licenses file named `CUDB_LKF_<cudb_node_id>.xml`

Example:

`CUDB_LKF_10.xml`

- fingerprint file named `lm_fingerprint_<cudb_node_id>`

Example:

`lm_fingerprint_10`

Note: Licenses and fingerprint files are required if the CUDB system version is previous to 1.10.

All the previous files must go under `/vnflcm-ext/backups/workflows/cudbvnfd/upgrade` directory. The final structure directory is created manually as shown in [Figure 3](#).

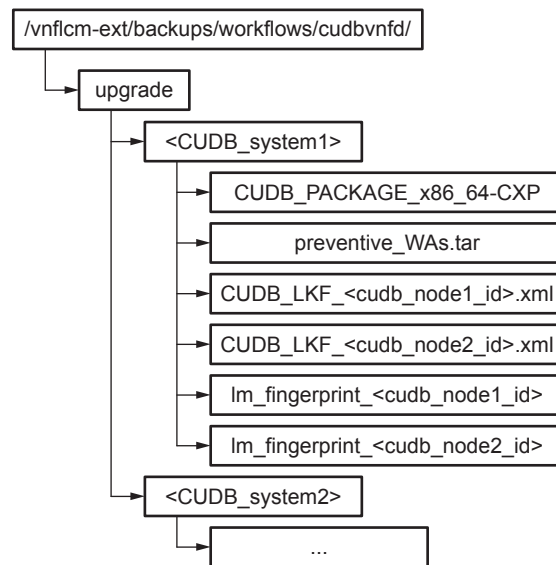


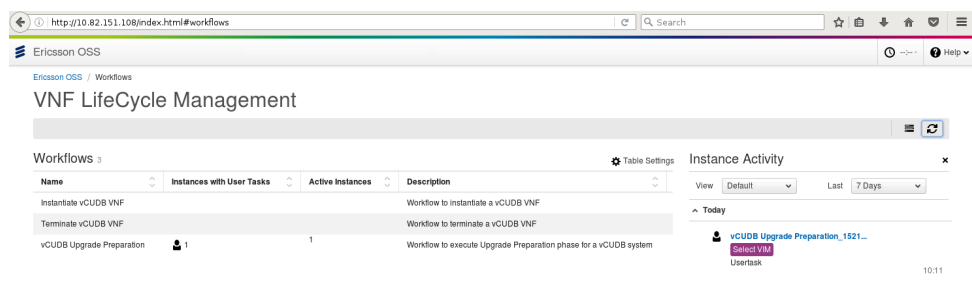
Figure 3 Final Structure Directory for vCUDB Upgrade Preparation

All configuration files must be placed manually in the corresponding directories.

3.3.2 vCUDB Upgrade Preparation Steps

Steps

1. In the VNF-LCM Workflows screen, select vCUDB Upgrade Preparation, and click **Start a New Instance**.
2. Instance Name field is filled out, click **Submit**.



3. Select the newly-created workflow from the Instance with User Tasks panel, and click on the man icon.
4. On the Select VIM screen, select a VIM, and click **Submit**.



Task

Select VIM

Select VIM:

CEE_POD_M

Submit

Reset

5. On the Select Tenant screen, select a Tenant, and click **Submit**.

Task

Select Tenant

Select Tenant

CUDB-VNF10

CUDB-VNF28

Submit

Reset

6. On the Collect User Data for Upgrade Preparation screen, select a folder with upgrade input files, VNF instance and root password for selected VNF instance, and click **Submit**.



Task

Collect user data for Upgrade Preparation

Upgrade preparation data

Select folder containing input files for upgrade of the vCUDb system*

Select VNF instance*

Root password for selected VNF instance*

The Select folder containing input files for upgrade of the vCUDb system field displays VNF configurations available for upgrade preparation in the /vnflcm-ext/backups/workflows/cudbvnfd/upgrade directory.

The workflow log shows the executed procedures and the progress in percentage. The expected progress information output must be similar to the following example:

Level	Workflow Name	Message
INFO	Upgrade Preparation	All procedures executed successfully (100%)
INFO	Upgrade Preparation	Upgrade Preparation Phase Execution Successful.
INFO	Upgrade Preparation Execution	Procedure SV_PROC_IBU_ADAPT_CONFIGURATION executed successfully (80%)
INFO	Upgrade Preparation Execution	Procedure SV_PROC_ROUTER_CONFIGURATION_GENERATION executed successfully (60%)
INFO	Upgrade Preparation Execution	Procedure SV_PROC_SYSTEM_AUDIT executed successfully (50%)
INFO	Upgrade Preparation Execution	Procedure SV_PROC_IBU_SAVE_CONFIGURATION executed successfully (40%)
INFO	Upgrade Preparation Execution	Procedure SV_PROC_CHECK_IF_MIGRATION_NEEDED executed successfully (17%)
INFO	Upgrade Preparation Execution	Procedure SV_PROC_SYSTEM_UPGRADE_PREPARATION executed successfully (5%)
INFO	Upgrade Preparation Execution	Upgrade not started, wait ...
INFO	Upgrade Preparation Execution	Upgrade not started, wait ...
INFO	Upgrade Preparation Execution	Upgrade not started, wait ...
INFO	Upgrade Preparation	Deploying files for upgrade. It may take a while...
INFO	Upgrade Preparation	Starting Upgrade Preparation Phase Execution.
INFO	Collect Stack Details	VNFD id: PODA_CUDb-VNF18_VNF23, Stack id in Openstack: 2e93f2f1-1a79-40ee-a2ec-e3930271cc6f
INFO	Collect user data for Upgrade ...	Selected VNF instance: CUDb-VNF18

The number of executed procedures and the total number of procedures in this phase depend on the upgrade path. The duration of each procedure is different. It takes more time for some procedures to be executed on all the nodes of the system.



3.4 vCUDB Upgrade System

This section describes how to execute upgrade of CUDB SW for a vCUDB system using VNF-LCM. To execute upgrade on a vCUDB system, this workflow must be executed once for every VNF in the system. Upgrade workflow execution should be performed one by one. Some operations done in this workflow are system wide.

Note: The troubleshooting of the upgrade workflow is not within the scope of this document. In case of failure, please contact CUDB Administrator.

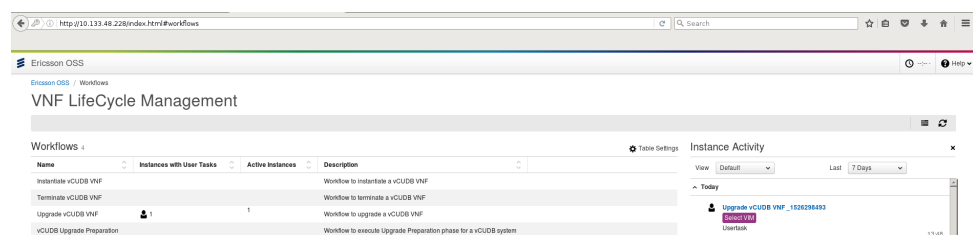
3.4.1 vCUDB Upgrade System Prerequisites

In order to execute vCUDB upgrade workflow, vCUDB Upgrade preparation workflow must be executed previously as described in [vCUDB Upgrade Preparation](#) on page 16, without any error. See also [Appendix: General Considerations when Upgrading](#) on page 26.

3.4.2 vCUDB Upgrade VNF Steps


Steps

1. In the VNF-LCM Workflows screen, select vCUDB Upgrade, and click **Start a New Instance**.
2. Instance Name field is filled out, click **Submit**.



3. Select the newly-created workflow from the Instance with User Tasks panel, and click on the man icon.
4. On the Select VIM screen, select a VIM, and click **Submit**.




 Task

Select VIM

Select VIM:

5. On the Select Tenant screen, select a Tenant, and click **Submit**.

 Task

Select Tenant

Select Tenant

6. On the Collect User data for Upgrade screen, select VNF instance, check Automatic Fallback to restore the previous CUDB software version in case the upgrade fails, and root password for the selected VNF instances, and click **Submit**.



Task

Collect user data for Upgrade

Upgrade data

Select VNF instance*

Root password for selected VNF instance*

☐ Automatic Fallback

Submit

Reset

Note: If Automatic Fallback option is chosen, if the upgrade fails, the fallback is executed without stopping. If it is not selected and the upgrade fails, the execution is stopped and manual intervention is needed. Contact CUDB Administrator.

- On the Collect user data for Orchestrator Node screen, insert the password for the specified VNF instance that is used as an orchestrator from which the upgrade will be started for the selected VNF, and click **Submit**.

Task

Collect user data for Orchestrator Node

Orchestrator node data

Orchestrator node is CUDB node 23

Root password for the orchestrator node:*

Submit

Reset

After This Task

The workflow log shows the executed procedures and the progress in percentage. The expected progress information output must be similar to the following example:



Workflow Diagram		Workflow Log		
Time	Level	Workflow Name	Message	
> 2018-05-14 12:29:18.938	INFO	Upgrade	All procedures executed successfully (100%)	
> 2018-05-14 12:29:18.938	INFO	Upgrade	Upgrade Phase Execution Successful.	
> 2018-05-14 12:29:29.755	INFO	Upgrade execution	Procedure NI_PROC_FB_MST_TAKE_NODE_BACK executed successfully (96%)	
> 2018-05-14 12:29:05.601	INFO	Upgrade execution	Procedure NI_PROC_FB_MST_NODE_FINAL_ACTIONS executed successfully (94%)	
> 2018-05-14 12:25:47.963	INFO	Upgrade execution	Procedure NI_PROC_RESTORE_DATA executed successfully (88%)	
> 2018-05-14 12:19:11.757	INFO	Upgrade execution	Procedure NI_PROC_SMG_DEGRADED_FLAG_AFTER_AUTOMATED_INSTALL executed successfully (84%)	
> 2018-05-14 12:18:52.639	INFO	Upgrade execution	Procedure NI_PROC_FB_MST_IBU_EXECUTE_CUDB_AUTOMATED_INSTALL executed successfully (82%)	
> 2018-05-14 11:51:54.528	INFO	Upgrade execution	Procedure NI_PROC_IBU_DEPLOY_CONFIG executed successfully (72%)	
> 2018-05-14 11:51:38.829	INFO	Upgrade execution	Procedure NI_PROC_IBU_WAIT_AIT executed successfully (58%)	
> 2018-05-14 11:25:26.240	INFO	Upgrade execution	Procedure NI_PROC_IBU_START_AIT executed successfully (56%)	
> 2018-05-14 11:25:08.118	INFO	Upgrade execution	Procedure NI_PROC_IBU_INSTALL_AIT executed successfully (52%)	
> 2018-05-14 11:24:32.209	INFO	Upgrade	Starting Upgrade Execution.	
> 2018-05-14 11:24:22.233	INFO	Get orchestrator node	Node 23(10.0.37.100) is orchestrator node.	
> 2018-05-14 11:24:20.879	INFO	Get orchestrator node	Getting orchestrator node for upgrade execution.	
> 2018-05-14 11:24:20.657	INFO	Collect Stack Details	VNFD id: PCDA_CUDB-VNF18_VNF23, Stack id in Openstack: ac712b57-6c76-4200-a03f-a42c969e8d92	
> 2018-05-14 11:24:20.242	INFO	Collect user data for Upgrade	Selected VNF instance: CUDB-VNF18. Automatic fallback: false	
> 2018-05-14 11:24:07.169	INFO	authenticateCloud	Authentication towards cloud type - CEE is successful	
> 2018-05-14 11:24:06.859	INFO	selectVmInfo	Vm details vmiid= 32c4811-3cda-11e8-8385-b163e8a8603, vmiHostIpAddress= 10.0.58.56, vmiHostName= ctpoda.sel.gic.ericsson.se, vmiAuthURL= https://ctpoda.sel.gic.ericsson.se:5000/v2.0, vmiName= CEE_POD_A, tenna...	
> 2018-05-14 11:23:46.702	INFO	authenticateCloud	Starting cloud authentication.	

The number of executed procedures and the total number of procedures in this phase depends on the upgrade path. The duration of each procedure is different. It takes more time for some procedures to be executed, for example NI_PROC_IBU_WAIT_AIT and NI_PROC_RESTORE_DATA.

Do!

If vCUDb base software version is previous to 1.12, after the CUDB VNF, deployed on CEE is upgraded, all VMs must be configured with ha-offline High Availability (HA) policy, as stated in the Other Requirements section of [CUDB Virtual Infrastructure Requirements](#). For more information, see [Other Requirements](#) on page 5.



4 Troubleshooting

If the workflow execution is unsuccessful, see the following options for more information on the cause of failure:

- Workflow Log view. Check the progress information output on VNF-LCM.
- Jboss Server log on VNF-LCM. During execution, log information is saved in this file:

```
# tail -f /ericsson/3pp/jboss/standalone/log/server.log
```

Contact Ericsson personnel if support is needed.

- If Instantiate VNF workflow was failing during CUDB installation, connect through either sysmgmt or oam vip, and check the automatedInstall.log file in SC_2_1:

```
ssh <cudb_user>@<vip> cd /home/coremw_appdata/incoming/cudb-  
install-temp/automatedInstall.log
```

- If vCUDB Upgrade Preparation workflow was failing in a procedure, more information about the error can be found in the /var/tmp/upgradeMonitor.log file on VNF-LCM.

For further help, contact a CUDB Administrator as Ericsson support to follow the corresponding *VNF-LCM Administration Guide* or *Troubleshooting documentation for CUDB*.

5 Appendix: General Considerations when Upgrading

5.1 General

During the CUDB upgrade:

- The installed software is exactly the same as the software in a maiden installed system. Therefore, the same behavior and performance is expected.
- All previous configuration is preserved, except some hardening parameters.

Upgrade is aimed to run on standard CUDB environments. The existence of any deviation, meaning any customization present in the target system, could affect the Upgrade execution, so it is recommended to contact the next level of support in advance to analyze the case. Deviations can include:

- Software Delivery Packages (SDPs) or Red Hat Package Manager (RPM) software files: for example, the `cudbReference` file
- System configuration: administrators, sudoers, and so on
- Network configuration: for example, QoS, VLAN IDs and subnets
- The upgrade must be performed during a low system traffic period (maintenance window) and scheduled according to the estimated times. Both the upgrade and fallback times must be considered during the planning activities.
- In case the system memory usage is above 85% in any node, contact Ericsson personnel to evaluate a Data Store (DS) expansion procedure before the upgrade.
- The system is up and running with no relevant alarms issued.

Examples of alarms not relevant for upgrade:

- Logchecker found minor error(s), Preventive Maintenance
- Root Login Failed, Security
- Fault retrieving subscriber statistics, Application Counters
- Deleted data due to reconciliation, Storage Engine
- Memory usage at Warning level



For information on the estimated times, consult with Ericsson personnel.

Both the upgrade and fallback times must be considered during the planning activities.

- In case the system memory usage is above 85% in any node, contact Ericsson personnel to evaluate a Data Store (DS) expansion procedure before the upgrade.
- There is enough space in /cluster to store the Data, Software, and Configuration Backups and Upgrade related files. If not, free up storage space by removing existing backups or not needed information, otherwise an external storage is needed:

available space at /cluster > SW and Configuration backup(1 GB) + Upgrade-created stuff(1GB) + Data backup (250MB (GEP3), 750MB (GEP5), 25MB (small vCUDB)) * number of ndb blades

- The system is up and running with no relevant alarms issued.

Examples of relevant alarms:

- Logchecker found minor error(s), Preventive Maintenance
- Root Login Failed, Security
- Fault retrieving subscriber statistics, Application Counters
- Deleted data due to reconciliation, Storage Engine
- Memory usage at Warning level

The CUDB system upgrade can include changes in the interfaces at network level that may require further actions external to the CUDB nodes. Refer to the *Interface* section of [CUDB 1.12 Network Impact Report](#).

- When a node is being disabled in the system, provisioning traffic is stopped while the masters are moved away of the upgrading node. In case there are no masters, provisioning does not stop.
- No system downtime is expected during the whole procedure.
- Minor traffic loss and dropped connections can be experienced in the following cases:
 - while the CUDB nodes are disabled in the system.
 - during the LDAP servers restart performed in the Node upgrade and Fallback phases needed due to the modification of database tables structure.



5.2 Recommendations

- Stopping the provisioning during CUDB node upgrade process is not compulsory. Bulk provisioning must be avoided.
- The CUDB node upgrade/fallback disables it in the CUDB system. The system provides for re-routing traffic, so there is no loss of service, but the overall traffic processing capacity of the system decreases significantly.
- During upgrade execution mastership movements are expected. To avoid mastership movements in some specific cases, move them manually.

5.3 Restrictions

- No configuration changes are allowed until the system upgrade is completed.
- Once the system is in mixed state (that is, some nodes are updated, but not all of them), do not use standard CUDB restore commands.
- Current upgrade/fallback procedure does not support handling of faulty blades such as ignoring or skipping them. If any blade is faulty it must be immediately replaced before continuing with upgrade/fallback.
- No system task scheduling changes are allowed. Therefore, avoid the execution of any command modifying the crontab, for example:
`cudbConsistencyMgr`.
- The upgrade phases must not be executed in different nodes at the same time.
- The `cudbCheckReplication` command can dump an internal error in the response printout when checking replication in slave DS units that might lead to erroneous interpretation of the command or in the status of the replication:

```
awk: fatal: can't open source file `/opt/ericsson/cudb/OAM/bin/cudbSystemStatus.awk' for →  
reading (No such file or directory)  
[info] Node20-DSG0 replication: OK
```

So, the use of the `cudbCheckReplication` command is restricted while the system has a mixed status. This restriction only applies if the base release is CUDB 1.2 or a previous version.

- Multiple LDAP request is not allowed until the system is fully upgraded.



Glossary

For the terms, definitions, acronyms and abbreviations used in this document, refer to CUDB Glossary of Terms and Acronyms



Reference List

CUDB Documents

1. CUDB Glossary of Terms and Acronyms 0033-HDA 104 03/10
2. CUDB Virtual Infrastructure Requirements 15/1553-HDA 104 03/10

ENM CPI Library References

1. VNF-LCM Installation Instructions 1/1531-CNA 403 3313
2. ENM Configuration System Administration Guide 1/1543-AOM 901 151-1

OSS-RC CPI Library References

1. VNF-LCM CEE/Openstack Installation Instructions 1/153 72-APR 901 0578
2. VNF-Lifecycle Manager System Administration Guide 1543-APR 901 0578