Oracle® Communications
Unified Data Management (UDM) Cloud Native Installation Guide

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Contents

List of Figures

List of Tables

1

What's New in This Guide?

This section shares the list of new features introduced in every OCUDM release. For more release specific information, please refer to its release notes.

Release 1.2
No updates for this release.

Release 1.1

The following new features are introduced in this release:

- – UDM support to SIDF - SUCI de-concealment
  – UDM's Nudm-sdm service support to subscriptions and notifications

2
Overview

Oracle 5G UDM, implemented as a cloud native function, offers a combination of the AUSF and UDM NF's as detailed out by 3GPP.

- The Authentication Server Function (AUSF) supports authentication for 3GPP access as specified in 3GPP TS 33.501.
- The Unified Data Management Function (UDM) supports following functionalities:
  - Generate 3GPP 5G AKA Authentication Vectors
  - User Identification Handling (e.g. storage and management of SUPI for each subscriber in the 5G system)
  - UE's Serving NF Registration Management (e.g. storing the serving AMF for UE, storing the serving SMF for UE's PDU Session)
  - Supports retrieval of the UE's individual subscription data for slice selection, AM data, SM data, SmfSelection data, smf ue context data and supports acknowledgment of SoR and UpU function
  - Supports subscription based on data change notification service

Oracle 5G UDM Solution

- Encapsulates the AUSF and UDM functionalities under a common Network Function.
- Provides a HTTP2 based RESTful interface for other NFs to consume the services offered.
- Uses Helm chart for all configurations and deployment.
- Runs in stateless mode of offloading storage of all information externally in 5G UDR.
  - Uses Nudr services as specified in 3GPP TS 29.504 and 3GPP TS 29.505 to retrieve required data from the UDR
  - Processes the incoming request includes updating data in the UDR whenever applicable
- Leverages a common Oracle Communications Cloud Native Framework
- Compliant to 3GPP Release 15 specification
- Has tiered architecture providing separation between the connectivity, business logic and data layers
- Uses MySQL NDB Cluster as the backend database in the Data Tier
- Registers with NRF in the 5G network, so the other NFs in the network can discover AUSF/UDM through NRF and also enables discovery of UDR(s) from NRF

For more information on UDM services, refer to Cloud Native Unified Data Management (UDM) User's Guide.

References

- Cloud Native Environment (CNE) Installation Guide
- Cloud Native Unified Data Management (UDM) User Guide
- Cloud Native Unified Data Repository (UDR) Installation and Upgrade Guide
- Cloud Native Unified Data Repository (UDR) User Guide
- Cloud Native Unified Data Repository (UDR) Rest Specification Guide

Acronyms

Table 2-1   Acronyms

Acronyms	Definition
3GPP	3rd Generation Partnership Project
AMF	Access and Mobility Management Function
AuSF	Authentication Server Function
GUAMI	Globally Unique AMF Identifier
NRF	Network Repository Function
NSSAI	Network Slice Selection Assistance Information
SMF	Session Management Function
SUCI	Subscription Concealed Identifier
SUPI	Subscription Permanent Identifier
UDM	Unified Data Management
UDR	Unified Data Repository

How to use this document

Although this document is primarily to be used as an initial installation guide, its secondary purpose is to be used as a reference for Disaster Recovery procedures.

When executing this document for either purpose, there are a few points which help to ensure that the user understands the author's intent. These points are as follows:

1. Before beginning a procedure, completely read the instructional text (it will appear immediately after the Section heading for each procedure) and all associated procedural WARNINGS or NOTES.

2. Before execution of a STEP within a procedure, completely read the left and right columns including any STEP specific WARNINGS or NOTES.

If a procedural STEP fails to execute successfully, STOP and contact Oracle's Customer Service for assistance before attempting to continue. My Oracle Support for information on contacting Oracle Customer Support.

Figure 2-1   Example of a Procedure Steps Used in This Document

Each step has a checkbox the user should check to keep track of the progress of the procedure.

The Title column describes the operations to perform during that step.

Each command the user enters, and any response output, is formatted in 10-point `Courier` font.

	Title	Directive/Result Step
1. ☐	Change directory	Change to the backout directory. `$ cd /var/TKLC/backout`
2. ☐	**ServerX**: Connect to the console of the server	Establish a connection to the server using cu on the terminal server/console. `$ cu -l /dev/ttyS7`
3. ☐	Verify Network Element data	View the Network Elements configuration data; verify the data; save and print report. 3. Select **Configuration > Network Elements** to view Network Elements Configuration screen.

Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 2-2   Admonishments

Icon	Description
DANGER	Danger: (This icon and text indicate the possibility of personal injury.)
WARNING	Warning: (This icon and text indicate the possibility of equipment damage.)
CAUTION	Caution: (This icon and text indicate the possibility of service interruption.)

Customer Training

Oracle University offers training for service providers and enterprises. Visit our web site to view, and register for, Oracle Communications training at http://education.oracle.com/communication.

To obtain contact phone numbers for countries or regions, visit the Oracle University Education web site at www.oracle.com/education/contacts.

My Oracle Support

My Oracle Support (https://support.oracle.com) is your initial point of contact for all product support and training needs. A representative at Customer Access Support can assist you with My Oracle Support registration.

Call the Customer Access Support main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select **2** for New Service Request.

2. Select **3** for Hardware, Networking and Solaris Operating System Support.

3. Select one of the following options:

    • For Technical issues such as creating a new Service Request (SR), select **1**.

    • For Non-technical issues such as registration or assistance with My Oracle Support, select **2**.

You are connected to a live agent who can assist you with My Oracle Support registration and opening a support ticket.

My Oracle Support is available 24 hours a day, 7 days a week, 365 days a year.

Emergency Response

In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at 1-800-223-1711 (toll-free in the US), or by calling the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

• A total system failure that results in loss of all transaction processing capability

• Significant reduction in system capacity or traffic handling capability

• Loss of the system's ability to perform automatic system reconfiguration

• Inability to restart a processor or the system

• Corruption of system databases that requires service affecting corrective actions

• Loss of access for maintenance or recovery operations

• Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.

3

UDM Installation

This section explains the procedure to deploy, configure and uninstall UDM.

Prerequisites

Following are the prerequisites to install and configure the UDM:

- **Access to OpenStack Environment:** User should have access to an existing OpenStack Environment including the OpenStack Desktop. This environment is configured with appropriate resource flavors and network resources that allows its users to allocate resources to the virtual machines created via this procedure.

- **Availability of a pub key:** Users must have a pub key for logging into the Bootstrap Host. This key should be placed into the customer OpenStack Environment using Import Key tab on the Launch Instance→Key Pair dialog or via the Compute→Access and Security.

- **OCUDM Software:** User must install Kubernetes v1.13.3 and HELM v2.12.3. UDM consists of:

  - Helm Charts that reflect the OCUDM software version. It is a zipped tar file that you need to unzip.

  - Docker images of the micro-services that are shared as tar file. You need to untar it.
    Additional softwares that you need to install as per the requirement of the services:

Table 3-1   Additional Softwares

Software	Version	Notes
elasticsearch	1.21.1	Needed for Logging Area
elastic-curator	1.2.1	Needed for Logging Area
elastic-exporter	1.1.2	Needed for Logging Area
logs	2.0.7	Needed for Logging Area
kibana	1.5.2	Needed for Logging Area
grafana	2.2.0	Needed for Metrics Area
prometheus	8.8.0	Needed for Metrics Area
prometheus-node-exporter	1.3.0	Needed for Metrics Area
metallb	0.8.4	Needed for External IP
metrics-server	2.4.0	Needed for Metric Server
tracer	0.8.3	Needed for Tracing Area

> **✏ Note:**
>
> If you want any of the above services and its respective software is not installed in CNE, then install that software before proceeding.

> **✏ Note:**
>
> Some of the above mentioned software(s) are updated frequently. Their later versions than those listed above should work with UDM 1.1. Some UDM features and services work differently depending on the software being used.

Create Database User/Group

The Database administrator should create a user in MYSQL DB using MySQL NDB cluster. UDM uses NDB MySQL database to store the UDM/AUSF persistent information, which provides HA and geo-redundancy capabilities.

The database administrator should also provide user with necessary permissions to access the tables in the NDB cluster. The steps to create a user and assign permissions are as follows:

The steps to create a database user are as follows:

1. Login to the server where the ssh keys are stored and SQL nodes are accessible.

2. Connect to the SQL nodes.

3. Login to the Database as a root user.

4. Create a user and assign it to a group having necessary permission to access the tables on all the SQL nodes:

```
CREATE USER '<username>'@'%' IDENTIFIED BY '<password>';
DROP DATABASE if exists <db_name>;              (db_name refers to udmdb)
CREATE DATABASE <db_name> CHARACTER SET utf8;
GRANT SELECT, INSERT, CREATE, ALTER, DROP, LOCK TABLES, CREATE
TEMPORARY TABLES, DELETE, UPDATE,EXECUTE ON
<db_name>.* TO '<user>'@'%';
USE <db_name>;
```

Network Access

The Kubernetes cluster hosts must have network access to:

- Local docker image repository where the UDM images are available.
  To check if the Kubernetes cluster hosts has network access to the local docker image repository, try to pull any image with tag name to check connectivity by executing:

  ```
  docker pull <docker-repo>/<image-name>:<image-tag>
  ```

- Local helm repository where the UDM helm charts are available.
  To check if the Kubernetes cluster hosts has network access to the local helm repository, execute the `helm repo update` command.

> **✎ Note:**
>
> Some of the systems may need to use the helm command with `helm --kubeconfig admin.conf`

- Service FQDN of UDM must be discoverable from outside of the cluster (i.e., publicly exposed so that ingress messages to UDM can come from outside of Kubernetes).

Client Machine Requirements

A client machine (laptop/desktop) where the user executes deployment commands should have:

- Network access to the helm repository and docker image repository.

- Configuration of Helm repository on the client.

- Network access to the Kubernetes cluster.

- Necessary environment settings to run the kubectl commands. The environment should have privileges to create a namespace in the Kubernetes cluster.

- Installation of Helm client with the **push** plugin. This allows the `helm install` command to deploy the software in the Kubernetes cluster.

> **✎ Note:**
>
> User should execute all the kubectl and helm related commands used in this guide on a system depending on the infrastructure/deployment. It can be a client machine such as a virtual machine, server, local desktop and so on.

Installation Preparation

The following procedure describes the steps to download the UDM Images and Helm files from OSDC.

Table 3-2   Installation Preparation

Step No. #	Procedure	Description

1 ☐	Download the UDM package file	Customers are required to download the UDM package file from Oracle Software Delivery Cloud (OSDC). Package is named as follows:
		
		`<nfname>-pkg-<marketing-release-number>.tgz`
		
		For example:
		
		`ocudm-pkg-1.1.0.0.0.tgz`

Table 3-2   (Cont.) Installation Preparation

Step No. #	Procedure	Description

2 ☐	Untar the UDM Package File	Untar the UDM package to the specific repository:
		
		`tar -xvf <<nfname>-pkg-<marketing-release-number>>.tgz`
		
		The package file consists of following:
		
		1. UDM Docker Images File: tarball contains images of UDM
		`ocudm-images-1.1.0.tar`
		
		2. Helm File: tarball contains Helm charts and templates
		`ocudm-1.1.0.tgz`
		
		3. Readme txt File: Contains cksum and md5sum of the tarballs
		`Readme.txt`

3 ☐	Verify the checksums	Verify the checksums of tarballs mentioned in Readme.txt.
4 ☐	Load the tarball to system	Execute the following command to extract the Docker images locally: `docker load --input <image_file_name.tar>` Confirm docker images are extracted correctly using the following command: `docker images	grep ocudm (8 docker images must be present)` For verification, check the UDM Images section below to get the list of UDM images.

5 ☐	Tag and Push docker images to Docker registry	Execute the following command to push the docker images to docker registry:
		
		`docker tag <image-name>:<image-tag> <docker-repo/`
		`<image-name>:<image-tag>`
		
		`docker push <docker_repo>/<image_name>:<image-tag>`

Table 3-2   (Cont.) Installation Preparation

Step No. #	Procedure	Description
6 ☐	Push helm charts to helm repo	Execute the following commands to push helm charts to the helm repository. 1. `tar -zxvf ocudm-1.1.0.tgz` (ocudm-1.1.0.tgz is a part of ocudm package, refer to step 2 for details) 2. `cd ocudm` 3. `helm push --force . <helm_repo>`
7 ☐	Download UDM Custom Template	The UDM Custom Templates are available on OHC. Customers can download these templates and customize it as per their requirement.

OCUDM Images and HELM Files

Following are the OCUDM Images detail.

Table 3-3   OCUDM Images

Container	Image
ocudm-nudm-uecm-service	ocudm/nudm_uecm_service
ocudm-nudm-ue-auth-service	ocudm/nudm_ue_auth_service
ocudm-nudm-sdm-service	ocudm/nudm_sdm_service
ocudm-nudm-sdm-notify-service	ocudm/nudm_sdm_notify_service
ocudm-ausfueauthenticator	ocudm/nudm_ausf_ueauth_service
ocudm-nudm-nrf-client-service	ocudm/nrf_client_service
ocudm-endpoint	ocudm/ocingress_gateway
ocudm-perf-info	ocudm/perf_info

UDM Deployment

This procedure describes the steps to deploy UDM on CNE. The below steps need to be executed from a server which has access to Kubectl and helm commands.

Table 3-4   UDM Deployment

Step No.#	Procedure	Description
1 ☐	Search helm chart	Execute the following command to check the version of the helm chart installation. This step is required ocudm helm charts are part of some helm repository. `helm search <chart_name>` **Note**: chart_name can be obtained from Chart.yaml file in ocudm helm charts shared as part of the package.
2 ☐	Prepare custom_values.yaml file	Prepare a custom_values.yaml file with the required parameter information. Refer to Configuration Parameter for more information on parameters. You can also download sample ocudm_values.yaml file from OHC.
3 ☐	Deploy UDM using HELM repository	Execute the following command: `helm install <helm-repo>/chart_name -f <custom_values.yaml> --name <deployment_name> --namespace <namespace_name> --version <helm_version>` Where: **helm-repo**: repository name where the helm images, charts are stored **custom_values**: helm configuration file which needs to be updated based on the deployment site requirement **deployment_name** and **namespace_name**: depends on customer configuration. For example: helm install ocudm-helm-repo/ocudm -f <custom values.yaml> --name ocudm --namespace udmsvc --version <helm version>
4 ☐	Deploy UDM using extracted HELM charts	Execute the following command: `helm install -f <custom values.yaml> --name ocudm --namespace <namespace> <chartpath>./<chart>.tgz`
5 ☐	Check repo status	Execute `helm status <deployment_name>` to check the deployment status.
6 ☐	Check svc status	Check if all the services are deployed and running: `kubectl -n <namespace_name> get services`

Table 3-4   (Cont.) UDM Deployment

Step No.#	Procedure	Description
7 ☐	Check pod status	Check if all the pods are up and running: `kubectl -n <namespace_name> get pods` Check OCUDM Pod Details section given below for the pod details.

OCUDM Pod Details
The OCUDM Pod details are as follows:

```
kubectl get pods -n myudm
NAME                                                    READY
STATUS     RESTARTS    AGE
ocudm-ausfueauthenticator-5745c4c594-4ttnz              1/1       Running
0          3d2h
ocudm-endpoint-5f9b49689c-g4x2r                         1/1       Running
0          3d2h
ocudm-endpoint-5f9b49689c-gtw24                         1/1       Running
0          3d2h
ocudm-nudm-nrf-client-service-d65bf7b5b-s7dzx           1/1       Running
0          3d2h
ocudm-nudm-sdm-notify-service-6459c7c8cf-hph7d          1/1       Running
0          3d2h
ocudm-nudm-sdm-service-df485d6d-qtfgm                   1/1       Running
0          3d2h
ocudm-nudm-ue-auth-service-b66886d84-9p79t              1/1       Running
0          3d2h
ocudm-nudm-uecm-service-c58c5d68c-7tbqz                 1/1       Running
0
3d2h

ocudm-perf-info-5f6b8f9856-kb5gj                        1/1       Running
0          3d2h
```

UDM Uninstallation

To uninstall UDM, perform the steps given below from a server that has access to Kubectl and helm commands.

Table 3-5   UDM Uninstallation

Step No.#	Procedure	Description
1 ☐	Undeploy UDM	Execute the following command to uninstall UDM: `$ helm delete <deployment_name> --purge`
2 ☐	Delete namespace	Execute the following command to delete the namespace: `kubectl delete namespace <deployment_name>` **Note**: Deleting the namespace, deletes all the other Kubernetes objects in that namespace.

4

UDM Upgrade Procedure

Upgrading an existing UDM deployment, replaces the running containers and pods with new ones. If there is no change in the pod configuration, an existing deployment is not replaced. Unless there is a change in the service configuration of a micro service, the service endpoints remain unchanged (NodePort etc).

To upgrade UDM, perform the steps given below from a server that has access to Kubectl and helm commands.

Table 4-1   UDM Upgrade Procedure

Step No.#	Procedure	Description
1	Uprgade UDM	Execute the following command to upgrade UDM: `$ helm upgrade <release> <helm chart> [--version <OCUDM version>] -f <ocudm_customized_values.yaml>` \<release\> can be found in the output of 'helm list' command \<chart\> is the name of the chart in the form of \<repository/ocudm\> e.g. reg-1/ocudm or cne-repo/ocudm

2	In case of issues, rollback	Check the history of helm deployment:
		
		`helm history <helm_release>`
		Rollback to the required revision:
		
		`helm rollback <release name> <revision number>`

5

UDM Configuration Parameters

The UDM micro services have configuration options. The user should be able to configure them via deployment values.yaml

> **Note:**
>
> The default value depends on the UDM service. Some of settings default value may change.
> NAME: is the release name used in helm install command
>
> NAMESPACE: is the namespace used in helm install command
>
> K8S_DOMAIN: is the default kubernetes domain (svc.cluster.local)
>
> Default Helm Release Name:- ocudm

Following tables provide a list of configuration parameters in the Helm file.

These configuration parameters are common to all micro services.

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
config.udr.ip	UDR service to connect if not discoverable through NRF	ocudr-endpoint.myudr	Not applicable	This is a fallback option for UDR connectivity
config.udr.port	Port to connect to UDR service above	80	Valid Port	
config.nrfClient.fqdn	NRF Client service fqdn of UDM	ocudm-nudm-nrf-client-service	Not applicable	
config.nrfClient.port	NRF Client service port of UDM	5001	Valid Port	
config.httpRetryCount	Retry count for any http requests towards any client in UDM microservices	2	[1 - 4]	
config.udmFqdn	FQDN of OCUDM	ocudm-endpoint.myudm.svc.cluster.local	Not applicable	
mysql.primary.host	NDB cluster sql primary node IP	udm-db	Valid SQL node IP	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
mysql.secondary.host	NDB cluster sql secondary node IP	udm-db	Valid SQL node IP	
mysql.database	DB name to be used	udmdb	Not applicable	
mysql.port	Port used for establishing connections	3306	Not applicable	
mysql.username	Username for mysql login	changeme	Not applicable	
mysql.password	Password for mysql login	changeme	Not applicable	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
image.repository	Full Image Path	ocudm/nudm_uecm_service	Not applicable	
image.tag	Tag of Image	1.1.0	Not applicable	
image.pullPolicy	This setting will tell if image need to be pulled or not	Always	Possible Values - Always IfNotPresent Never	
logging.level.root	Log Level	WARN	Possible Values - WARN INFO DEBUG	Log level of the nudm-uecm-service pod
deployment.replicaCount	Replicas of nudm-uecm-service pod	2	Not applicable	Number of nudm-uecm-service pods to be maintained by replica set created with deployment
minReplicas	Minimum Replicas	1	Not applicable	Minimum number of pods
maxReplicas	Maximum Replicas	4	Not applicable	Maximum number of pods
service.http2enabled	Enabled HTTP2 support flag for rest server	true	true/false	Enable/Disable HTTP2 support for rest server

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
service.type	nudm-uecm-service service type	ClusterIP	Possbile Values- ClusterIP NodePort LoadBalancer	The kubernetes service type for exposing nudm-uecm-service deployment Note: Suggested to be set as ClusterIP (default value) always
service.port.http	HTTP port	5001	Valid Port	The http port to be used in nudm-uecm-service
service.port.https	HTTPS port	5002	Valid Port	The https port to be used for nudm-uecm-service
service.port.management	Management port	9000	Valid Port	The actuator management port to be used for nudm-uecm-service
resources.request.cpu	Cpu Allotment for nudm-uecm-service pod	3	Not applicable	The cpu to be allocated for nudm-uecm-service pod during deployment
resources.target.averageCpuUtil	CPU utilization limit for autoscaling	80	Not Applicable	CPU utilization limit for creating HPA

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
image.repository	Full Image Path	ocudm/nudm_ue_auth_service	Not applicable	
image.tag	Tag of Image	1.1.0	Not applicable	
image.pullPolicy	This setting will tell if image need to be pulled or not	Always	Possible Values - Always IfNotPresent Never	
logging.level.root	Log Level	WARN	Possible Values - WARN INFO DEBUG	Log level of nudm-ue-auth-service pod

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
deployment.replicaCount	Replicas of nudm-ue-auth-service pod	2	Not applicable	Number of nudm-ue-auth-service pods to be maintained by replica set created with deployment
minReplicas	Minimum Replicas	1	Not applicable	Minimum number of pods
maxReplicas	Maximum Replicas	4	Not applicable	Maximum number of pods
service.http2enabled	Enabled HTTP2 support flag	true	true/false	Enable/Disable HTTP2 support for rest server

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
service.type	nudm-ue-auth-service service type	ClusterIP	Possbile Values- ClusterIP NodePort LoadBalancer	The kubernetes service type for exposing nudm-ue-auth-service deployment

N o t e : S u g g e s t e d t o b e s e t a s C l u s t e r I P (d e f a u l t v a

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
				lue) always
service.port.http	HTTP port	5001	Valid Port	The http port to be used for nudm-ue-auth-service
service.port.https	HTTPS port	5002	Valid Port	The https port to be used for nudm-ue-auth-service.
service.port.management	Management port	9000	Valid Port	The actuator management port to be used for nudm-ue-auth-service
resources.request.cpu	Cpu Allotment for nudm-ue-auth-service pod	3	Not applicable	The cpu to be allocated for nudm-ue-auth-service pod during deployment
resources.target.averageCpuUtil	CPU utilization limit for autoscaling	80	Not Applicable	CPU utilization limit for creating HPA
config.udmAuthService.op	Operator Variant Algorithm Configuration Field on UDM.	cdc202d5123e20f62b6d676ac72cb318	Hex values Length: 32 hex digits	

NUDM-SDM-Service Micro Service

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
deployment.replicaCount	Replicas of nudm-sdm-service pod	2	Not applicable	Number of nudm-sdm-service pods to be maintained by replica set created with deployment

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
homeplmnid	Home PLMN id configured on UDM	12345	Not Applicable	
image.pullPolicy	This setting will tell if image needs to be pulled or not	Always	Possible Values - Always IfNotPresent Never	
image.repository	Full Image Path	ocudm/ nudm_sdm_servi ce	Not applicable	
image.tag	Tag of Image	1.1.0	Not applicable	
logging.level.root	Log Level	WARN	Possible Values - WARN INFO DEBUG	Log level of the nudm-sdm-service pod
maxReplicas	Maximum Replicas	4	Not applicable	Maximum number of pods
minReplicas	Minimum Replicas	1	Not applicable	Minimum number of pods
resources.reques t.cpu	Cpu allotment for nudm-sdm-service pod	3	Not applicable	The cpu to be allocated for nudm-sdm-service pod during deployment
resources.target. averageCpuUtil	CPU utilization limit for autoscaling	80	Not Applicable	CPU utilization limit for creating HPA
service.http2ena bled	Enabled HTTP2 support flag for rest server	true	true/false	Enable/Disable HTTP2 support for rest server
service.port.http	HTTP port	5001	Valid Port	The http port to be used in nudm-sdm-service
service.port.https	HTTPS port	5002	Valid Port	The https port to be used for nudm-sdm-service
service.port.man agement	Management port	9000	Valid Port	The actuator management port to be used for nudm-sdm-service

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
service.type	nudm-sdm-service service type	ClusterIP	Possbile Values- ClusterIP NodePort LoadBalancer	The kubernetes service type for exposing nudm-sdm-service deployment

Note: Suggested to be set as ClusterIP (default va

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
sdmFqdn	SDM FQDN to be used in Location headers in responses sent by SDM service	ocudm-endpoint.myudm	Not Applicable	
pendingRetries	Number of retries to be done for subscription failure towards UDR	5	Range: 1 - 10	
subscriptionRetryInterval	Frequency in which the subscription retries should be performed towards UDR.	5	Range: 1 - 60 Unit: Seconds	
sdmNotifyFqdn	This will be used as api root in callbackreference uri in SubscriptionData Subscription body.	ocudm-endpoint.myudm	Not Applicable	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
image.repository	Full Image Path	ocudm/ nudm_sdm_notify_service	Not applicable	
image.tag	Tag of Image	1.1.0	Not applicable	
image.pullPolicy	This setting tells if image need to be pulled or not	Always	Possible Values - Always IfNotPresent Never	
logging.level.root	Log Level	WARN	Possible Values - WARN INFO DEBUG	Log level of the nudm-sdm-notify-service pod

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
deployment.replicaCount	Replicas of nudm-sdm-notify-service pod	2	Not applicable	Number of nudm-sdm-notify-service pods to be maintained by replica set created with deployment
minReplicas	Minimum Replicas	1	Not applicable	Minimum number of pods
maxReplicas	Maximum Replicas	4	Not applicable	Maximum number of pods
service.http2enabled	Enabled HTTP2 support flag for rest server	true	true/false	Enable/Disable HTTP2 support for rest server

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
service.type	nudm-sdm-service service type	ClusterIP	Possbile Values-ClusterIP NodePort LoadBalancer	The kubernetes service type for exposing nudm-sdm-notify-service deployment

N o t e : Suggested to be set as ClusterIP (default v

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
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service.port.http	HTTP port	5001	Valid Port	The http port to be used in nudm-sdm-notify-service
service.port.https	HTTPS port	5002	Valid Port	The https port to be used for nudm-sdm-notify-service
service.port.management	Management port	9000	Valid Port	The actuator management port to be used for nudm-sdm-notify-service
resources.request.cpu	Cpu Allotment for nudm-sdm-notify-service pod	3	Not applicable	The cpu to allocated for nudm-sdm-notify-service pod during deployment
resources.target.averageCpuUtil	CPU utilization limit for autoscaling	80	Not Applicable	CPU utilization limit for creating HPA
notifyRetryCount	Number of retries to be done for notification failure towards AMF	1	Range: 1 - 10	
notifyRetryInterval	Frequency in which the notification retries should be performed towards AMF.	5	Range: 1 - 60 Unit: Seconds	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
image.repository	Full Image Path	ocudm	Not applicable	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
image.name	Full name	nudm_ausf_ueauth_service	Not applicable	
image.tag	Tag of Image	1.1.0	Not applicable	
image.pullPolicy	This setting tells if image need to be pulled or not	Always	Possible Values - Always IfNotPresent Never	
loglevel	Log Level	WARN	Possible Values - WARN INFO DEBUG	Log level of the ausfueauthenticator pod
deployment.replicaCount	Replicas of ausfueauthenticator pod	2	Not applicable	Number of ausfueauthenticator pods to be maintained by replica set created with deployment
minReplicas	Minimum Replicas	1	Not applicable	Minimum number of pods
maxReplicas	Maximum Replicas	4	Not applicable	Maximum number of pods
service.http2enabled	Enabled HTTP2 support flag for rest server	true	true/false	Enable/Disable HTTP2 support for rest server

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
service.type	ausfueauthenticator service type	ClusterIP	Possbile Values- ClusterIP NodePort LoadBalancer	The kubernetes service type for exposing ausfueauthenticator deployment

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Suggested to be set as ClusterIP (defaultva

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
service.port.http	HTTP port	5001	Valid Port	The http port to be used in ausfueauthenticator service
service.port.https	HTTPS port	5002	Valid Port	The https port to be used for ausfueauthenticator service
service.port.management	Management port	9000	Valid Port	The actuator management port to be used for ausfueauthenticator service
resources.request.cpu	Cpu Allotment for ausfueauthenticator pod	3	Not applicable	The cpu to allocated for ausfueauthenticator pod during deployment
resources.target.averageCpuUtil	CPU utilization limit for autoscaling	80	Not Applicable	CPU utilization limit for creating HPA
servingNetworkNameList	List of serving network names by the AUSF node	5G: mnc100.mcc101.3gppnetwork.org ,5G: mnc101.mcc102.3gppnetwork.org	Not Applicable	
configuredUdm	Enable usage of the configured UDM in values	true	true/false	
UdmHost	The configured UDM host fqdn	ocudm-nudm-ue-auth-service	Not Applicable	
UdmPort	Port to connect to the UDM pod	5001	Valid Port	
auditDuration		3600000		
expiryDuration		300000		
unexpectedAuthTypeNotify		true	true/false	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
nrfHost	The NRF client service host details running as part of this UDM AUSF helm deployment	ocudm-nudm-nrf-client-service	Not Applicable	
nrfPort	The port to be used to connect to NRF client service	5001	Valid Port	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
host.registrationbaseurl	NRF url for registration	http://ocnrf-endpoint.mynrf.svc.cluster.local/nnrf-nfm/v1/nf-instances	Not applicable	
host.subscriptionbaseurl	NRF url for registration	http://ocnrf-endpoint.mynrf.svc.cluster.local/nnrf-nfm/v1/subscriptions		
host.discoverybaseurl	NRF url for registration	http://ocnrf-endpoint.mynrf.svc.cluster.local/nnrf-disc/v1/nf-instances		
host.notifybaseurl	NRF url for registration	http://ocudm-nudm-nrf-client-service.myudm.svc.cluster.local:5001/nnrf-client/v1/notify		
host.notificationbaseurl	NRF url for registration	http://ocudm-nudm-nrf-client-service.myudm.svc.cluster.local/nnrf-client/v1/notify		
host.proxy.ssl	SSL flag	false	true/false	SSL flag to enable SSL with udr nrf client pod
logging.level.root	Log Level	WARN	Possible Values - WARN INFO DEBUG	Log level of the UDM nrf client pod
image.repository	Full Image Path	ocudm/nrf_client_service	Not applicable	
image.tag	Tag of Image	1.1.0	Not applicable	

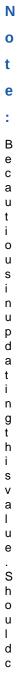| Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
image.pullPolicy	This setting tells if image need to be pulled or not	Always	Possible Values - Always IfNotPresent Never	
heartBeatTimer	Heart beat timer	90	Unit: Seconds	
udmgroupId	Group ID of UDM	udm-1	Not applicable	
ausfgroupId	Group ID of AUSF	ausf-1		
capacityMultiplier	Capacity of UDM	500	Not applicable	Capacity multiplier of UDM based on number of UDM pods running
supirange	Supi Range supported with UDM	[{\"start\": \"10000000000\", \"end\": \"20000000000\"}]	Valid ue range	
gpsiRanges	gpsi Range supported with UDM	[{\"start\": \"10000000000\", \"end\": \"20000000000\"}]	Valid ue range	
externalGroupIdentifiersRanges	External group identifier range supported with UDM	[{\"start\": \"10000000000\", \"end\": \"20000000000\"}]	Valid ue range	
priority	Priority to be sent in registration request	10	Not applicable	
routingIndicators	Routing Indicators send in NRF registration request	[\"00\"]	Not applicable	
udmAllowedNfs	UDM allowed NF type to be sent in NRF registration request	AMF,CUSTOM_ORACLE_SCP,SMF,AUSF	Any valid NF name as per spec	
ausfAllowedNfs	AUSF allowed NF type to be sent in NRF registration request	AMF,CUSTOM_ORACLE_SCP	Any valid NF name as per spec	
plmnList	PLMN list used during registration	[{\"mnc\": \"14\", \"mcc\": \"310\"}]	Valid MCC and MNC values	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
masterIp	NF service ipv4 address to be used during UDM/AUSF registration	10.0.0.0	Valid IP address	
authFqdn	FQDN for auth service to be registered with NRF	ocudm-ausfueauthenticator.myudm.svc.cluster.local	Not Applicable	
sdmFqdn	FQDN for sdm service to be registered with NRF	ocudm-nudm-sdm-service.myudm.svc.cluster.local	Not Applicable	
sdmNotifyFqdn	FQDN for sdm notify service to be registered with NRF	ocudm-nudm-sdm-notify-service.myudm.svc.cluster.local	Not Applicable	
uecmFqdn	FQDN for uecm service to be registered with NRF	ocudm-nudm-uecm-service.myudm.svc.cluster.local	Not Applicable	
ueauFqdn	FQDN for ueau service to be registered with NRF	ocudm-nudm-ue-auth-service.myudm.svc.cluster.local	Not Applicable	
locality	Operator defined information about the location of the NF instance (e.g. geographic location, data center)	West0	Not Applicable	
endpointLabelSelector	Label selector used for ocudm endpoint	ocudm-endpoint	Not Applicable	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
livenessProbeUrl udm	URL used by nrf-client-service to check liveness probe of other udm microservice pods. This includes apigateway and excludes AUSF pod	http://ocudm-nudm-uecm-service.myudm.svc.cluster.local: 9000/actuator/ health,http:// ocudm-nudm-ue-auth-service.myudm.svc.cluster.local: 9000/actuator/ health,http:// ocudm-nudm-sdm-service.myudm.svc.cluster.local: 9000/actuator/ health,http:// ocudm-nudm-sdm-notify-service.myudm.svc.cluster.local: 9000/actuator/ health	Not Applicable	Be cautious in updating this value. Should consider namespace used for udm deployment and name resolution setting in k8s
livenessProbeUrl ausf	URL used by nrf-client-service to check liveness probe of other ausf microservice pod along with apigateway.	http://ocudm-ausfueauthenticator.myudm.svc.cluster.local:9000/ actuator/health	Not Applicable	Be cautious in updating this value. Should consider namespace used for udm deployment and name resolution setting in k8s.

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
fqdn	UDM FQDN	ocudm-endpoint.myudm.svc.cluster.local	Not Applicable	FQDN to used for registering in NRF for other NFs to connect to UDM.

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Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes

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Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
fullnameOverride	Name to be used for deployment	ocudm-endpoint	Not applicable	
global.type	ocudm-endpoint service type	LoadBalancer	Possbile Values- ClusterIP NodePort LoadBalancer	
global. dockerRegistry	Docker registry to pull image	docker-registry.udr.us.oracle.com :5000/ocudm	Not applicable	
global. staticNodePortEnabled	assign static pre-defined port to api-gateway service	false	true/false	
global. staticHttpNodePort	static http node port value	30075	30000-32767	
global. staticHttpsNodePort	static https node port value	30043	30000-32767	
global. service.metalLbIpAllocationEnabled	Enable or disable Address Pool for Metallb	true	true/false	
global.metalLbIpAllocationAnnotation	Address Pool for Metallb	" metallb.universe.tf/address-pool : signaling"	Not applicable	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
image.name	Docker image name	ocingress_gateway	Not applicable	
image.tag	Image version tag	1.5.0	Not applicable	
image.pullPolicy	This setting will tell if image need to be pulled or not	Always	Possible Values - Always IfNotPresent Never	
resources.requests.cpu	Cpu request for ocudm-endpoint pod	3	Not applicable	
resources.requests.memory	Memory request for ocudm-endpoint pod	2G	Not applicable	
resources.limits.cpu	Cpu limit for ocudm-endpoint pod	4	Not applicable	
resources.limits.memory	Memory limit for ocudm-endpoint pod	2G	Not applicable	
resources.target.averageCpuUtil	CPU utilization limit for auto scaling	80	Not applicable	
log.level	Logging level	INFO	INFO/DEBUG/ WARN	
initssl	Initialize SSL framework	false	Not Applicable	
oauthValidatorEnabled	OAUTH Configuration	false	Not Applicable	
enableIncomingHttp	enable/disable incoming HTTP packets	true	true/false	
enableIncomingHttps	enable/disable incoming HTTPS packets	false	true/false	
enableOutgoingHttps	enable/disable outgoing HTTPS packets	false	true/false	
maxConnectionsQueuedPerDestination	Queue Size of api-gateway	5000	Not Applicable	
maxConnectionsPerIp	Connections from api-gateway to other microServices	10	Not Applicable	

Parameter	Description	Default Value	Range or Possible Values (if applicable)	Notes
routesConfig	Routes configured to connect to different micro services of UDM	- id: uecm_mapping_ http uri: http:// {{ .Release.Name }}-nudm-uecm-service:5001 path: /nudm-uecm/** - id: ue_auth_mappin g_http uri: http:// {{ .Release.Name }}-nudm-ue-auth-service:5001 path: /nudm-ueau/** - id: sdm_mapping_ht tp uri: http:// {{ .Release.Name }}-nudm-sdm-service :5001 path: / nudm-sdm/** - id: sdm_notify_map ping_http uri: http:// {{ .Release.Name }}-nudm-sdm-notify-service: 5001 path: / nudm-sdm-notify/** - id: ausf_mapping_ht tp uri: http:// {{ .Release.Name }}-ausfueauthentica tor:5001 path: / nausf-auth/**	Not Applicable	