Oracle® Communications

Networks Data Analytics Function Network Impact Report

Release 24.2.2

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Oracle Communications Networks Data Analytics Function Network Impact Report, Release 24.2.2

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Contents

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Acronyms

The following table provides information about the acronyms and the terminology used in the document.

Table Acronyms

Acronym	Description
3GPP	3rd Generation Partnership Project
5GC	5G Core Network
5GS	5G System
AF	Application Function
API	Application Programming Interface
AMF	Access and Mobility Management Function
CNC	Cloud Native Core
CNE	Oracle Communications Cloud Native Core, Cloud Native Environment
FQDN	Fully Qualified Domain Name
GUI	Graphical User Interface
HTTPS	Hypertext Transfer Protocol Secure
KPI	Key Performance Indicator
HA	High Availability
IMSI	International Mobile Subscriber Identity
K8s	Kubernetes
ME	Monitoring Events
Network Slice	A logical network that provides specific network capabilities and network characteristics.
NEF	Oracle Communications Cloud Native Core, Network Exposure Function
NF	Network Function
NRF	Oracle Communications Cloud Native Core, Network Repository Function
NSI	Network Slice Instance. A set of Network Function instances and the required resources (such as compute, storage and networking resources) which form a deployed Network Slice.
NSSF	Oracle Communications Cloud Native Core, Network Slice Selection Function
NWDAF	Network Data Analytics Function
OAM	Operations, Administration, and Maintenance
PLMN	Public Land Mobile Network
REST	Representational State Transfer
SBA	Service Based Architecture
SBI	Service Based Interface
SMF	Session Management Function
SNMP	Simple Network Management Protocol
SUPI	Subscription Permanent Identifier
UDM	Unified Data Management

Table (Cont.) Acronyms

Acronym	Description
UE	User Equipment
URI	Uniform Resource Identifier

What's New in This Guide

This section introduces the documentation updates for Release 24.2.x in *Oracle Communications Networks Data Analytics Function Network Impact Report*.

Release 24.2.2 - F96697-02, November 2024

- Added software requirement details in the Software Requirements section.
- Added upgrade paths in the Supported Upgrade and Rollback Paths section.
- Added metrics in the Metrics section.

Release 24.2.0 - F96697-01, July 2024

- Added compatibility matrix details in the Compatibility Matrix section.
- Added Common Services load lineup details in the Common Services Load Lineup section.
- Added resource requirement details in the Resource Requirements section.
- Added orchestration details in the Orchestration section.
- Added information about new features in the OCNWDAF Features section.
- Added Helm parameter details in the Helm section.
- Added KPIs and Alerts in the Key Performance Indicators and Alerts sections.

1 Introduction

The purpose of this document is to highlight the changes made in OCNWDAF from Release 24.1.x to Release 24.2.x. These changes may have impact on the customer network operations and must be considered while planning the deployment.

> **Note**
>
> The performance and capacity of the OCNWDAF system may vary based on the call model, Feature/Interface configuration, and underlying CNE and hardware environment.

1.1 Compatibility Matrix

This section lists the versions of added or updated components in Release 24.2.x. To know the list of all the supported versions, see *Oracle Communications Network Analytics Suite Release Notes*.

Release 24.2.2

There is no change in the compatibility matrix in this release.

Release 24.2.0

The following table lists the versions of added or updated components in Release 24.2.0:

Table 1-1 Compatibility Matrix

Component	Compatibility Version
CNE	• 24.1.x
cnDBTier	24.1.x
OSO	NA
CNC Console	• 24.2.x • 24.1.x • 23.4.x • 23.3.x • 23.2.x
OCNADD	24.2.x
ATS	24.2.0

1.2 Common Services Load Lineup

This section lists the versions of added or updated common services in Release 24.2.x. To know the list of all the supported versions, see *Oracle Communications Network Analytics Suite Release Notes*.

Release 24.2.2

There is no change in the common services load lineup in this release.

Release 24.2.0

The following table lists the versions of added or updated common services in Release 24.2.x:

Table 1-2 Common Services Load Lineup

Service Name	Version
nwdaf-egress-gateway	24.1.0
nwdaf-ingress-gateway	24.1.0
nrf client	23.4.2
Helm Test	22.4.0
ATS Framework	24.2.0

1.3 Software Requirements

This section lists the added or updated software required to install Release 24.2.x. For more information about software requirements, see *Oracle Communications Networks Data Analytics Function Installation and Fault Recovery Guide*.

Release 24.2.2

The following table lists the versions of added or updated software required to install Release 24.2.2:

Table 1-3 Software Requirements

Software	Version
Kubernetes	• 1.28.x • 1.27.x • 1.26.x

Release 24.2.0

The following table lists the versions of added or updated software required to install Release 24.2.0:

Table 1-4 Software Requirements

Software	Version
Kubernetes	• 1.26.x • 1.25.x • 1.24.x

Table 1-4 (Cont.) Software Requirements

Software	Version
Helm	• 3.12.3 • 3.12.0 • 3.10.3 • 3.9.4 • 3.8.0 • 3.6.3 • 3.5.0 • 3.1.2
Podman	• 4.6.1 • 4.4.1 • 4.2.0 • 3.3.1 • 3.2.3 • 2.2.1

Table 1-5 Additional Software

Software	Version	Used For
MetalLb	0.12.1	External IP
Prometheus	2.45.0	Metrics
tracer	1.21.0	Tracing

1.4 Orchestration

This section provides information about orchestration changes in Release 24.2.x.

Release 24.2.2

The following table provides information about orchestration changes in this release.

Table 1-6 Orchestration

Orchestration Changes	Status	Notes
Support for in-service upgrade and roll back	No	For information about upgrade, see Supported Upgrade and Rollback Paths section. Rollback is not supported on OCNWDAF.
Changes in the `values.yaml` file	No	For information on Helm parameters, see Helm section.
Changes in the resource information for `values.yaml` file	No	For information about changes in the resource requirements, see Resource Requirements section.
Changes in the CSAR package	No	For more information on the CSAR package, contact My Oracle Support.
Changes in Role-Based Access Control (RBAC) policy	No	No new RBAC policies are added.

Table 1-6 (Cont.) Orchestration

Orchestration Changes	Status	Notes
Changes in Life Cycle Management (LCM) Operations	No	No new LCM operations are added.
Helm Test Support	No	For information about Helm test, see Performing Helm Test section in *Oracle Communications Networks Data Analytics Function Installation, Upgrade, and Fault Recovery Guide.*

Release 24.2.0

The following table provides information about orchestration changes in this release.

Table 1-7 Orchestration

Orchestration Changes	Status	Notes
Support for in-service upgrade and roll back	No	For information about upgrade, see Supported Upgrade and Rollback Paths section. Rollback is not supported on OCNWDAF.
Changes in the `values.yaml` file	Yes	For information on Helm parameters, see Helm section.
Changes in the resource information for `values.yaml` file	Yes	For information about changes in the resource requirements, see Resource Requirements section.
Changes in the CSAR package	No	For more information on the CSAR package, contact My Oracle Support.
Changes in Role-Based Access Control (RBAC) policy	No	No new RBAC policies are added.
Changes in Life Cycle Management (LCM) Operations	No	No new LCM operations are added.
Helm Test Support	No	For information about Helm test, see Performing Helm Test section in *Oracle Communications Networks Data Analytics Function Installation, Upgrade, and Fault Recovery Guide.*

1.5 Resource Requirements

This section lists the added or updated resource requirements in Release 24.2.x. For more information about resource requirements, see *Oracle Communications Networks Data Analytics Function Installation and Fault Recovery Guide*.

> **Note**
>
> Changes in the resource requirements are highlighted in **bold**.

Release 24.2.2

There is no change in the resource requirements in this release.

Release 24.2.0

The following table lists the added or updated resource requirements in this release:

Table 1-8 Core Microservices Resource Requirements

Microservice Name	Instances	POD Replica		CPU/POD		Memory/POD (in GB)		Ephemeral Storage	
		Min	Max	Min	Max	Min	Max	Min (Mi)	Max (GB)
ocn-nwdaf-analytics-info-service	1	1	2	1	2	1	2	**200**	**200**
nwdaf-ingress-gateway	2	2	5	1	2	2	**4**	**200**	**200**
nwdaf-egress-gateway	2	2	5	1	2	2	**4**	**200**	**200**
nwdaf-cap4c-spring-cloud-config-server	1	1	1	1	2	1	2	**200**	**200**
ocn-nwdaf-data-collection-service	1	1	3	**4**	**4**	**4**	**4**	**200**	**200**
ocn-nwdaf-data-collection-controller	1	1	2	1	2	1	2	**200**	**200**
ocn-nwdaf-subscription-service	1	1	2	1	2	1	2	**200**	**200**
ocn-nwdaf-mtlf-service	1	1	2	1	2	1	2	**200**	**200**
cap4c-configuration-manager-service	1	1	2	1	2	1	2	**200**	**200**
cap4c-model-controller	1	1	3	1	2	1	2	**200**	**200**
cap4c-model-executor	1	1	3	1	2	1	2	**200**	**200**
cap4c-stream-analytics	1	1	3	1	2	1	2	**200**	**200**
nwdaf-portal	1	1	2	0.5	1	1	2	**200**	**200**
nwdaf-portal-service	1	1	2	1	2	1	2	**200**	**200**
cap4c-scheduler-service	1	1	2	1	2	1	2	**200**	**200**
cap4c-stream-transformer	1	1	2	1	2	1	2	**200**	**200**
cap4c-api-gateway	1	1	2	1	2	1	2	**200**	**200**
cap4c-kafka-ingestor	1	1	3	1	2	1	2	**200**	**200**
ocn-nwdaf-cap4c-reporting-service	1	1	2	1	2	1	2	**200**	**200**

Table 1-8 (Cont.) Core Microservices Resource Requirements

Microservice Name	Instances	POD Replica		CPU/POD		Memory/POD (in GB)		Ephemeral Storage	
ocn-nwdaf-geo-redundacy-agent	1	1	2	1	1	1	1	**200**	**200**
nwdaf-cap4c data-replicator	1	1	1	1	1	2	4	**200**	**200**
cap4c-capex-optimization-service	1	1	2	1	2	1	2	**200**	**200**
ocn-nwdaf-analytics-decision-engine-service	1	1	2	1	2	1	2	**200**	**200**
Total	**25**	**25**	**55**	**12.5**	**45**	**30**	**55**	**4600**	**4600**

2 OCNWDAF Features

This chapter lists the added or updated features in Release 24.2.x. For more information about the features, see *Oracle Communications Networks Data Analytics Function User Guide*.

Release 24.2.2

There are no new features or enhancements in this release.

Release 24.2.0

Oracle Communications Networks Data Analytics Function (OCNWDAF) 24.2.0 is updated with the following enhancements:

- **Deployment in OCI using OCI Adaptor:** Oracle Cloud Infrastructure (OCI) is a set of complementary cloud services that enable you to build and run a range of applications and services in a High Availability (HA) hosted environment. OCNWDAF can be integrated into the OCI using the OCI Adaptor. For more information on deploying OCNWDAF on OCI , see *Oracle Communications Networks Data Analytics Function User Guide* and *Oracle Communications Networks Data Analytics Function Installation, Upgrade, and Fault Recovery Guide*.
- **Support for TLS 1.3:** Network Functions (NFs) or peers use Hypertext Transfer Protocol Secure (HTTPS) to establish secured ingress and egress connections with consumer NFs and producer NFs, respectively. These communication protocols are encrypted using Transport Layer Security (TLS). The OCNWDAF now supports TLS 1.3 on the Ingress and Egress interfaces. For more information, see *Oracle Communications Networks Data Analytics Function User Guide*. To configure TLS 1.3 support, see *Oracle Communications Networks Data Analytics Function Installation, Upgrade, and Fault Recovery Guide* .
- **Support for Model C Communication:** 5G Service Based Interface (SBI) communication models are used to establish connections among NFs and NF services. These communication models facilitate consumer NFs to route service requests to producer NFs either directly or indirectly through the Service Communication Proxy (SCP). The OCNWDAF now supports the Model C communication model. Model C is an indirect communication model in which consumers can query the NRF to perform NF discovery (delegated discovery) or the consumers can directly send service requests to the SCP without NRF discovery. The SCP is located between the OCNWDAF and the producer NFs, and data is collected from them. OCNWDAF supports the "3gpp-Sbi-Binding" 5G SBI custom header. This header contains a comma-delimited list of Binding Indications from an HTTP server for storage and use of HTTP clients. For more information, see *Oracle Communications Networks Data Analytics Function User Guide*. To enable or disable this feature, see *Oracle Communications Networks Data Analytics Function Installation, Upgrade, and Fault Recovery Guide*.
- **SNMP Support:** Simple Network Management Protocol (SNMP) is an application-layer protocol designed for monitoring and managing network devices within a Local Area Network (LAN) or Wide Area Network (WAN). OCNWDAF forwards the Prometheus alerts as Simple Network Management Protocol (SNMP) traps to the southbound SNMP servers. The Prometheus Alert Manager is integrated with Oracle Communications Cloud Native Core, Cloud Native Environment (CNE) snmp-notifier service. The external SNMP servers are set up to receive the Prometheus alerts as SNMP traps. For more information, see *Oracle Communications Networks Data Analytics Function User Guide*.

- **Enhanced NF Load Analytics:** The Oracle Communications Network Analytics Data Director (OCNADD) can be configured as a data source for NF load analytics. When OCNADD is configured as a data source, the NF Load Analytics information in the OCNWDAF GUI is enhanced to include information such as Round Trip Time (RTT), Observed Transactions Per Second (OTPS), NF Load information, and Error Rates (only for UDM). A graphical representation of all these NF Load analytics parameters is displayed on the OCNWDAF GUI. The OCNADD has to be configured with specific filters and correlations for this enhancement. A new ML model, SARIMAX, is introduced for NF Load analytics. For more information, see *Oracle Communications Networks Data Analytics Function User Guide*.
- **Upgrade Support:** The OCNWDAF now supports upgrade from the previous release. The preupgrade tasks, upgrade procedure, and the supported upgrade paths are documented in the *Oracle Communications Networks Data Analytics Function Installation, Upgrade, and Fault Recovery Guide*.
- **OCNWDAF GUI Enhancements: The OCNWDAF GUI is enhanced with the following changes:**
  - The OCNWDAF GUI is enhanced with two new pages for Dashboard and Alerts. The Dashboard page displays OCNWDAFs Key Performance Indicators (KPIs), offers the option to view real-time data, and allows users to filter the KPIs based on time interval, KPI interval, and refresh rate. The Alerts page displays the list of alerts generated by OCNWDAF.
  - The Slice Load Monitoring page displays different visualization styles of slice data. The Slice Load Monitoring Page now contains three tabs Active Slices, Line Chart, and Tracking Areas.
  - The NF Load Dashboard screen displays the NF Load information, that includes NF instances, NF load level as peak and average load values, it has been enhanced to display graphs of Round Trip Time, Observed Transactions Per Second, Error Count (only for UDM), and NF Load. You can also obtain predictive analytics information by providing a Start Time and Forecasting Period in the GUI.
  - The Machine Learning (ML) Model Selector page is updated with a new ML Model "SARIMAX" for NF Load analytics.

  For more information, see *Oracle Communications Networks Data Analytics Function User Guide*.

3

Supported Upgrade and Rollback Paths

This chapter lists the supported upgrade and rollback paths in Release 24.2.x. For more information about upgrade procedures, see *Oracle Communications Cloud Native Core, Networks Data Analytics Function Installation, Upgrade, and Fault Recovery Guide*.

OCNWDAF Release 24.2.2

Supported Upgrade Path

The following table lists the supported upgrade path in this release:

Table 3-1 Supported Upgrade Path

Source Release	Target Release
24.1.0.0.0, 24.2.0	24.2.2

Supported Rollback Path

OCNWDAF does not support rollback.

OCNWDAF Release 24.2.0

Supported Upgrade Path

The following table lists the supported upgrade path in this release:

Table 3-2 Supported Upgrade Path

Source Release	Target Release
24.1.0.0.0	24.2.0

Supported Rollback Path

OCNWDAF does not support rollback.

4 Configuration

This chapter lists the added or updated configuration changes in Release 24.2.x.

4.1 Helm

This section lists the Helm parameter changes in Release 24.2.x. For more information about Helm parameters, see *Oracle Communications Networks Data Analytics Function Installation and Fault Recovery Guide.*

Release 24.2.2

There are no changes in the Helm parameters in this release.

Release 24.2.0

The following are the Helm parameters changes in release 24.2.0:

OCI Configuration Parameters

- isOciCLuster
- ociMetricsNamespace
- ociCompartmentId

Model C Communication Parameters

- sbiRoutingEnabled
- sbiRoutingDefaultScheme
- sbiRoutingEnabled
- peerConfiguration
- id
- host
- port
- apiPrefix
- healthApiPath
- modelc.binding.enabled

TLS 1.3 Parameters

- clientDisabledExtension
- serverDisabledExtension
- tlsNamedGroups
- clientSignatureSchemes
- service.ssl.tlsVersion
- allowedCipherSuites

- cipherSuites
- messageCopy.security.tlsVersion

Prometheus Parameters

- prometheus.enabled
- prometheus.ipAddress

4.2 REST API

This section lists the REST API changes in release 24.2.x. For more information about the REST APIs, see *Oracle Communications Networks Data Analytics Function User Guide*.

Release 24.2.2

There are no changes in the REST APIs in this release.

Release 24.2.0

New REST APIs are not introduced in release 24.2.0.

5 Observability

This chapter lists the observability changes in release 24.2.x.

5.1 Metrics

This section lists the added or updated metrics in Release 24.2.x. For more information on the metrics, see *Oracle Communications Networks Data Analytics Function User Guide*.

Release 24.2.2

Added OCNWDAF metrics for the following services in the *Oracle Communications Networks Data Analytics Function User Guide*:

- Analytics Information Service
- Data Collection Service
- Subscription Service

Release 24.2.0

New metrics are not introduced in release 24.2.0.

5.2 Alerts

This section lists the added or updated alerts in Release 24.2.x. For more information on the alerts, see *Oracle Communications Networks Data Analytics Function User Guide*.

Release 24.2.2

There are no updates to alerts in this release.

Release 24.2.0

The following alerts are introduced in release 24.2.0:

- OCNWDAF_SUBSCRIPTION_CREATE
- OCNWDAF_SUBSCRIPTION_CREATE_FAILURE
- OCNWDAF_SUBSCRIPTION_DELETE
- OCNWDAF_SUBSCRIPTION_UPDATE
- OCNWDAF_SUBSCRIPTION_DELETE_FAILURE
- OCNWDAF_SUBSCRIPTION_UPDATE_FAILURE
- OCNWDAF_ABNORMAL_BEHAVIOR_STATISTICS_NOTIFICATION
- OCNWDAF_ABNORMAL_BEHAVIOR_THRESHOLD_NOTIFICATION
- OCNWDAF_ABNORMAL_BEHAVIOR_PREDICTION_NOTIFICATION
- OCNWDAF_NETWORK_PERFORMANCE_STATISTICS_NOTIFICATION

- OCNWDAF_NETWORK_PERFORMANCE_THRESHOLD_NOTIFICATION
- OCNWDAF_NETWORK_PERFORMANCE_PREDICTION_NOTIFICATION
- OCNWDAF_NF_LOAD_STATISTICS_NOTIFICATION
- OCNWDAF_NF_LOAD_THRESHOLD_NOTIFICATION
- OCNWDAF_NF_LOAD_PREDICTION_NOTIFICATION
- OCNWDAF_SLICE_LOAD_STATISTICS_NOTIFICATION
- OCNWDAF_SLICE_LOAD_THRESHOLD_NOTIFICATION
- OCNWDAF_SLICE_LOAD_PREDICTION_NOTIFICATION
- OCNWDAF_MODEL_CREATION_FAILURE
- OCNWDAF_MODEL_CREATION_SUCCESS
- PRESENCE_IN_AOI_REPORT_RECEIVED
- LOCATION_REPORT_RECEIVED
- UES_IN_AREA_REPORT_RECEIVED
- NF_LOAD_REPORT_RECEIVED
- SMF_SES_EST_REPORT_RECEIVED
- SMF_SES_REL_REPORT_RECEIVED
- KAFKA_SOURCED_REPORT_RECEIVED
- OCN_NWDAF_SVC_HIGH_CPU_LOAD
- OCN_NWDAF_SVC_HIGH_JVM_MEMORY_USAGE
- OCN_NWDAF_SVC_NOT_RUNNING_ALERT

5.3 Key Performance Indicators

Release 24.2.2

There are no updates to KPIs in this release.

Release 24.2.0

The following Key Performance Indicators (KPIs) are introduced in OCNWDAF Release 24.2.x.

- Frontend Reports Received Total
- Frontend Bytes Received Total
- Kafka Sourced Reports Received Total
- Total Kafka Bytes Received
- Nwdaf Subscriptions Created Total
- Nwdaf Subscriptions Accepted Total
- Nwdaf Subscriptions Data Reports Sent
- Nwdaf Subscriptions Threshold Reports Sent
- Nwdaf Subscriptions Prediction Reports Sent
- Analyticsinfo Request Received Total