

# Oracle Communications Unified Data Repository (UDR) datasheet

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## Introduction

Oracle Communications Cloud Native Core Unified Data Repository (UDR) is a key component of the 5G Service Based Architecture. It is implemented as a cloud native function and offers an unified database for storing subscription, authentication, service authorization, policy data, session binding, exposure data and application state information.

## Overview

There is need of a centralized entity in the network that can provide the producer Network Function (NF) subscriber data, enabling network elements to quickly and efficiently access the required subscriber information without needing to know the exact database where the data is stored, control the access of devices into the mobile network, store the unstructured data. In addition to requirement of a converged repository and an unified database for storing and retrieving subscription, authentication, service authorization, policy data, session binding, exposure data and application state information etc.

Oracle provides a multi-functional unified data repository which can be configured either as a Unified Data Repository (UDR), Unstructured Data Storage Function (UDSF), Equipment Identity Register (EIR), Subscription Locator Function (SLF).

## Product description

Oracle Communications UDR has a three-tier architecture, connectivity tier, business logic tier and data tier.

The **Connectivity tier** load balances the traffic via ingress API gateway and egress API gateway. It also provides authenticity and integrity protection.

The **Business tier** provides the business logic of UDR. In addition to business logic defined by 3GPP and other micro services to enhance resiliency.

The **Data tier** is the stateful component that provides network-wide data coherence. The Data tier uses Oracle MySQL Network Database (NDB) cluster as the backend database which provides high availability and georedundancy capabilities.

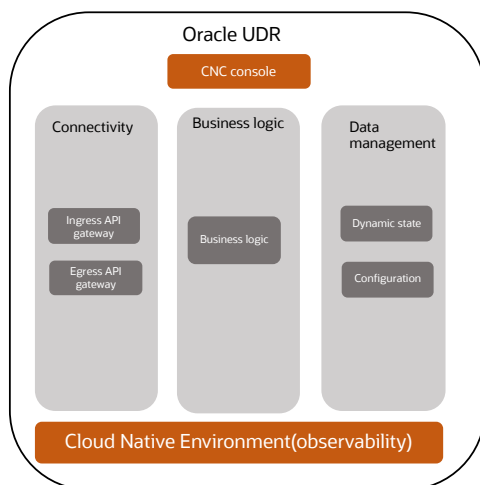


Figure-1 Functional diagram of Oracle Communications UDR

## Detail description of features and benefits

Oracle Communication Cloud Native Core UDR supports a range of differentiated features like –

### Ease of operation

- Provides Automated Test Suite (ATS) for validating different functionalities. ATS allows to execute UDR, SLF, and EIR test cases using an automated testing tool with no intervention from the user.
- Supports collecting the subscriber provisioning logs by enabling the provisioning logging mechanism. It also enables the operators to log the 5G subscriber provisioning requests for create, update, and delete operations.
- Enables enhanced error response mechanism where UDR sends additional pieces of information in the details field of the payload to investigate, and trouble shoot the errors.
- Supports in determining health of a site, site to be partially or completely isolated for restoration purpose.
- Supports UDR SLF controlled shutdown feature to provide the partial or complete isolation of the site from the network so that the operator can perform necessary recovery procedures when required.

### Multiple Provisioning capabilities

- Support provisioning using REST API, and SOAP/XML interfaces.
- Enables GUI based provisioning using CNC Console. Eases the operation with Subscriber Bulk Import Tool.
- Provides subscriber database export functionality which is helpful in migration from 4G to 5G.
- Supports logging provisioning activities which help in maintaining a detailed audit trail of changes made to the subscriber profiles and services.

### Improved security

- Enables Network Policies, an application-centric construct that allows to specify how a pod can communicate with various network entities.
- Provides OAuth2.0 security feature that authenticate requests received from valid consumer NFs.
- Supports TLS 1.3 on connectivity tier for improved encryption, reduced latency and enhanced privacy improving overall security posture.

### Enhanced observability

- Enables visibility of available backup list, cnDB tier version, database statistics, heartbeat status, geo-replication status through Cloud Native Core Console.
- Supports Kubernetes Probes for health check of pods.
- Supports multiple log levels which the operator can set based on the requirement.

### Smooth transition from 4G to 5G

- Supports Converged Quota, which enables cnPCRF to access and manage 4G and 5G quota.
- Provides the capabilities of both 5G UDR and 4G UDR. It supports migrating subscriber data from 4G UDR to the cloud-native UDR (cnUDR or 5G UDR). The cnUDR provides functionality such as migration tools and On-Demand Migration features to migrate the 4G policy subscriber data from 4G OCUDR to cnUDR.

- Enables to auto enroll the subscriber if the subscriber record does not exist, required for subscribers in roaming scenarios, where cnPCRF does a PATCH operation to update the subscriber data.
- Provides suitable congestion control features for Diameter Gateway pods to avoid adverse impacts on latency and performance.
- Enables distribution of diameter connection in a controlled manner by balancing the diameter traffic evenly.

## Multi-functional capability

- Support for 5G EIR Signaling, the Equipment Identity Register (EIR) is a network entity used in Global System for Mobile communication (GSM) networks that stores lists of International Mobile Equipment Identity (IMEI) numbers, which correspond to physical handsets (not subscribers).
- Supports Unstructured Data Storage Function (UDSF) which allows other 5G NFs to store and retrieve unstructured data. Its specifications are not defined by 3GPP. This functionality is a part of Oracle's 5G UDR solution.
- Provides SLF functionality which can acts as a centralized entity that provides the producer NFs subscriber data without needing to know the exact database location.

## Enhanced resiliency

- Supports multiple site redundancy, all sites of UDR are active and can take traffic.
- Provides alternate route to connect to other NFs, thereby increasing resiliency of the network.
- Support robust Overload Control mechanism which are essential for efficient overload management, ensuring smooth operations by regulating traffic and resource allocation.
- Provides 6 9's reliability with MySQL robust data base framework.
- Supports Conflict Resolution in a multisite deployment by updating subscriber data on all the sites during replication down time.

## Summary

Oracle Communications UDR is designed with cutting edge Oracle engineering and is compliant with latest 3GPP release standards, has been deployed in many networks across the globe for tier 1 operators like [Orange](#) and many deployments are under NDA presently. Oracle Communications combines 40+ years of heritage in network experience with cloud innovation to deliver highly secure, robust, and flexible cloud native 4G/5G core network solutions, empowering CSPs to launch the best in breed features and create differentiation in the market by offering world class reliable products.

**“Oracle’s capabilities will essentially serve as the control tower of our network core, enabling our customers to consume software on demand and facilitating the advanced core functions required to power a truly automated network.”**

### Marc Rouanne

Chief Network Officer,  
DISH Wireless

## Key business benefits

Oracle Communications UDR is the practical realization of SBA. It is the most fundamental NF required to implement 5G:

- Provides converged capability of migrating subscriber data from 4G UDR to the cloud-native 5G UDR.
- Helps CSPs to effectively manage their 5G network by providing multi functionality that is Oracle Communication UDR can be configured as UDR, UDSF, SLF or EIR.
- Provides functionality such as migration tools and On-Demand Migration features to migrate the 4G policy subscriber data from 4G UDR to cnUDR

## Related products

- Oracle Communications Cloud Native Core, Security Edge Protection Proxy (SEPP)
- Oracle Communications Cloud Native Core, Binding Support Function (BSF)
- Oracle Communications Cloud Native Core, Policy Control Function (PCF)
- Oracle Communications Cloud Native Core, Policy, and Charging Rules Function (cnPCRF)
- Oracle Communications Cloud Native Core, Cloud Native Environment CNE)
- Oracle Communications Cloud Native Core, Network Exposure Function (NEF)
- Oracle Communications Cloud Native Core, Signal Communications Proxy (SCP)
- Oracle Communications Cloud Native Core, Network Data Analytics Function (NWDAF)
- Oracle Communications Cloud Native Core, Data Director (DD)

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