

# Oracle Communications 5G Cloud Native Core, Policy Control Function (PCF)

Oracle Communications Cloud Native Core, PCF enables you to control 5G network by implementing complex policies decisions based on network subscriber and service information. At the core of Oracle Communications PCF lies a flexible and intuitive policy design experience helping you to generate and test network policies from scratch and deploy them into their production environment in matter of minutes. With the Oracle Communications PCF, you can customize tailored offerings for a wide range of use cases ranging from Enhanced Mobile Broadband, Ultra-Reliable and Low Latency Communication, and Massive IOT.

Oracle Communications PCF creates dynamically tailored policy solutions, reduces complexities, and rapidly activate new policies. It provides a robust policy, customize your policy solutions, supports in maximizing revenue growth and achieve a true competitive advantage by combining the PCF with your analytics suite to offer data-driven personalization.

## Overview

The 5G network is expected to support massive number of devices with various data, transmission, and bandwidth requirements. These requirements are driven mainly by use cases ranging from mobile broadband, massive IOT and mission critical services. You are required to build and manage supporting infrastructure to enable businesses to scale, manage, secure, analyse and monetize the zettabytes of data created by the growing number of connected devices, with zero impact on Quality of Service (QoS). Due to a wide range of devices and applications, targeted services for 5G will be very different from existing services in terms of amount, type, and pattern of data exchange over the network.

To cope with diverse service requirements, it is imperative that intelligent decisions, such as allocation of resources, scheduling of resources and efficient network adaption are made at the network level. Therefore, to harness and capitalize the full capabilities of your 5G network, you must deploy an intelligent, flexible, scalable, and robust policy framework.

## Product description

Oracle Communications Cloud Native Core PCF is a one stop solution for



Oracle Communications PCF integrates with your analytics suite, and continuous deployment (CD) pipelines supporting you to maximize revenue growth and achieve a true competitive advantage to offer data-driven personalization.

**“In trials, the Oracle 5G PCF solution performed beyond expectations and met our discerning metrics for driving the success of our upcoming 5G deployment. After six years of successful partnership with Oracle in the 4G realm, we look forward to continuing the partnership with Oracle in the 5G domain and as we move to deliver new, innovative offerings to our customers.”**

**Corp.”**

**Gwangwook Lee VP**

Core Network Strategy & Planning Department KT Corp

## Key Business Benefits

Oracle Communications Cloud Native Core, PCF is built on more than a decade of

Managing policies in a 5G network. Designed and built as a microservices on cloud native principles, Oracle Communications PCF uses network, subscriber, and service information to help you create policies.

Oracle Communications has a rich heritage in 4G policy solutions encompassing more than a decade of experience and expertise, and an established policy solution deployment base within global tier 1 operators' most demanding networks, serving hundreds of millions of subscribers. For the 5G network, Oracle Communications PCF brings the policy design experience to the next level by providing ultimate flexibility, extensibility, modularization, and assurance to deploy new policies supporting existing and new use cases rapidly and securely. Oracle Communications Cloud Native Core PCF is configured with the best of industry features and high-end engineering, its prominent features include:

- Interworks with the 3GPP binding Support Function (BSF) for storing subscriber session binding information that can be accessed by PCF, Network Exposure Function (NEF) and Application Functions (AFs) for different use cases. The PCF can also use Oracle Communications 5G Unified Data Repository (UDR) for storing subscriber profile and subscriber entitlement information
- Supports Rx for Voice over 5G (Vo5G), emergency call and over-the-top (OTT)/AF based use cases
- Supports migration from 4G to 5G and change QOS on 5G session
- Policy design evolution to support modular and flexible domain driven policy
- Supports session management, access management services and UE policy services
- Flexible, user friendly policy design framework for rapid policy use case deployments
- Supports multiple deployment options – Public Land Mobile Network (PLMN) level, as well as network shared slice or network specific slice as per requirement
- Provides high availability and multisite geo redundancy support
- Supports model C and Model D communication

## Oracle Communications functional diagram

Oracle Communications PCF separates processing/business logic and state concerns following the corresponding logical grouping of microservices/components. Consequently, an actual policy function can be composed of the necessary microservices to provide the desired function. Oracle Communications PCF integrates with a variety of common services for data collection, analysis, and visualization services for operational aspects like logs, metrics, and traces.

- **Connectivity:** Components interfacing with external entities. Ingress gateway and egress gateway is utilized to interface with external traffic to the PCF. These are stateless sets of components.

expertise and experience of designing and deploying policy solution. Oracle's policy solution is deployed with more than 60 tier-1 service providers across the globe. It offers various business benefits:

- Enables you to efficiently manage policies in a 5G network with an intuitive and easy to use graphical interface
- Prepare 5G networks to support devices at scale
- Prepares the 5G network to support massive number of devices without compromising Quality of Service (QoS)
- Enables you to differentiate by providing customizable and tailored offerings for your consumer and enterprise customers
- Reduce operating costs while focusing on your 5G investment
- Cloud native solution with support for CI/CD and DevOps workflows

### Key features

Oracle communications cloud native 5G policy framework is designed and built to handle stringent demands of 5G network and seamlessly scale to cater your ever-expanding network. The prominent features of PCF are as follows:

- Microservices based cloud-native architecture
- Compliant with latest 3GPP release
- Supports session management (SM) policy control service, access, and mobility management (AM) policy control service UE policy services and policy authorization (PA) service
- Separates processing/business logic and state concerns following the corresponding logical grouping of microservices /components

- Business logic: Application layer running the PCF business logic, policy engine and various services that can be enabled based on deployment needs. These are stateless sets of components.
- Data Management: Data layer responsible for storing various types of persistent data. The PCF is built to be able to plug in different types of backend data layers that could be internal or external.

Oracle Communications Cloud Native Core, PCF System Architecture Oracle Communications Policy Design and Run-time Environment Oracle Communications robust and reliable policy design has evolved over years to provide modularity, automation, and flexibility to its PCF

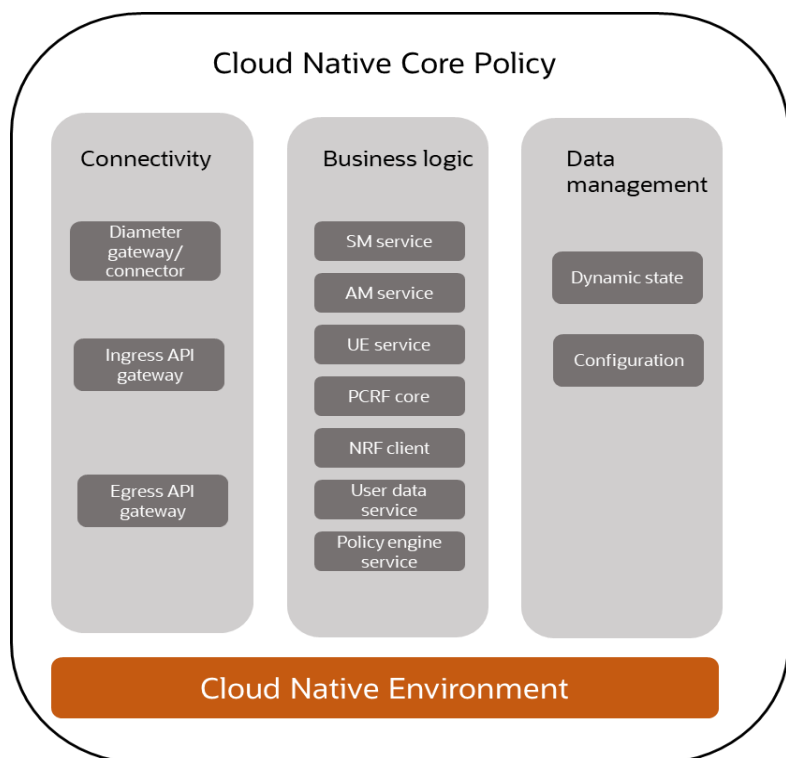


Figure 1. Oracle Communications Cloud Native Core, PCF System Architecture

## Oracle Communications Policy Design and Run-time Environment

Oracle Communications robust and reliable policy design has evolved over years to provide modularity, automation, and flexibility to its PCF.

Table 1: Oracle Policy Design and Run-time Environment

Services	Descriptions
Design	<ul style="list-style-type: none"> <li>• Modular and flexible domain driven policy design</li> <li>• Modules will encompass data model, triggers, conditions, and actions</li> <li>• Modules can be designed via a GUI</li> <li>• Modules can be extended or built by operators</li> </ul>

- Packaged to support container-based cloud infrastructure

### Oracle Communications Solutions

- Oracle Communications Cloud Native Core, Policy, and Charging Rules Function (CnPCRF)
- Oracle Communications Cloud Native Core, Service Communication Proxy (SCP)
- Oracle Communications Cloud Native Core, Network Repository Function (NRF)
- Oracle Communications Cloud Native Core, Unified Data Repository (UDR)
- Oracle Communications Cloud Native Core, Binding Support Function (BSF)
- Oracle Communications Cloud Native Core, Cloud Native Environment (CNE)
- Oracle Communications Cloud Native Core, Network Exposure Function (NEF)
- Oracle Communications Cloud Native Core, Network Slice Selection Function (NSSF)
- Oracle Communications Cloud Native Core, Security and Edge Protection Proxy (SEPP)

Oracle Communications cloud native Network Functions enable you to manage and monetize your 5G network. You can manage and analyse quality of service and create policies for innovative services through Oracle Communications products and solutions.

<b>Run time</b>	<ul style="list-style-type: none"> <li>• Run time engine service to expose APIs</li> <li>• Run time engine service to be stateless and independently scalable</li> </ul>
<b>Testing</b>	<ul style="list-style-type: none"> <li>• Automated testing framework to enable regression and validation of policy logic and modules</li> </ul>
<b>UE Policy Service</b>	<ul style="list-style-type: none"> <li>• Provides UE policy, including Access Network Discovery and Selection Policy (ANDSP) and UE Route Selection Policy (URSP) via the AMF transparently to the UE</li> <li>• Implements UE management service-related policies over the N15 interface towards the AMF</li> </ul>

Policy Control Services supported by Oracle Communications PCF supports the following services as defined by 3GPP.

Table 2: Policy control services supported by Oracle Communications PCF

Services	Description
<b>Session management policy control service</b>	<ul style="list-style-type: none"> <li>• Enforcement control of policy decisions related to QOS, charging, gating, service flow detection, packet routing and forwarding, and traffic usage reporting</li> <li>• Policy decisions can be distributed among the User Plane Function (UPF), Radio Access Network (RAN) and User Equipment (UE) depending on the policy type and Network Slice Selection Assistance Information</li> </ul>
<b>Access and mobility policy control service</b>	<ul style="list-style-type: none"> <li>• Enforcement control of policy decisions related to Radio Access Technologies (RAT) /Frequency selection priority</li> <li>• Enforcement of Service Area Restrictions is executed in the UE</li> <li>• Enables location tracking for a UE to get periodic updates on subscriber current location</li> </ul>
<b>Policy Authorization (PA)</b>	<ul style="list-style-type: none"> <li>• Supports APP session establishment, termination and notify to terminate feature</li> </ul>

- Supports PCC rule authorization for app flow info
- Provides gating control

## Summary

In the evolution to 5G, you are making a transition from a limited policy scope to network wide policy management and moving from purpose-built hardware, monolithic software, and legacy deployment to a cloud native model. Oracle Communications PCF is uniquely positioned to meet these requirements. Oracle Communications PCF has been deployed in many networks across the globe for tier-1 operators like [DISH](#), [KT](#), [Vodafone](#) and [BT](#) etc.

Oracle Communications has combined more than a decade of experience in developing insightful policy management solution with wide portfolio of advanced cloud technologies to offer a sophisticated, robust, and scalable policy management framework for 5G.

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