

# Oracle Communications Core Session Manager

Oracle Communications Core Session Manager (CSM) enables Voice over LTE (VoLTE), Voice over Wi-Fi (VoWiFi), Rich Communications Services (RCS), fixed-network modernization, over-the-top (OTT) service integration and more. Oracle CSM is designed from the ground up to be 100% virtualized.

## Overview

Core session management functions play a critical role as the central control point directing signaling flows through the network and between the network elements. Virtualization allows service providers to efficiently share hardware resources across different services. It enables operators to manage multifaceted, multivendor networks more effectively, rapidly launch new services and easily reallocate resources with less capex and optimized opex. The Oracle CSM is designed to fully support core session management capabilities in virtualized environments for IP Multimedia Subsystem (IMS) networks. It provides a set of call session control functions (CSCF) including Serving-CSCF (S-CSCF), Interrogating-CSCF (I-CSCF) and their associated 3GPP interfaces.

Telecom networks are undergoing multiple technology and service transitions. Oracle CSM is built with a flexible architecture, allowing service providers to easily adjust, adapt, and leverage core session management for the dynamic network needs of today and tomorrow. Oracle CSM is built on a nimble signaling core for maximum interoperability and service flexibility without sacrificing reliability. Oracle CSM is fully functional with third-party IMS ecosystem products, including Home Subscriber Server (HSS) and Application Server functions.

## Virtualization and public cloud support

Leveraging Oracle's many years of experience designing virtualized products, Oracle CSM is designed from the start to run in a virtualized environment. Supported hypervisors for Oracle CSM –Virtual Network Function (VNF) include Kernel Based Virtual Machine (KVM) and VMware ESXi.

Oracle CSM supports HEAT templates for improved automation and Virtual Machine (VM) instantiation which can be used in Network Function Virtualization (NFV). Supporting a virtualized function in a public cloud requires meeting special requirements. Public clouds have very specific guidelines such as IP addressing usage, hypervisor selection and I/O mode to provide security and integrity for all its tenants. Operators can leverage the benefits of public cloud deployments by running Oracle CSM software on Oracle Cloud Infrastructure (OCI).

## Key business benefits

- Designed from the start to run in a virtualized environment
- Fully complements existing Oracle Communications Session Border Controller investments
- An extensible solution that easily scales from as little as a few thousand to millions of subscribers

## Elastic scalability

Oracle Communications Core Session Manager aligns with elastic scalability principles. Combined with Oracle Communications Session Border Controller and Oracle Communications Subscriber-Aware Load Balancer, a virtualized Oracle Communications Core Session Manager core can scale from as little as a few thousand to millions of subscribers.

## Flexible architecture

In today's dynamic market environment, the ability to quickly deploy, scale, and repurpose infrastructure assets is critical. Oracle CSM is architected to provide maximum flexibility without sacrificing standards compliance and rapid deploy ability.

## Flexible signaling engine

Oracle CSM provides a comprehensive signaling platform based on the field proven Acme Packet OS. It provides robust interoperability in real-time with granular Session Initiation Protocol (SIP) manipulation abilities. Oracle CSM signaling engine is fully programmable with scripting support, allowing more advanced session control and pragmatic session flow options. This robust field programmability helps to virtually guarantee interoperability with current and future SIP-based infrastructure elements in IMS and non-IMS environments including application servers, media servers, media gateways, SBCs and other CSCFs.

For improved performance and manageability and reduced latency, CSM provides routing control with ENUM interface support and preferential routing based on User Equipment capabilities. The Oracle CSM enhances network resiliency by supporting Stream Transmission Control Protocol (SCTP). It can communicate with the HSS using either Diameter over SCTP or TCP protocol based on the configuration. It also provides IPv4 and IPv6 interworking support for various interfaces, including Diameter interfaces. By extending support to standard interfaces, Oracle CSM is a central part of IMS ecosystem and works well with other products such as home subscriber databases, application servers and over-the-top (OTT) clients.

## Dynamic load balancing

Oracle CSM enables a single point of IP presence and uniform load balancing for service invocation in a clustered virtual machine environment (VME) and software instances within data centers. Session Load Balancer and Route Manager (SLRM) is a SIP aware load balancer, which provides a single IP entry point to Oracle CSM clusters. It also provides session-based routing capabilities and dynamic discoveries of Oracle Communications Core Sessions Managers in a virtualized environment.

## Centralized database

Oracle CSM supports a centralized subscriber database deployment. Using its Cx Diameter interface, HSS elements can be queried for network operation procedures such as subscriber authentication, service orchestration rules (for example, initial filter criteria), and serving CSCF assignment and lookup.

## Key features

- Fully virtualized solution available on commercial hypervisors
- Supports deployment over Oracle Cloud Infrastructure (OCI)
- Call Session Control Functions: S-CSCF, I-CSCF
- Dynamic load balancing support
- Support for 3GPP IMS-AKA authentication mechanism
- Routing control with ENUM interface support and preferential routing based on User Equipment capabilities
- Advanced SIP Header Manipulation Rules and DIAMETER Manipulation Rules for increased interoperability
- LST support for wildcard Public Service Identity (PSI) Routing
- Support for multiple logical registrars

## LST for wildcard PSI routing

A Local Subscriber Table (LST) is an XML formatted file that contain PSI definitions (distinct or wildcard) to be used for PSI routing (i.e., routing for services which are hosted by application server instead of end users). Since user details are available locally in LST file, this forgoes the need of relying on an external user database and helps the carrier in saving cost.

## Multiple authentication options

Oracle CSM provides multiple authentication options, with a wide range of capabilities for interfacing with older systems and newer OTT-based networks. It supports SIP DIGEST method for authentication in IMS and SIP-based networks. It also provides enhance security in IMS by supporting the 3GPP based IMS-AKA (Authentication and Key Agreement) authentication mechanism, which is based on a long-term secret key, shared between the IP Multimedia Services Identity Module (ISIM) and home network's Authentication Centre (AUC).

## Multiple logical registrars

Oracle CSM can run multiple logical networks inside a single VM. Logical partitioning of the network can be done based on sources and domains. Operator can define multiple registrars linked with different HSS in one single CSM for large IMS-based solutions spread across different geographies and/or different subscriber databases.

## Epicenter of the Oracle Communications session delivery infrastructure

Oracle Communications Core Session Manager fully compliments the Oracle Communications Session Border Controller (SBC). It can augment the Oracle SBC's Proxy and Emergency Core Session Control Functions (P/E-CSCF) at the edge, with the Serving and Interrogating CSCF (I/S-CSCF) in the core, and with standard compliant interfaces for connecting to Application Servers (AS), Subscriber Databases, and Interconnect networks. Oracle CSM is available as a pre-integrated solution with the Oracle Communications Session Border Controller, providing a rapidly deployable solution that leverages Oracle SBC's field-proven security, reliability, interoperability, and regulatory compliance features. Oracle CSM supports Transport Layer Security (TLS) for SIP to protect user and network privacy by providing authentication and guaranteeing the integrity for communications.

Oracle CSM provides the critical core session management functions required to tie together Oracle's other network session delivery infrastructure products. Combined with other Oracle Communications products, Oracle CSM completes a comprehensive session delivery solution for classic IMS, pre-IMS, and OTT-oriented networks. Oracle CSM is fully functional with Oracle's third-party network session delivery and control infrastructure ecosystem partners.

## Complete core session management

Oracle Communications Core Session Manager combined with Oracle Communications Session Border Controller provides a complete session management solution. Oracle CSM is complimented by a management and support system, real-time service monitoring, and implementation services.

## Network session delivery and control infrastructure

Oracle's network session delivery and control infrastructure enables enterprises and service providers to manage the many challenges in the delivery of IP voice, video, and data services and applications. Service provider solutions are deployed at network borders and in the IP service core to help fixed-line, mobile, wholesale, and over-the-top service providers optimize revenues and realize long-term cost savings. In the enterprise, session delivery infrastructure solutions seamlessly connect fixed and mobile users, enabling rich multimedia interactions and automating business processes for significant increases in productivity and efficiency.

The following Oracle products are part of the network session delivery and control infrastructure:

- Oracle Communications Session Border Controller
- Oracle Communications Session Router
- Oracle Communications Subscriber-Aware Load Balancer
- Oracle Enterprise Session Border Controller
- Oracle Session Delivery Management Cloud
- Oracle Communications Session Delivery Manager
- Oracle Communications Operations Monitor

### 3GPP IMS compliant functions and features

Oracle Communications Core Session Manager is 3GPP compliant with the call session control functions and interfaces indicated in the tables below.

**Table 1. Supported 3GPP IMS functions**

FUNCTION	DEFINITION	DESCRIPTION
S-CSCF	Service Call Session Control Function	Core session control proxy and registrar
I-CSCF	Interrogating Call Session Control Function	Core routing proxy, determines S-CSCF instance for registration

**Table 2. Supported 3GPP IMS interfaces**

INTERFACE	DEFINITION	DESCRIPTION
Cx	Interface to HSS database	Diameter authentication, authorization, location update and lookup
Mx	Interface to I-BCF	SIP interface to interconnect with outer IMS networks
ISC	Interface to AS	SIP interface from S-CSCF to application server
Mj/Mg	Interface to MGCF	SIP interface for sending signaling to PSTN
Mw	Interface to Access-SBC/P-CSCF	SIP interface for connection to access networks

### Management and support systems

Oracle CSM supports comprehensive embedded management via secure console. It supports access to Simple Network Management Protocol (SNMP) Management Information Bases (MIBs), historical and call data records, system configuration, protocol trace and debug, real-time log viewing, syslog, file management, software updates and more. Oracle CSM integrates with Oracle Communications Operations Monitor for end-to-end network monitoring and troubleshooting. Oracle Communications Operations Monitor captures and analyzes all required signaling messages from the network, providing CSPs with full, end-to-end call correlation and quality metrics in real time. For a simplified and more insightful way to manage Oracle Communications Session Delivery products including Oracle CSM, operators can use the SaaS-based network management solution – Oracle Session Delivery Management Cloud or the on-premises solution – Oracle Communications Session Delivery Manager.

### Professional services

Oracle's integration service for Oracle Communications Core Session Manager is a robust deployment service that offers customers a thorough and streamlined design and implementation of Oracle's network session delivery and control infrastructure solutions. It combines an array of Oracle professional services offerings into a single service solution, including pre-installation planning, project management, solution architecture and design, solution testing and certification, onsite implementation, and post implementation remote consulting.

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