

# Monetize 5G with Oracle Converged Charging System

Legacy charging systems will not cope with 5G demands in terms of performance, scalability and new business models. Oracle Converged Charging System allows service providers to monetize 5G with operational excellence. Realize your 5G business strategy more consistently and reliably than the competition, at any scale.

## Deliver digital innovation with operational excellence

5G means doing things differently. Transform the user experience with real-time charging and spend control. Carve out network slice opportunities. Pioneer B2C, B2B and B2B2X services and ecosystems. Drive IT principles into the network to unleash cloud native agility. Monetize 5G with Oracle Converged Charging System (CCS) – the 5G-ready cloud native CCS with industry-leading in-memory data grid technology. Deliver digital innovation with operational excellence.

Oracle CCS has been designed with the 5G future in mind. It is built on industry-leading data technology, such as Oracle database and Oracle Coherence – the industry-leading in-memory data grid technology. Oracle CCS is aligned with the 5G service-based architecture and offers converged charging as a functional component of a billing and revenue management system that is feature rich, network grade and extensible. It is available in a DevOps aligned cloud native deployment model to significantly reduce costs and accelerate innovation.

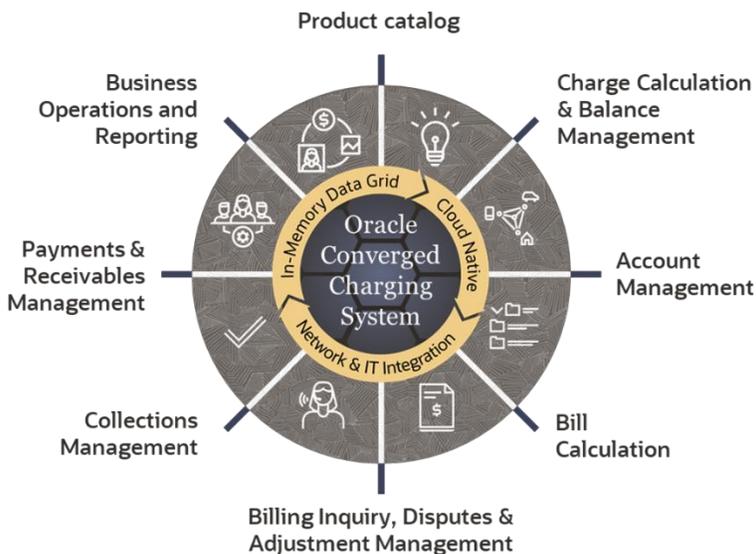


Image 1. Oracle provides converged charging and end to end revenue management

## Key Business Benefits

Monetize 5G with Oracle Converged Charging System – the 5G-ready cloud native CCS with industry-leading in-memory data grid technology. Deliver digital innovation with operational excellence.

- **Ready for 5G charging demands.** In-memory charging grid providing ultra-low latency, elastic scalability and unrivalled service continuity.
- **Harness IT agility and efficiency.** Cloud native deployment option takes advantage of modern compute and infrastructure environments.
- **Monetize value-based digital offers.** Combine charging models for the 5G multi-slice future with real-time experiences powered by open APIs.
- **Efficiently manage the entire revenue lifecycle.** Integrated billing, invoicing and revenue management to support any business model.

## 3GPP compliant charging system (CCS)

Oracle CCS is highly configurable and provides sophisticated online and offline converged charging for any service, segment and payment model.

**Advanced 4G and 5G data session charging.** It reduces core network loads and enhances customer experience with adaptive quota allocation that avoids quota starvation and hoarding by automatically adjusting the quota sizes and expiration times. It further supports long running session charging with predictable and un-predictable rating condition changes and online charging re-rating with uninterrupted usage processing.

**Compliant with 3GPP Release 15.** Oracle CCS supports 5G converged charging architecture in both standalone (SA) and non-standalone (NSA) 5G core networks using an HTTP/2 and Diameter gateway. SIGTRAN-CAMEL (circuit-switched voice and SMS) is also supported through Oracle's Convergent Charging Controller (OC3C).

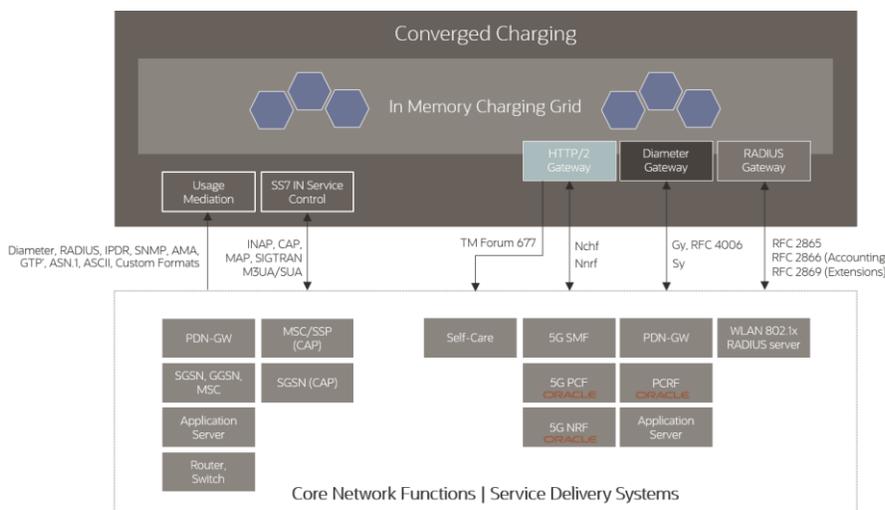


Image 2. Direct core network integration with any 4G or 5G network (NSA & SA)

## Ready for 5G charging demands

Oracle CCS is powered by Oracle Coherence, an in-memory data grid technology which enables extreme performance, elastic scalability and cutting-edge service continuity in the event of any failure.

### Not just a cache

A traditional database application will move large amounts of data from the database to the processing which results in additional latency. Oracle Coherence provides an infrastructure which permits extremely large in-memory distributed data grids. In this way, Oracle CCS uses Coherence to practically eliminates data-access times by executing “where the data is” – it co-locates processing and data, so the focus is on compute rather than communicate. All subscriber and tariff information are located in-memory, in the charging grid, so that extreme levels of transactions can be supported with minimal latency – key or 5G charging.

### Key Product Features

- 3GPP compliant CCS supportive of both SA and NSA 5G core networks
- In-memory charging grid enabling extreme scalability with cutting-edge resiliency
- TM Forum certified pricing UI designed for the business user with intuitive, web-based navigation workflows
- Rate any metric or attribute
- Support any payment option
- Authorize all transactions in real-time
- Consumer, enterprise and partner support with full partner settlement across complex value chains and network slices
- Modern architecture with cloud native foundations supporting DevOps agility and efficiency
- Comprehensive billing, revenue collection and revenue analytics
- Compliance to ASC606/IFRS15 for contract management and revenue recognition
- Modern, secure web-based Billing Care and Business Operations Center applications
- Productized software that can be extended by developers with a fully documented and supported software development kit
- API framework to integrate with external applications such as self-service web apps, notification platforms, order provisioning, customer care and policy management
- Active-Active Disaster Recovery
- Kafka notification framework, Prometheus and Grafana metrics monitoring support

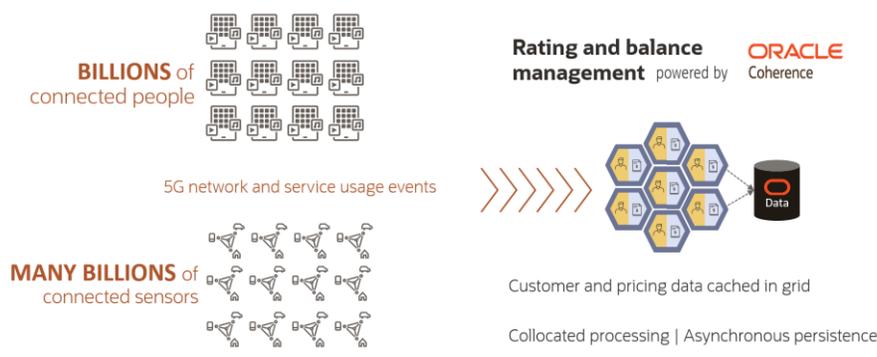


Image 3. Oracle provides an in-memory charging grid, engineered for extreme performance

**Grid scales up with optimal latency and throughput**

The in-memory data grid can grow organically from few to dozens of nodes by harnessing additional data storage and/or processing capacity. Data is balanced across the grid to ensure load is evenly distributed for optimal latency and throughput. This means Oracle CCS can scale as required from hundreds of transactions per second to many thousands of transactions per second.

**Active-active multiple site deployment using Coherence federation**

Coherence can be extended across multiple data-centers while providing a near real-time copy of the entire grid for disaster recovery purposes. This means Oracle CCS can uniquely ensure that calls are never dropped, and accumulated data is never lost if any process fails (nodes, machines and site failures) by taking advantage of automatic resiliency of all data across a geographically distributed data grid.

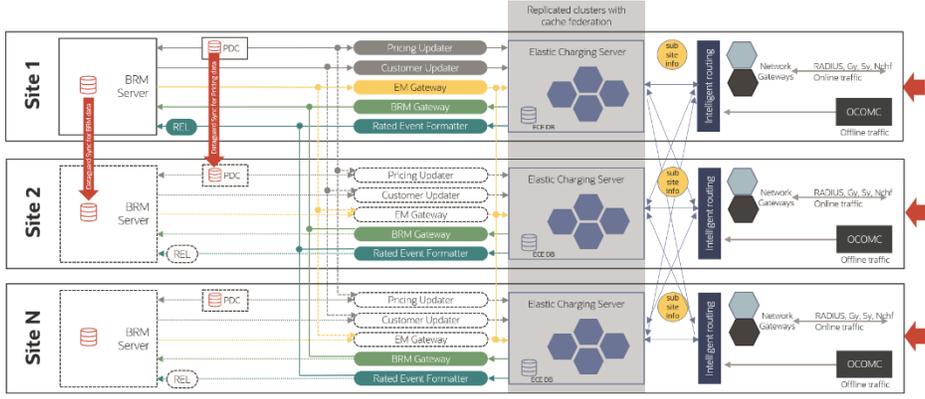


Image 4. Oracle Converged Charging System provides unique active-active multi-site deployment

Oracle CCS supports comprehensive multiple site charging deployment options and uniquely supports active-active mode: all sites are running all the time, so any traffic from any user can be handled by any server. Active-active results in less risk in the event of fail over to another site because the entire system is always running. Every subscriber is configured with a preferred site, and Intelligent routing ensures the preferred site is always used for processing when the site is available – this allows latency to be further optimized, as processing

**Oracle Coherence**

Oracle Converged Charging System is powered by Oracle Coherence – a key benefit over alternative solutions with home-grown propriety models

- The first and industry leading in-memory data grid
- Huge R&D technology investment from Oracle
- Scaling critical enterprise applications for nearly two decades (since 2002)
- Proven in other very demanding environments (such as financial trading)
- Constant improvements to resiliency and performance through the combined test/feature requirements of hundreds of other uses

**Related Offerings**

Oracle Converged Charging System is commonly deployed alongside:

- Oracle Digital Experience for Communications – Launch Experience
- Oracle Digital Experience for Communications – Care Experience
- Oracle Communications Offline Mediation Controller
- Oracle Communications Policy Management

**Comprehensive Multiple-Site Charging Deployments**

Engineered options to meet your business continuity needs:

- Active – warm standby
- Active – hot standby
- Segmented active – active
- Active - active



can be organized across sites and chosen based on a geographically distributed grid with full bi-directional replication enabled by Coherence federation.

## Harness IT agility and efficiency

**Cloud native deployment.** Oracle CCS is broadly aligned with the TM Forum Application Framework (TAM) and provides a multi-service, containerized and Kubernetes-orchestrated architecture that integrates into any CSPs cloud native environment of choice. Each Docker container image is designed for a specific task or service, for example online charging, billing care, pricing design and business operations. Each service is containerized into a POD (an atomic deployment unit for Kubernetes). Customers can use Docker to spin up containers and Helm is used to provide packaging which aids deployment. Kubernetes is then used to manage the PODs and to perform orchestration.

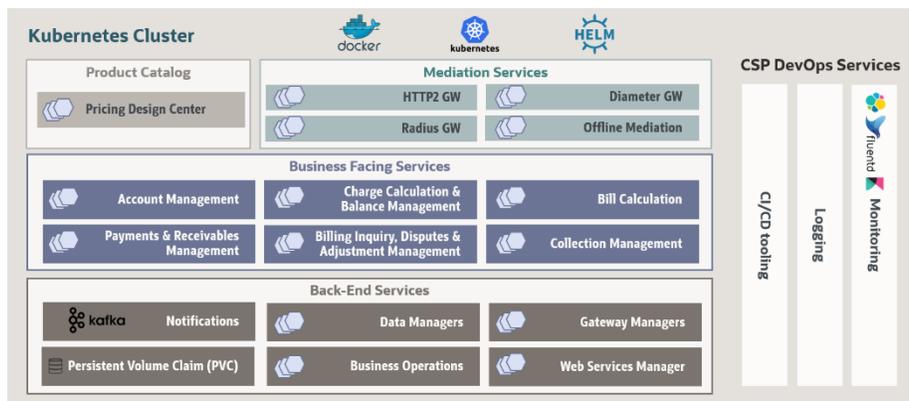


Image 5. Oracle Converged Charging System is broadly aligned with TAM and provides cloud native deployment with customer choice of CNE

**Harness DevOps to enables faster and more reliable releases.** Oracle CCS integrates with any CI/CD pipeline and DevOps methodology -an agile approach which allows development and operations teams to work closely together on the full end-to-end process. In this way, services are delivered quickly, first-time and without any services going down: a key requirement to thrive in 5G with rapid business model exploration.

**Operate efficiently.** Oracle CCS enables service providers to maximize compute utilization and seamlessly manage growth using simpler updates and efficient scaling. It can be deployed on any private cloud behind a firewall as well as any public cloud infrastructure. For rapidly launching new 5G services, Kubernetes can be used to spin up additional multi-replica services when needed and taken down when services finish – such as to support a 5G-enabled stadium concert over the weekend.

**Simple updates.** Upgrading traditional software has always required non-trivial planning to offset risk with some planned downtime. Now Oracle’s cloud native CCS enables customers to quickly benefit from the latest innovations uses Kubernetes services and deployments to enable simpler updates and configuration changes with minimal to zero downtime.

## Key Cloud Native Features

The following services support Oracle Main Product:

- Kubernetes-orchestrated containerized multi-service architecture
- Container runtime provided by docker
- Helm charts simplify installation of BRM and its dependencies into a Kubernetes cluster
- Choice of Oracle database: physical or containerized
- Incorporate the EFK stack for centralized logging and visualization comprising Elasticsearch, fluentd and Kibana
- Utilize any CI/CD pipeline to support the rapid launch of differentiating services
- Incorporate BRM configuration and extension support
- Deploy on any private cloud behind a firewall or any public cloud infrastructure
- Best deployed on Oracle's industry-leading Cloud Infrastructure with its autonomous capabilities, adaptive intelligence and machine learning cyber security
- Supports industry standard cloud native technologies for volume / cluster networking and logging and monitoring
- Kubernetes services and deployments to enable simpler upgrades and configuration changes
- Efficient scaling utilizing Kubernetes inbuilt horizontal scaling

## Monetize value-based digital offers

Oracle CCS allows service providers to combine new charging models for the 5G multi-slice future with real-time experiences powered by open APIs.

**Innovate.** Launch compelling consumer offerings by creating personalized offers, plans, and subscriptions that comprise metering, unlimited data with speed tiering, spending limit control, content bundles and dynamic sharing / gifting. For IoT-focused offerings, incorporate new pricing metrics aligned to the value of the CSP's role in the ecosystem such as content type, IoT device, business outcome, uplink/downlink, and provisioned 5G network slice (which can be tailored to customer requirements around factors such as QoS, speed, latency, security, mobility and reachability).

**Real-time experience.** Publish real-time notifications using a JMS or Kafka notifications framework based on triggers such as threshold breaches, spend control, low balance, offer purchases and lifecycle changes.

**Digital self-care.** Oracle is a signatory and board member of the TM Forum Open API manifesto. Oracle CCS follows an API-first approach and is aligning with TM Forum Open APIs. Open APIs and a rich API framework enables integration with customer experience and mobile self-care applications to enable a precise, up-to-date view of all balances, subscriptions and transaction history.

## Efficiently manage the entire revenue lifecycle

You need more than a standalone charging system to unlock new revenue opportunities. Oracle CCS provides integrated billing, invoicing and end revenue management to support any business model with low OPEX.

- TM Forum certified Pricing Design Center to rapidly design and deploy simple or complex 4G/5G offers and promotions
- Integration framework and data model support for product catalogs that expose TMF 620: Product Catalog Management Open API.
- Support for recurring subscriptions and one-off purchases with flexible contract management to handle the complexities of revenue recognition (ASC606/IFRS15)
- Single unified solution for B2C, B2B and B2B2X
- Partner settlement across complex multi-party value chains
- Comprehensive management of collection, account receivables, taxation and general ledger integration
- Business Operations Center to enable the creation, scheduling and viewing of results for operations related to billing, payment collection, invoicing, GL reporting, product catalogue synchronization and refunds
- Comes with pre-configured and customizable reports including analysis of usage, subscriptions, customer behavior, revenue assurance and G/L.

## TM Forum Open API Aligned Rest End Points

- **TMF 677: Usage Consumption API.** Provides balances and consumption counters
- **TMF 678: Customer Bill Management API.** Generate bill on demand. Retrieve one or more customer bill, invoice
- **TMF 666: Account Management API.** Retrieve one or more bill unit details for an account
- **TMF 654: Prepay Balance Management API.** Create balance adjustment, create dispute. Retrieve one or more adjustment balance, dispute balance, bucket balance
- **TMF 676: Payment Management API.** Create payment. Retrieve one or more payment info. Allocating payment to a bill TMF 635: Usage Management API. Retrieving one or more usage event details
- **TMF 620: Product Catalog Management Open API.** Integration framework and data model support for 3rd party product catalogs.

## Oracle 5G Now Portfolio

Built with TM Forum aligned Open API aligned REST end points, the Oracle CCS is part of Oracle's complete 5G Now portfolio

- Full revenue management
- Digital experience
- Network slice orchestration
- Service fulfillment
- Partner ecosystem enablement

## Summary

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- **Harness IT agility and efficiency.** Cloud native deployment option takes advantage of modern compute and infrastructure environments.
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### 5G Whitepaper

“Learn How 5G Technology and Future Business Models Will Impact Revenue Management Systems”

[Read now >>](#)

### Learn More

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