Transformation from Legacy IN to Next Generation IN (NGIN) Infrastructures

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Oracle Communications Service Delivery Products
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Next Generation Intelligent Networks

Key Takeaways

• The combination of Oracle and BEA has resulted in a Service Delivery product portfolio that leads the industry.
• Together with Convergin, Oracle offers a software-based Next Generation IN (NGIN) Infrastructure solution targeting the SCP Replacement Market.
• Standards-based IN Prepaid solution with Oracle BRM, Oracle Communications Converged Application Server, and Convergin Accolade WCS running on commercial off-the-shelf hardware.
Oracle Communications Solutions
Complete Footprint

- ERP and Enterprise Management
- Customer Relationship Management
- Billing and Revenue Management
- Order Management
- Inventory Mgmt
- Service Activation
- Service Delivery Platform
- Application Integration Architecture
- Integration
- Master Data Management
- Fusion Middleware
- Infrastructure
- Carrier Grade Framework
Convergin is global leader in SCIM and Service Brokerage

8 Years in the network mature products deployed in the core of telecom networks

Partner of Oracle for network mediation and orchestration

Over 15 deployments in mobile, fixed, NGN and MVNO carriers

Comprehensive OOTB support for connectivity into legacy network and service platforms
Market Opportunity Drivers

1. Legacy SCP End of Life
2. Reduced OPEX
3. Deliver Service to Additional Networks
4. Expanded/New Service Logic

Legacy SCP
- Application Specific Service Logic
- On-board Database
- Single IN Protocol Transaction Processing
- Proprietary SS7 HW
- Proprietary Platform
Customer targets

- Service providers that need to replace legacy IN Service Control Point (SCP) infrastructure products reaching end-of-life.
- Service providers that want to adopt a “Cap and Grow” strategy for CS networks.
- Service providers that need to re-implement existing revenue generating services (e.g. Prepaid, VPN, Toll Free Calling, Voice Calling with Announcements).
- Service Providers that look for solutions to enable more converged Web and Telco services for both legacy and next-generation networks.
- Service Providers that are looking for NGIN alternative to legacy IN to reduce operating cost.
- Service providers that look for a Standards-based Service Delivery solution for deploying new services.
- Service providers that are Oracle BRM customers and look to replace an old IN Prepaid solution.
Oracle Communications and Convergin joint NGIN solution overview
Next Generation IN vs. Legacy IN

- Legacy SCPs are well integrated for their defined network functions, and lack the flexibility and openness of IT platforms.

- Next Gen IN is based on an extended Converged Application Server containing all network capabilities and robustness, yet with the breadth of software adaptors for building new services in a flexible and rapid way, integrated to OSS/BSS assets.
A Comprehensive NG-IN Offering

Converged Communication Network

Converged Application Server for NG-IN
- Applications
- Service Mediation
- J2EE Based Application Server
- Network Mediation
- Off-the-shelf HW and SW Platforms

Converged On-Line Charging
- Offline & Online Charging, Rating, & Billing

Service 1
Service 2
Service N

Accolade WCS
Linux, Solaris
HP, Sun, IBM, Others

OCCAS

BRM

Proprietary & Confidential
Migration from Legacy to Next Gen Solutions
The Oracle-Convergin NG-IN Offering

- **Fixed Networks**
  - INAP, AIN, TCAP

- **Mobile Networks**
  - CAP, INAP, WIN

- **NGN/IMS Networks**
  - SIP, ISC, Diameter
MIGRATION PATH: Next Gen SCP

- Short time to market, lower cost of service introduction
- Leverage and Expand Existing Services
- Replace EOL SCPs
- Deliver Services across Network Domains

Fixed Networks
INAP, AIN, TCAP

Mobile Networks
CAP, INAP, WIN

NGN/IMS Networks
SIP, ISC, Diameter
MIGRATION PATH: Converged Charging

Replace Prepaid SCP to Converged Charging

Deliver Services across Network Domains

Fixed Networks
INAP, AIN, TCAP

Mobile Networks
CAP, INAP, WIN

NGN/IMS Networks
SIP, ISC, Diameter
Summary

• Allowing Next Gen IN service delivery based on Oracle Standards based J2EE Converged Application Server, enabled with Convergin Accolade WCS Service Mediation and Orchestration Capabilities

• Carrier grade, Flexible, and Standards based environment to enable:
  • Migration of SCPs to SDP based Next Gen IN
  • Migration of Prepaid SCPs to Converged Charging solution
  • Fixed & Mobile Convergence – Unified Service Delivery!
  • Prepaid & Postpaid – Unified Charging!
Architecture Highlights
J2EE Centric NG-IN Solution

J2EE/JSR289 Converged Application Server

- Telco OA&M
- Service Orchestration
- SS7 TDM & Sigtran
- Charging Mediation
- Service Mediation
NG-IN Architecture Highlights

Enterprise Service Bus

On-Line Charging and Rating

OCCAS J2EE/JSR289 Converged Application Server

Converged Application Server

App

Prepaid Services

J2EE Converged Container

MSC

SSP

SSW

CSCF

Proprietary & Confidential
NG-IN Architecture Highlights

**IM-SSF**
Connecting to Legacy SCPs
- Northbound **Stateful** adaptors allowing the invocation of external service logic from Legacy SCP
- Invokes services off an SCP for any call/session routed through the Converged Application Server

**IM-SCF / Reverse IM-SSF**
Connecting to Legacy Network
- Southbound **Stateful** network adaptors to allow new logic over legacy networks
- Interacts with an MSC (or SSP) for service logic, running as Servlets on the Converged Application Server
NG-IN Architecture Highlights

- **Orchestration Engine (OE)**
  Creating composite/blended services
  - Acting as the Application Router of the Converged Application Server
  - Handles service compositions based on a variety of composition engines
  - Orchestration Profiles loaded from on-board DB, from HSS, or any other profile source

- **Enhanced Orchestration**
  Linking SOA and Telecom Services
  - Orchestration Engine can invoke BPM engine to invoke composite services based on dynamic scenarios
  - Web Services based service orchestration
  - User Status and User Balance can affect service delivery
NG-IN Architecture Highlights

- **IM-OCF**
  Prepaid Charging adaptor for OCS
  - Allowing real-time charging and balance control for all calls/sessions routed through the Converged Application Server
  - Can be invoked any time in the service execution (or multiple times, when conditions change)
  - Uses the Oracle Converged Application Server Diameter Ro (IMS-Standard) to interact with the Oracle BRM Online Charging Server
NG-IN Architecture Highlights

**Prepaid SCP, NG-IN Replacement**
- Migrate Prepaid SCP to Converged Prepaid-Postpaid environment
- Existing Services can still be invoked from legacy SCPs
- Converge Wireline and Wireless under converged solution
- *SIs: Develop apps via Servlets that enrich and customize services behaviour to end-customers*
Unified Administration and Configuration
NG-IN Solution for Converged Charging, Prepaid and Credit Control
Converged Prepaid-Postpaid Solution
Real-Time Charging Applications

Real-Time Prepaid Call Control Applications

- Configurable service behavior for Prepaid users based on profiles and scenarios (e.g. credit scenarios, call scenarios, subscribed services, etc).
- Online charging of Originating, Terminating, Forwarding, Voice Mail Diversion, SMS trigger, etc.
- Support both switch based and on-board charging timers
- Provides the foundations for advanced credit control services (parental control, etc.)

Real-Time User Interactions Applications

- Pre-call, mid-call, post-call interactions (e.g. Credit status, Time left warning, recharge proposal)
- IVR sessions management for user interaction scripts (e.g. top-ups, balance checks)
- Support for industry media server control standards for IMS (MRF) or for legacy (Intelligent Peripheral/SRF)
- Support for multiple branding based on subscriber profile
# Protocol Support for Legacy SS7 Networks

## SS7 TDM and SIGTRAN Based

### Comprehensive SS7 Protocol Support

<table>
<thead>
<tr>
<th>Network</th>
<th>Protocol</th>
<th>OOTB Connectivity Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile GSM/UMTS</td>
<td>CAMEL phases 1-4</td>
<td>MSC Connectivity (SCP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Legacy SCP connectivity (SSF)</td>
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<td>Wireline &amp; Mobile</td>
<td>INAP CS1 (and vendor specific</td>
<td>MSC/SSP Connectivity (SCP)</td>
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<td></td>
<td>variants)</td>
<td>Legacy SCP connectivity (SSF)</td>
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<tr>
<td>Wireline (North America)</td>
<td>AIN 0.1, 0.2</td>
<td>SSP Connectivity (SCP),</td>
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<td></td>
<td></td>
<td>Legacy SCP connectivity (SSF)</td>
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<td></td>
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<td>Legacy TCAP Access (800, LNP, CNAM, LIDB, etc.)</td>
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<tr>
<td>Mobile CDMA/1x/EVDO</td>
<td>WIN IS-771, IS-826</td>
<td>MSC Connectivity (SCP),</td>
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<td></td>
<td></td>
<td>Legacy SCP connectivity (SSF)</td>
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<td>Mobile GSM/UMTS Core</td>
<td>MAP</td>
<td>HLR, SMSC Connectivity</td>
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<td>ANSI 41C/D</td>
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NG-IN Converged Prepaid-Postpaid Services Architecture
E2E Availability Architecture Highlights
Example: Prepaid-Postpaid Unified Services Solution – with Custom-built Services

• **The All-In Family Pack**
  - Home (broadband or legacy) phone
  - Up to 5 mobile phones, some of which are Prepaid phones or limited spending per month
  - IPTV & On-Usage paid VOD Service

• **Using NG-IN Converged Solution, a wide range of services is delivered**
  - Single account for all usage, on-line charging of Voice and Data services
  - Short-dial within the Family (VPN-like service)
  - Branding and Promotions announcements
  - Social networking (WS) – allow discounted calls for users who are now online on the Operator’s PortalNet
  - Call grabbing between home (shared) phone and personal mobile phone – applying the HomeZone rate!
  - ...and more!
Customer Use Case
Customer Case Study
Communications Network Operator, Canada

Business Overview:
• Over 700,000 wireline and wireless subscriber base
• Legacy IN infrastructure currently runs key revenue-generating services including prepaid, VPN, and closed calling groups
• Company objective to reduce Operating Expenses of key revenue-generating services by 50% or more
• Evolution to full SOA (Service Layer) and IP (Network Layer)

Solution Imperatives:
• Replace in-house prepaid SCP, legacy IN infrastructure, with Next Generation IN solution
• Enhance service offering with connectivity to web services
• Support rollout of new UMTS network alongside CDMA network

Technology Implemented:
• Oracle-Convergin NG-IN Solution
  • OCCAS
  • IM-SCF CAP, IM-SCF WIN
  • OE - 3GPP IFC OLP
  • IM-OCF
Customer Solution Deployment Elements

Migrate and Enhance
Multi-Network – CDMA alongside IMS, and UMTS
Existing Service Logic Migrated
New Services Created: Credit Control, Call Mgmt
Full Web Services integration with OSS/IT

Legacy SCP

Wireless Prepaid with VPN, Closed User Groups, Call Restrictions, and Friends & Family Services

Converged Application Server

J2EE Converged Container

CAP IM-SCF
WIN IM-SCF

VPN, CUG, Private Num Plan
BW List, Call Restrictions
Credit Control
Calling card
Prepaid

IM-OCF

CDMA

CDMA

UMTS

NGN/IMS

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Customer Case Study
Communications Network Operator, Canada

Core Network

Mobile devices

SGW

NGIN SSU

NGIN PN

NGIN PN

NGIN PN

MSC

IP

SS7/SIGTRAN

GSM/3G Wireless

SOAP/Diameter

OSS/BSS

LB
Oracle & Convergin
Converged Charging Demo
Demo Network Setup

- SOAP
- CAP
- Diameter

- Home MSC
- Accolade WCS (o/ OCCAS)
- Existing SCPs

- CAPv2
- CAPv3
- Diameter
- Ro
- WS

- Visited Network
- Visited MSC
- BRM
- OCSG
Message Flow Example

Oracle Billing and Revenue Management
- Rating
- Billing and Invoicing
- Balance Tracking

Oracle Web Portal
- Customer Portal

Oracle Communications Service Gatekeeper

OCCAS Converged Container

Convergin Accolade WCS
- WCS IM-SSF
- WCS IM-OCF

MSC
- GSM Network
- Setup
- Setup (from A)

Mobile A
- IDP
- Connect

Mobile B
- IDP
- RRB,Conn (A → B-Number)

OE
- Implement the real time service orchestration for the call across the SCP/BRM and other apps

Oracle Web Portal
- Customer Portal

Oracle Billing and Revenue Management
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Message Flow Example

GSM Network

Mobile A

Mobile B

ERB (oanswer)

Diameter: CCR

Diameter: CCA

Continue

Answer

During the call, user account is updated in real time according to usage and call progress
Message Flow Example

Oracle Web Portal

Oracle Billing and Revenue Management
- Rating
- Billing and Invoicing
- Balance Tracking

Oracle Communications Service Gatekeeper

OCCAS Converged Container
- Diameter: CCR
- Diameter: CCA

Convergin Accolade WCS
- WCS IM-SSF
- WCS IM-SCF

MSC

GSM Network

Mobile A

Mobile B

Sends SMS with the user’s balance

Queries for user’s balance

Your Pre-Paid Balance is now: $3.98.
To recharge your account click the link www.brmaervice.com/account=75

ERB (odisconnect)

Continue

Disconnect

WCS IM-SSF

WCS IM-SCF

Rating

Billing and Invoicing

Balance Tracking

Rating

Billing and Invoicing

Balance Tracking

Rating

Billing and Invoicing

Balance Tracking