Oracle Communications
Network Service Orchestration Solution

Rapidly deploy and scale NFV-enabled services or simplify and automate core networks transitioning to NFV with the Oracle Communications Network Service Orchestration (NSO) solution. Using the solution’s feature-rich, extensible and product-based approach, Communications Service Providers (CSPs) can rapidly design and automate the lifecycle management – including deploy, scale, heal and terminate – of evolving network services in complex virtual and physical networks.

**NFV Challenges**

CSPs are looking to quickly deploy and generate new revenues. Some CSPs are first focused on evolving their offers with NFV-based services such as vCPE, vFirewall and vHG, while others are targeting the transformation of their core network infrastructure to Cloud technology. As CSPs begin to transform, they are reporting these challenges:

- Service-specific solutions with limited abstractions and flexibility
- Poor integration to upstream management systems
- Immature and evolving VNFs
- Inability to orchestrate across hybrid networks
- Support growing multi-vendor complexity

**Solution Overview**

The Oracle Communications Network Service Orchestration solution fully integrates with existing Business and Operational Support Systems (BSS/OSS), other end-to-end orchestrators and/or service portals empowering Enterprise customers to manage their services (physical and virtual equally).

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**Key Features**

- Visual design of network services and rapid on-boarding with network service and VNF templates
- Carrier-grade, dynamic service and resource orchestration engine for complex scenarios
- Automated creation of network forwarding paths for service chaining
- Hybrid virtualized & physical device support
- Open RESTful API for integration with BSS/OSS, analytics and policy engines, self-service portals, etc.
- Extensible plug-in cartridges for multi-vendor VNF Managers, VNFs, EMSs, VIMs and SDN Controllers.
- Part of Oracle Intelligent Orchestration Framework for automated lifecycle transitions
- Federated design approach aligned to industry standards across OSS and NFV orchestration Pre-integrated with Oracle Communications OSS and NFV solutions

**Key Benefits**

- Rapidly launch revenue-generating NFV-based services with extensible, product-based approach
- Increase market agility with built-in templates and metadata-driven design-time methodology
- Differentiate services with rapid integration of multivendor NFV
It orchestrates, automates and optimizes the lifecycle of any network services and VNFs along with their required virtual and infrastructure resources through real-time coordination with Virtual Network Function Managers (VNFM), Element Managers (EMS), Virtualization Infrastructure Managers (VIMs), and SDN controller thereby turning ETSI’s NFV MANO functional architecture into a productized, deployable reality.

Network Service Lifecycle Management

The Oracle Communications Network Service Orchestration solution uses: 1) a design-time environment to design, define and program the capabilities which are “developed” once and “used” many times and 2) a run-time execution environment to execute the logic programmed in the design environment for uniform delivery and lifecycle management.

**NSO Solution Lifecycle Flows**

During the Design Time framework, one of the solution’s key differentiators is its flexibility to model in a structured approach Network Services, VNFs, associated virtual and infrastructure resources, configuration requirements, thresholds, lifecycle actions, policies, etc. This onboarding process-driven approach comes with full lifecycle management and versioning.

**VNF vendor / system designer info**

<table>
<thead>
<tr>
<th>Lifecycle actions and parameters</th>
<th>Business Interaction model</th>
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<tbody>
<tr>
<td>Parameters and validation for lifecycle requests</td>
<td>– What is to be entered via portal / API call</td>
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**Structural details**

| – VDUs and their resource requirements | Service and Service Configuration model |
| – VNF Topology (internal & external connectivity) | – Each VDU is listed in the service configuration. Specify flavor (e.g. small/medium), number of instances |

| Dynamic model | ‘Design and Assign’ and ‘Calculate Technical Actions’ rulesets |
| – Design rules | – Covers all requirements for lifecycle actions with southbound systems |
| – Policies for scaling and healing (includes KPIs, thresholds, actions) | |

**VIM/ VNFM/ EMS/ SDN controller artefacts: system images, configuration files, HEAT/vApp templates**

| Adapted configuration files, Heat/ vApp templates |

**Table 1. Example of VNF details captured in the NSO solution catalog for on-boarding.**
During run-time execution, the Oracle Communications Network Service Orchestration solution enables service providers to:

- Instantiate and configure network services and their constituent, interconnected VNFs including all required resources.
- Manage network services/VNFs scaling, healing and termination. This can include the specification of customer network traffic flows ("network forwarding paths") using the SDN Controller as part of the orchestration of the end-to-end service, or during load-balancing for example after a scaling action. The run-time function executes the onboarded lifecycle actions automatically or via manual steps. The graphic below shows how additional gaming server VMs can be added to support the processing load for a gaming network service.

**Figure 3. On-demand elastic scaling example for a gaming network service.**

- Lifecycle rules and logic (i.e. which action to take) are monitored and triggered by: existing OSS assurance solutions, open source solutions (e.g. Ceiometer) or advanced policy and analytics solutions. When an action is received, the solution automatically reconfigures the network to enable closed-loop and elastic scaling of the network service.
- Integrate with complementary components within a broader solution footprint using RESTful APIs (Web Services) for automated operation.

**Oracle Intelligent Orchestration Framework**

The Oracle Intelligent Orchestration Framework is an industry-defining approach to NFV that orchestrates services, applications and network elements with guidance from policy management and insights from real-time analytics with a flexible Oracle or third party mix and match approach.

The framework gathers and analyzes network performance information, evaluates the network’s operation against predefined policies and business rules, and automatically triggers the Oracle Communications Network Service Orchestration solution to appropriately modify the behavior of services, network functions, and virtualized

**RELATED PRODUCTS**

Supports intelligent network service orchestration integrated into key operational processes:

- Oracle Communications Application Orchestrator
- Oracle Communications Rapid Service Design and Order Delivery
- Oracle Communications Network Resource Management
infrastructure – in a closed loop manner.

Figure 2. The NSO Solution within the Oracle Intelligent Orchestration Framework

**Rapid Path to NFV**

The Oracle Communications Network Service Orchestration solution helps CSPs accelerate their evolution to NFV in multiple ways:

- Seamless extension of Oracle OSS solution to support the rapid introduction of virtual network functions alongside physical network functions and the zero-touch fulfillment of end customer services on the hybrid infrastructure. The NSO solution is pre-integrated through a common design-time framework and information model aligned to the TM Forum SID.

- When combined with the pre-integrated Oracle Application Orchestrator (VNFM) and Oracle VNFs, the overall solution can be deployed faster and automate complex core vIMS (VoLTE, VoWiFi) network scenarios.

- As part of the hybrid or virtualized multi-vendor NFV solution (VNFs, EMSs, VNFMs), the NSO solution orchestrates the end-to-end network domain with an open integration framework for any third party tool, including assurance, policy and analytics or upstream OSS.