Cloud Operations Manager

Release 24

Nokia Cloud Operations Manager automates lifecycle operations of containerized network functions (CNFs), virtual network functions (VNFs), and network services (NSs). It optimizes and governs platform resource usage and is designed for distributed, multi-tenant, multi-vendor cloud infrastructures.

Overview

Telco applications are increasingly leveraging cloud-native principles, which will often co-exist with VNFs. Multiple integrated applications provide an inter-related service as application suites or engineered systems such as VoLTE or core networks. Cloud Operations Manager automates the lifecycle management of such hybrid networks to achieve agility and cost savings. It provides the following main functions:
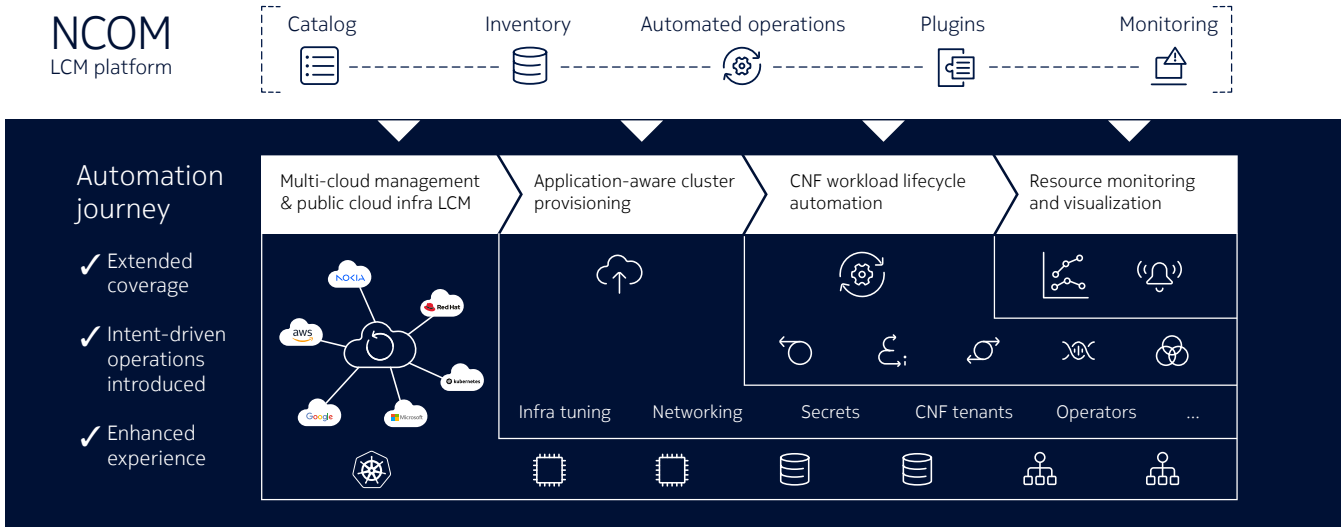
- **Lifecycle management of 5G Core CNFs**
- **Unified lifecycle management, centralized monitoring and visualization** of CNFs, VNFs and NSs
- **Unified cloud infrastructure management** of multiple, geographically distributed Kubernetes and OpenStack cloud infrastructures

- **Resource orchestration:** creation and management of cluster resources
- **Infrastructure LCM:** create, upgrade, terminate Kubernetes CaaS. AWS EKS cluster LCM can be performed using AWS IaaS APIs

The functions shown in figure 1 are delivered by a set of microservices. Plug-ins and open APIs ensure maximum flexibility by enabling it to work with the cloud infrastructure from any vendor.

Cloud Operations Manager is pre-integrated with Nokia Container Services (CaaS), CloudBand Application Manager (VNFM) and CloudBand Infrastructure Software (VIM and NFVI). Nokia Professional Services offers integration services for components from other vendors.

Figure 1: Cloud Operations Manager - functional view

Benefits

Unified lifecycle management

- Simplified modeling of CNFs, VNFs and NSs

- Lifecycle management automation of CNFs, VNFs and NSs (create, deploy, terminate, upgrade, rollback, scale, heal)

- Simplified creation and management of complex service function chains

Centralized monitoring and visualization

- Single-pane-of-glass to monitor the status of CNFs, VNFs and NSs

- Drill-down to the details of the constituent resources

- Enhanced assurance with resource monitoring, topology and root cause analysis for CNFs, VNFs and NSs

Unified cloud infrastructure management

- Simplified management of large-scale, multi-tenant, multi-site, multi-vendor, multi-VIM / VNFM / SDN-C NFV clouds and Kubernetes CaaS

- Off-the-shelf integration of multi-cloud Kubernetes CaaS: Nokia NCS, RedHat OpenShift, AWS EKS , Google GKE and Microsoft AKS

Resource management

- Automation of pre-requisite (Day -1) tasks needed for CNF, VNF and NS deployment including:

  - Identity management (namespace/tenants, projects, users, etc.)

  - Resource configuration (VM flavors, etc.)

  - VNF package management (central VNF catalog, image distribution to VIMs, etc.)

  - CNF secret management.

- Automation of resource lifecycle management and maintenance operations such as upgrades, patch distribution and batch configurations

Deployment and operation

- Alignment with open source upstream for rapid innovation, lower costs, without vendor lock-in

- User-extensible plugins and open APIs allow easy integration with third-party elements.

- Standalone deployment or integrated into full Nokia stack (NFVO, VNFM, SDN-C, VIM, CaaS)

- End to end automation going well beyond CNF LCM with full lifecycle management of Kubernetes CaaS

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Features and benefits	
Addressing the full operational spectrum of NFV and cloud-native domains	• Day -1: All infrastructure preparations before service or application can be deployed / instantiated • Day 0: Delivery of service or application into the network domain • Day +1: Ensuring service or application is operating with the right SLAs
Pre-integrated with Nokia's management stack and VNFs / CNFs, or standalone	• Part of a tested and validated end-to-end NFV / cloud-native offering or available on a standalone basis
Embedded support for multi-VIM, VNFM, SDN and Kubernetes CaaS solution integration	• Plug-in architecture enables short integration cycles in multi-vendor environments
Off-the-shelf multi-cloud Kubernetes CaaS integration	• Unified lifecycle management of Nokia CNFs across multi-vendor CaaS • Faster time to market due to reduced services work
SDN integration for complete network service connectivity	• Generic solution for networking requirements of network services across data centers and WAN, interconnected with the VNF deployments across multi-VIM/VNFM environments • Decoupling of the VIM, CaaS and SDN controller enables deployment scenarios without VNFs and their VIMs or CNFs and their CaaS platforms.
Analytics and policy engine to optimize telco cloud resource utilization	• User-extensible tools to control cloud behavior and usage patterns
Open-source descriptor model (TOSCA), workflow engine and topology & correlation engine	• Simplified network operation and reduced OPEX by leveraging common and open technologies including workflow, policy, identity management, topology and correlation
Resiliency	• Cloud-native software architecture delivers high availability with load balancing • Geo-redundancy
Operability	• Workflow engine visualization, graphical NSD designer, backup & restore, log auditing & analysis and template versioning (backward compatibility)
Multi-tenancy and role-based access control	• System is partitioned to realms (tenants) • Each realm operates as a logical Cloud Operations Manager, offering independent management of cloud infrastructures, services and applications
Lean and proven	• Lean, small footprint microservices with selective installation capability, in production with many customers as part of multi-vendor environments

About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.