

MARKET NOTE

5G Operational Readiness: Nokia Digital Operations Center for Automated and Simplified Network Slice Management

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EXECUTIVE SNAPSHOT

FIGURE 1

Executive Snapshot: 5G Operational Readiness — Nokia's Digital Operations Center for Automated and Simplified Network Slice Management

Nokia is a global company that creates the technology for connecting the world. Headquartered in Espoo, Finland, Nokia offers a portfolio of network equipment, software, services, and licensing opportunities across the globe. Nokia is publicly traded on the Helsinki, Euronext Paris, and New York Stock Exchange with reported FY19 revenue of 23.3 billion euros. Driven by its research teams, including Nokia Bell Labs, Nokia's focus is on 5G network infrastructure and operations software, reporting over 130 5G deployments globally among its communications service provider (SP) and large enterprise customer base.

Key Takeaways

- It is easy to call multi-access edge computing (MEC) combined with 5G the next wave of mobile technology, though it is much more from both a business perspective and a technology perspective. The flexibility that 5G brings enables a switch in business focus toward satisfying customer needs "for the one," rather than delivering a new technology sale "for the many." As a result, network slicing was established to deliver personalized network functionality for groups of customers with the same network needs or, in a growing number of cases, network slices that satisfy the individual service needs of business customers.
- Network slicing involves multiple logical networks designed with degrees of network functionality and priced for customers by using differing service-level agreement (SLA) parameters. Slices are then delivered across a shared network infrastructure.
- The 5G management functions may start out as manual operations, but as the number of slices grow, especially when bundled network slices work together to satisfy a single customer service order, effective end-to-end (E2E) operational efficiency, managed complexity, and customer experience satisfaction are achieved through automation.
- The Nokia Digital Operations Center provides a round-trip, closed-loop, and automated process to design, deploy, and operate network slices at scale across multivendor, multidomain, and multi-technology environments. IDC believes that by providing converged service activation and assurance capabilities, Nokia provides a solid way to address the dynamic operations needs of slicing.

Source: IDC, 2020

IN THIS MARKET NOTE

5G and MEC together are capturing market attention through the promise of fast, high-volume, and low-latency solutions designed to meet critical customer challenges. Noted in most 5G/MEC discussions are phrases such as "business intent networking," "zero-touch automation," and "network slicing." Meeting the operational and monetization requirements implied by these terms, like 5G network technology itself, is an evolving exercise in standards compliance, customer needs, changing market conditions, complex solution delivery schedules, real-time revenue tracking compliance, and controlling operating costs. In business terms, 5G/MEC is transforming how communications networks serve customers by changing the decades-old technology-first business model into a customer experience model focused on satisfying customer expectations.

This IDC Market Note looks at how Nokia's Digital Operations Center addresses the network service design, service delivery, service assurance, and operational intelligence functions while integrating with the BSS layer regarding the revenue management needs of customer services. This document highlights how these functions support the dynamic aspects of 5G/MEC architecture, especially the dedicated logical slices of network functionality traversing a shared 5G infrastructure.

IDC'S POINT OF VIEW

5G Operational Realities – Processes Are Everything

5G/MEC holds limitless possibilities for customers, especially those that are digitally transforming the way they do business. While estimates vary concerning the impact of transformation, especially the impact 5G can have on business change, a multitrillion-dollar opportunity is forming for industries willing to embrace what digital everything can do for them. Much of this new revenue promise rests with 5G networks effectively delivering low-latency, high-bandwidth, and ultrafast connectivity. The promise also rests on the distributed nature of 5G architecture and bringing enterprise functionality such as remote storage and compute capabilities next to the telecom edge.

All network services follow a common set of business processes from customer order to service delivery to solution monitoring, with dynamic operations now playing a significantly advanced service management role. These processes – service delivery, service assurance, monetization, and continuous network intelligence gathering – are followed for all use cases from video surveillance, machine remote control, immersive augmented reality (AR) and virtual reality (VR) to cloud robotics, Smart Cities, assisted vehicles, the Internet of Medical Devices, and smart two-way video communications.

A key aspect of the 5G promise is service personalization. For example, network latency thresholds from an assembly line, a remote telemedicine procedure, or a virtual reality gaming experience have different requirements and daily time intervals when designed levels of low-latency, high-bandwidth, and ultrafast connectivity are important for effective business outcomes. These and many other use cases require a unique combination of network capabilities for a set period or involve spur-of-the-moment adjustments or could even follow a sequence of network performance parameters mixed with "regular" network operation.

Automation Is the Key But How?

It is easy to call 5G/MEC the next wave of mobile technology, though 5G/MEC is much more from both a business perspective and a technology perspective. The flexibility that 5G brings enables a switch in business focus toward satisfying customer needs "for the one," rather than delivering a new technology sale "for the many." Therefore, network slicing was established to deliver personalized

network functionality for individual customers, though slice management requires differing degrees of operations and monetization flexibility. In this environment, network connectivity services morph from technology offerings to intent-based services that can address individual customer expectations. The business model moves from a technology-driven approach to the one focused on the customer, for defining and then delivering network behavior that matches with personalized service expectations.

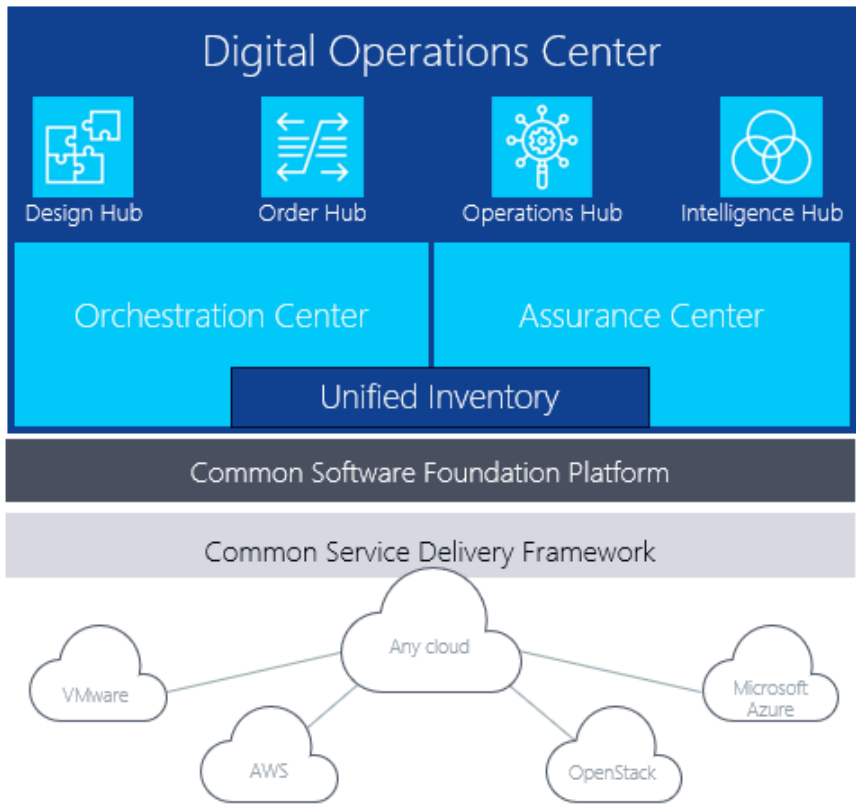
Business processes and systems designed years ago to manage voice and messaging services are ill-equipped to operate in the dynamic network and services environment that 5G/MEC presently defines. An evolved digital operations model, where assurance and fulfillment come together to satisfy a single closed-loop automated process regardless of the number or complexity of managed slices, solves the operations challenges that such services bring. Customer needs then feed the intelligent network-aware orchestration, pushing service requirements to the underlying network domains – access, core, transport, and cloud.

Nokia Digital Operations Center

The Nokia Digital Operations Center (see Figure 2) provides a round-trip, closed-loop, and fully automated process to design, deploy, and operate digital services, including network slices, at scale across multivendor, multidomain, and multi-technology environments.

FIGURE 2

Nokia's Digital Operations Center Functional Architecture



Source: Nokia, 2020

Automation is one of the primary objectives of the Digital Operations Center. As more and more of the operations processes become automated, user interfaces (UIs) to the system are less about doing the tactical processing of steps and more about the setup of processes, oversight of the automations, and exception handling. For these activities, there are various personas and job/role types that benefit from the Digital Operations Center. As such, Nokia has organized the product accordingly:

- **Design Hub.** The Design Hub provides the means for E2E service modeling and orchestration. This is where SLAs and policies are "designed in" to service models for use throughout the operations processes. It is geared to trigger or get service order requests, manage manual tasks, address fallout tasks, change orders inflight, and check order progress.
- **Order Hub.** The Order Hub provides insight to all activities in the order flow. It shows active orders, provides historical views, and enables drilldown for any required supervisory actions throughout the orchestration and fulfillment steps. The Order Hub enables back-office teams to monitor service order status and make manual interventions whenever necessary.
- **Operations Hub.** Orchestration policies and SLAs are "designed in" to the services during the design phase. The Operations Hub monitors the E2E services and their performance to the "designed in" policies and SLAs. As the Assurance Center module performs operational actions such as root cause analysis, service impact analysis, and automated action triggers, the Operations Hub provides staff with the oversight and intervention capabilities as needed. The Operations Hub is most used by network operations center (NOC) and service operations center (SOC) personnel as a first-line support.
- **Intelligence Hub.** The Intelligence Hub provides views for network resource discovery and reconciliation, which include viewing topology of instantiated services. The Intelligence Hub provides network and services analytics for advanced troubleshooting, trend analysis, forecasting, and related network management functions. The Intelligence Hub is used by network engineering, planning, and optimization teams to define capacity management needs, service quality challenges, and automations.
- **Nokia Orchestration Center.** The Nokia Orchestration Center provides intelligent E2E service orchestration. It automates and optimizes service delivery utilizing artificial intelligence (AI) and machine learning (ML) to decompose business intent and deploy it accordingly to the network. The Nokia Orchestration Center uses several submodules including a service catalog module for managing and storing designed service components with related technical service composition and workflow models along with the service design module, which provides capabilities for service modeling to enable business intent orchestration. The Nokia Orchestration Center also depends on the Unified Inventory module.
- **Unified Inventory.** Unified Inventory is a shared logical resource and service inventory, which is used by both the Nokia Orchestration Center and the Nokia Assurance Center. As such, it enables a closed loop between the service delivery and service assurance processes based on this common view of policies and service models. Service assurance can seamlessly start to monitor services instantiated by orchestration.
- **Nokia Assurance Center.** The Nokia Assurance Center is a multivendor, multi-technology, and multidomain system that provides a unified assurance platform across traditionally separate and disparate systems and domain silos. Leveraging Bell Labs' artificial intelligence and machine learning technology, the system is an ingredient in Nokia's broader operations software portfolio to enable round-trip operations automation.

By closing the loop between traditionally separate fulfillment and assurance processes, communications SPs can intelligently manage the complete service life cycle to drive the most optimized use of infrastructure resources, limit overprovisioning, automate service delivery, and

address service optimization needs to help better meet SLA commitments. Nokia's Digital Operations Center is built upon the Nokia Common Software Foundation platform that is designed to unify data and information models along with limiting the use of any redundant or repeated process steps.

LEARN MORE

Related Research

- *5G Operational Readiness: Wipro's 5G/MEC Edge Solution Delivery Approach* (IDC #US47061120, December 2020)
- *Market Analysis Perspective: Worldwide Communications Service Provider Operations and Monetization, 2020* (IDC #US46799220, August 2020)
- *5G Operational Readiness: Amdocs, Netcracker, Nokia, and Oracle Communications Commit to TM Forum's Open Digital Architecture* (IDC #lcUS46652520, June 2020)
- *Netcracker Announces OSS/BSS Cloud-Native Digital Solution Portfolio* (IDC #lcUS46512820, June 2020)
- *5G Operational Readiness: HPE's Core-to-Edge Network Infrastructure and Operations Management Solution* (IDC #US46143620, March 2020)
- *5G Operational Readiness: Oracle's Digital Experience for Communications Solution* (IDC #US45943720, February 2020)

Synopsis

This IDC Market Note provides IDC's perspective on Nokia's Digital Operations Center solution for addressing the service provisioning, activation, and assurance functions relative to digital services enablement.

"One of the greatest challenges communications SPs face is how to provision, activate, and assure digital services in a 5G/MEC environment when partner contributions are present and ongoing operational conditions are dynamic. Complexity increases as technology advances toward network slice enablement, which then moves the operations functions closer to a fully automated status for meeting customer expectations. At this point, today's currently installed systems become a major limiting factor in the race to deliver higher customer value." – Karl Whitelock, research vice president, Communications Service Provider Operations and Monetization at IDC

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