

This IDC Spotlight looks at the key challenges that telecommunication providers face in their transformation efforts and examines Netops.ai as a solution.

Powering Agility and Flexibility in Next-Generation Networks

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Market Overview – CSPs’ Digital Transformation

Digital transformation is a strategic imperative for telecommunication (telecom) providers as they look to evolve their business and become digital service providers. Through investments in a range of digital technologies, operators are modernizing their network by implementing virtualized, software-based networks that will reduce operational costs and improve efficiency. However, while cost reduction and operational efficiencies are two key desired outcomes from their transformation efforts, results thus far have been mixed.

Transforming business operations on a scale that is required by telecom providers has proved to be complex, largely due to the broad array of activities that must be coordinated across people, process, and technology. On the technical side, telecom service providers’ goal is to build dynamic, scalable, and agile networks that support exiting connectivity services, as well as a range of new services. As operators build out next generation 5G networks, they see significant opportunities to offer a range of B2B and B2B2X services. In fact, many operators are heavily dependent on finding these new sources of revenue to help pay back their investments in 5G. As a result of the broad rollout of 5G, telecom service providers’ early transformation initiatives have focused on modernizing their infrastructure.

Network Modernization

Increasing data traffic and the need to support greater bandwidth were once key drivers for upgrading the telecom network; but more recently, the changing ways in which consumers and enterprises are relying on connectivity to support new use cases have forced telecom service providers to rethink how the network can serve the broad connectivity requirements of a diverse set of consumer and enterprise customers. In addition, a focus on flexibility and agility allows providers to react to changes in customer demand more rapidly. In fact, increasing operational agility and time to market is commonly cited as a key driver for network modernizations.

AT A GLANCE

KEY STAT

- » Almost 50% of telecom operators said improving customer experience was one of the biggest drivers for transformation.

KEY TAKEAWAYS

To overcome key operational challenges and successfully transform into digital services providers, telecom operators must

- » simplify and unify OSS to support hybrid cloud and virtual/cloud native network functions
- » adopt flexible network infrastructure to support new 5G use cases
- » have multi-vendor support across infrastructure and network workloads
- » ensure end-to-end automation to drive operational efficiency.

Network virtualization and software-defined networks are at the heart of a new hybrid cloud architecture that will allow service providers to accelerate innovation. Other key technologies for building next-generation cloud-native networks include network slicing and multi-access edge computing (MEC), as well as a set of artificial intelligence (AI)-based tools to manage and orchestrate end-to-end 5G networks.

5G Monetization

The implementation of 5G infrastructure is strategically important for telecom service providers. Unlike previous generations, 5G is more than a consumer play; it holds the promise of combining high-speed, low latency connectivity and edge computing to offer tailored connectivity services for specific industry use cases. While most early 5G implementations are Non-standalone, the move to Standalone 5G is where the technology will provide significant business benefit for telecom service providers by supporting a range of new revenue-generating services. Given the fact that telecom revenues have been stagnant over the past few years, operators are highly motivated to find new sources of revenue that can drive a new level of growth and profitability.

As a result of these dynamics, service providers must rethink all aspects of their business, including how they engage and interact with customers, how they develop and take new offerings to market, and, perhaps most importantly, how they run the day-to-day operations in a more efficient manner. IDC believes that providers are on a path to becoming digital services providers running an operating model that is highly digitalized, and encompasses next-generation technologies like AI, analytics and automation, and is centered around cloud at the core.

CSP Transformation Drivers

Telecom service providers have long sought to reduce their operating expenditures and drive efficiencies, and their move to a cloud-native/hybrid architecture is a key part of this strategy. Migrating to a cloud-native infrastructure and shifting workloads to the public cloud gives operators the scale to offer a broad set of B2B and B2B2X services, while lowering their cost of running the network.

Further value is achieved by investing in end-to-end automation across the network life cycle. Supporting zero-touch provisioning has long been a north star goal for service providers to accelerate time to market for new services, improve network performance by using automation to support predictive and proactive network management, and use AI/ML and analytics tools to better understand customer patterns to drive a better customer experience.

Customer experience is viewed as a key source of competitive advantage. As connectivity is the conduit to driving internal business value in the form of improved operations, that value is increasingly extended to customers by supporting secure, reliable, and agile network operations that enable a range of industry-specific use cases. More and more, telecom service providers are taking a customer-centric approach to their operations to drive differentiation and reduce customer churn in a highly competitive market.

Operational Challenges for CSP networks

Today's telecom networks are designed in a vertically siloed fashion within the infrastructure, virtual functions and orchestration layers of the network. The network platforms are supported by vendors that own the entire technology stack and look very similar to the proprietary platforms that telecom operators have long wanted to move away from. Having a single vendor for that entire vertical stack locks an operator into its supplier's innovation cycle, increases operational costs, and reduces flexibility. The challenge of managing a vertically siloed network (infrastructure, VNFs, orchestration) is further exacerbated by the multivendor procurement strategy adopted by many telecom operators.

As telecom service providers move workloads to the public cloud and operate their own private cloud environments, the challenge of running and managing a distributed network will become a challenge. The same is true of edge

locations. Edge compute locations will be essential to telecom service providers' strategies for offering industry specific ultra-low latency services. Subsequently, there will likely be multiple edge and multiple cloud environments, and in a distributed network such as this, scaling network deployment across a range of domains will be a challenge.

Current operational support systems (OSS) have long been viewed as one of the biggest obstacles to achieving operational flexibility and agility. The complexity built up over a number of years due to the massive quantity of back-office applications in use limits telecom service providers' ability to accelerate the rollout of new services, and react to customer and market changes speedily. Providers increasingly see running the network in a proactive manner rather than reactively has a significant impact on customer experience, and are making this a business priority. In fact, IDC's Telecom Transformation survey reveals that nearly 50% of telecom operators indicated that improving customer experience was one of the biggest drivers for transformation. Lacking the ability to streamline their operational support systems, providers will struggle to monetize the heavy investments being made to modernize their networks.

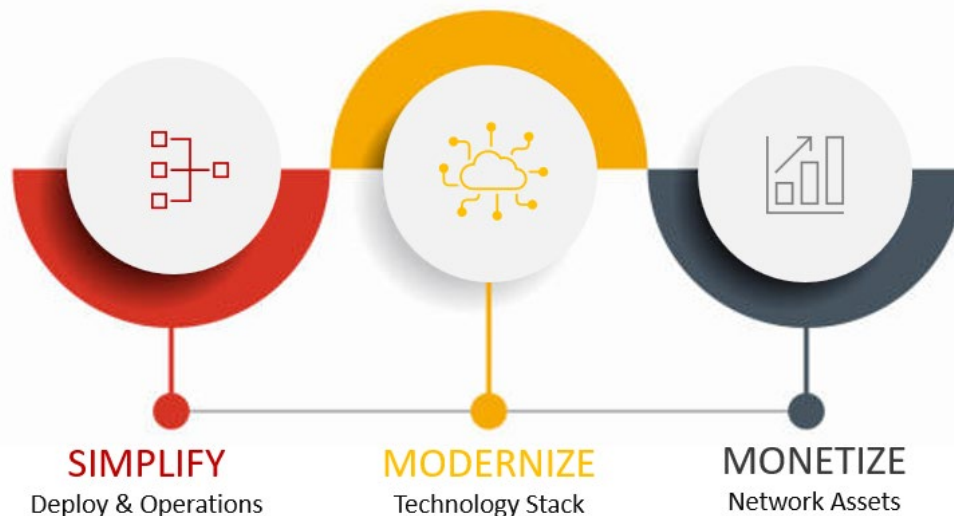
To overcome these challenges, telecom service providers need the following:

- » Simplified and unified OSS to support hybrid cloud and virtual/cloud native network functions
- » Flexible network infrastructure to support new 5G use cases
- » Multi-vendor support across infrastructure and network workloads
- » End-to-end automation to drive operational efficiency

Enabling Operational Transformation: Tech Mahindra's NetOps.ai Framework

Tech Mahindra's netops.ai is an automation and orchestration framework designed to accelerate the deployment of 5G by automating processes across the network life cycle. Many telecom service providers looking to deploy next-generation 5G networks encounter challenges that slow down their network rollouts. These challenges include a lack of advanced and appropriate tooling, poor network function orchestration, inadequate support for multi-vendor environments, and insufficient service testing, validation, and certification.

FIGURE 1: **Netops.ai Framework for Powering Next Generation Networks**



Source: Tech Mahindra

The netops.ai framework takes a holistic view of network operations that addresses business and technical challenges, such that the automation of network operation processes is applied in a coordinated instead of a siloed manner which creates islands of automation.

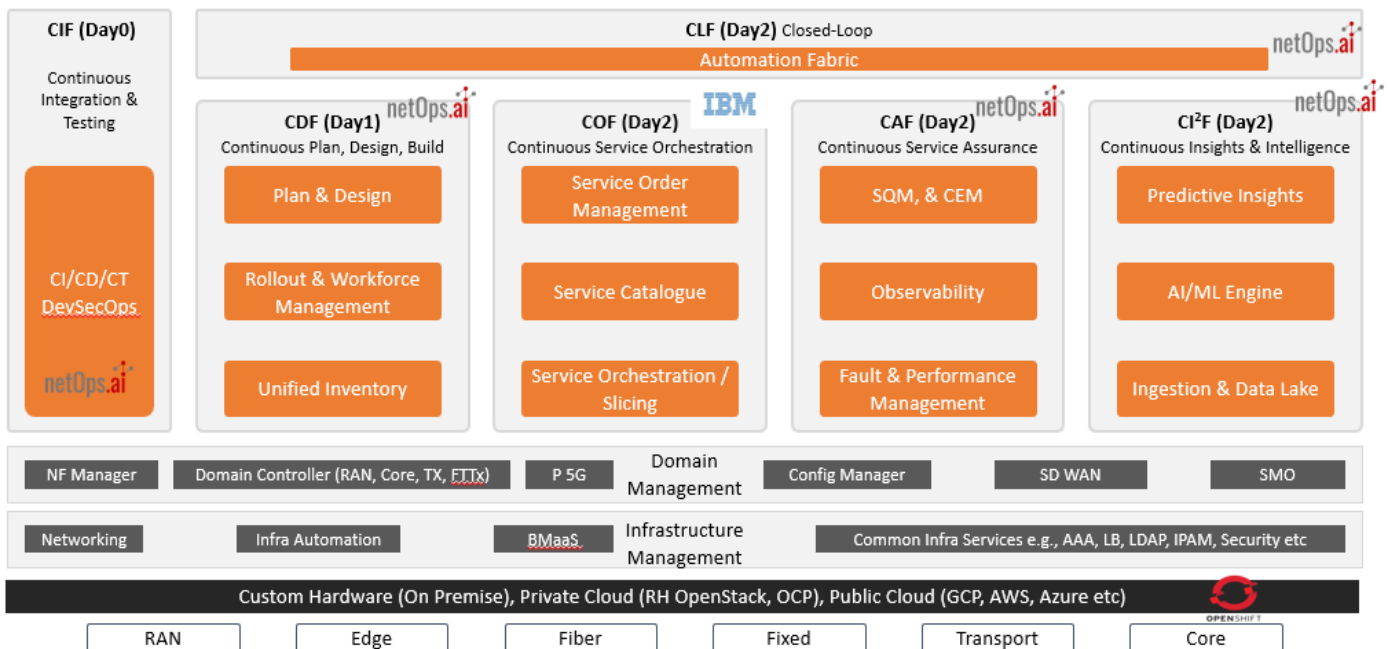
The netops.ai framework focuses on three primary issues: simplifying network deployment and operations, modernizing the infrastructure technology stack, and enabling the monetization of network assets. Simplification is a key value proposition for netop.ai. (Figure 1). By removing manual processes across the network life cycle through automation, netops.ai can enable zero-touch orchestration.

In addition, tying processes to systems rather than people allows telecom service providers to rapidly scale their network to meet changing network requirements without the need to deploy manual resources.

Netops.ai is an open-source framework that runs on Red Hat’s OpenShift Container Platform and utilizes RedHat OpenStack as virtualized infrastructure. It acts as a one-stop-shop for enabling multi-domain and hybrid cloud automation for network deployment, continuous integration, continuous deployment, continuous test, network assurance and AI-based operations across cloud, infrastructure, core, access and transport networks, and edge domains.

Netops.ai support for zero-touch orchestration covers day zero, day 1 and day 2 network operations using closed loop automation. Figure 2 highlights netop.ai’s end-to-end network life cycle automation framework. Netops.ai combines devops automation, test validation and service assurance on a single platform. This enables operators to design, deploy, validate and activate services on a single platform.

FIGURE 2: **Netops.ai’s End-To-End Network Life Cycle Framework**



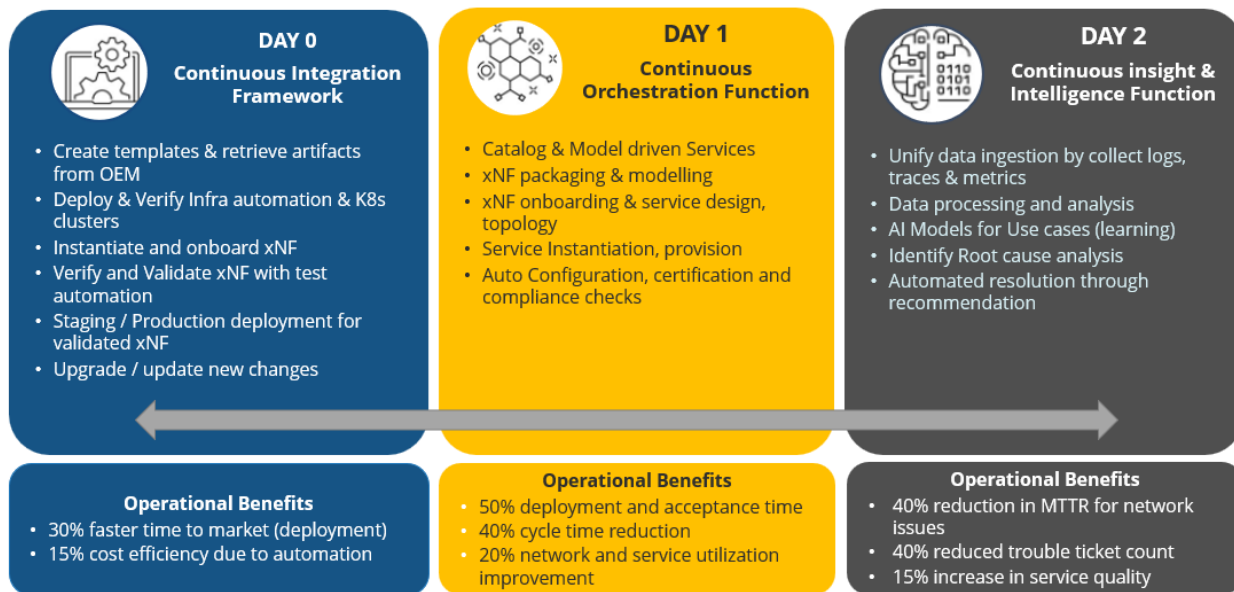
Source: Tech Mahindra

Key features of the netops.ai framework include:

- » **Telco Cloud Automation:** Automating Telco Cloud deployment for different personas and enabling one-click deployment of Telco Cloud
- » **NF Lifecycle Automation:** Automating NF onboarding and end-to-end network integration with integration accelerators in its VNF-Xchange
- » **NetDevOps:** Implementation of complete DevOps (CI/CD) pipeline for 5G networks in a multi-vendor environment
- » **Service Orchestration:** Automation of network Services with orchestration, including closed-loop-control implementation for self-healing and auto-scaling

As depicted in Figure 2, the Netops.ai platform offers a set of modules designed to implement AI across day zero, day one and day two network operations. Each module focuses on using AI and automation for a specific set of tasks that yields operational benefits for service providers. The following table highlights the processes supported by each netops.ai module and the estimated operational benefits.

FIGURE 3 *NetOps.ai Modules for Autonomous Networks*



Source: Tech Mahindra

Spotlight: Tech Mahindra

Tech Mahindra is a global information technology services and consulting company headquartered in Pune, India. In 2023 the company reported revenues of \$6.7 billion, with operations in 90 countries. The company offers a broad portfolio of technology and consulting services designed to help companies digitally transform their business through the use of advanced digital technologies like cloud, AI, analytics, and IoT to accelerate their transformation journey.

While Tech Mahindra has a strong market presence in the communications industry, the company serves a diverse set of industries including:

- » Banking, Financial Services and Insurance
- » Utilities
- » Public Sector and Government
- » Media and Entertainment
- » Healthcare Life Sciences
- » High-Tech
- » Professional Services
- » Manufacturing
- » Retail and Consumer Goods
- » Travel, Transportation, Hospitality and Logistics
- » Oil & Gas

Through a broad ecosystem of partners in domains such as applications, digital platforms, edge cloud, and connectivity, Tech Mahindra supports more than 150 use cases across several industries. One key relationship that Tech Mahindra has is its long-standing partnership with IBM.

Enabling Connectivity, Security, Observability and Automation Across a Virtualized, Hybrid Multicloud Environment with IBM

Complementing Tech Mahindra's netops.ai, IBM's Software Networking portfolio is designed to provide the tools to deliver the visibility, connectivity, policy management and automation necessary to operate in a virtualized hybrid multi-cloud environment and deliver applications in a curated end-to-end experience. Improving customer experience is a strategic priority for CSPs and these tools provide the control and end-to-end visibility needed to ensure a superior customer experience.

According to Andrew Coward, GM of Software Networking at IBM, the hybrid cloud, virtualized infrastructure has created its own challenges. He explained, "In many ways, network operators have lost control of the network, because they don't control the customer experience end-to-end anymore, and a new set of tools and thinking is required to bring visibility, connectivity, security and automation to the hybrid cloud to wrangle control back to the operator."

Tech Mahindra is an IBM Platinum Business Partner and has established dedicated centers of excellence across a range of IBM solutions. The two companies have also made joint investments in innovation labs for strategic areas such as hybrid cloud, 5G, automation, AI, IoT, and data. The implementation of these technologies is essential to helping organizations achieve operational transformation goals of agility and operational efficiency. With over 3,500 skilled technologists covering key IBM technologies, and a broad presence across a range of industry sectors, IDC believes the Tech Mahindra-IBM relationship can act as an accelerator for the adoption of the Netops.ai framework.

Nitish Nanda, Tech Mahindra's Vice President for Telco Cloud and Network Automation, elaborates on this partnership: "As the 5G story starts to mature, we see new age networks possessing the pre-requisites to be more

cloud centric, agile, multivendor and automated. At Tech Mahindra, one of our missions is to help CSPs unlock the value of their network by simplifying operations, modernizing tech stack, and enabling monetization.

“Tech Mahindra’s netOps.ai platform, in partnership from IBM and Red Hat, provides a single click and single pane of glass E2E solution that enables CSPs to unlock the value of 5G network characterized by multi-site deployments, multi/hybrid cloud infra, multi-domain (RAN/transport/core) network elements, and multi-vendor eco system. This is a one-of-its-kind solution that enables the benefits of DevOps, orchestration, test automation, service assurance, and autonomous operations in a single platform, helping us in our mission to provide state-of-the-art services for our customers.”

Challenges

While the Netops.ai framework is designed to address many of the issues that have slowed telecom operators’ deployment of 5G, IDC believes that there are challenges that Tech Mahindra will face as it seeks to drive adoption of its framework. Some of the challenges include:

- » Operators are at different stages of 5G deployment and Tech Mahindra must meet operators wherever they are in their transformation journey.
- » Many operators lack the in-house technical skills to implement new technologies like AI and analytics effectively. Knowledge sharing with operators will be critical.
- » As new technologies are being implemented, new processes will be needed to take full advantage of the capabilities/functionality of the new technologies.

Conclusion

As telecom service providers seek to transform their business operations and become digital service providers, operational transformation is critical to creating new business value, driving operational efficiency, and leveraging technology to drive competitive advantage through innovation and differentiation. Operators are making heavy investments in 5G, with the promise of the technology driving new revenue opportunities across a range of industries. To unlock the potential of 5G, a framework like Netops.ai may be needed to provide end-to-end provisioning of 5G across the entire life cycle utilizing AI and enterprise automation. Given Tech Mahindra’s strong presence in telecom operations, its expertise in advanced technologies like AI, automation and cloud, and key partnerships with companies like IBM/Red Hat, IDC believes the company, with its Netops.ai framework, has an opportunity to help telecom operators accelerate their 5G journey.

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Curtis Price is the Program Vice President of IDC's Infrastructure Services group. He oversees research within IDC's Sustainability, Network Infrastructure and Data Center Services. Across these areas, Mr. Price provides expert insight and analysis of the trends and market dynamics impacting enterprise and communication service providers.

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