How cloud and AI-powered automation are transforming the telco operations model

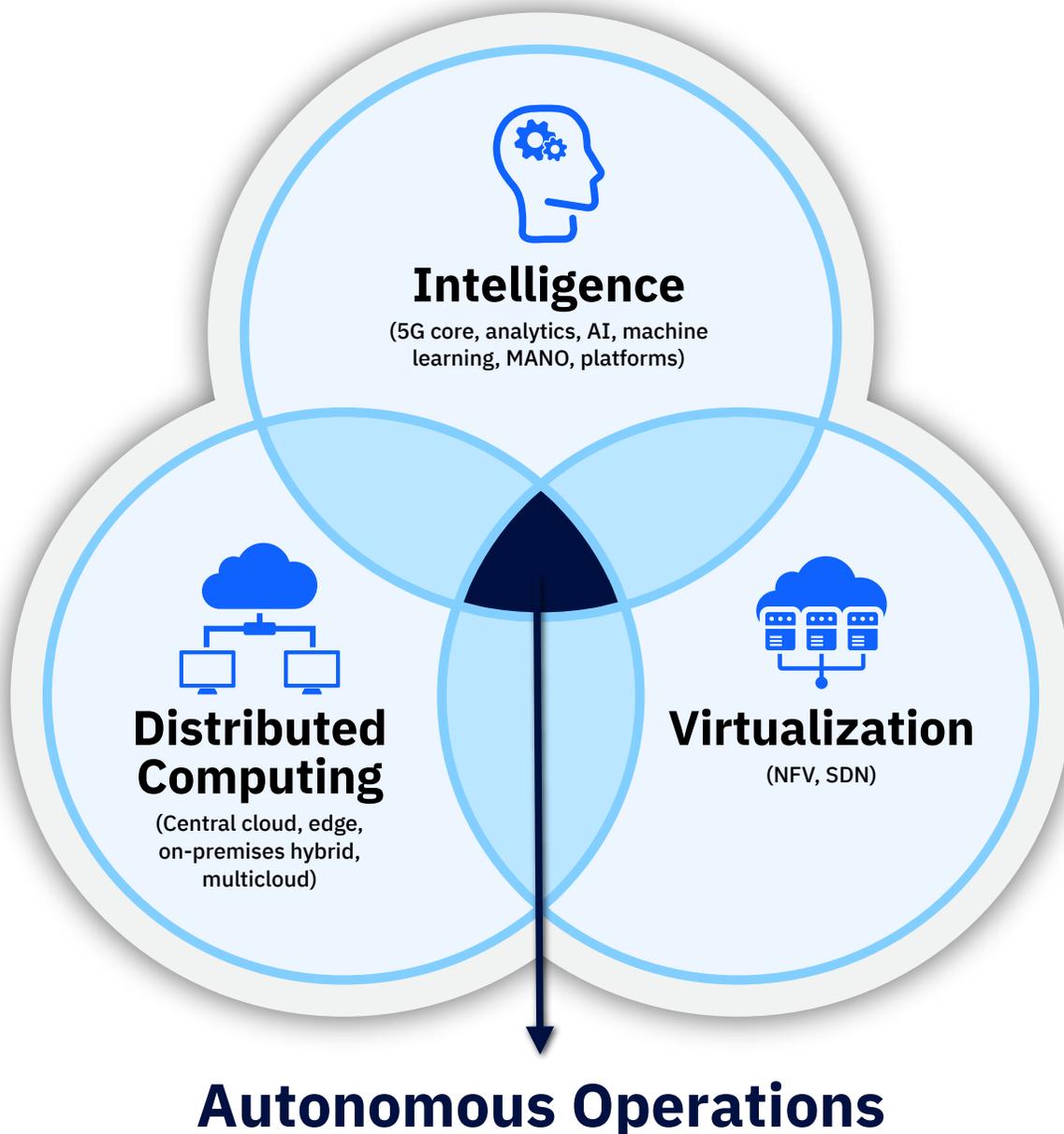TBR

Introduction:
The new telco cloud operations model

Leading communication service providers (CSPs) are transforming into digital service providers (DSPs) to capitalize on new market opportunities, while aligning with the economic realities and customer expectations of the digital era.

A foundational aspect of this transformation requires CSPs to adopt a fundamentally new cloud-centric network operations and service delivery model. This model employs distributed computing, virtualization and intelligence platforms (e.g., AI and machine learning) to achieve autonomous operations. The new operations framework is vital for CSPs to dynamically enable and support the provisioning of intelligent connectivity in an agile and economically feasible manner.

Intelligence
(5G core, analytics, AI, machine learning, MANO, platforms)

Distributed Computing
(Central cloud, edge, on-premises hybrid, multicloud)

Virtualization
(NFV, SDN)

Autonomous Operations

CSPs will require this autonomous operations model to more efficiently run their businesses and have the agility to capitalize on new use cases that arise from 5G and edge computing. This is especially relevant for enterprise use cases and the role CSPs can play in the digital transformation of the enterprise. New use cases include, but are not limited to, the following:

- **AR/VR –** e.g., augmented or immersive experiences for consumer and enterprise use cases, such as remote learning, entertainment experiences, gaming, or employee training and problem troubleshooting

- **Autonomous transportation –** e.g., self-driving vehicles such as drones, boats, trains, cars, buses and trucks, as well as asset tracking, traffic management and logistics coordination

- **Computer vision –** e.g., surveillance, product and service quality inspection, and big data visualization

- **Healthcare applications –** e.g., smart ambulance, remote surgery, telehealth and embedded device communications

- **Robotic process automation –** e.g., factory automation, warehouse automation, retail and food store automation

Leading CSPs have achieved aspects of this "zero-touch," evolved operations model, evident in network operations centers (NOCs) becoming "lights-out" centers that leverage AI, machine learning and analytics. Normalizing life cycle models, employing intent-driven orchestration and adopting closed-loop operations are a few key ways CSPs are progressing to zero-touch automation. The new model autonomously handles most network tasks such as network monitoring and alarm management. Humans are still required to handle complex tasks such as escalated alarms and to oversee the NOC, but generally, these centers have become almost fully automated, yielding a variety of cost and KPI benefits to the CSP.
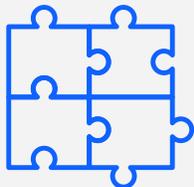
Normalized Life Cycle Model

Standardized life cycle operations for all xNFs to enable model-driven automation with CI/CD toolchains

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Intent-driven Orchestration

Model the desired service operational state rather than pre-programming workflows

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Closed-loop Operations

Apply ML and AIOps to proactively respond in dynamic environments

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Zero-touch automation

Automation will ultimately extend across the entirety of the network as part of the end-state, fully transformed CSP. Chief technology officers (CTOs) are driving their organizations to a near-fully autonomous, intelligent network that can operate at scale with as little human intervention as possible. The network would leverage AI and machine learning to self-learn and adapt to changes in the network in real time.

How cloud changes the situation and paves the way for the end-state realization

The cloud is a foundational component of the autonomous network, and a CSP's cloud framework should fully support hybrid, multicloud environments to deliver maximum flexibility to more seamlessly manage change and minimize vendor lock-in.
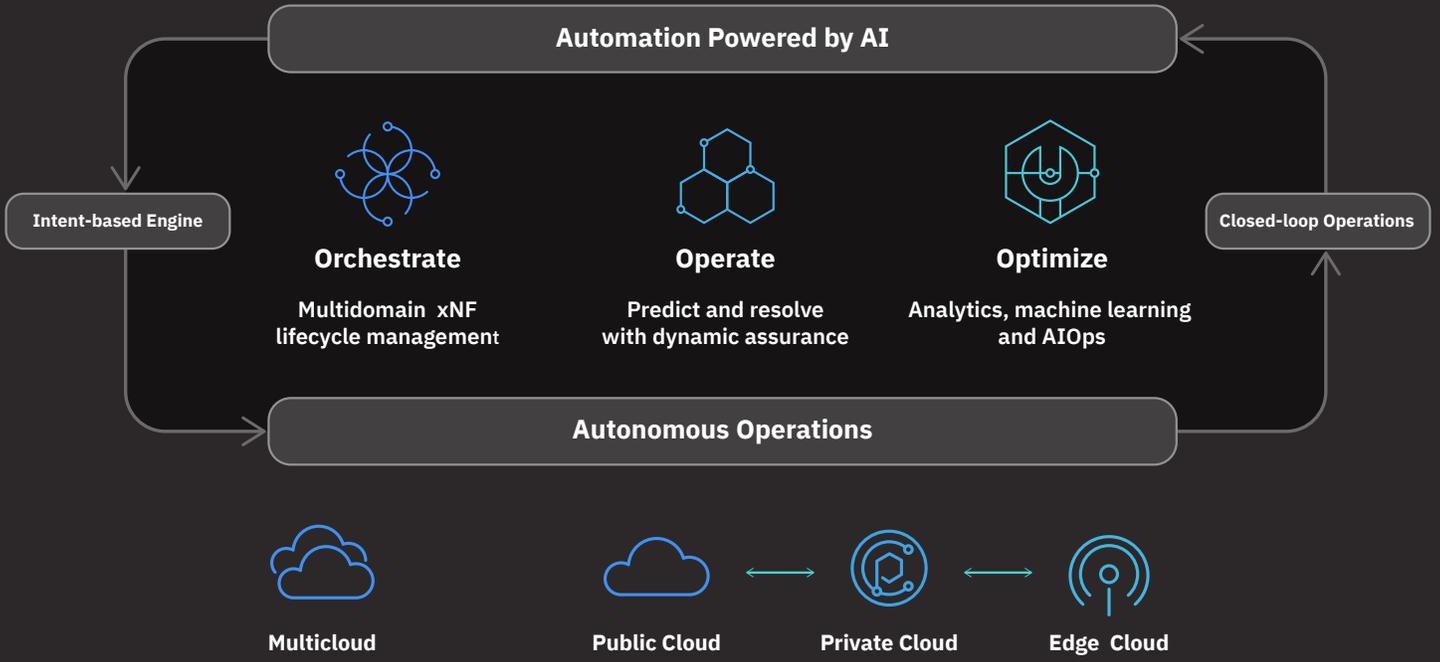
Cloud computing, in conjunction with edge computing, will enable AI to be distributed across the network from the core to the access layer. This will satisfy the latency considerations required for proactive, AIOps-driven operations and ensure that field resources are appropriately tailored to meet the needs of local environments in real time. The cloud is also essential to adopting DevSecOps, CI/CD and site reliability engineering (SRE) processes to create dynamic and flexible network environments. Adopting these processes, disciplines and a cloud operating model is the key to network transformation and continuous improvement. This model also empowers CTOs to have more visibility and control over the network via real-time updated network performance and management dashboards and to make more informed decisions with intent-based, declarative power over how the network operates.

How IBM can help CSPs address operations transformation

Transforming to the new telco operations model is a challenging process, and even the most advanced CSPs will require significant assistance from the vendor community. To get the most out of the new generation of networking equipment, CSPs need a new generation of tools and the willingness to transform their processes, maximize operational cost reduction and take a path to continuous improvement.

Leading vendors, such as IBM, stand ready to assist CSPs in their transformations with a range of solutions and services customized to meet the unique needs of individual CSPs. IBM can help drive CSPs' operational transformation to an autonomous framework. IBM's platform for telco cloud blends service assurance with intent-based automated management and orchestration (MANO) to achieve optimal network performance. The solution is flexible enough to be tailored to the unique needs of CSPs that are on the journey to fully autonomous operations and a zero-touch operational model.

IBM- and Red Hat-led Multivendor Ecosystem

Automation Powered by AI

Intent-based Engine

Closed-loop Operations

Orchestrate

Multidomain xNF
lifecycle management

Operate

Predict and resolve
with dynamic assurance

Optimize

Analytics, machine learning
and AIOps

Autonomous Operations

Multicloud

Public Cloud

Private Cloud

Edge Cloud

IBM Cloud | Google Cloud | Microsoft Azure | AWS | Other Clouds | Red Hat Openshift

TBR

Anchored by Red Hat OpenStack® and OpenShift® platforms, IBM is able to deliver on the vendor-agnostic, hybrid multicloud framework for CSPs as well as provide the full benefits that the CTO desires, including greater visibility and control over the network.

Conclusion

The network of the future will be intelligent, autonomous, programmable, adaptable, dynamic, agile and cost-efficient. It will also operate with minimal human intervention required to support the system. This is the end-state model that CTOs at leading CSPs intend to realize as they evolve their organizations.

CSPs must adopt this new network operations model to fully benefit from and capitalize on opportunities that arise in the digital era. Legacy infrastructure models and ways of working need to be transformed, and automation needs to become foundational.

CSPs will require significant assistance from the vendor community to support them through this transformation. Vendors such as IBM (with Red Hat) stand ready to assist with a full range of capabilities and solutions that are tailored specifically to address this transformation to an autonomous network operations model. IBM's platform for telco cloud is one key example of how forward-thinking vendors are ready to walk with CSPs on their journeys to realize their fully autonomous network operations goals.