Reinventing networks with cloud-based networking

*Service enhancement, elastic scale and
new revenue opportunities*

Long-term, dramatic telecommunications shifts including declining revenues, market erosion from disruptive players, expanding data and video volumes and mobile workload volatility are driving communication service providers (CSPs) to meet disruptive trends and challenges with transformative strategies. Transformation is being accomplished by moving previously fixed function specific hardware to virtualized services that can be optimized and scale to meet consumer demand. IBM brings its deep competencies in cloud and cognitive computing to enable the reinvention of networks with cloud-based networking.

Profit has collapsed from increasing traffic and rising cost. Massive network data volumes and the unprecedented growth in video challenge today's network. Yet all of this creates new opportunities to monetize the network with innovative technology. As a result, CSPs are examining how network costs can be radically reallocated, operational efficiency increased and new sources of revenue enabled through rapid innovation.

Today, CSPs are witnessing the convergence of cloud and network that is opening up the opportunity to shift costs for CSPs in both CAPEX and OPEX. Today's network infrastructures were not built to allow the agility required for growth, next-generation services and offerings and innovation. Infrastructure agility, made possible through secure cloud-based networking allows new services to be brought online faster, driving cost reductions in both CAPEX and OPEX.

Cloud-based networking using network functions virtualization (NFV) and software defined networking (SDN) technologies enable the speed, performance and security to transform networks by speeding service fulfillment, operations and innovation. Transformation to cloud-based networking provides greater efficiencies and revenue opportunities, enabling CSPs to meet changing market demands and capitalize on expansion opportunities, that is, to *reinvent their network*.

What is cloud-based networking?

Cloud-based networking brings software-defined network functions to the world of hardware-centric network environments. With software-defined, virtualized networks, CSPs can rapidly provision network functions and service chaining. Cloud-based networking uses a service lifecycle management approach that unifies the legacy infrastructure of operations support systems (OSS). This enables a continuous engineering environment from inception to retirement with closed loop, continuous orchestration empowered by cognitive service operations. Cloud-based networking engages the client seamlessly with omni-channel customer engagement so orders can be crafted around the individual and move from order to operation. Cloud-based networking is based on open software and technology that reduces capital investment in hardware. This cost advantage is achieved by using open, general compute platforms coupled with the automations of tasks to reduce CAPEX and OPEX.

What does it do?

Cloud-based networking unlocks revenue opportunity by transforming networking business through infrastructure agility.

Cloud-based networking using NFV and SDN offers simpler administration, faster development and deployment of services and more efficient pricing models. This model enables standardization across IT and OT infrastructure resulting in elastic scalability. As cloud technology evolves it can leverage legacy investments and extend the usefulness and capability of existing infrastructure.

Cloud-based networking solutions enable new capabilities and capacity through the network. Service enhancement, revenue- generating activities and customer programs or improvements—which would have created weeks of delays due to network rigidity—can now be deployed and managed in a matter of days, enabled by automated, scalable cloud-based networking solutions using common IT resources.

With Cloud-based networking, faster and improved processes speed new capabilities:

- New functionalities and functions are rapidly on-boarded, and new software and software updates are tested and developed through agile network DevOps enabling network agility.
- Network services automatically test desired functions and services in a virtual lab, then rapidly move to a production environment to enable continuous engineering and lifecycle management.
- Solutions scale through closed-loop continuous orchestration of functions, linked to policy-based network service performance. This allows for more capacity, more optimization and reconfiguration of the network, based on the user and network needs during the day, as functions scale in-out and up-down.
- Services are designed to quickly introduce new service offerings using an agile catalog, enabling speed to market.
- The network is secured through end to end governance and visibility across all layers of the network.

The result is a transformed network with the agility to deploy quickly, enable new average revenue per user and scale at a much lower cost than in the past.

At-a-glance

IBM cloud-based networking technology and systems integration capabilities allows reinvention of network infrastructure, business and operations. The benefits of cloud-based networking enable CSPs to:

- Increase infrastructure agility
- Radically shift CAPEX and OPEX costs
- Maximize network capacity
- Monetize a new generation of network-based services
- Deliver consistent high-quality customer experiences

IBM cloud-based networking focus

IBM cloud-based networking focuses on enabling open, multivendor, cloud-based networking for the service provider by using resources that are common across IT and network, on premise or cloud, and which can be applied to either one as required.

IBM enables the transformation, the cloud environment, the systems and network integration, the delivery—and the security—required for cloud-based networking, designed for IT and communications technology. IBM provides integrated offerings, including design, integration and management services across multiple delivery models.

Employing SDN to connect virtualized functions, IBM provides management through an analytics-driven, real-time OSS using both predictive and cognitive operations. IBM cloud-based networking also leverages the deep IBM portfolio of analytics-enabled security capabilities for cloud computing that provide needed identity, threat protection and oversight for managing a secure cloud-based network environment.

IBM offers a suite of integrated offerings to help CSPs realize the benefits of cloud-based networking. As cloud and networking converge, premier management capabilities from IBM enable flexible, innovative delivery models across hybrid network and IT requirements.

With a broad portfolio of analytics and automation, IBM can deliver cognitive service management and orchestration, network monetization, and real-time customer care. Examples in the IBM portfolio of cloud-based networking solutions for CSPs include:

- IBM® Tivoli® Netcool® software for service providers, which is designed for end-to-end service management, problem isolation, and automation to help service providers operate more effectively for greater service assurance. Netcool Operations Insight provides analytics to optimize operations along Agile Service Management to provide real time topology of services made of physical and virtual, IT and Network components over time to provide a service topology for events and historical needs
- DevOps promotes closer collaboration between business, development and IT operations so that enterprises can continuously and efficiently develop and deliver innovative digital products and services to market. IBM DevOps solutions include:
    - IBM Rational® Test Workbench: Automate and execute API, functional UI, and performance testing and service virtualization.
    - IBM UrbanCode™ Deploy: Orchestrate and automate how applications, middleware configurations and database changes are deployed into development, test and production environments in the cloud or on-premises.
    - IBM Application Performance Management: Detect and correct performance issues in applications and infrastructure to improve user experience.

- IBM Watson™ Foundations, a comprehensive set of analytics software that helps bring together silos of insight whether at rest or in real time, structured or unstructured. It provides visualization capability for faster reaction and proactive network operation for communication service providers.
- IBM QRadar® The IBM Security Intelligence Platform, also known as QRadar, integrates SIEM, log management, anomaly detection, vulnerability management, risk management and incident forensics into a unified highly scalable, real-time solution that provides superior threat detection, greater ease of use, and low total cost of ownership compared with competitive products.
- IBM Security Identity and Access Assurance, a bundled software solution that strengthens security with automated identity and access management for a variety of environments. IBM Security Identity and Access Assurance helps clients administer, protect and monitor user access to resources, and it provides auditing and reporting to help clients comply with security regulations.
- IBM Marketplace Portal provides a catalogue of services to meet business needs. A subscription-based model, it gives flexibility to the customer to add services at will, convert their services into OPEX and also reduce the number of appliances but still provide services like routing, security, WAN-optimizers and load balancers.

As cloud-based networking is much more than a technology shift, and represents a business operating transformation, IBM helps providers migrate their technology and supports the transformation with multiple business models. IBM offers business transformation services through IBM Global Business Services Strategy and Change for Business and Organization Transformation, as well as transformation of the OSS process, tools and people to real time.

IBM Global Technology Services (GTS) helps with network transformation and integration of multi vendor cloud-based network functions. GTS provides NFV platform environment and also virtual CPE enablement. GTS also provides managed infrastructure as a service (IaaS) for private and hybrid cloud, for monitoring, support and management of cloud environments and IT infrastructure services.

No one vendor has an end-to-end capability across all software enabled network functions. However, with the open IBM Business Partner ecosystem—and a tailored, extensive cloud portfolio—IBM helps clients begin the transformation to cloud-based networking.

Why IBM?

IBM is uniquely positioned to help clients transform to cloud-based networking. IBM offers deep core technical competencies to enable cloud computing in private, public or hybrid clouds for carriers and enterprises. IBM has worked with over 4,000 clients through open cloud solution delivery, providing a deep understanding of the cloud environment. IBM has significant resources, including our Business Partner relationships, to deliver comprehensive cloud-based networking solutions for CSPs.

For more information

To learn more about IBM cloud-based networking solutions for the telecommunications industry, please contact your IBM representative or IBM Business Partner, or visit the following website: **ibm.com**/industries/communications.

Additionally, IBM Global Financing can help you acquire the IT solutions that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize an IT financing solution to suit your business goals, enable effective cash management, and improve your total cost of ownership. IBM Global Financing is your smartest choice to fund critical IT investments and propel your business forward. For more information, visit **ibm.com**/financing.

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