5G network technology enables communications SPs to deliver unparalleled customer value. Bifurcation of network operations from business management brings advanced connectivity and solution flexibility. Cloud-based BSSs/OSSs hold the key for rapid responsiveness to changes in business structure, customer needs, and network definition.

Operational Readiness for 5G, Cloud, and a NetCo/ServCo Split Drives New IT Requirements

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Introduction

Multiple factors are now competing for the attention and resources of communications service providers (SPs). Chief among these competing demands is network technology evolution including 5G and the dynamic shift of communications SP workloads to the cloud. In addition, many communications SPs are separating network operations from customer-centric business management by splitting into network infrastructure companies (NetCos) and customer services organizations (ServCos). These factors are driving new requirements for the service provisioning, assurance, charging, billing, and partner management functions, including:

» **5G infrastructure deployment.** Monetizing 5G and 5G standalone (5G SA) requires communications SPs to engage in more agile and autonomous strategies that harness software-defined networking (SDN) and enterprise partnerships for business solution offerings. Dynamic and real-time operations and monetization systems, along with process automation, remain a major transformational focus.

» **Business separation.** Network complexity from 5G SA, multi-access edge computing (MEC), network as a service (NaaS), and multisided business models is changing how communications SPs do business. These advances drive complexity in service models and delivery. Many communications SPs are breaking away their customer-facing operations teams from their network infrastructure groups to better address customer expectations and new opportunities. For a dual company business model, will existing customer care, charging, and service provisioning systems/processes address both retail and wholesale service needs?

» **Cloudification of the network and business operations.** Cloudification of network functions — virtualized network functions (VNFs) and cloud-native network functions (CNFs) — is placing new burdens on old systems and processes that were not designed to manage intent-based network architecture. Moving some operations management workloads to the cloud and expecting correlation with existing noncloudified systems creates not just orchestration challenges but also less-than-optimal service performance and a disappointing customer experience.

AT A GLANCE

WHAT'S IMPORTANT

» **5G is for enterprises.** 5G for consumers is about faster speeds and feeds, but 5G also changes the game for enterprises. It can move the focus from connectivity services to B2B solutions using multi-industry data. 5G also requires a new approach for many of the OSS/BSS functions.

» **Rising data volumes.** With 8.4 billion mobile data users globally, the average data consumption rate per smartphone in 2023 will be 19GB/month. By the end of 2028, this level is expected to grow to 46GB/month. Traditional pricing models are becoming obsolete in favor of alternatives.

» **Cloud-native architecture.** Survey results show that more than 50% of communications SPs believe moving application architecture and development environments to the cloud will bring greater flexibility, orchestrate innovation, and provide business agility.

This paper provides insight about the operations, orchestration, and charging challenges new technology deployment, cloud evolution, and new ways of doing business bring to existing processes and systems. It also explains how suppliers must address these needs from both a network operations perspective and a business management perspective.

Complex Network Architecture and What Comes with It

Through the 3GPP service-based architecture (SBA) road map, the 5G core charts the use of new 5G network functions. These functions are designed to help communications SPs deliver transformational value while offering the potential for creating sustainable new revenue. 5G services also hold the greatest potential for addressing the challenge of finding the new revenue streams that can augment a shrinking connectivity services business. In this environment, automation needs escalate as a growing multi-technology network, with increasing complexity, must also operate with an interactive partner environment spanning multiple industries to deliver customer value (see Figure 1).

FIGURE 1: *Hybrid Network Component Architecture — Complexity Abounds*
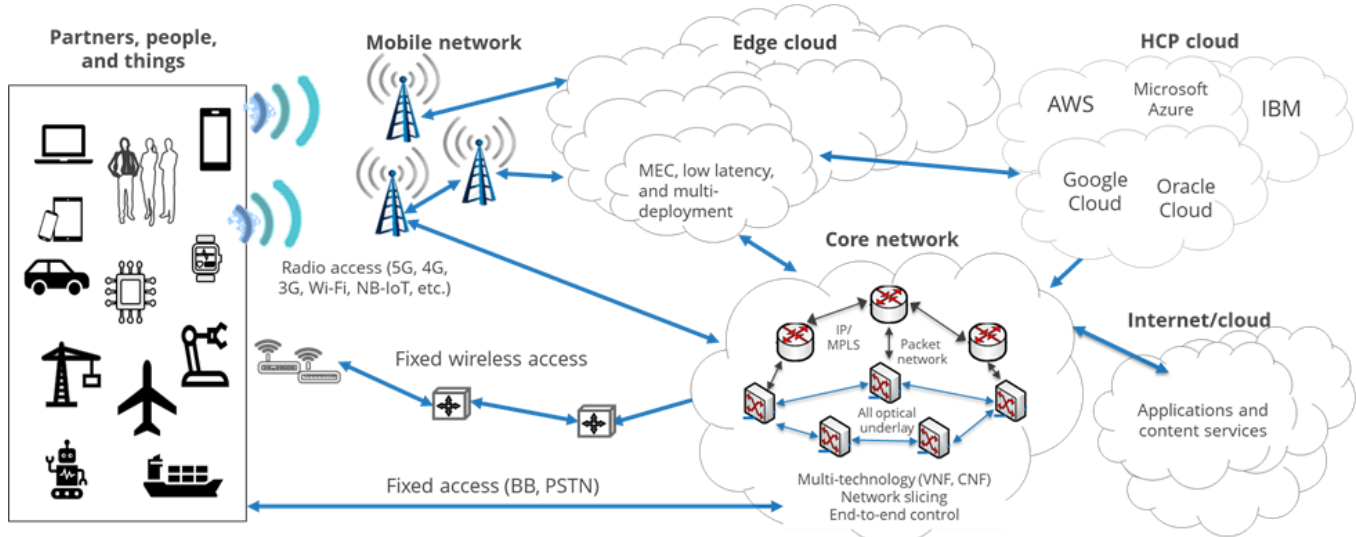
Source: IDC, 2023

For example, customers expect 5G business solutions to change how services are defined and strategic outcomes are achieved. In healthcare, diagnostic tracking using 5G MEC–based data analysis enables healthcare professionals to redefine every aspect of the patient wellness process. In manufacturing, a combination of network slices will help identify production defects by using high-speed computer vision techniques during scheduled intervals. In security, video surveillance can redefine how physical security is delivered at much lower cost than using manual methods. For these and hundreds of other business scenarios, specialized services knowledge from partners or other knowledgeable sources needs to map to technology methods that in combination can shape business opportunities.

New services, along with traditional network connectivity management, still funnel through a strategic enabling imperative: managing complex revenue processes. With 5G's multidimensional adaptability and multipartner relationships, service packages extending beyond connectivity require a new type of charging and billing model. This approach needs to address the adaptable nature of business-to-business (B2B) and business-to-business-to-consumer (B2B2x) services involving partner relationships along with the revenue accountability aspects of each. Such services also require real-time provisioning responsiveness.

The real challenge in a new services environment is that customers desire an understanding of how their services are handling their specific needs. In addition, communications SP work teams want a single view of how network behavior meets expectations. This personalized approach is why 5G SA network slicing has gained attention and why such capabilities are redefining how customers will regard network connectivity services now and into the future. Although slicing is not yet fully available, preparing for its management complexities is something that all organizations (suppliers and communications SPs) need to act on with diligence, especially regarding orchestration, real-time service monitoring, and revenue management.

What Investors Want and Customers Need — Competitive Opportunity

For decades, government regulators have watched the dizzying growth of individual communications SPs and, in some cases, initiated orders for their structural separation. One of the most recognized breakups was that of the former AT&T Bell System in 1983 into seven regional telcos and a transport company. Today, three companies remain. Each is in a dramatically redefined state from the original parts of the split, though they are much stronger individually than the whole was collectively. Similar actions have occurred in Singapore, Australia, the Middle East, and parts of Europe. Some of these separations are government mandated (e.g., AT&T), while others are self-initiated as a means of providing clarity to business purpose, strategic investment for growth, and long-term customer commitment. For example:

» In January 2021, mobile operators Telefonica O2 UK and Vodafone UK, both ServCos, established a network sharing partnership that both companies jointly own. Cornerstone Telecommunications Infrastructure Limited (CTIL) is a NetCo providing tower access and radio network sites for each of these two ServCo operators.

» In July 2021, TDC Denmark finalized its separation into a retail services (ServCo) entity known as Nuuday and an infrastructure (NetCo) entity known as TDC NET.

» In March 2022, Telecom Italia finalized its separation into a NetCo and a ServCo. The company continues to engage in this re-configuration and asset re-allocation process.

» In July 2022, Telenet Group Brussels and municipal infrastructure (electricity, gas, sewer, and cable) Fluvius brought their broadband/fiber network assets together as a new company called NetCo.

While there are many more examples of NetCo/ServCo organizations, self-separating communications SPs are thriving because of changes happening at the business level and within their network operations for the regional geographies in which they compete. Success factors include regulatory relief from various pricing and customer impacting controls; exposure to a greater addressable market in their respective ServCo and NetCo domains; cheaper access to capital; sharpened management focus on the specific aspects of each group, meaning network infrastructure or customer experience; and higher valuations from a honed business strategy and mix of investors.

The rollout of 5G compounds the need for separation because of the level of capital spend brought to the global communications market by 5G, 5G Advanced, and eventually 6G as well as hyperscaler cloud provider (HCP) offerings through MEC. At the same time, critical operations concerns are beginning to surface for this ever-changing environment and the differing needs of NetCos and ServCos. The NetCo side seeks business support systems (BSSs) capable of addressing wholesale services sales. The ServCo side seeks combined customer-facing B2B and business-to-consumer (B2C) functionality to address multisided B2B2x business models for consumer and enterprise.

Within the NetCo and ServCo environment, new business management and network operations challenges emerge. For example, can the same systems manage the network-facing NetCo, "FiberCo," and "InfraCo" needs of a business while maintaining the customer-facing ServCo side? With different processes at play, can the systems addressing these processes satisfy the delivery, assurance, and monetization aspects of each ServCo's customer service offering? How are existing systems and processes accounting for capability sets that involve partners? How do customers gain a better end-to-end (E2E) service experience? Is it realistic to assume that evolving technology will provide the highest value in meeting customer expectations, but only if the right level of automation, partner interaction, and systems support is achieved?

Cloudification Drives Down Cost and Improves Business Responsiveness

5G/MEC creates an environment where Internet of Things (IoT)-based solutions can be positioned to satisfy customer requests as a response to a problem rather than only to fulfill a connectivity order. Many business service scenarios, for example, now involve edge-deployed 5G connectivity together with the edge-based compute and storage capabilities of an HCP. App developers use these combined capabilities to create solutions. Today, multiple solutions have already progressed beyond the proof-of-concept stage. However, from a communications SP's perspective, many of the business management needs of these offerings, including charging/billing and operations, are yet to be worked out.

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A growing concern is balancing the new operations and monetization requirements that advanced technology demands of existing connectivity operations. Previously installed operations support systems (OSSs) and BSSs, for example, must now be upgraded to meet new business needs but are often challenged to produce desired transformational results in expected time frames. These new needs include support for B2B and B2C interactions (business model evolution) and orchestration of E2E service-level assets for ServCos with a seamless handoff of network orchestrated resources from NetCos. Required service monitoring involving cloud-based network technology and driven by AI to address quality-of-service specifications tied to customer-facing service-level agreements is mostly unproven at scale. Real-time charging/billing for consumed resources using traditional and nontraditional charging/billing triggers will require converged wholesale/retail systems. Partner/supplier ecosystem management is yet another concern.

Silos of data locked within many installed network operations and business management systems along with inflexible systems integrations often keep transformation efforts from reaching anticipated objectives. Moving workloads to the cloud is especially challenging because of network and process complexity. How will operations be addressed for a multicloud network environment? How will service quality monitoring be effectively managed across all components of a service definition? How will customers be billed, revenue collected and accounted for, and partners accurately paid out?

Regardless of the systems architecture and business processes at play to satisfy new technology expectations, the objectives of process and IT systems transformation remain the same. The objectives are to:

» Enable new business models with a many-to-one and one-to-many delivery strategy to take advantage of the compounding effects of simultaneous revenue streams working collectively for the service delivery organization.

» Expand from a partial view to a full view of customers by integrating across internal product and data silos to reveal customer challenges and behaviors.

» Encourage innovation and experimentation by taking advantage of software-as-a-service (SaaS)-based solutions to quickly test out new ideas, identify ways to provide new business value, and support change with minimal investment of time and resources.

» Redefine existing processes to be more responsive to customer needs, to be more efficient, and to be more flexible when change is needed.

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The orchestration, management, and monetization of services in this transformed environment requires a complex series of activities to ensure that partners within an ecosystem provide their contributions at the right time and in the right manner. It is also critical to ensure the parts that compose a service are orchestrated into a fully operational solution. Upon service delivery and service consumption, the same partners are then fairly compensated as resources are consumed. For business and service assurance, an open and fair exchange of data and events is essential for enabling the entire ecosystem to operate with transparency. These activities require a new type of IT infrastructure known as a digital business ecosystem platform.

Considering Netcracker Cloud Solutions and the NetCo/ServCo Challenge

New business strategies require an extended service enablement and monetization approach that provides factors to provision, activate, and charge for connectivity. This approach also requires a business model that incorporates needed partner capabilities such as data storage, compute capacity, productivity apps, firewall services, and a variety of specialized industry-specific apps that must live at the enterprise edge to deliver the highest customer value. Most communications SPs lack the necessary IT systems that can address these new partner-enabled service bundles for consumers and advanced solutions for business and enterprise customers. The multipartner environment, which many communications SPs endeavor to build, is an example of what IDC calls "multiplied innovation" — several capability sets welded together for establishing an end solution that fully addresses customer expectations.

Netcracker's flagship cloud-native Netcracker Digital Platform provides optimized OSS and BSS solutions designed to meet the operations and monetization management needs of NetCos and ServCos. The company's cloud-native, multitenant solutions are based on mature open source technologies that leverage open APIs, DevOps automation, and out-of-the-box components for rapid deployment and cloud agility. They can also be deployed in any cloud environment. Netcracker further claims it can simplify the go-to-market necessities of both NetCos and ServCos through flexible commercial models, consulting services, scalable operations, and multicountry working knowledge of operations solutions involving regulatory compliance. The company's cloud-native solutions take advantage of a SaaS commercial model, and Netcracker says it is the

only global IT vendor providing evergreen upgrades for its full-stack portfolio that spans revenue, customer, and service management domains. These include Netcracker Cloud BSS for ServCos and Netcracker Fiber Cloud Solution (see Figure 2).

FIGURE 2: *Netcracker Cloud Solutions for NetCos and ServCos Functional Architecture*
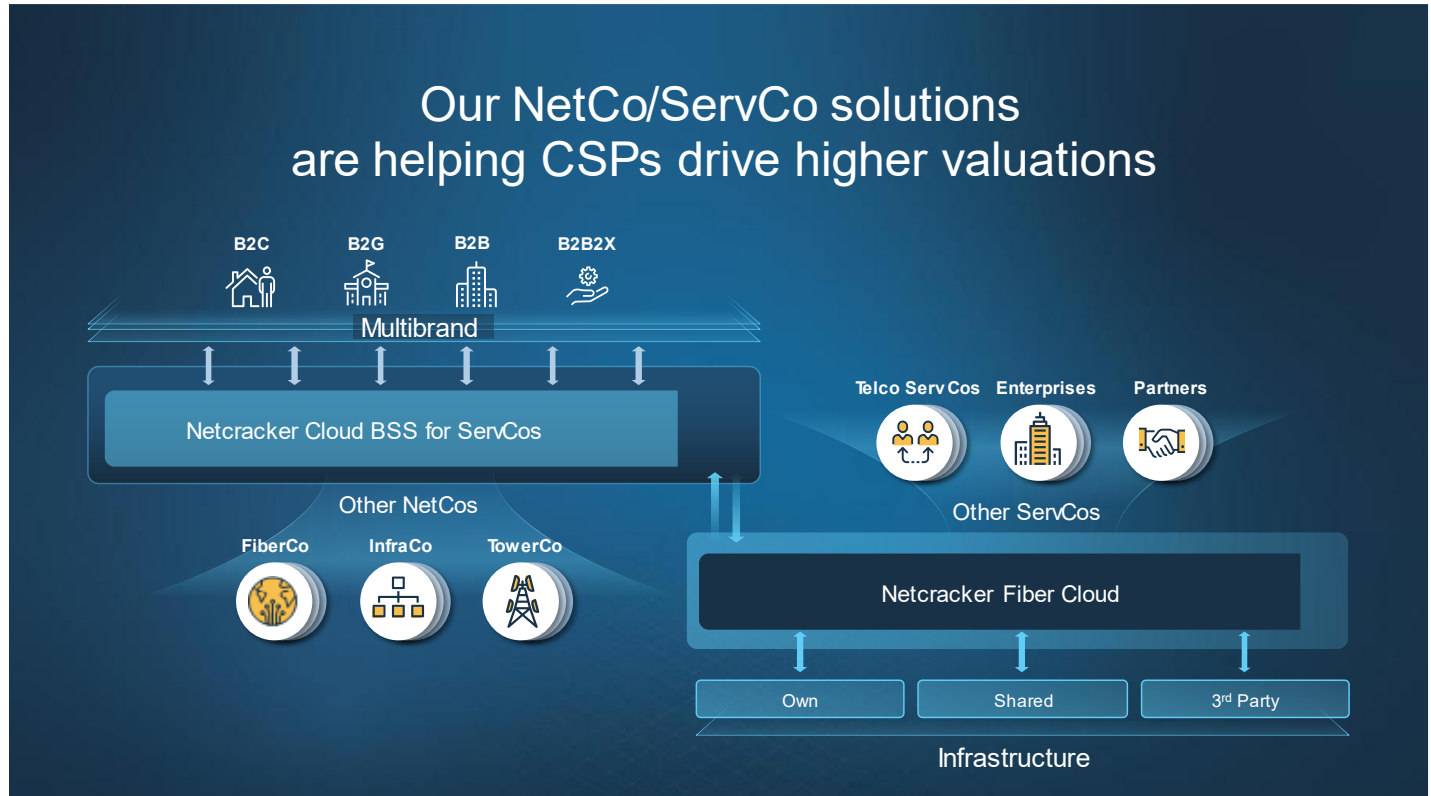
Source: Netcracker, 2023

» **Netcracker Cloud BSS for ServCos** enables the launch of new digital services involving a variety of business relationships. It supports automated lead-to-cash business processes including concept to market, lead to order, usage to payment, and problem to solution. By leveraging optimized BSS applications that natively run on the cloud, ServCos can take advantage of working with partners to establish the right kinds of services and business solutions for the specific needs of their customer base. Netcracker Cloud BSS for ServCos consists of several cloud-based modules including Channel Management, Product Management, Revenue Management, Service and Resource Management, Partner Management, and Customer Management. The company also notes that customers using the Netcracker Cloud BSS for ServCos solution benefit from faster time to value, support for new business models, and the ability to address innovative 5G services monetization capabilities.

» **Netcracker Fiber Cloud Solution** comprises an optimized set of out-of-the-box BSS/OSS capabilities to address the specific needs of implementing, managing, and expanding the fiber infrastructure business. The solution consists of four functional modules: Wholesale BSS, Service Management and Orchestration, Hybrid Resource Management, and Infrastructure Management. The solution modules are designed to grow as the business grows, focused on ROI-based delivery. All business processes are automated, from the service order to infrastructure management and assurance, and the solution incorporates wholesale-centric BSS to drive expansion with new customers and partnerships.

The company states that by using the Netcracker Fiber Cloud Solution, a communications SP can reduce the time, cost, and complexity barriers of launching modern fiber operations with Netcracker's pre-integration solution, vendor-agnostic approach, and flexible commercial models. All solution components are based on cloud-native technology that can be deployed on any cloud platform, and they are fully compliant with standards including TM Forum Open APIs and ODA framework. The Netcracker Fiber Cloud Solution also helps fiber NetCos navigate the highly dynamic digital market landscape in their journey to gain financial advantage, greater efficiency, and a differentiated market position.

Challenges

Communications SPs must deal with multiple moving parts within the business reconfiguration of a NetCo and ServCo split, along with a rise in technical and business complexity. Critical challenges that communications SPs and their suppliers, such as Netcracker, must be continuously aware of include:

» **Service-level flexibility.** Dynamically changing services defined by new technology or business relationships represent a growing trend that requires a level of automation well beyond what most installed OSSs/BSSs can manage. SaaS-based business and technology solutions can rapidly deliver effective functionality to market. This key requirement is important to keep in mind as business transformation strategies are enacted.

» **Business complexity.** The ServCo/NetCo split of any communications SP implies that the two groups inherit various installed systems that are likely insufficient for addressing new business and operations needs. Becoming operationally ready in such an environment requires new, flexible cloud-based solutions that can address both wholesale and retails needs and that can successfully interface with previously installed systems. Meeting these needs is not a trivial exercise.

» **Industry-level solutions.** 5G offers communications SPs the opportunity to deliver business-level solutions to customers rather than just network connectivity. Solutions have real-time and dynamic components that go far beyond what existing systems can address. A SaaS-based platform is a good choice when multiple partners are involved, time to market is critical, and rapid change is essential.

» **Partner dynamics.** Competitive undercurrents from a constantly evolving NetCo framework — think network API services for developers, large enterprises, and other ServCos, which can involve multiple NetCos in the customer value delivery chain for the same ServCo — are a primary reason why the NetCo/ServCo model is so appealing to businesses. Partner-provided digital services or capability sets to enable end-to-end solutions are another reason. An ecosystem management platform approach is critical to this strategy.

Conclusion

Communications SPs that build competitive advantage are those that can manage network and operations complexity to define value or to create and capture value in existing industry verticals. Over the next 12–18 months, communications SPs have much to do in preparing their systems and processes to support the advanced services and business solutions that a global NetCo/ServCo world demands. In this environment, doing nothing or exerting minimal transformation effort is no longer an option for business success.

About the Analyst

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John Byrne is IDC's Research Vice President, Communications Service Provider (Comms SP) Operations and Monetization industry practice. He provides strategic insight regarding the future of operations and monetization in an evolving cloud-native environment. Coverage areas include rating and charging, policy management, partner/ecosystem management, subscriber data management, order management, customer service assurance, revenue assurance, orchestration, catalog, inventory, and network operations. His rich analyst experience provides a unique perspective on the imperative for comms SPs to align technology with a growing number of business outcomes to thrive in the hybrid 5G era.

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