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CAN YOUR NETWORK DELIVER THE POTENTIAL OF THE CLOUD?

By Mike Kozlowski and Guy Gilliland

THE IT INDUSTRY IS undergoing a technology and data revolution. Technology is accelerating the pace of change, creating new pathways for managing the customer experience and delivering services—and generating new business models. More than 50% of consumer touchpoints are now via online, mobile, or social media channels. These changes have already become embedded in consumer behavior, and many companies are struggling to keep up.

Agility has become a major challenge as CEOs work to modernize their businesses—particularly as disruptive competitors appear seemingly in the blink of an eye. BCG research shows that companies die sooner than ever before: one in three public companies overall and one in six large companies will not survive the next five years. (See "Die Another Day: What Leaders Can Do About the Shrinking Life Expectancy of Corporations," BCG article, July 2015.)

To anticipate these disruptions and stay ahead of the curve, companies are investing in data analytics, digital, and security technologies. The cloud has become a critical part of this transformation. But one of the major delivery vehicles of the cloud—the network—is often merely an afterthought, if it's given any thought at all.

To better understand this weakness in the technology landscape, BCG conducted a study on the future direction of the network industry. We found that network as a service (NaaS) represents a compelling value proposition. Not just a pay-as-you-go utility, NaaS offers a more intelligent, flexible, and secure infrastructure. It can help businesses improve their efficiency and performance in the cloud—and holds the potential to dramatically disrupt the network services industry.

The Cloud Is Here and It's Transformational

The cloud unlocks a vast software as a service (SaaS) ecosystem offering best-of-breed business capabilities at the click of a button. In a BCG survey of 750 CIOs of

medium-size companies in the US, 65% said they expect to move workloads to a public or private cloud by 2017.

Companies get a big bang for their buck in the cloud. For a typical retailer, the cloud drives dramatically lower spending on a like-for-like basis. Exhibit 1 shows how a medium-size retailer could reduce baseline IT costs by 47% after replicating its existing IT stack in the cloud, thereby freeing up funds that can be reinvested in the business.

Companies are looking to the cloud to handle their new and changing business workloads. Retailers are looking to compete with online-only retailers by providing low-cost, agile, and secure point-of-sale systems, innovative loyalty programs, and optimized supply chain processes, while also unlocking new business opportunities through customer data mining and targeting. Health care providers are grappling with a continuously changing regulatory environment and a growing need to make electronic health records available throughout the hospital and across practitioner devices while ensuring patient confidentiality. (See the sidebar, "The Crucial Importance of the Network for Health Care Providers.") Educational institutions need to deliver rich online course materials, on demand, on any device, both on and off campus.

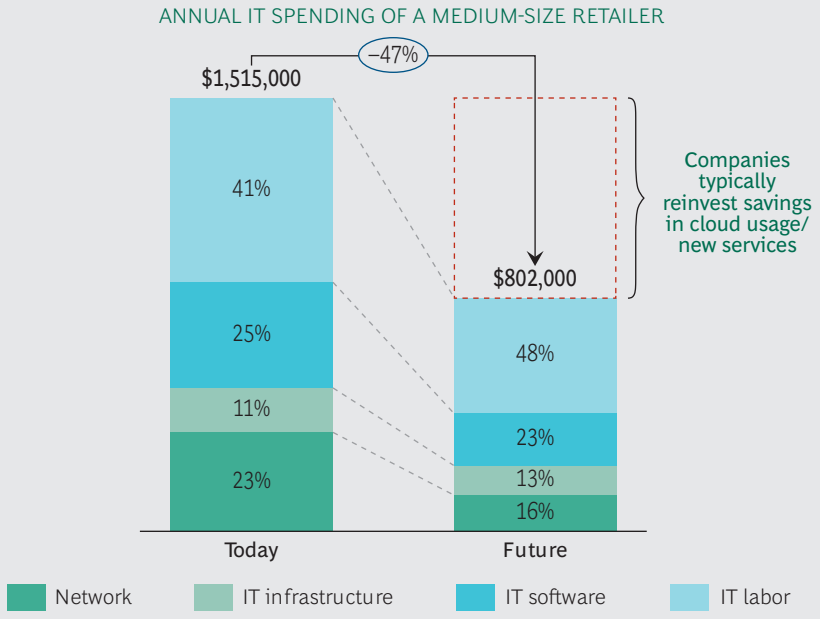
Enterprises are looking to shift existing workloads to the cloud and enable new workloads with a cloud-centric infrastructure. This will drive productivity improvements and support new and more flexible business models. As a result, IT infrastructure is evolving to meet these needs—moving from a largely siloed set of "stacks" to a much more flexible "as a service" model.

In response to such high demand, the cloud industry is growing quickly, with 3,200 SaaS companies and hundreds of infrastructure as a service and platform as a service companies receiving venture capital funding since 2010. NaaS is still nascent, however, with fewer than 15 companies competing in the space.

The Cloud's Achilles' Heel

The cloud (both public and private) can make us work smarter, faster, and cheaper, but many companies aren't getting all they

EXHIBIT 1 | Cloud Technologies Offer Huge Cost Savings



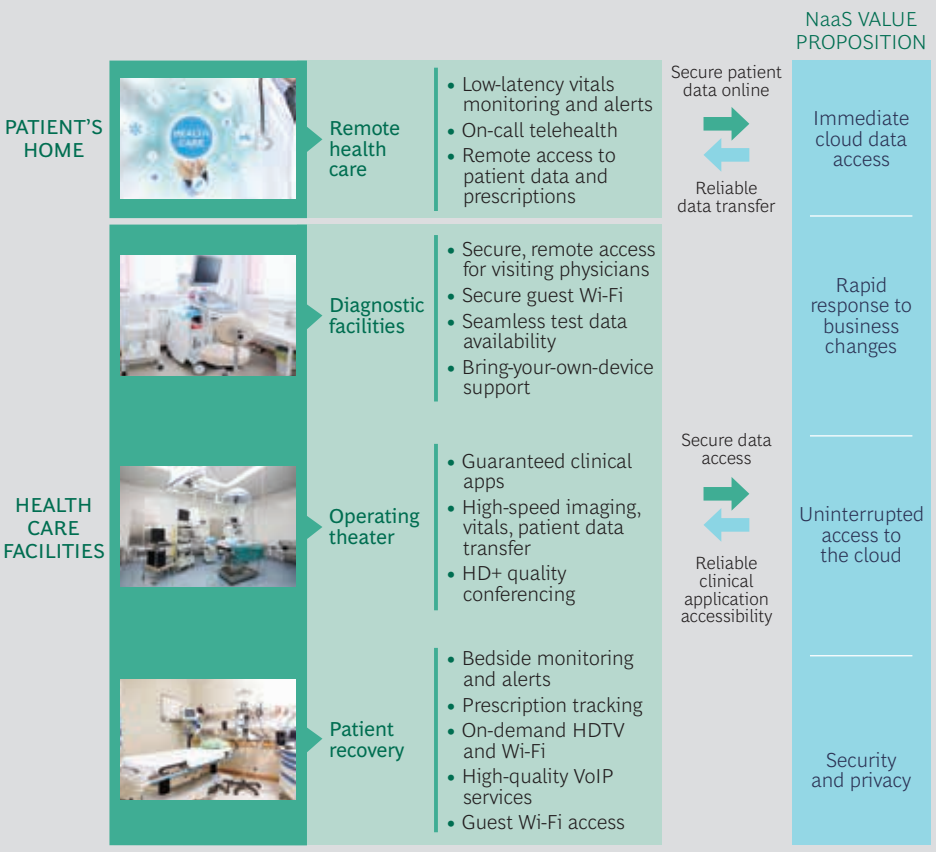
Sources: BCG market research and company interview.
Note: Results for a retailer with 500 employees and 40 stores using the public cloud; data from Amazon Web Services, SaaS pricing, and estimates of labor reduction based on cloud outsourcing and automation.

THE CRUCIAL IMPORTANCE OF THE NETWORK FOR HEALTH CARE PROVIDERS

Health care is going digital, but the transition isn't easy. Health care CIOs are walking a thin line as they transition to electronic health records. They must ensure continued mission-critical, high-quality IT support while meeting all government mandates and compliance requirements. At the same time, patients are expecting 24/7 online access to their records, both within and outside the hospital, and practitioners expect to be able to work across departments using their own iPads and devices. All of this must be managed on a tight budget. (See the exhibit below.)

In our survey and interviews, the ability to keep up with regulatory and business change was the number one concern of health care executives: 94% said they were not satisfied with their IT department's ability to adapt to change. One executive lamented, "We have been overwhelmed with regulatory requirements in the past few years." Nearly half were not satisfied with their level of IT innovation. One respondent noted that innovation is particularly challenging in an environment where "clinical operations are rapidly moving toward real-time and anytime access." Approximately half of respondents were also disappointed in their IT capabilities as they relate to the customer experience. Consumers are looking to engage via online and mobile devices, and practitioners are looking to access patients' electronic health records across depart-

Health Care Companies Face Increasingly Complex Digital Challenges



Source: BCG analysis.

THE CRUCIAL IMPORTANCE OF THE NETWORK FOR HEALTH CARE PROVIDERS (continued)

mental boundaries. The security concerns alone are formidable. Data security is critical, but so is the ability to compartmentalize and manage where data is transmitted—a task that only the network can provide.

Much of the change for health care providers has thus far taken place outside the cloud, with significant development effort expended on proven and trusted clinical applications. However, it is inevitable that health care systems will shift to the cloud once clinical SaaS has proven itself and existing infrastructure reaches its end of life. In the meantime, the network within the hospital is becoming a key concern for health care providers.

should from their investment—because the cloud has an Achilles' heel. It can only perform as well as its weakest link. For most businesses, that's the network, and a poorly optimized, static network can actually destroy value.

The network can become a bottleneck. Applications can run much slower than they should. Connecting a new network in order to launch a pop-up store, for example, may take weeks or months. Security can be compromised. Bursts of heavy traffic can lead to network crashes. The customer experience can suffer, leading to customer churn. In our survey, only 6% of retail companies were satisfied with the adaptability of their network infrastructure.

Furthermore, the traditional IT stack is becoming fragmented as new applications are born in the cloud but complex legacy applications remain on private infrastructure. This fragmentation raises barriers to the seamless flow of information and security risks as the IT department scrambles to secure a multitude of databases being accessed by myriad devices operating within and outside corporate offices.

Despite these large-scale changes in the IT landscape, networks seem to be frozen in time. While the speed and efficiency of the cloud technology stack is accelerating, networks are still a "fat pipe" delivering connectivity with basic service levels. Moreover, the network is still delivered on 30-, 60-, or even 90-day delivery times. One bank executive we spoke to said his company was forced to postpone a branch opening because of delays installing the network—at a cost of millions per day.

It doesn't have to be this way.

NaaS: Faster, Better, Smarter Connectivity

When the network is overburdened, the cloud will not perform to its potential. Keeping the network running smoothly becomes extremely challenging once IT infrastructure is distributed across multiple, potentially fragmented cloud-based vendors. But a new solution is emerging, and it's the most interesting thing that's happened in networking in a long time. (See Exhibit 2.)

The network of the future delivers real value in the cloud world, helping companies operate more intelligently, seamlessly, and efficiently. NaaS represents not just an incremental change. It represents a sea change. It offers a new commercial model that will provide flexibility, service guarantees, and efficient pay-per-use pricing. Applications will scale up or down on demand. New networks will be deployed in minutes rather than days or weeks. Consumers will have a seamless experience. Privacy and security will be guaranteed. NaaS offers the following specific advantages:

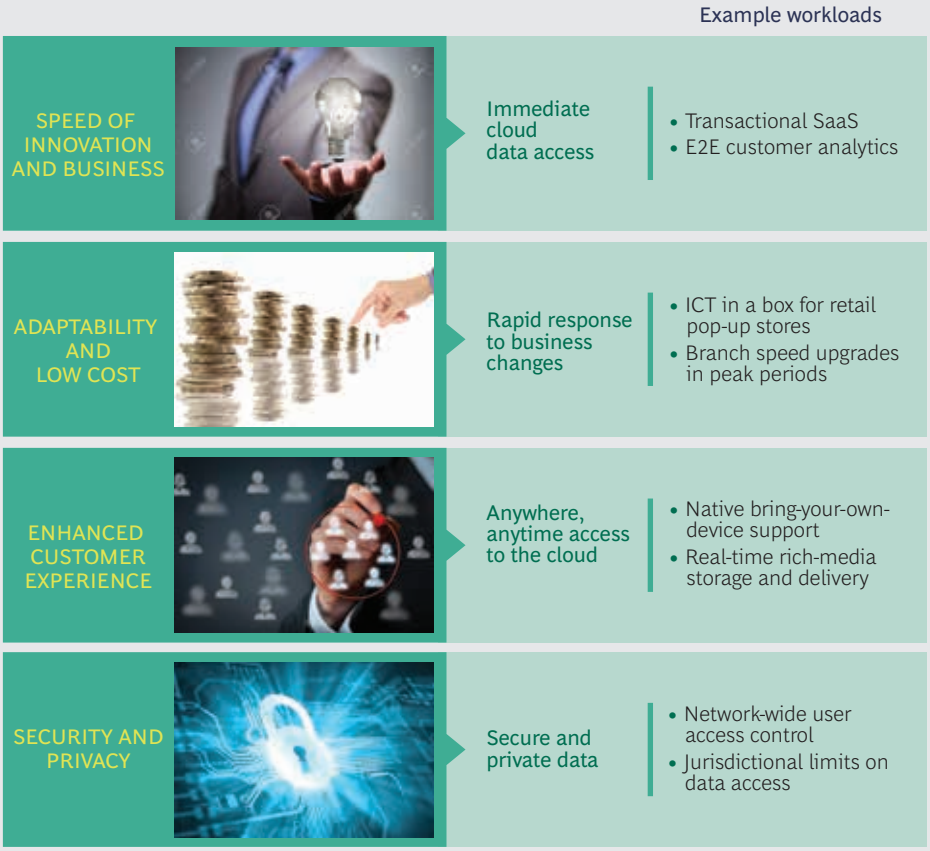
- **Immediate Cloud Data Access.** A consistent, high-quality consumer experience across channels becomes particularly problematic in a fragmented cloud environment. Getting data from the cloud to the user or from the user to the cloud can be subject to frustrating delays. Because NaaS will be able to replicate data and move it closer to where it's needed, users will gain immediate access to cloud-based applications.

- **Rapid Response to Business Changes.** Consumers expect 24/7 service, wherever they are, whenever they want it. Businesses need to scale networks rapidly—to achieve burst bandwidth for peak loads and fast bandwidth for pop-up stores, for example. NaaS will allow companies to respond to consumer demand without delay with flexible pay-per-use utility charging models.

- **Anywhere, Anytime Access to the Cloud.** Employees can't be optimally productive without reliable connectivity to the company's cloud-based services. NaaS can provide a dedicated network connection from the workplace to the company's remote servers. With a dedicated network connection, connectivity is ensured.

- **Security and Privacy.** With so much data stored on desktops, local servers, and in the cloud, cybercrimes have skyrocketed. Since 2013, there has been a 126% growth in major cyberattacks. CEOs—and consumers—need to know that their data is being kept private and secure. A smart network can intelligently compartmentalize data, control where sensitive data is routed, and ensure that only certain people can access and download it. The network can serve as the single trusted authority to control access to private data.

EXHIBIT 2 | NaaS Responds to Business Challenges



Source: BCG analysis.

CEOs and technology decision makers need to reevaluate their networks. They are making a substantial investment in the cloud, but even best-in-class cloud services can be brought to their knees by problems in the network. The cloud represents a huge change, and over 60% of the companies we surveyed are looking for help to reduce the risks involved in the transition.

Network Service Providers Prepare for NaaS Growth

Rising to the challenge and opportunity presented by the cloud and NaaS, some network service providers are adding new capabilities to their infrastructure and service offerings. Their goal is to deliver a complete range of on-demand or agile service options.

By implementing software-defined network (SDN) technology, for example, network service providers can automate the delivery of wavelength services across their optical network. This provides an open orchestration platform to deliver services that meet the demands of network-intensive enterprise customers. While the initial focus is on high-bandwidth services and users, the long-term goal is to virtualize a broader range of agile products to deliver on-demand, as-a-service options for a wide variety of enterprise network customers.

By adding SDN technology, network service providers are also aiming to address the needs of increasingly distributed, cloud-driven enterprise customers, for whom business agility goes hand in hand with performance, reliability, and security. Most notably, SD-WAN is being quickly embraced, with a number of innovative providers offering services that will usher in an era of SDN-enabled services that are accessible by enterprises of any size.

NaaS Unlocks the Full Value of the Cloud

Companies need to take a good look at the overall maturity of their IT cloud and the changes needed across their IT environment to unlock the cloud's full potential. This journey will evolve through four stages:

1. **Adopt:** the IT team struggles to meet business demands.
2. **Advance:** the IT team supports best practices in SaaS adoption.
3. **Aspire:** the IT team achieves a scalable cloud infrastructure.
4. **Excel:** the IT team provides full cloud-enabled, self-service IT.

The cloud cannot reach its full potential if the network doesn't keep up. Successfully transitioning to the optimized, secure cloud means upgrading your network. Without addressing the network, companies will face data bottlenecks and delays, in addition to security risks and inefficiency from an increasingly fragmented and complex IT environment. With a comprehensive strategy in place, companies can rapidly develop their IT and reap the full potential from emerging business opportunities.

This article is based on a study that was commissioned by Earthlink, which coauthored the article. Earthlink was subsequently acquired by Windstream and is now a Windstream company. The original version of this article has been updated to reflect a more current perspective on the market.

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