Transforming IT to Support Digital Business Transformation
Introduction

Digital transformation, including the business and technology changes brought on by mobile first, social, videos, and big data, is forcing organizations in every industry to rethink their strategy for keeping technology infrastructure up-to-date, remaining competitive, and delivering on new opportunities for business and revenue growth.

Transformation has brought about data consumption growth, increasing cloud adoption, workforce mobilization, and an explosion of applications. While these changes are exciting, they come with challenges to networks, many built and deployed before these developments hit the enterprise, including increased bandwidth needs, greater remote connectivity, expensive network equipment upgrades, and growing need for data security.
Many service providers have compute, storage and data center capabilities, but few have the broad enterprise networking and WAN experience needed to implement, protect and operate true end-to-end solutions.

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Data Consumption Growth
Businesses across various industries are taking advantage of digital transformation benefits such as improved customer relationships, innovations in products and services, cost savings, and enhanced decision-making capabilities.

This has led to a rapid rise in enterprise data consumption, fueled by the need for increased agility and accessibility, increasing deployment of Internet of Things (IoT) devices, big data insights to drive competitive advantage, and growing volume and variety of business data, often generated by customer-driven data sources.

Many experts predict that the size of the digital universe will double every two years at least, with human- and machine-generated data seeing a 10 times faster growth than traditional business data, according to a recent report by insideBIGDATA.

“The key factor driving the adoption of data-intensive computing is the need to rapidly analyze exploding volumes of data at the point of creation and at scale,” the report noted.

In this new big data environment, enterprises face pressure to store and retrieve data securely with reduced costs and improved efficiency. One option is the cloud, providing a means to store and retrieve massive amounts of data at a low upfront cost, minimal IT infrastructure support, rapid and predictable implementation, and automatic upgrades.

Move to the Cloud
As more and more companies move their data to the cloud, data security is becoming an increasing worry in the enterprise.

Concerns about data security, however, are not discouraging companies from moving to the cloud. According to a recent survey by B2B ratings and reviews firm Clutch, nearly 70 percent of businesses said they planned to increase spending on cloud computing this year. One in five of those businesses report that their cloud computing spending this year will likely increase by more than 30 percent, according to the survey of 283 U.S. IT professionals.

Many enterprises see the cloud as the next logical step for data storage and management. “Cloud is the new normal. When businesses need to evaluate new solutions, or need to do a hardware refresh on existing solutions, cloud is the go-to solution to figure out how
to do that,” said Jeremy Przygode, CEO of California-based managed service provider Stratalux.

Security and compliance, however, continue to be challenges for businesses implementing cloud solutions. In a survey of more than 300 IT operations pros by Fugue, close to 40 percent said that these issues are slowing down cloud adoption and 44 percent said that they are working to ensure infrastructure security and compliance in their cloud organizations.

Mobile Workforce
The introduction of the iPhone 10 years ago not only kicked off a revolution in personal communication, it also transformed the enterprise. More and more employees started bringing their iPhones and other mobile devices to work, and the shift toward enterprise mobility began. Now, enterprises that are not mobile are falling further behind their competitors.

The enterprise mobility market is forecast by Key Market Insights to grow from $35.1 billion last year to $73.3 billion by 2021, at a compound annual growth rate of 15.87 percent. Some of the driving forces of enterprise mobility are increased productivity and employee satisfaction, reduced hardware cost, increased smartphone penetration, demand for enterprise mobility software, and growing use of managed mobility services.

Not only full-time employees are becoming mobile, but also temporary and contract workers. For contract, field, and temporary workers to be as productive as their full-time counterparts, they need secure access to the same data on their mobile devices.

App Explosion
There has been an explosion of applications, particularly for mobile devices. According to App Annie’s new Market Forecast, by 2021 the global app economy will reach more than $6 trillion.

This app explosion is also happening in the enterprise. The mobile enterprise application market size is forecast by Research and Markets to grow from $48.24 billion...
in 2016 to $98.03 billion by 2021, at a compound annual growth rate of 15.24 percent.

Factors fueling that growth include increase in smartphone penetration, enhancements in connectivity and productivity of both employees and enterprises, demand for real-time information capture, and enterprises’ continued focus on making their processes mobile ready.

Enterprise resource planning (ERP) software is expected to take the largest market share. ERP software enables enterprises to increase their operational efficiencies, improve employee communication and collaboration, provide anytime access to information, and enhance workforce productivity.

In the enterprise application market, hybrid apps will dominate the market share due to their robust functionalities, such as cross-platform support, access to devices, and ease of development, according to Research and Markets.

Hybrid apps have a suite of features, such as they can integrate with device file systems and web-based services, they have embedded browsers to improve access to online content and a capability to support various platforms, reducing developers’ development costs.

**Increasing Bandwidth Needs**

All of these trends in the enterprise are greatly increasing bandwidth needs and straining networks. Enterprises expect their bandwidth needs to grow around 30 percent annually, with datacenters having the highest capacity needs (1.7 Gbps per site) and growth (40 percent per year), according to a recent survey of 163 enterprises by IHS Markit.

To handle these bandwidth needs, enterprises are upping their investment in wide area network (WAN), spending by more than 20 percent annually, reflecting the significant demands placed on their WANs.

Better security and more capacity are the top changes enterprises plan to make to their WANs over the next year, the survey found.
**Remote Connectivity**

Branch offices, remote site, and mobile workers all require remote connectivity to the corporate network. This increasing need for remote connectivity is severely taxing the corporate network and IT personnel.

On the mobile front, more than half of 110 senior-level enterprise executives surveyed by WBR Digital for NetMotion Software said that they plan to grow their mobile workforce in 2017, with 15 percent planning more than 20 percent growth.

The executives said that they see up to 300 IT trouble tickets per month, and most of those are for remote network connectivity problems that are difficult to diagnose.

The respondents pointed out that they need to take steps to fill network gaps in order to preserve user and application access across networks.

Roughly one-third of respondents reported dropped network connections and application difficulties. As a result, IT departments have their hands full with remote connectivity problems.

Branch offices and remote sites are emerging as engines of transformation. Most enterprises are seeing device growth in remote sites, and one-quarter said this growth is significant, according to a survey by Enterprise Management Associates for Cisco.

The primary sources of device growth at remote sites are PCs and laptops, IoT devices, and smartphones and tablets. A majority of enterprises are allowing remote sites to connect directly to public cloud services, the survey found.

**Network Equipment Upgrade Costs**

One solution to address these connectivity issues is to invest money in on-premise network equipment upgrades.

Unfortunately, IT budgets are always under pressure. Corporate leadership is often wary of the cost and consequently delay an upgrade by asking IT managers to maintain the current systems “for now.”

By neglecting to upgrade their networks in a timely fashion, enterprises can lose up to 39 percent of peak performance and add up to 40 percent in application management costs and up to 148 percent in server administration costs, according to a recent IDC report.

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*IDC White Paper, sponsored by Dell, Why Upgrade Your Server Infrastructure Now, July 2016*
Much of the cost for equipment upgrades comes from up-front capital expense, with the rest from operating expenses for support and maintenance. Enterprises purchase the equipment, along with some maintenance and support, and depreciate it over several years.

**Hardware-based vs. Software-defined Networks**

If an enterprise decides to upgrade its hardware-based networks, the costs and disruption caused might leave IT personnel and employees frustrated.

Among the drawbacks of a hardware-based solution are the initial capital outlay, the difficulty of defending return on investment, and the risk of getting locked into a proprietary solution.

In addition, enterprises must absorb or outsource the large manpower burden needed to install, configure, and run WAN hardware, such as switches, routers, load balancers, virtual private networks (VPNs), accelerators, and firewalls.

There is an alternative to the cost and disruption caused by upgrading hardware-based networks—software-defined networks.

In order to improve app performance and to better manage WAN capital and operating expenditures, enterprises are increasingly adopting software-defined WAN (SD-WAN).

Switching to SD-WAN can centralize network provisioning and security, provide holistic enterprise management, simplify remote and branch office connectivity, provide WAN optimization, improve app performance, reduce network capital and operating expenses, and improve quality of service.

Gartner estimated that enterprise spending on SD-WAN will increase from $129 million in 2016 to $1.24 billion in 2020, or a compound annual growth rate of 76.2 percent. The market research firm predicts that 25 percent of enterprises will adopt SD-WAN in the next two years.

“While WAN architectures and technologies tend to evolve at a very slow pace—perhaps a new generation every 10 to 15 years—the disruptions caused by the transformation to digital business models are driving adoption of SD-WAN at a pace that is unheard of in wide-area networking,” according to Gartner.

**Network-enabled Cloud**

Network-enabled cloud brings cloud capabilities inside the enterprise by extending the benefits of cloud flexibility, multitenant economics, and on-demand provisioning using the private corporate network.
Public cloud provides enterprises with flexibility, convenience, and scalability with low initial investment, but with attendant concerns about security, performance, control, customization, and integration with on-premise systems.

Private cloud addresses these concerns, but at the cost for enterprises of deploying, running, and maintaining the infrastructure.

Hybrid clouds enable enterprises to pick and choose various elements from the public cloud and private cloud that make the most sense. They can provide a balance of convenience, cost savings, and security.

Network-enabled cloud brings public and private clouds into a unified infrastructure, allowing for visibility of traffic flow and streamlined bandwidth allocation.

In addition, network-enabled cloud taps into multiprotocol label switching (MPLS) VPN-based connections to link up on-premise and cloud assets. This ensures consistency across both public and private cloud assets, a sought-after attribute of the hybrid cloud era.

Network-enabled cloud includes the ability to tap into the inherent performance assurance features of MPLS VPNs, such as quality-of-service routing and traffic management and prioritization.

With network-enabled cloud, cloud resources in the service provider’s datacenter become nodes on the enterprise WAN, providing security, traffic isolation, and in-transit protection of applications and data. Furthermore, on-net cloud computing protects enterprises from internet threats such as distributed denial of service attacks and malware.

Enterprises are able to leverage the security protection already embedded in their WAN that provides secure networking between enterprise locations and datacenters.

**IT Expertise to Support New Network Environment**

As IT functions become more complex, IT departments are struggling to staff and train experts in diverse disciplines to support the new network environment, so they look to the cloud to save on costs.
Network-enabled cloud can offer enterprises a way to take advantage of the cloud without having to hire and train additional IT staff members.

The key requirements for vendors to offer enterprises network-enabled cloud are integration into existing infrastructure, strong security, ease of use, scalability, outstanding support and services, experience in relevant industry, and innovation.

**AT&T Network Products and Services**

To help enterprises cope with network challenges posed by digital transformation, AT&T offers a number of network products and services, including VPN, Ethernet, high bandwidth services, SDN/network function virtualization (NFV) and Flexware, and AT&T NetBond for Cloud.

In terms of VPN, AT&T’s MPLS-enabled VPN and network-based IP VPN platforms combine to provide secure private IP and public internet VPN access that allows companies to connect their applications between offices, users, and locations, including access to public and private cloud services.

AT&T Network-based IP VPN Remote Access products provide secure access to business applications regardless of location, access, or device across the AT&T global network. Dynamic routing to AT&T MPLS VPN services through high-speed backbone infrastructure is based on MPLS technology, providing enterprises consistent application performances. AT&T MPLS VPN also supports service differentiation by employing class of service for latency-sensitive applications.

Based on SDN and NFV technologies and deployed on AT&T Integrated Cloud platform, AT&T FlexWare has the flexibility to be any kind of network appliance the enterprise requires. It breaks the traditional appliance-based networking model, so enterprises can have more flexibility and control.

With AT&T FlexWare, enterprises can mix and match devices and applications and deploy them to global locations faster than with traditional single-purpose-built network equipment models.

NFV technology provides an alternative to buying, configuring, and testing individual proprietary network appliances. With NFV, software replaces these appliances and is downloaded and deployed to customer-premises equipment at different locations within the network, like datacenters or remote offices.

Flexware simplifies hardware installation, eliminates the need for proprietary network appliances and associated skillsets, and gives enterprises a choice of FlexWare applications from a list of AT&T-certified vendors. In addition, enterprises can deploy, configure, and change FlexWare applications at their sites quickly and often without hardware changes.

In terms of network-enabled cloud, AT&T NetBond for Cloud enables enterprises to connect their VPN to cloud providers of their choice. It offers high-
performance access to applications, protection against threats and attacks, and the ability to quickly provision cloud resources online and scale them on-demand.

AT&T NetBond integrates the VPN with cloud providers using SDN and proprietary technology. This provides a secure high-performance connection to cloud-based applications. The ecosystem has more than 20 members and provides customers access to more than 25 different cloud solutions.

NetBond delivers enterprise-grade security by taking traffic off the public Internet, creating a highly secure connection between the VPN and the cloud, and isolating cloud traffic from that of other traffic through proprietary technology.

AT&T NetBond enables enterprises to scale their business and remain in control by adjusting networking and cloud resources quickly. Enterprises can route traffic from devices and locations directly to the cloud provider, avoid the slowdowns associated with sending traffic to the cloud through datacenters, and scale bandwidth to accommodate peak traffic loads.

**Conclusion**

Digital transformation is changing the way enterprises do business, prompting a massive rethink of their network strategy. While these changes are exciting, they come with challenges to networks, including increased bandwidth needs, greater remote connectivity, expensive network equipment upgrades, and growing need for data security.

To help enterprises cope with network challenges posed by digital transformation, AT&T offers a number of network products and services, including VPN, Ethernet, high bandwidth services, SDN/NFV and Flexware, and NetBond. The best AT&T solution will depend on the individual enterprises needs and goals.

Learn more about [network evolution](#)

And for more on [hybrid cloud](#)