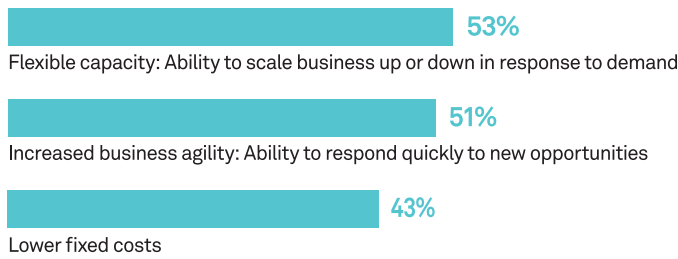


Is Your Network Holding Back Your Company's Cloud Ambitions?

“All In” for Cloud

A few years ago, some industry watchers were downplaying the importance of cloud technology, pigeonholing cloud as primarily an IT efficiency tool. Analysts see it quite differently now. In fact, cloud has become a key enabling technology for digital transformation. In a recent study by Harvard Business Review, respondents cited the top benefits of cloud technology as flexible capacity (53 percent), business agility (50 percent) and lower fixed costs (43 percent).¹



Source: Harvard Business Review

Top benefits of cloud technology

The term “cloud” embraces three primary deployment models: private, hybrid and public. At present, 71 percent of enterprises are opting for a hybrid model, a number projected to grow to 80 percent by 2017.² To many observers, hybrid is the future because it offers the advantages of public cloud—scalability and reduced up-front investment—while retaining the security and control offered by private cloud.

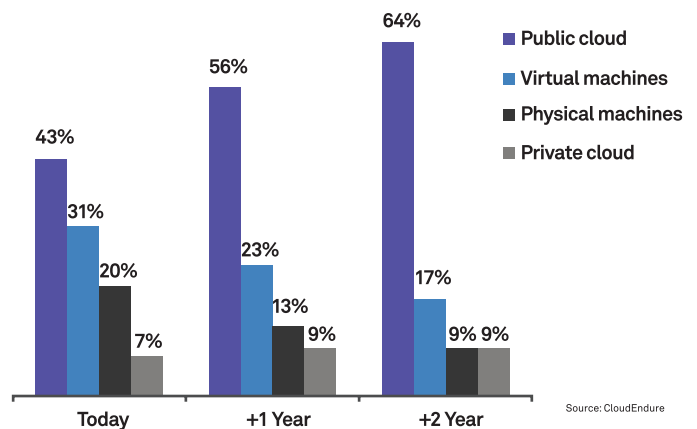
However, this way of looking at cloud reflects the existing paradigm of the centralized data center. In that mode of thinking, cloud resources are an extension of on-premises resources, but the emphasis is still on the data center. That meme is disappearing rapidly: 70 percent of CIOs have adopted a cloud-first approach when it comes to new strategic initiatives.³

The trend in the digital enterprise is unmistakably away from on-premises resources (both physical and virtual) and in the direction of public cloud. Public cloud adoption today is at 43 percent and will grow to 64 percent over the

next two years. While private cloud will grow modestly over the same period (from 7 to 9 percent), data center resources (physical and virtual) will fall by almost half, from 51 percent to 26 percent.⁴

The end-state is a fundamental shift in how we think about and even talk about infrastructure. IDC predicts that clouds will stop being referred to as “public” or “private” and even drop the cloud designation all together. At that point, cloud will simply be “the way business is done and IT is provisioned.”⁵ One thing is universally accepted:

For any enterprise that relies on technology, the transition to the cloud—whether public, private or hybrid—is inevitable.



Source: CloudEndure

Mix of public, private and on-premise resources, 2016-2018

¹ “The Digital Transformation of Business,” Harvard Business Review, 2015.

² “RightScale 2016 State of the Cloud Report.”

³ Marilyn Carr, “IDC Market Spotlight: Cloud Definitions and Opportunities,” April 2015.

⁴ “2016 Cloud Migration Study,” CloudEndure.

⁵ Ibid

Traditional Networks Under Siege

Cloud adoption may be inevitable, but it's not easy. As enterprises move to deploy cloud architectures, the network becomes the key factor in determining the success or failure of cloud initiatives. At the same time, many of the demands of today's enterprise environments are at odds with the network's original design assumptions. Three key trends—dispersed workforce, software as a service (SaaS) and other cloud-based services and applications, and bandwidth-intensive collaboration tools—highlight the problem.

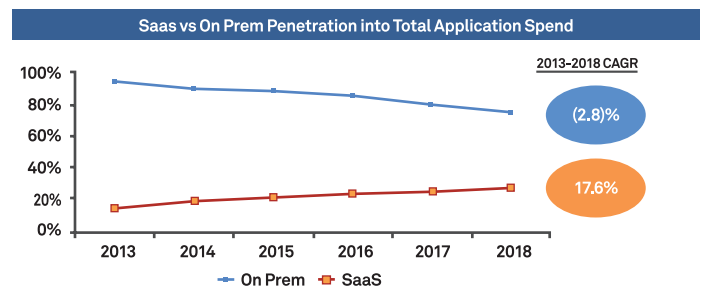
Dispersed workforce

More users are working outside the corporate campus than ever before, either from home offices or an ever-expanding number of branch offices. The 2015 Gallup Work and Education poll found that 37 percent of U.S. workers worked remotely from their home offices at least part of the time, a four-fold increase in just 10 years.⁶ Also, large corporations have been decentralizing their operations over the last decade to the point where nearly 80 percent of enterprise employees and contractors are now located in branch and regional offices.⁷ The net result is a dramatic increase in the amount of traffic on the enterprise's wide-area network (WAN) for remote offices and branch offices (ROBO).

Cloud-based services and applications

Enterprises are increasingly turning to SaaS, lured by benefits such as pay as you go, automatic upgrades and reduced infrastructure spend. Overall, outlays for SaaS are approaching 30 percent of the total application budget in the enterprise.⁸ To take just one example, customer resource management (CRM) reached a tipping point in 2016: Half of all CRM revenue is now SaaS, a figure that will grow to 62 percent in 2018.⁹

SAAS APPROACHING 30% OF APPLICATION SPEND



Source: IDC, Worldwide Enterprise Application Spend by SaaS and On-Prem, 2013-2018.

Application spending as a percentage of total IT spend

The move to SaaS places a strain on legacy networks that were designed for a datacenter-centric environment. These hub-and-spoke architectures require ROBO traffic to pass through the data center to access the SaaS resources, unnecessarily loading the WAN and introducing latency that can negatively impact application performance. Such performance issues have a direct impact on the business in areas such as decreased employee productivity, lost revenue opportunities, lower customer satisfaction and damage to brand. These topologies also make it difficult to route network traffic through the most cost-effective means and to offer quality of service.

⁶ Jeffrey M. Jones, "In U.S., Telecommuting for Work Climbs to percent," August 19, 2015.

⁷ Steve Woo, "It's Not Your Dad's Branch Office...", January 27, 2016.

⁸ Byron Deeter and Kristina Shen, "The State of the Cloud - 2015," June 18, 2015.

⁹ Ibid

Bandwidth-intensive business usage

A new generation of communication and collaboration tools is putting intense pressure on network performance. Video-intensive applications such as teleconferencing, remote training and multimedia presentations create unprecedented demand that is difficult to satisfy with a finite amount of bandwidth. Increased adoption of advanced video communications will cause business IP traffic to grow by a factor of two between 2015 and 2020.¹⁰ More powerful business-critical applications such as data analytics and engineering simulations add to the challenge.

As a result of these developments, IT planners are bracing for a network avalanche. In a recent survey of enterprise IT departments, 54 percent of respondents expect bandwidth requirements to grow by half in 2016 and 48 percent expect them to double by the end of 2017.¹¹ Given that traditional architectures are often rigid and difficult to scale, not to mention overly complex to manage, these findings put the network on a collision course with the bandwidth needs of the enterprise going forward.

The Need to Modernize

If cloud initiatives are to succeed, the enterprise network needs to be modernized. Modernization is not an incremental activity of adding a few routers and switches here and there; in fact, that approach only makes things worse. Nothing less than a complete rethinking of the network is needed to support a comprehensive cloud strategy.

One area of primary importance is the WAN. Existing WAN solutions suffer from a number of problems:

- **Cost.** MPLS fees from service providers represent a significant portion of the WAN budget. The ability to reroute selected traffic over the Internet can make a real impact on network costs.
- **Service quality.** Traditional WANs are not application aware, making it difficult to control quality of service and meet SLAs. As a result, business-critical applications become less responsive, affecting user productivity.
- **Visibility.** The degree to which enterprise IT groups can see into public clouds is limited and may require the use of special tools, adding to the complexity of network management.

From a practical point of view, modernizing the network starts with rethinking the WAN architecture. The imperative is to create a WAN that can support the needs of the cloud-driven business for performance, operational efficiency and business agility.

Optimizing application performance

A key mandate for IT groups is to ensure that employees, contractors and customers have responsive, reliable access to business-critical applications. To achieve this goal, network managers must optimize network traffic across the entire cloud architecture; that is, to and from the cloud, from branch office to public or private clouds, between offices and more.

In a cloud environment, applications and data are highly mobile, creating additional challenges for network architects. Moving applications and data to the cloud impacts both bandwidth and latency. During and after the migration, bandwidth utilization increases and traffic patterns begin to vary significantly. Quite often, network links become saturated, which can degrade the end-user experience of both existing applications and the newly deployed cloud application.

IT managers must have tools and processes that streamline cloud migrations and ensure that migrated applications meet performance SLAs and user expectations.

¹⁰ "Cisco Visual Networking Index, 2015-2020," 2015.

¹¹ "State of the Network," Viavi Solutions, 2016.

While nothing new, WAN optimization controllers continue to play a vital part in enterprise networks. Within a cloud migration scenario, WAN optimization streamlines the movement of large volumes of data, reducing network utilization and associated time and costs. Cloud-aware WAN optimizers can also accelerate SaaS and other cloud applications while increasing business transaction throughput.

For hybrid WANs, seek solutions that offer the right quality-of-service control mechanisms to improve network link utilization, protect user experiences, and ensure applications traverse the right network path (i.e., business-critical traffic over MPLS, recreational traffic to the Internet).

Simplifying network operations

The complexity of legacy networks also applies to the management tools. Often the tool set has been built by accretion; that is, when a new piece of network equipment is procured, it comes with its own tool. Despite having all of these disparate tools, blind spots still occur across distributed networks. While most enterprises have made significant efforts to consolidate and simplify management tools, the result is still overly complex and lacks key capabilities.

The need is for a unified solution that combines network monitoring with user experience, infrastructure, and application monitoring for a holistic view of performance. With end-to-end visibility, network administrators can resolve problems faster and minimize disruptions for end users. A single view of the truth enables teams to collaborate more effectively, without pointing fingers. Advanced analytics provide new, powerful insights into application performance.

IT managers can further reduce network management burdens by deploying tools that automate routine tasks such as provisioning new services, reallocating virtual resources and updating router configurations at branch offices.

In addition, automation reduces the risks of human error that could compromise security, degrade application performance and even cause network outages. The result is to dramatically lower the cost of supporting remote locations and free up IT resources for more strategic initiatives.

As more and more enterprise workloads migrate to cloud, IT planners are opting for new workload-aware network management tools, many of which are themselves cloud-based. These offerings typically include capabilities such as application performance management (APM), availability management, capacity optimization and IT operations analytics. By 2017, more than 60 percent of cloud deployments will include the purchase of new or updated cloud management solutions that use the workload-centric approach.¹²

Improving business agility

As digital transformation initiatives continue to gain steam, business units (BUs) are fast becoming the prime influencers of the IT agenda. In many cases, the BUs have been more aggressive in moving to the cloud than the central IT function, the so-called “shadow IT” phenomenon. A 2015 global survey of 200 CIOs found that 83 percent experienced some level of unauthorized provisioning of cloud services.¹³

However, shadow IT has proved to be both a strain on the BUs and a source of headaches for IT. As a result, IT managers are increasingly working to align more closely with the organization’s business objectives. Those efforts are paying off: Enterprise BUs increasingly acknowledge the role of central IT to set policies (up from 31 percent to 44 percent year-over-year), select public clouds (up from 34 percent to 42 percent) and select private cloud technologies (up from 35 percent to 44 percent).¹⁴

A modernized WAN must take into account the need for close collaboration between the IT group and BU managers. For many organizations, this and other requirements are driving network architects to take a close look at an innovative technological solution: the software-defined WAN (SD-WAN).

¹² Robert Mahowald et al, “IDC FutureScape: Worldwide Cloud 2016 Predictions – Mastering the Raw Materials of Digital Transformation.”

¹³ James Quigley, “It’s Time To Embrace, Not Fear, Shadow IT,” September 25, 2015.

¹⁴ RightScale, op. cit.

SD-WAN Comes of Age

SD-WAN uses software and cloud-based technologies to simplify WAN connectivity. In essence, the WAN is abstracted as a software-based virtual entity, which simplifies network operations and improves business agility. SD-WAN enables IT to deliver fast, secure and reliable application services.¹⁵

Unlike traditional WANs that have no visibility into the business, SD-WANs are tightly coupled to the business and ensure the network continues to meet the needs of the organization.¹⁶ IT can set business-oriented policies that are centrally managed and applied network-wide across all remote locations. This dramatically simplifies configuration changes, guides traffic flows over the best network path, and helps IT accommodate evolving

business requirements while meeting SLA commitments to the BUs. SD-WANs provide real visibility into users, their locations and the health of the network services they need. Lastly, they reduce the need for legacy networking infrastructure, slashing operational costs. In fact, one survey found that the software-defined approach reduces costs associated with traditional WANs by 20 percent.¹⁷

Adoption of SD-WAN is growing at a rapid clip as companies look to streamline their WAN infrastructure as they transition to more cloud-based applications. Consistent security (36 percent), price (35 percent) and reduced complexity (31 percent) were the top drivers for enterprises considering SD-WAN.¹⁸

¹⁵ Sanjay Uppal et al, Software-Defined WAN for Dummies, John Wiley & Sons Ltd., 2015.

¹⁶ Zeus Kerravala, "A Software-Defined WAN Is a Business Imperative," ZK Research, May 2015.

¹⁷ Marcia Savage, "SD-WAN Ramping Up In The Enterprise," July 11, 2016.

¹⁸ "IDC Survey Finds Consistent Security, Price and Reduced Complexity Drive SD-WAN Consideration in the Enterprise," IDC Press Release, July 7, 2016.

The Bottom Line

To remain relevant, your enterprise needs to move aggressively to implement a cloud environment. The benefits are substantial; cloud-based enterprises are more agile, provide a better user experience and gain cost savings by simplifying network operations.

However, the potential benefits of cloud cannot be achieved with legacy networks that are rigid, complex and difficult to manage. The solution is network modernization; in particular, re-architecting the enterprise WAN to

optimize application performance, simplify network operations and improve business agility.

Many enterprises are evaluating SD-WAN as a way to achieve these goals. Unlike traditional WANs, SD-WANs are tightly coupled to the business via policies that automate routine tasks and ensure the network continues to meet the needs of the organization.

To learn more about how a modernized network can pave the way to cloud success, please visit www.riverbed.com.

About Riverbed

Riverbed Technology, the leader in application performance infrastructure, provides the most complete platform for the hybrid enterprise to ensure applications perform as expected, data is always available when needed, and performance issues can be proactively detected and resolved before impacting business performance. Learn more at riverbed.com.

The logo for Riverbed Technology, featuring the word "riverbed" in a bold, lowercase, orange sans-serif font.