

A Forrester Consulting Thought Leadership Paper Commissioned By Riverbed

Successfully Consolidating Branch-Office Infrastructure In The Face Of More Users, Services, And Devices

Infrastructure And Operations Professionals Meet Their Goals With Strategic Consolidation And Advanced Optimization Solutions

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FORRESTER

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Executive Summary

As companies evolve, many are focusing on two seemingly dichotomous strategies: consolidation and expansion. Taking a page out of Lean Thinking, companies are continuing to drive waste out; redundant or underutilized software, hardware, and operations from branch and remote locations continue to be consolidated. On the flip side, business decision-makers are expanding by scouting for new revenue streams and remaining relevant to their customer base. As a result, businesses are demanding that IT departments respond by helping them achieve two goals: 1) to embed themselves in their customers' lives, and 2) to offer personalized products and services. As more resources are dispersed into their customer's environments and employees leverage their own devices, infrastructures will encounter new stress points as video and collaboration tools connect employees together and virtual desktop infrastructure supports the empowered employee.

In September 2011, Riverbed commissioned Forrester Consulting to evaluate what was required to support the consolidation of infrastructure and operations (I&O) with the demands of emerging business goals of customized services and products. Forrester Consulting surveyed 207 IT decision-makers from enterprises around the world and found that enterprises were still focused on increasing efficiencies through strategic consolidation of hardware, software, and operations, but they were balancing consolidation with the need to support a dynamic, dispersed, and empowered workforce. To be able to meet both strategies, advanced WAN optimization solutions and strategic consolidation were the key ingredients to successful consolidation efforts; consolidation is a strategic imperative that has been a long road for many, but is only partway done and remains a top priority.

Key Findings

Forrester's study yielded four key findings:

- Even though I&O has been in the process of virtualizing and consolidating, only a minority of companies have completely virtualized their infrastructure, and very few have consolidated.
- Organizations are strategically consolidating applications, storage, and servers.
- Empowered, distributed, and dynamic workforces highlight the careful consideration of what hardware, software, and applications get consolidated.
- Consolidation can only be completed with the support of advanced WAN optimization solutions to ensure that the business remains relevant and competitive.

To Increase Efficiencies, I&O Leverages Server And Storage Virtualization To Facilitate Consolidation

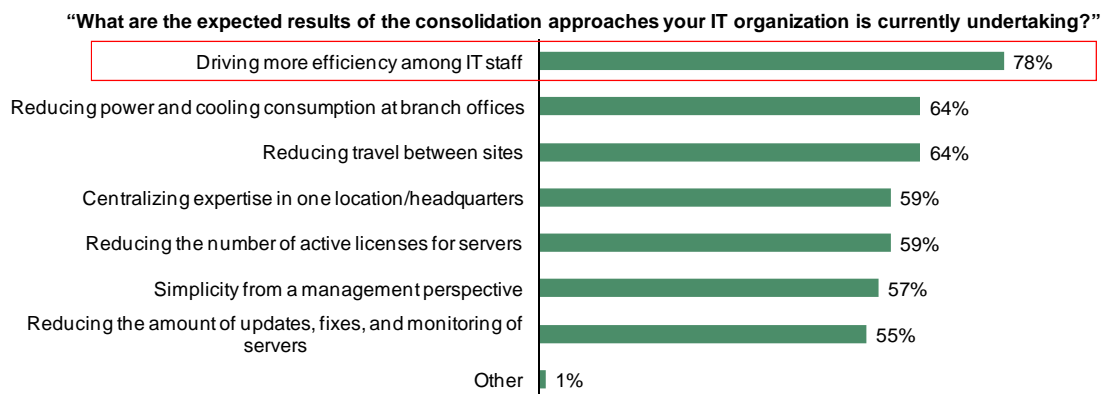
Over the past few years, business executives have forced I&O professionals to industrialize their operations and infrastructure; other business units (BUs) consider them cowboys on the open plains, only accountable to themselves. The outcries have pushed CFOs to examine why IT budgets have been growing exponentially over the past two decades while company revenues, a small factor of improvement, and other departments were decreasing. I&O has been tasked

to be more efficient (see Figure 1). Thus, standard business practices within retail and manufacturing— measured by objectives, optimizing workflow, Six Sigma, and Lean Thinking — have been brought into IT I&O. So it’s no surprise that even though budget freezes are starting to thaw and initiatives are ignited, I&O teams continue to position virtualization and consolidation as top priorities (see Figure 2).¹

Consolidation, in effect, eliminates the “death by a thousand cuts” that comes from having too much infrastructure. Businesses are hemorrhaging resources by supporting:

- **A large amount of distributed software and hardware.** Many firms questioned the redundant and fragmented IT capabilities of having duplicate assets, support functions, relationships, and processes. In fact, Forrester found that two-thirds of companies are restructuring their IT organization to be better aligned with the business and reduce cost associated with duplication and management ambiguity — poorly designed processes and organization structures, overloaded staff, and IT’s traditional workaround culture.²
- **Underutilized compute and storage power.** Traditional data centers had a single application or database associated with a particular piece of hardware to ensure that one application didn’t interfere with the operations of another one. An x86 server deployment achieved only meager utilization and single-digit efficiencies. Even worse, utilization metrics can be found in the storage arena where accountability has taken the back seat to servers. To complicate metrics, the effectiveness of storage and developing KPIs gets buried in tiers, scalability, drives, and even in the nuances of allocated versus used.

Figure 1
Operational Efficiency Is At The Top Of Mind Of I&O Professionals



Base: 192 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

Figure 2**I&O Teams Increase Efficiencies Through Virtualization And Consolidation**

Base: 192 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

Even though virtualization companies have been quick to highlight that most environments are virtualized and ready to evolve to cloud entities, Forrester has found that most enterprises haven't matured their existing virtual environment management practices to the point of being ready to operate a highly standardized, automated, and thus autonomous cloud environment; they are a long way from creating cloud computing services with their infrastructure. The reality is most businesses are in the middle of their transformation, and very few have completed the journey.

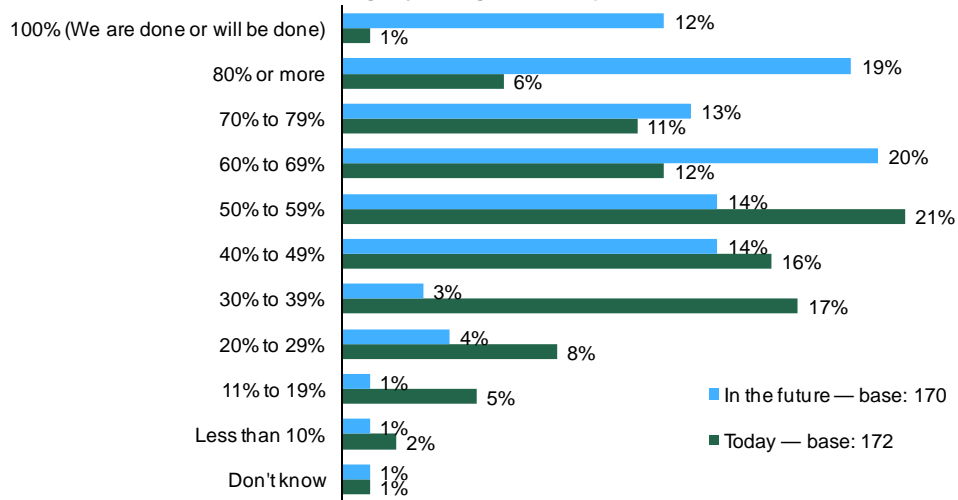
- In a survey of enterprise hardware decision-makers in Q3 2010, the priority was still consolidation and virtualization (reported as a high or critical priority by 80% of respondents).³
- Seventy percent of survey respondents feel their consolidation with their servers and storage efforts are less than 50% complete (see Figure 4 and Figure 5).
- According to Forrester's Forrsights Hardware Survey, Q3 2010, less than half (45%) of the x86 servers within enterprises are virtualized today.
- Less than 13% of those surveyed felt they had completed consolidation of their data centers and only a tiny 7% have done so in the branch offices (see Figure 5).

The industry's mindset has mostly focused on server virtualization and consolidation; storage, applications, and networking have played an equal role in the effort to increase efficiencies.

Figure 3

I&O Has Consolidated Less Than Half The Server Infrastructure

“How much of your server infrastructure is consolidated today or will be consolidated in the future according to your organization’s plans?”



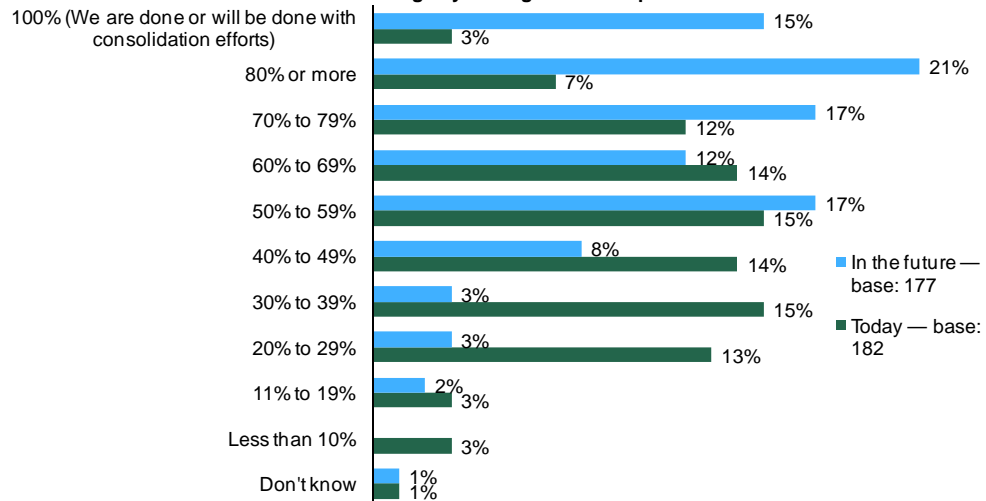
Base: 192 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

Figure 4

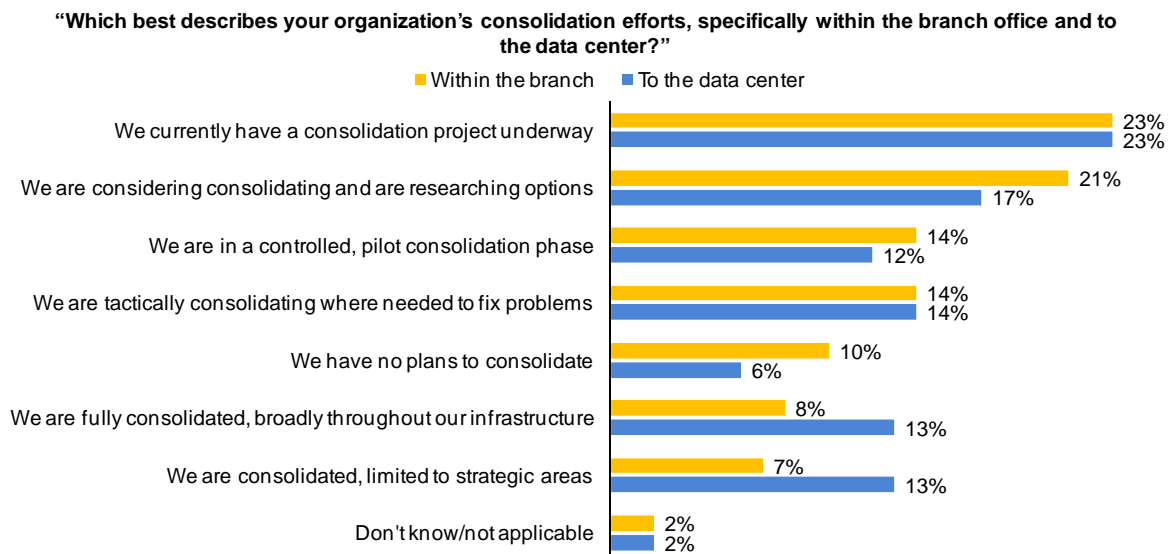
Still A Long Road Ahead With Storage Consolidation, With Most Organizations Only Halfway Done

“How much of your storage infrastructure is consolidated today or will be consolidated in the future according to your organization’s plans?”



Base: 192 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

Figure 5**Very Few Organizations Have Finished Their Consolidation Efforts**

Base: 192 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

By embracing industrialization concepts, IT consolidation and standardization took on the challenge of sorting out and merging redundant and fragmented IT capabilities by removing duplicate assets, support functions, relationships, and processes for the purpose of increasing the real value of IT investments. Consolidating an IT infrastructure and processes moves IT assets to a more centralized model. At least 83% of those surveyed have spent the energies on reducing the amount of hardware — storage and servers — to increase utilization in the branch office, while only 67% of the respondents found redundancy and consolidation opportunities with applications. This means organizations are:

- **Not bulldozing the entire infrastructure in the remote offices and centralizing it.** I&O is reducing the amount of servers and storage devices but taking a more conservative approach with applications. Operational teams are not removing every application and centralizing but strategically choosing which ones to centralize and which ones to keep at the branch office.
- **Leaving some hardware and increasing their utilization.** Certain applications and data need to reside locally in order for them to run effectively, such as DNS and DHCP services. In the same token, all hardware can't be eliminated either. Routers, switches, WAN optimization, and other devices are the connecting fabric and must remain local. Thus, solutions exist to increase the utilization of those devices through services platforms, or organizations have chosen to keep a server that will be virtualized.
- **Leveraging other hardware.** Advanced WAN optimization hardware offer services capabilities to host the applications to allow the reduction of hardware but keep the applications in place.

Business Strategy Around A Dispersed And Empowered Workforce Dictates I&O's Consolidation Strategy

I&O teams' consolidation efforts, framed by business teams, are preparing for growth and scouting for new revenue streams. Instead of creating bulk services and products and trying to win customers over by price, enterprises are:

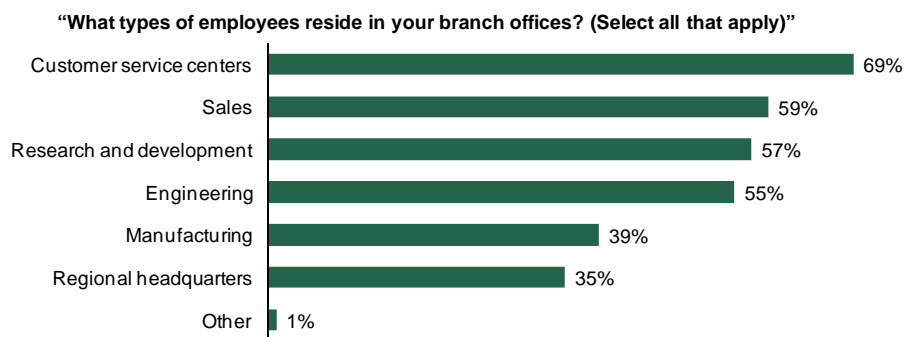
- **Embedding themselves in their customers' lives.** By being closer to the customer — like bank centers in grocery stores — the business can be more in tune with its customers and increase customer loyalty. This is causing a business metamorphosis for organizations ranging from a few large locations to those with multitenancy in a lot of locations.⁴
- **Offering personalized products and services.** Consumers want unique products and services that fit who they are at that moment in time and where they are located. The “have it my way” generation will continue to expect personalized service. This means whether an organization manufactures cars or delivers services, the business has to be dynamic so it can keep its current customer base and expand it.

This means infrastructures will need to support:

- **An ever-increasing dispersed workforce.** To react quickly and serve customer needs, enterprises are decentralizing their workforce and placing them in flow with their customer's lives. Thirty-nine percent of respondents indicate the amount of employees accessing company data remotely has increased in the past year, while 79% say it will increase in the future. To ensure teamwork and trust, new workloads — collaborative applications, videoconferencing, file-sharing solutions, and voice over IP — will be placed onto WAN, and these applications require high throughput and low-latency connections.
- **A complex, dynamic, and heterogeneous branch office.** With infrastructures connecting the world together, companies are using the opportunity to tap into lower-cost resources and increasing their pool of resources to leverage. Aerospace companies, which regularly would be restricted to aerospace engineers from the Seattle area, are leveraging talent from India, Japan, Germany, or other countries with a strong focus on engineering. The branch and remote offices, once bastions dedicated to sales teams with a very narrow set of services, are turning into microcosms of their campuses. More than 55% of our survey respondents had engineering, sales, and R&D at the remote offices (see Figure 6). With such a diverse population, the remote office's business requirements become as fluid and complicated as each respective role's unique needs and service requirements.
- **Empowered employees.** As employees are located further away from traditional support systems, they become more dependent on their own local resources. Employees are under extreme pressure to do more, and they often find the technology they have at home is better than the workplace, so employees are demanding that they use their own consumer devices in the workplace to get their jobs done.⁵ Survey respondents already saw a more than 18% increase in tablets being used in the branch offices compared with the past year, while desktop usage dropped. Organizations are being forced to create a self-service infrastructure that can support bring-your-own-device (BYOD) to work. The security and control points won't be at the business-provided device but rather embedded in the network. I&O's control point will start at the port, which means rolling out authentication and client virtualization infrastructure.⁶ Streaming everything that once resided on the PC across WAN links puts a heavy pressure on them.

Historically, remote offices supported a few sales team members who were using email, a few desktop applications, and customer resource management software; now, they are required to manage multiple types of users with their own devices, a unique set of data, and potentially hundreds of apps. Gone are the days of buying a bigger pipe to the branch office or the cookie-cutter set-up-and-go mentality. I&O teams must implement solutions that can dynamically interweave a set of functions leveraging the most optimized set of capabilities and resources to ensure that they are getting the same or better experience than if they were on the campus LAN.⁷

Figure 6
Branch Offices Are No Longer A Homogenous Pool Of Sales Personnel



Base: 207 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

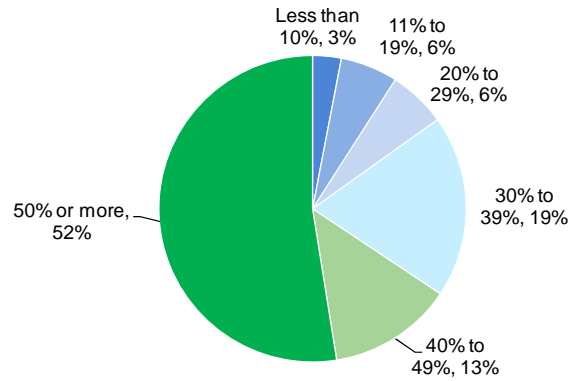
Besides deploying an infrastructure that can orchestrate the right services with so many variables, I&O professionals are balancing complete centralization of all infrastructure components with regulations, business goals, and user demands. The reality is that consolidation and virtualization teams are not centralizing and eliminating every component in the branch office but are carefully selecting what they can consolidate locally, what they can centralize on a macro level, what remains untouched, and how they can increase the efficiency of the remaining components. I&O managers aren't centralizing:

- **Core data.** There are many services that are best left resident on servers in the branch office to ensure resiliency and functionality of that branch in the event of a WAN outage. Across all of the companies surveyed for this study, more than half have 50% or more of the data located at branch offices (see Figure 7).
- **Mission-critical apps.** Seventy percent of the respondents feel email, large business applications, and backup solutions should remain close to the user (see Figure 8).
- **Collaboration tools.** To support the growing dispersed workforce, more than 60% of I&O managers want to ensure that virtual desktop, collaboration tools, and voice over IP are available in the remote office and area, choosing to host those locally on branch-office hardware.

Figure 7

To Ensure The Best Experience, Data Is Kept Close

“What percentage of all data in your organization would you estimate is stored primarily in branch offices today?”



Base: 207 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

Figure 8

Traditional Applications Continue To Dominate Branch-Office Compute Space

“In regards to your branch offices, what software/applications are being run locally on dedicated infrastructure in any of your branch offices?”



Base: 207 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

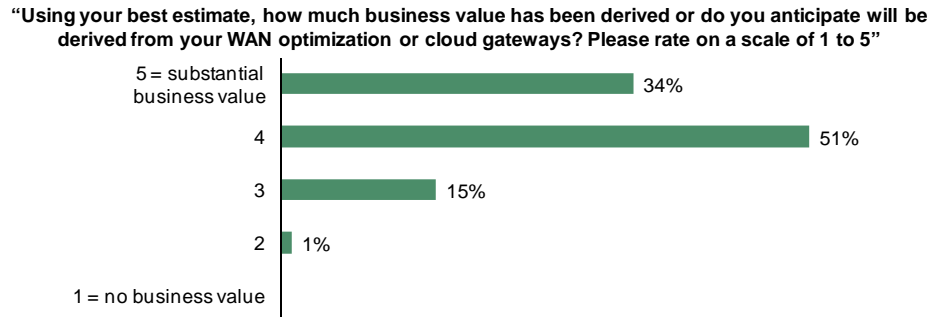
Optimization Solutions Enable I&O To Support Consolidation And Expansion Efforts

I&O members are tackling their consolidation process with optimization technology and a multidiscipline approach. On one side, the organization has to support its No. 1 priority — increase performance — and on the other hand, support new applications along with a dispersed and empowered workforce. Therefore, infrastructure personnel are carefully picking what they consolidate, what they centralize, and what they leverage. More than 83% of respondents were consolidating servers and storage, but only 65% were consolidating applications. I&O team members — server, storage, networking, and virtualization — are consolidating and strategically centralizing by working together and sharing hardware like WAN optimization controllers, which are a vital component to remote locations.

Traditionally, the answer to slow applications or traffic congestion has been to throw bandwidth at problems as opposed to investing in new technology. Budgets and the lack of high-speed connections have pushed this knee-jerk reaction to the side. It feels good initially but is not sustainable. As most companies are centralizing old applications and trying to use new applications to drive efficiency, and the performance of many applications deteriorates with distance, it's not hard to understand why businesses have installed or are installing WAN optimization controllers. Eighty-five percent of enterprises consider the technology of substantial and strong value (see Figure 9). Branch-office consolidation teams get higher-level returns on their investment when they:

- **Take an architectural approach.** Companies that benefited from WAN optimization felt the deployment was much more than addressing bandwidth or latency issues. Almost 90% of those surveyed feel that the delivery of services and content is part of large technology decision and strategy (see Figure 9). With most data stored still at branch offices, IT is looking to leverage cloud gateways in the branch office instead of sending all the data back to one location and buying bandwidth from there to the cloud. Bandwidth prices increase exponentially, not linearly.
- **Break down the technology silos.** Companies that are building out more remote sites and connecting employees together through collaboration tools like voice and video see the deployments intertwined with optimization technology. Eighty-six percent of businesses feel that application and networking are interrelated and should be built out together (see Figure 10). This also applies to consolidation. Whether it is an app, server or storage device, today's infrastructure is an intertwining set of services that are dependent on each other.
- **Utilize the platform for other services.** Branch offices still need fundamental pieces of hardware (switches, access points, routers, WAN optimization) to keep the location connected. Advance solutions that have virtualized platforms support the organizations that want to remove hardware like servers and storage but keep the apps local. Not only does the experience improve with employees accessing the application, but the networking team also gets rewarded for consolidation, which is not a usual characteristic.

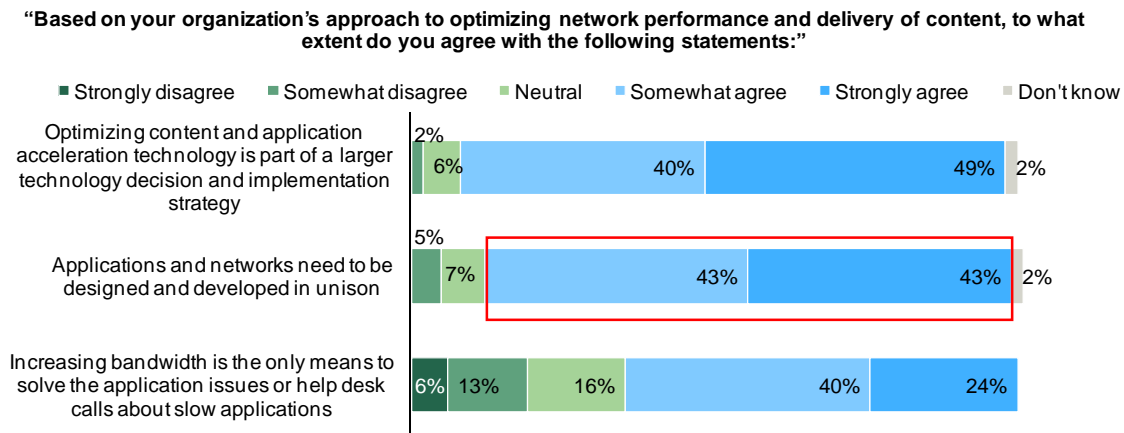
Figure 9
 Optimization Technology Helps Organizations Meet Their Business Objectives



Base: 207 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

Figure 10
 Optimization Is More Than A Band-Aid But Also Part Of The Business Strategy



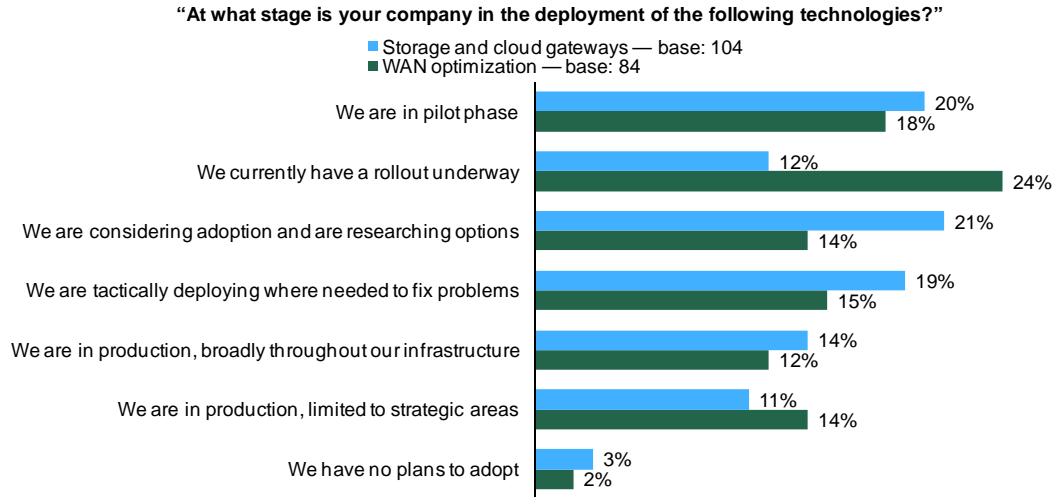
Base: 207 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

Delivering the right services to the right user at the right time on their own device requires an infrastructure that can orchestrate all the components. Companies found that the best results were realized when consolidation efforts were done by teams that include the business units and technology silos. Similarly, due to a symbiotic relationship between data and applications, organizations are tackling storage consolidation in tandem to ensure consistency of processes and unity of supporting components (see Figure 11). Organizations won’t have to reverse course if they realize later one piece can’t work because of increased latency. The industrial efforts can be accomplished quicker and with less overhead with partners that can help address both storage and server consolidation while enhancing how users connect with the data and applications.

Figure 11

Optimization Technology Is In Sync With Consolidation Of Storage And Servers



Base: 207 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

CONSOLIDATION IS AN I&O TEAM EFFORT

The enormity of a consolidation effort in a global organization can be daunting, but the rewards are compelling. As our survey shows, the majority of I&O leaders are either involved in or are planning consolidation projects. But in the not-too-distant future, consolidation won't be a project — it will be a way of life. Abundant and affordable servers and storage and “just add another server” thinking will be as outdated as punch cards and vacuum tubes. I&O leaders will need to adjust their vocabulary and their business approaches to drive greater business value from IT infrastructure. The road will be a long one, and the evolution to that phase with the associated efficiency benefits can only be realized if organizations:

- **Consolidate strategically.** Most of the industry has focused on server consolidation, but there is opportunity to look at storage, applications, and networking hardware. It doesn't mean having to centralize everything. Applications can be kept local but on hardware that can serve as dual-purpose appliance, like WAN optimizers.
- **Look for vendors that provide more than just WAN optimization.** Just as with consolidation, there is more than just application acceleration. Ensuring and enhancing a user's experience is an active combination of control, monitoring, and optimizing. I&O managers reap the most benefit when they can partner with vendors that can offer higher efficiencies and support a dynamic, dispersed, and empowered workforce.
- **Realize consolidation is an I&O effort.** Consolidation touches on servers, storage, applications, monitoring, service desk, networking, and other teams. While many may think they know the other disciplines well enough to represent them, we've found this rarely to be a safe assumption. Trying to save time at the front end by not getting buy-in ultimately drags projects out with unforeseen hiccups.
- **Involve the business units.** IT's job should never have been as the “budget police” or “technology police”; that role evolved as the business threw budgets and work requests over the wall for IT to manage. When IT spending is fully transparent to business units in the context of key business functions, the animosity business leaders now direct at IT falls away. When they see IT spending in terms of key business functions, the dialogue turns away from animosity toward IT, focusing instead on making business-based decisions on how to change spending patterns. I&O should enlist BUs to help take an active role in strategic consolidation.

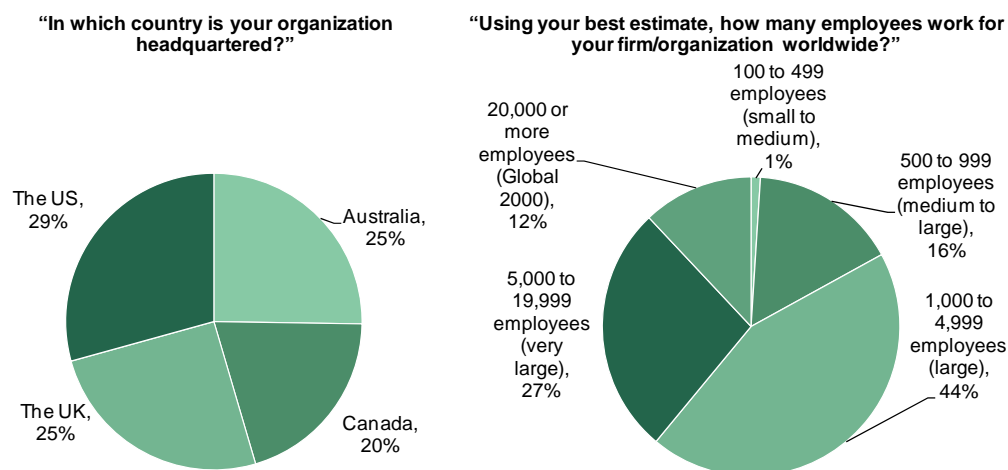
Appendix A: Methodology

In this study, Forrester conducted an online survey of 207 I&O professionals in the US, the UK, Australia, and Canada to evaluate how and if they are planning on consolidating their resources in branch offices. Roles included infrastructure architects; senior network administrators and engineers; enterprise and application architects; and directors, VPs, and managers of network operations. Questions provided to the participants asked about current consolidation efforts and future plans. Respondents were offered an incentive as a “thank you” for time spent on the survey. The study began in July 2011 and was completed in August 2011.

Appendix B: Demographics

Figure A

Country And Company Size Demographics



Base: 207 IT leaders in organizations with branch offices

Source: A commissioned study conducted by Forrester Consulting on behalf of Riverbed, August 2011

Appendix C: Endnotes

¹ 2010 will not be standard operating procedure. In fact, when we asked IT decision-makers to categorize the breakdown of the IT spend above, we found that only half is going to ongoing operations and maintenance. “Keeping the lights on” is taking a back seat. In fact, we found that new IT initiatives make up roughly one-third of the budget. Traditionally, IT budgets break down into ongoing operations versus innovation — i.e., new IT projects. This split has

always been roughly 70/30, so it's no surprise that 31% of the operating and capital budget will go to new IT initiatives in 2010. Source: "Focus Your I&O Budget On Three Key Initiatives," Forrester Research, Inc., July 16, 2010.

² CIOs who wish to position IT for more sustainable contributions to business productivity and innovation must first address two problems that have consumed IT since the early days of client-server: 1) duplication within IT assets and organizations, and 2) IT's traditional workaround culture. These conditions sap IT budgets and management's attention — making focus on business outcomes elusive and fleeting. CIOs must regularly look for symptoms signaling a rise in duplication and organizational ambiguity on the strategies and values that should guide IT efforts. Source: "Position IT For Innovation By Fixing Duplication And Ambiguity," Forrester Research, Inc., July 13, 2007.

³ In 2009 and 2010, about 80% of enterprise IT infrastructure decision-makers reported that consolidation and broad use of server virtualization were high or critical priorities — compared with just under 30% for internal cloud or public cloud in 2010. For more information, see "Navigating The Shifts In Computing Infrastructure Markets," Forrester Research, Inc., March 24, 2011.

⁴ For example, banks are closing down large branch offices and creating smaller boutique locations, like grocery stores, so they can be part of people's everyday flow and remain in their minds. Traditional big-box stores like Target, J.C. Penney, and Toys R Us are filling mall vacancies and walkways with pop-ups. The goal is to test out new product lines or to offer more locations for shoppers to get the hottest products at a fraction of the cost of traditional retail models.

⁵ For more information, see "The Internet Crushes The Work/Life Boundary," Forrester Research, Inc., March 17, 2011.

⁶ Emerging client virtualization technologies cost-effectively deliver a desktop tailored to each user scenario. This means that the traditional desktop model — inherently insecure, inflexible, and hard to manage — is a thing of the past. Organizations will instead identify their users by criteria like task-based, knowledge, or power users and will deliver dynamic desktops accordingly. After speaking to organizations looking at desktop and application virtualization, we know that client virtualization is not just an emerging trend; it's the future of the corporate PC. Source: "Demystifying Client Virtualization," Forrester Research, Inc., April 9, 2008.

⁷ Forrester defines a uXn as: a network architecture that focuses on monitoring, controlling, and optimizing the quality of user experience. Users could be defined as internal personnel who could be working remotely on the road, within the office, or at a branch office — basically anywhere. They may be connecting and creating a virtual work or personal environment depending on their immediate need, with endless options of hardware and operating systems. It's up to the infrastructure to understand the user and the vehicle they are using to create the new world. There are customers, vendors, and partners outside your organization who will demand their own instantaneous virtual world. To do this, they will need a user experience network that: 1) has granular visibility to customize services for each user; 2) optimizes the transport mechanisms by combining and accelerating the required service; and 3) can control the flow based on policies of the business. All three of these capabilities are tied together using a common policy framework designed to set user service-level agreements.