

August 20, 2009

A Standard Branch Office IT Platform To Optimize And Consolidate

Using WAN Optimization Appliances For Network
Optimization And Virtualization

A commissioned study conducted by Forrester Consulting on behalf of
Riverbed Technology, Inc.

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Branch Consolidation: Opportunity In Search Of A Platform

In April 2009, Forrester Consulting was contracted by Riverbed Technology to test hypotheses around the goals of IT organizations in a time of both financial constraint and increasing technological requirements. Specifically, this research endeavor set out to validate the following hypotheses:

- Organizations are still faced with onerous cost constraints as they progress into the latter half of 2009.
- The number of mobile and remote workers is steadily growing.
- These users, based remotely and in branch offices, are not currently provided with a parity of IT resources outside of central or headquarters locations.
- Branch offices represent a major opportunity in terms of consolidation through virtualization of server assets, contributing to cost savings and remote-worker efficiency.

Toward this end, Forrester created a survey for IT professionals, fielded in May 2009. The study consisted of responses from 300 IT professionals — 100 each of US- and UK-based firms, with the remaining 100 respondents split between France and Germany. All respondents were spread evenly across various vertical industries.

Key Findings

The organizations surveyed reported, on average, that more than one-third of workers are based at branch offices, and that most of those branch offices house more than 10 servers. As well as housing a substantial portion of the employee population, from an IT perspective, an average of one-third to half of company data also resides in these branch offices — in systems such as email servers, which are largely duplicating functionality that exists elsewhere.

While companies are pursuing long-term cost savings goals around improved power and cooling consumption and are currently virtualizing many of the servers that reside in branch offices, these organizations are still seeking a common platform on which to standardize branch office virtualization efforts.

One specific technology that nearly half of these organizations are considering is WAN optimization, which, in many cases, can offer a solid hardware platform for future virtualization and consolidation initiatives.

Forrester's study yielded five key findings:

- **Organizations remain focused on cost cutting.** Year-over-year reductions continue, but in the second half of 2009 and beyond, companies are faced with additional cost cutting pressure that will require them to prolong their reductions, and even increase their focus on driving IT efficiency and centralizing IT staff.
- **Branch offices are major installations.** The size of branch offices ranged greatly, from an average size of 241 employees in a small branch to an average of more than 1,200

employees in a large branch. More than half of the organizations surveyed reported 40% or more of their data was being stored locally, indicating that branch offices represent a sizable percentage of both workforce and IT infrastructure resources. And in addition, 46% of surveyed organizations note a separate tier of technology quality and performance applies to these offices in comparison to headquarters locations.

- **Server virtualization is nearly ubiquitous and will continue to mature.** The vast majority of firms surveyed (73%) are already virtualizing servers in branch offices and/or central data centers.
- **WAN optimization use in branches is growing.** Forrester found that 42% of respondent organizations are already using WAN optimization in some way today, and 45% of the respondents are showing healthy promise for adoption.
- **Standard platforms are in demand.** Thirty-three percent of respondents feel that an improvement in the centralization and management of systems will be most effective in addressing inefficiencies in their IT environments today, while 23% are seeking an increase in the standardization of architecture in IT systems. Lacking a standard IT platform, consolidation efforts and branch office installations are likely to vary from branch to branch, introducing additional inefficiencies rather than reducing them. The drive for this kind of standardization points even more directly to the need for a standard platform for consolidation and branch infrastructure operations.

The Savings Potential In Branch Offices

As organizations move into the second half of 2009 and look beyond into 2010, cost concerns have not diminished. This study reveals the moves organizations are making to address short-term tactical cost concerns. These investments also have the potential to improve their ability to weather future difficulties as a result of implementing newer technology.

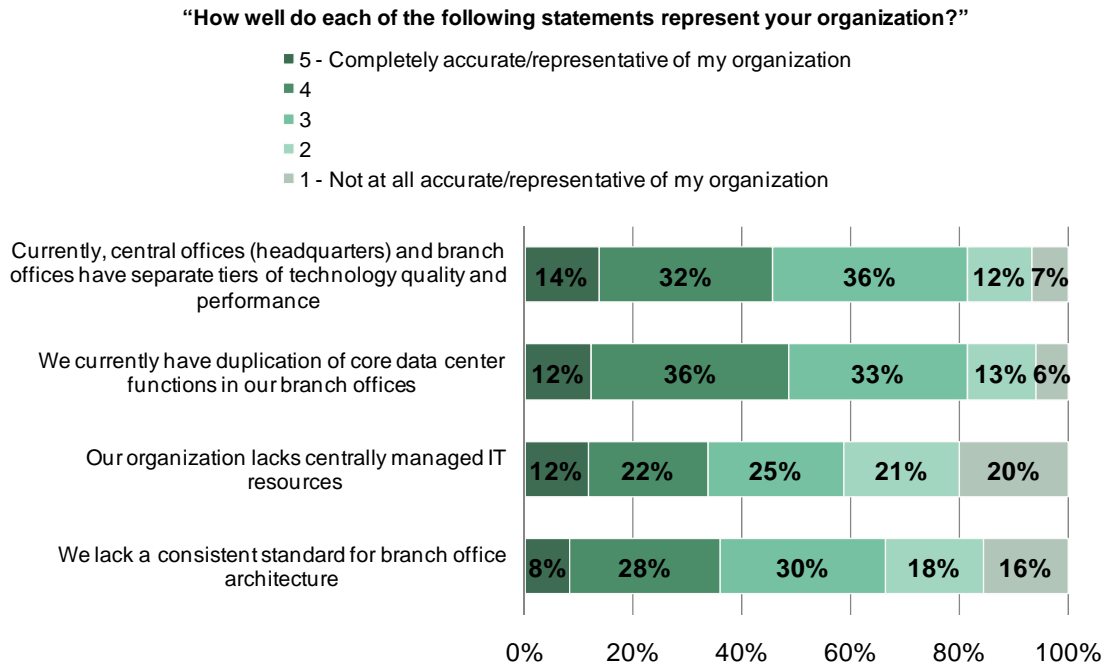
In our survey, only 5% of companies surveyed were not currently working to cut costs in their organizations. Of that 5%, most were not currently making changes and cuts because these actions had already been taken, as is the case for many organizations that acted quickly to alter course as financial storms loomed ahead. However, the greatest majority is in the midst of the following cost control activities:

- **Cutting costs in direct response to the economy.** Nearly a quarter of respondents, 24%, identified their organization as undergoing ad hoc cost control measures put into effect because of the economy. A separate 33% indicated that they were pursuing standard year-over-year reductions.
- **Two-pronged cost control.** Even more of the organizations surveyed — 35% — noted that they were implementing ad hoc cost controls on top of their normal annual cost reduction efforts.
- **Active cost control is the norm.** Ninety-three percent of survey organizations are currently taking an active role in cost reduction.

Branch Offices Maintain Unequal Technology Services And Performance

Branch offices are seen in many organizations as a lower priority as compared with headquarters or primary sites, and they are treated as such in terms of IT services and connectivity. Forty-six percent of respondents agreed that a separate tier of technology quality and performance is acceptable for branch offices in comparison with headquarters sites. Typically there is no standard architecture in these branch offices; nearly 40% of respondent organizations agree that this is a characteristic representation of their organizations (see Figure 1).

Figure 1: Firms Report Duplication And Separate Tiers Of Performance In The Branch

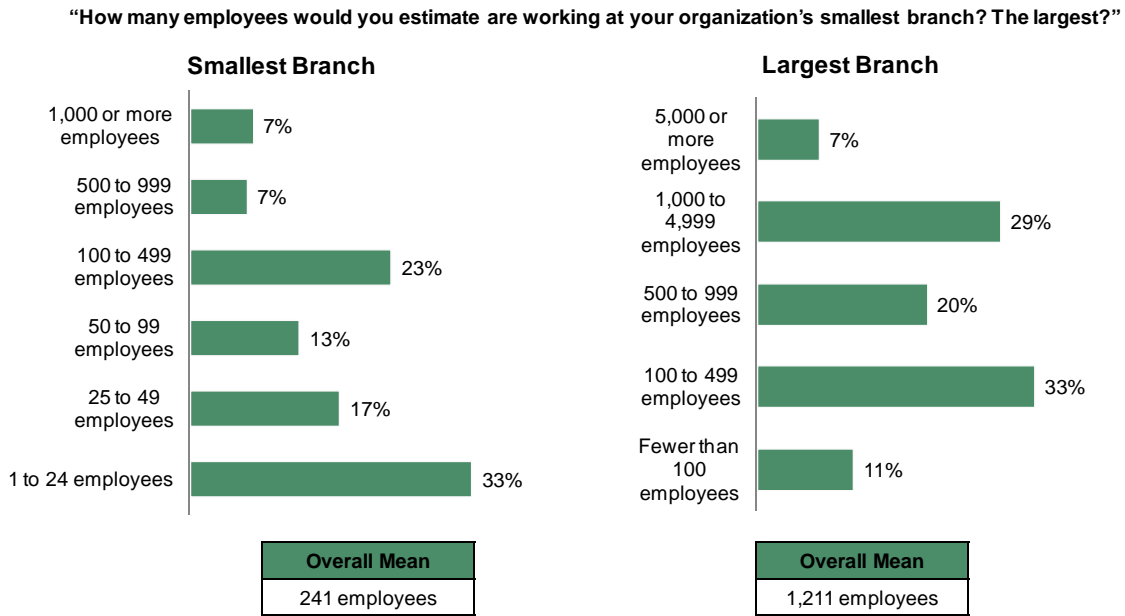


Base: 300 IT professionals with responsibility for data center operations
(percentages may not total 100 because of rounding)

Source: “Branch Consolidation,” a commissioned study conducted by Forrester Consulting on behalf of Riverbed Technologies, June 2009

This separate treatment does not only affect small remote offices. In fact, among companies surveyed, an average of less than half (45%) of employees are based in a central office location while more than a third, 34% on average, of employees are located in branch offices. These branch offices are substantial operations; based on data gathered in this study, the average size of organizations’ smallest branch office is more than 200 employees, while the average size of the largest branch office is well over 1,000 employees (see Figure 2).

Figure 2: From the Smallest Branches To The Largest



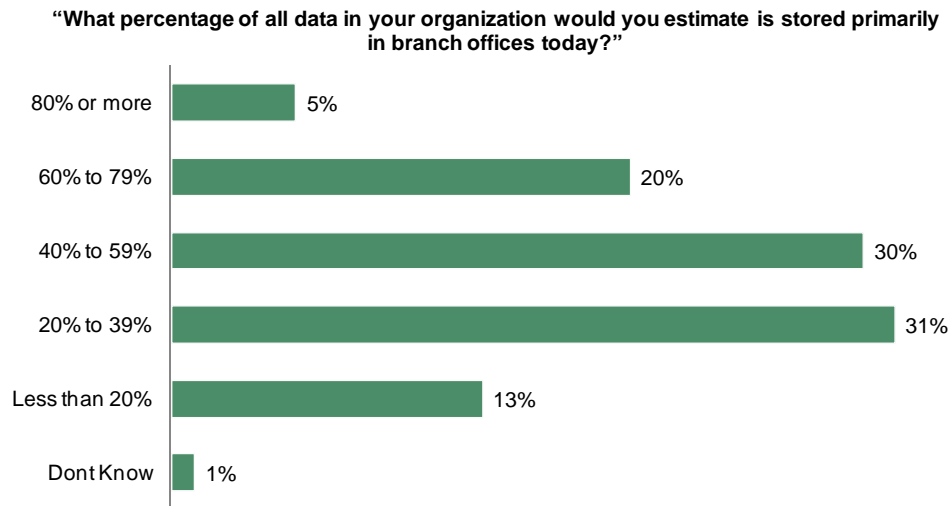
Base: 300 IT professionals with responsibility for data center operations

Source: “Branch Consolidation,” a commissioned study conducted by Forrester Consulting on behalf of Riverbed Technologies, June 2009

Inefficiency In Branches Demand To Be Addressed

Research shows that branch offices can represent more than one-third of companies’ power consumption. On average, 55% of enterprises use more electricity outside the data center, with up to 34% of that electricity being accounted for in branch offices.¹ In addition to the electricity inefficiency these offices represent, these offices are also home to duplicate functions that already reside in a central data center. The overall number of servers deployed in branch offices is a primary cause of the high power consumption there. Almost half of the respondents reported an average of more than 10 unique servers running in a typical branch office. These servers are also housing a substantial amount of company data: 61% of respondents report that anywhere from 20% to 59% of their company’s data is stored on these servers. An additional 25% of respondents reported that 60% to more than 80% of company data is stored in their branch offices (see Figure 3).

Figure 3: Branches Are Home To A Substantial Amount Of Data



Base: 300 IT professionals with responsibility for data center operations

Source: “Branch Consolidation,” a commissioned study conducted by Forrester Consulting on behalf of Riverbed Technologies, June 2009

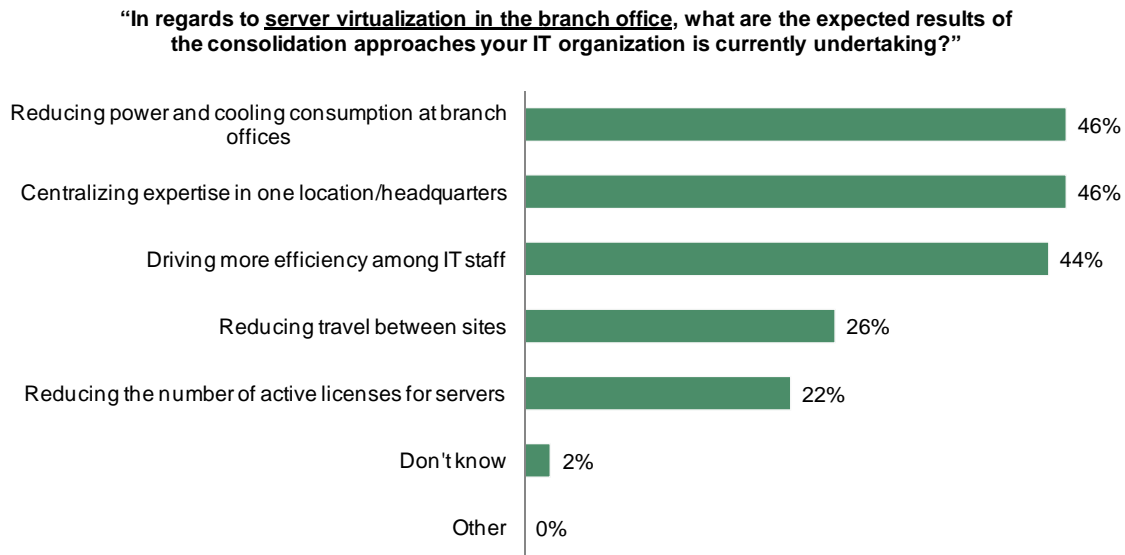
The consolidation of this infrastructure is an area of potential upside for many firms. In many cases, the branch office servers are running the same types of functions already running in the central data center. In fact, 48% of respondent organizations reported duplication of core data center functions in branch offices. Yet merely 33% of respondent organizations report that they are currently undertaking branch office consolidation and streamlining.

Branch Consolidation Should Be Led By Virtualization

Virtualization technology has been discussed as a means to streamline data center operations for some time; however, its use in the branch has been somewhat slower to take shape. Overall, a large majority of respondent organizations (73%) are undertaking virtualization of servers today.

There are many drivers for virtualization in branch offices, often led by the desire to reduce power and cooling requirements — to chip away at the one-third of a company’s electric bill that can be attributed to the branch — and also to help centralize staff and expertise in a central or headquarters location (see Figure 4). As many firms face staffing cutbacks or hiring freezes, centralizing expertise can be a critical step in maintaining strength in the IT ranks.²

Figure 4: Power/Cooling Savings Drive Branch Virtualization



Base: 134 IT professionals indicating current pursuit of this IT initiative (multiple responses accepted)

Source: “Branch Consolidation,” a commissioned study conducted by Forrester Consulting on behalf of Riverbed, Technologies, June 2009

Adopting New Tools For Efficiency

Virtualization and centralization of resources are two elements of a more efficient and cost-effective branch office infrastructure. Companies are also implementing tools for collaboration that can cut travel costs, speed up information sharing, and make organizations more efficient as a result. Some examples of efficiencies organizations are expecting:

- 49% of the organizations surveyed expect increased use of IP-based voice and video conferencing, primarily to reduce travel between sites.
- 32% of organizations surveyed plan to increase use of collaborations tools, and nearly half of those report expect this to increase efficiency among IT staff.
- 42% of respondents who reported increasing use of collaboration tools expected their use to help centralize IT staff.

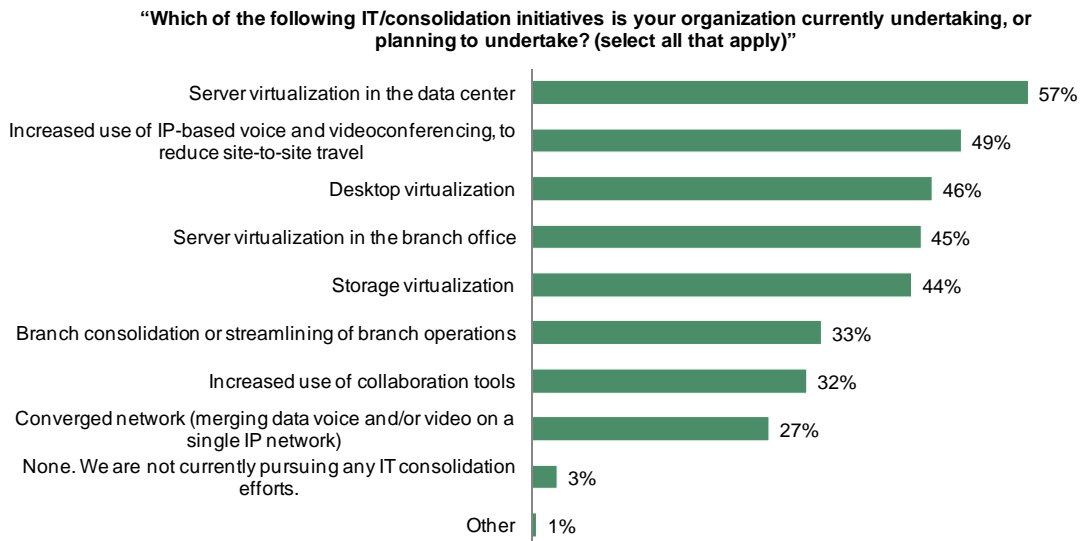
Across all of the companies consulted for this study, more than half expect to see the savings from the use of new tools and consolidation to result in a year-over-year cost reduction of 11% to 20%. As an example, server virtualization in the branch is an expected driver of increased IT efficiency, and lower power and cooling consumption — both cost savings drivers. However, many of the tools being used in consolidation efforts are likely to experience adverse impact from networks, especially WAN connections that are not updated to account for their use, recalling that nearly half of respondent organizations regarded a statement describing central offices and branch sites as having “separate tiers of technology quality and performance.”

Collaborative Tools Bring Efficiency But Suffer From Latency

In the quest to save money, most companies are turning to technology to help alleviate some of the cost of travel, communication, and collaboration. Forrester found that three of the top five IT consolidation priorities have the potential to be hindered by inadequate WAN bandwidth, and latency is also likely to negatively impact many of the applications and services that respondents are rolling out. An example of some latency- and bandwidth-sensitive imperatives:

- IP voice and video are the second-highest IT priority.** Almost 50% of respondent organizations are increasing their use of IP-based voice and videoconferencing to reduce travel costs (see Figure 5). These applications present a challenge for organizations with multiple sites, especially when there are separate tiers of service for headquarters and branch locations.
- Desktop virtualization follows close behind.** The No. 3 priority is desktop virtualization. In addition to the costs, licensing issues, and infrastructure concerns that surround an architectural shift to virtual desktops, network performance should be weighed as an equally high priority. In an environment where — in some models of deployment — streaming control and data traffic are dependent on an optimized WAN connection, latency can represent the difference between a usable and unusable desktop environment.
- Storage virtualization takes the No. 5 spot.** Rounding out the top five IT priorities in overall IT and consolidation is storage virtualization. Forty-four percent of respondents noted that this is an important initiative for their organizations. Depending on the design of the storage infrastructure, storage virtualization can also be a WAN-dependent offering if, for instance, storage infrastructure is virtualized and centralized in a data center that is accessible via WAN links to branches.

Figure 5: Top IT Consolidation Initiatives



Base: 300 IT professionals with responsibility for data center operations (multiple responses accepted)

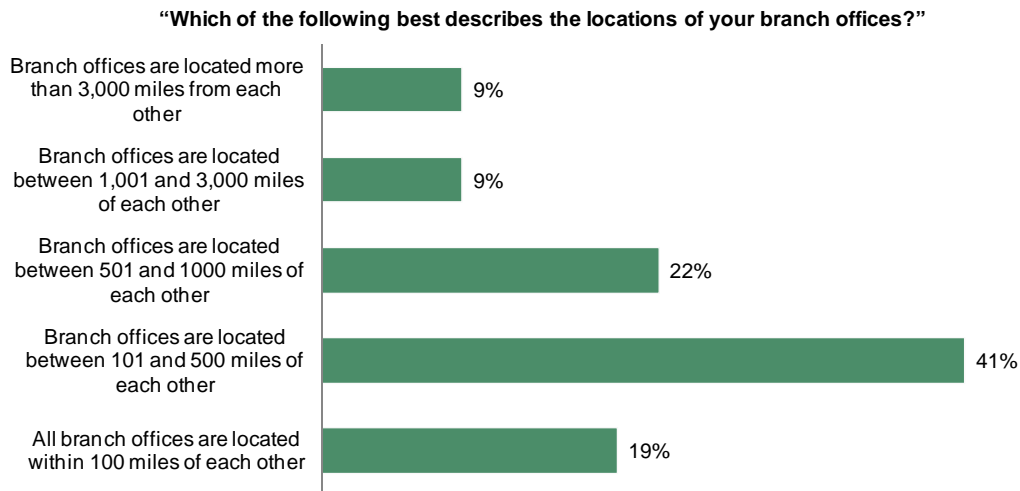
Source: “Branch Consolidation,” a commissioned study conducted by Forrester Consulting on behalf of Riverbed, Technologies, June 2009

Longer Distance Means Higher Latency

It is important to consider what the effect of higher latency will be on consolidated infrastructure as centralization drives applications and data further apart. Placing greater distance between users, data, and applications will increase latency. A proxy for potential latency is simply distance. The farther apart offices are from each other, the higher the latency will be. Forrester found that:

- **The majority of branches are within 1,000 miles of one another.** More than 80% of the organizations that were surveyed reported that their branch offices are generally within 1,000 miles of one another, with half of the group reporting that their branches are within 101 and 500 miles from one another (see Figure 6).
- **Distances inside of 1,000 miles respond to optimization.** Even though most branches are not separated by oceans, WAN optimization can be an effective tool to increase application performance and reduce bandwidth consumption.

Figure 6: The Majority Of Branches Are Within 1,000 Miles Of One Another



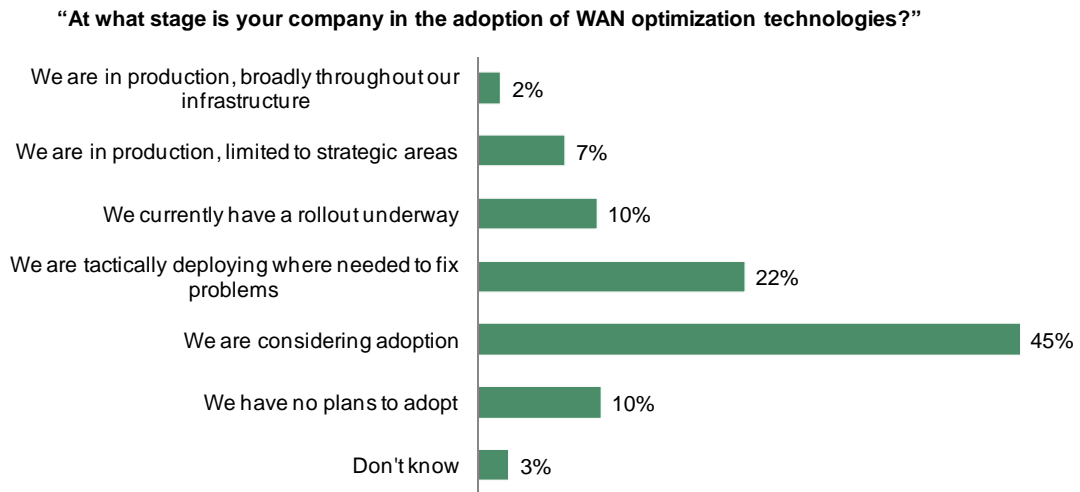
Base: 300 IT professionals with responsibility for data center operations

Source: “Branch Consolidation,” a commissioned study conducted by Forrester Consulting on behalf of Riverbed Technologies, June 2009

Adoption Of WAN Optimization Solutions: Dual Benefits

Since most companies are trying to use new applications to drive efficiency, and since the performance of many applications deteriorates with distance (because of latency), it's not hard to make a compelling business case for WAN optimization. Nearly half of enterprises are considering the technology today, with only 10% having no plans to adopt (see Figure 7).

Figure 7: Forty-Five Percent Are Waiting To Pull The Trigger On WAN Op Investment



Base: 300 IT professionals with responsibility for data center operations
(percentages do not total 100 because of rounding)

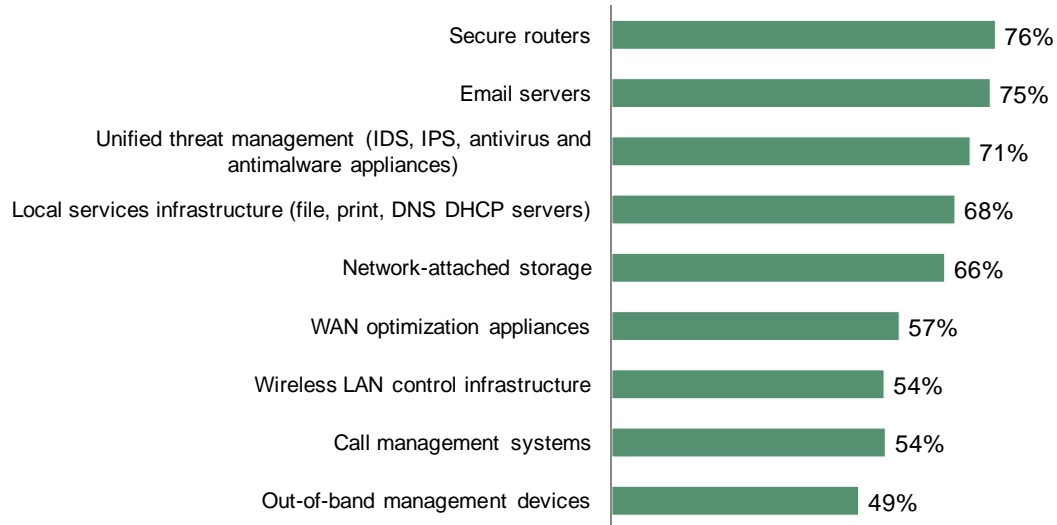
Source: “Branch Consolidation,” a commissioned study conducted by Forrester Consulting on behalf of Riverbed, Technologies, June 2009

WAN Optimization Is Finding Its Way Into The Branch . . .

Fifty-seven percent of the same respondents ranked WAN optimization appliances as crucial or very important to the operation of branch offices (see Figure 8). For firms that have not yet adopted WAN optimization appliances, the clear need for them leads one to believe that they will become an increasingly common part of a branch office's standard infrastructure.

Figure 8: WAN Ops Are Seen As Key To Branch Functionality

“Please rank the importance of each infrastructure element to branch functionality on a scale of 1 to 5, where 1=‘Not at all important to branch functionality’ and 5=‘Crucial to branch functionality’.”
Combined 4 and 5 responses shown



Base: 300 IT professionals with responsibility for data center operations

Source: “Branch Consolidation,” a commissioned study conducted by Forrester Consulting on behalf of Riverbed, Technologies, June 2009

... And Can Serve As The Branch Architecture Standard

The need to centralize services and information is the No. 1 priority in addressing current IT inefficiencies and also a driver for optimized WAN links. The second priority is the need for a standard architecture in IT systems, called out as a priority among almost one quarter of respondents.

Lack of IT standardization is the second benefit WAN optimization can bring. Using the WAN optimization appliance hardware as a platform on which servers can be virtualized, the appliance not only improves performance of centrally deployed applications and data, which reside in the data center, but it also drives consolidation of the branch infrastructure itself.

Through the use of common virtualization technology, integrated in some vendors’ products, organizations can host servers on the same hardware that optimizes and prioritizes traffic.

Companies surveyed for this research are not just evaluating the options for WAN optimization; nearly half of respondent organizations are ready to act and plan to begin IT consolidation efforts in 2010.

Consider WAN Optimization Solutions As A Platform And Network Improvement Investment

As you consider ways to drive efficiency and lower cost in your organization, take a holistic look at the potential benefit of new tools and the consolidation of existing systems. Consider the following:

- **What is the current branch office model?** Forrester sees two models of the branch office, representing a before and after view of consolidation. The “before”, or “thick” branch, consists of services, servers, and other infrastructure duplicated at branch sites, not always in a consistent manner. This model is extremely inefficient from a power, cooling, and IT staff requirement standpoint. The “after”, or “thin” branch, results when certain servers, services, and applications are centralized to a data center or headquarters location and rely on a consistent WAN connection for access. The latter model offers much greater power efficiency in the branch and the ability to centralize or even redistribute IT staff where they are needed. Into which model does your organization fit?
- **Is WAN optimization on the adoption road map?** If consolidation of any sort will involve data and applications residing across a WAN, it is important that an optimization solution of some kind be deployed. In addition to ensuring the performance of centralized applications and data, a WAN optimization solution will also serve as part of a solution to make user experiences more equitable between branch offices and headquarters.
- **Has your virtualization strategy taken branch offices into account?** While the consolidated model offers the possibility of locating some applications and servers across the WAN in your data center, 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. Using virtualization technology embedded in WAN optimization appliances, these servers can remain present in the branch but without the additional infrastructure (and associated power and cooling load).
- **What is the current standard architecture in the branch office?** Is your organization in a similar position to some of those surveyed for this study, where a standard architecture is lacking for IT systems? In branch offices, determining a standard approach for the consolidation and virtualization of servers is a critical first step to beginning consolidation through virtualization. The standardization of the platform for these virtual server iterations will drive the speed and efficiency with which IT professionals can deploy and maintain them.

Branch offices are likely to have a WAN optimization solution in place — if not now, soon, according to nearly half of respondents. The WAN optimization appliance provides two benefits. It helps usher in the new suite of services, applications, and tools IT is adopting by diminishing branch bandwidth requirements and reducing remote site latency. This same appliance, when empowered with the ability to virtualize servers on its hardware, can provide a standard IT platform allowing consolidation to take place not only by centralizing data in the data center but also by virtualizing servers and applications in the branch.

Appendix A: Methodology

In this study, Forrester Consulting, commissioned by Riverbed Technologies, conducted an online survey of 300 organizations in France, Germany, the United States, and the United Kingdom to evaluate current IT imperatives as they pertain to branch office configurations and operations and IT consolidation. Survey participants included decision-makers and influencers for network infrastructure with direct responsibility or influence over branch and/or central data center IT operations. Questions provided to the participants inquired about the details of branch office operations in their organizations, the nature of any consolidation and cost control initiatives taking place in their organizations at present, and future plans around the consolidation and virtualization of server resources. The study was conducted in May 2009.

Appendix D: Endnotes

¹ See Forrester's December 18, 2008 "More Energy Is Consumed Outside Of The Data Center, 2008" report.

² In "Forrester's Enterprise And SMB Networks And Telecommunications Survey, North America And Europe, Q1 2009," when asked, "Which of the following actions has your firm already taken this year or do you expect to take this year as a result of the current economic conditions?" 70% of companies surveyed responded, "IT staff hiring freeze(s)."