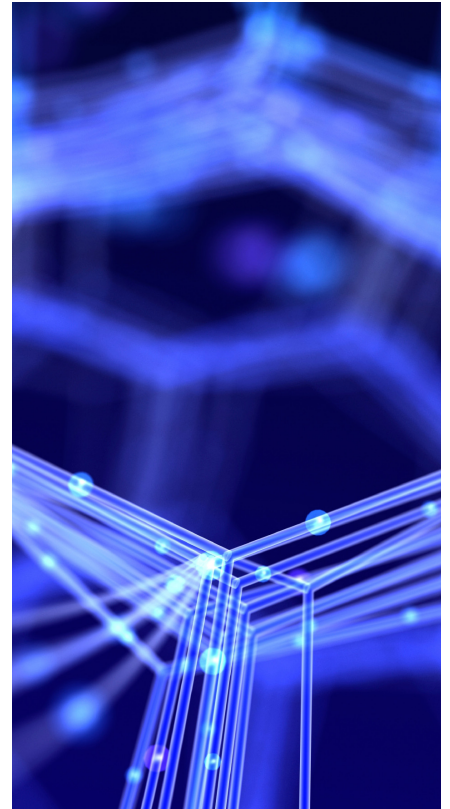


Keys to Unlocking IT Value through **WAN Optimization**

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Introduction

As recently as a few years ago, few IT organizations were concerned with the topic of ensuring acceptable application delivery to branch office employees. Now that topic is a top of mind issue for most IT organizations. One reason for that shift is that unlike the situation of a few years ago, today the vast majority of employees work in a branch office. Hence, the topic of ensuring acceptable application delivery to branch office employees has become more important in part because it impacts significantly more employees.

Another reason for the shift is that unlike employees who work in a headquarters facility, branch office employees typically access applications over a Wide Area Network (WAN). As will be explained in this special report, the fact that branch office employees have to use a WAN to access applications introduces a number of performance challenges.

One goal of this special report is to discuss the challenges facing IT organizations as they reassess what IT resources belong in branch offices. Another goal of this special report is to discuss how an emerging class of network equipment, called a branch office box (BOB), can be used to mitigate these challenges. This report will draw on the results of a survey that was given in August 2008 to the members of Network World's Technology Opinion Panel. Throughout this special report, the 168 enterprise IT professionals who responded to that survey will be referred to as The Survey Respondents.

The WAN Delivery Challenge

Driven by the need to reduce cost, increase security and ease their ability to comply with industry and governmental regulations, most IT organizations either already have completed the process, or are currently in the process of consolidating servers out of branch offices and into centralized data centers. The Survey Respondents were asked to indicate their organization's plans for server centralization. Their responses are shown in Table 1.

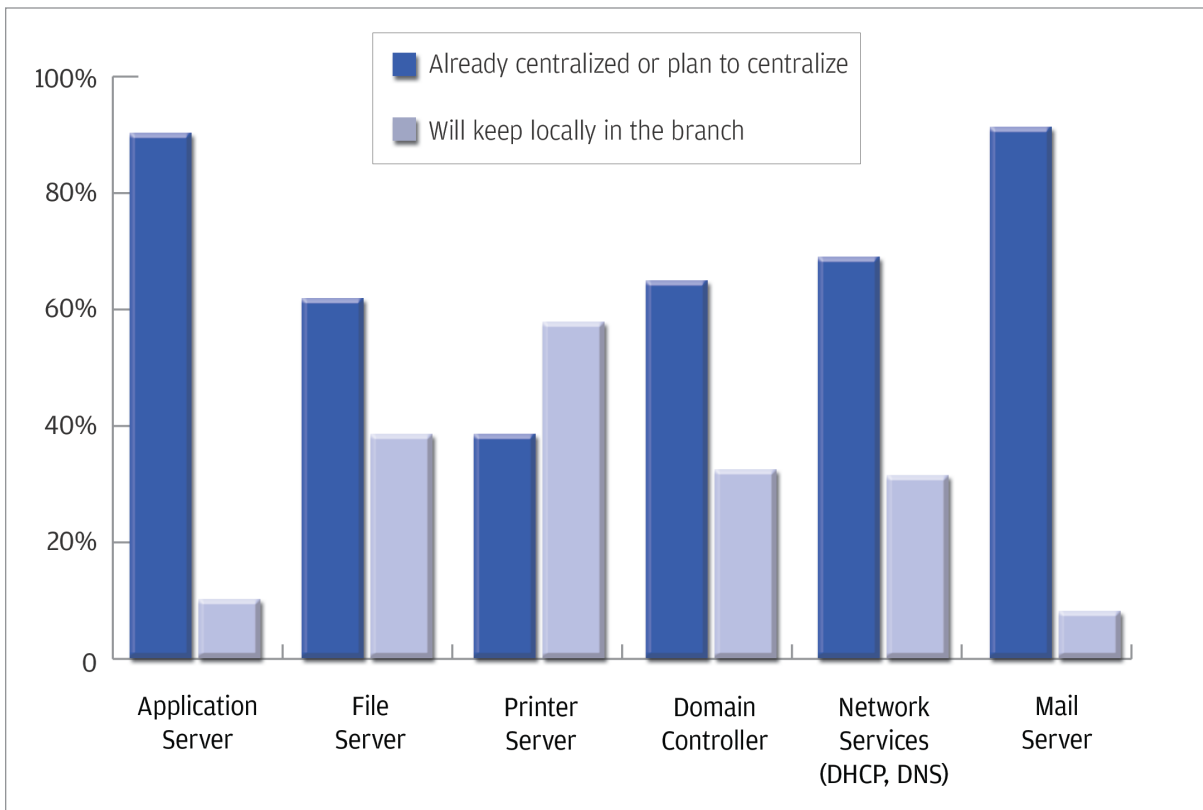


Table 1: The Extent of Server Consolidation

The data in Table 1 shows the strong interest that enterprise IT organizations have in providing services locally to branch office employees while simultaneously consolidating servers out of branch offices and into centralized data centers. In particular, the data shows the strong interest on the part of enterprise IT organizations to consolidate mail and application servers into centralized data centers. While the data indicates that there is also interest in consolidating other types of servers, roughly one third of The Survey Respondents intend to keep their network services, domain controllers and file services in their branch offices. In addition, over half of The Survey Respondents will keep their print servers locally in the branch. There are many reasons why IT organizations choose to keep IT resources within the branch office. For example, almost two thirds of The Survey Respondents indicated that avoiding application performance issues is the primary reason that would cause their organization to keep resources within the branch office. In addition, over half of The Survey Respondents indicated that being able to better cope with WAN outages is another reason why their organization would keep certain IT resources within branch offices.

The Survey Respondents were presented with a number of applications and protocols and asked to indicate how difficult it was to ensure their performance over the WAN. Figure 1 depicts the percentage of times that The Survey Respondents indicated that the application or protocol was either challenging or very challenging.

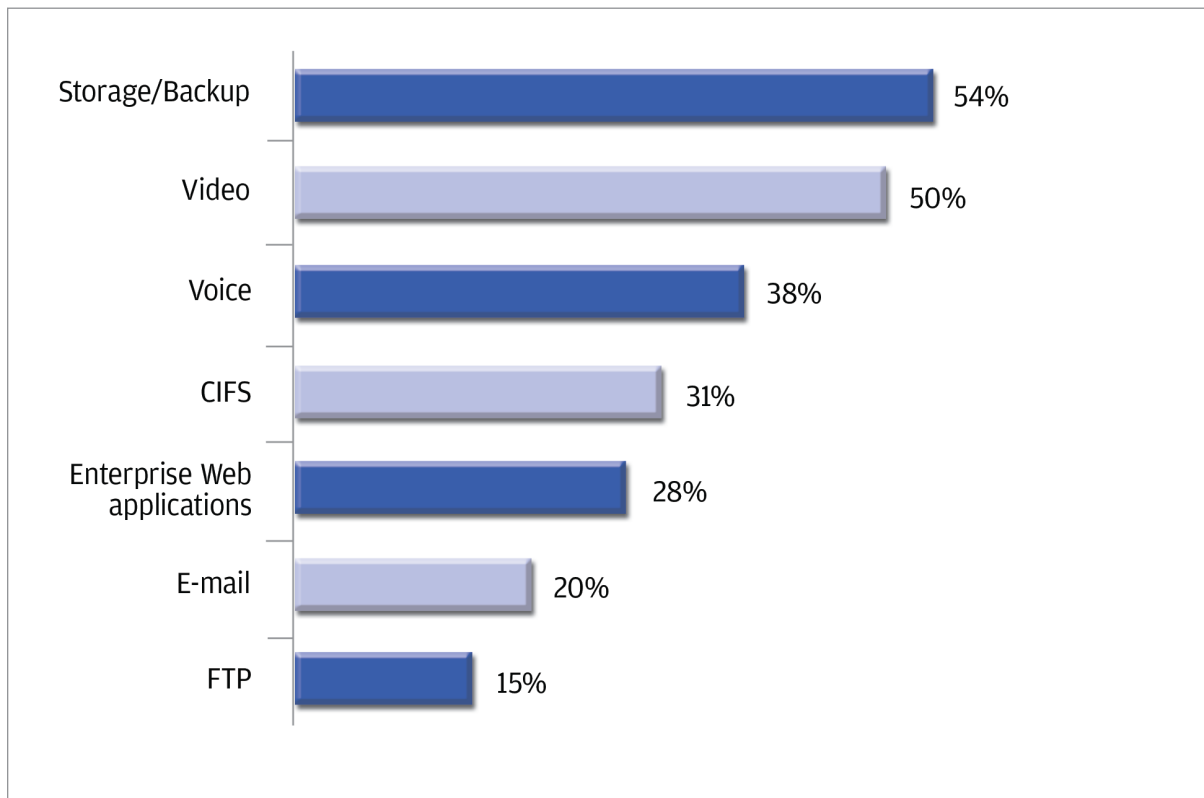


Figure 1: Challenging Applications and Protocols

To understand why The Survey Respondents found the applications and protocols listed in Figure 1 to be challenging, it is important to remember that when employees work in a headquarters facility they typically access applications over a Local Area Network (LAN) that provides very high capacity and very low levels of delay, jitter and loss. The Survey Respondents, however, indicated that today two thirds of the time when a branch office employee is accessing an application, they are accessing it from a centralized data center over a WAN link. In contrast to a LAN, the typical enterprise WAN is comprised of technologies such as Frame Relay, ATM and MPLS and has limited capacity and relatively high levels of delay, jitter and packet loss that can cause application performance issues. For example, storage/backup, E-mail and FTP are challenging because of the sheer volume of data that must be transmitted over a WAN link that

has limited capacity. Good quality video and voice requires lower levels of network delay, jitter and packet loss than are present in many enterprise WANs. CIFS (Common Internet File System) is a chatty protocol that typically requires hundreds of round trips to complete a transaction. This can result in unacceptable amounts of delay when run over a WAN with even modest levels of delay. Enterprise Web applications are accessed over the Internet, which often exhibits even more pronounced performance issues than does the enterprise WAN. In addition, IT organizations have less control over the performance of the Internet than they do over the performance of their enterprise WAN.

WAN Optimization

In order to respond to the challenges of successfully delivering applications to branch office employees, many vendors have developed a product that is often referred to as a WAN optimization controller (WOC). WOCs are also referred to as *symmetric solutions* because they typically require an appliance in both the data center as well as the branch office.

The Survey Respondents were asked if their organization was using WAN optimization technology such as compression or protocol acceleration for delivering applications to branch offices. Their responses are shown in Figure 2.

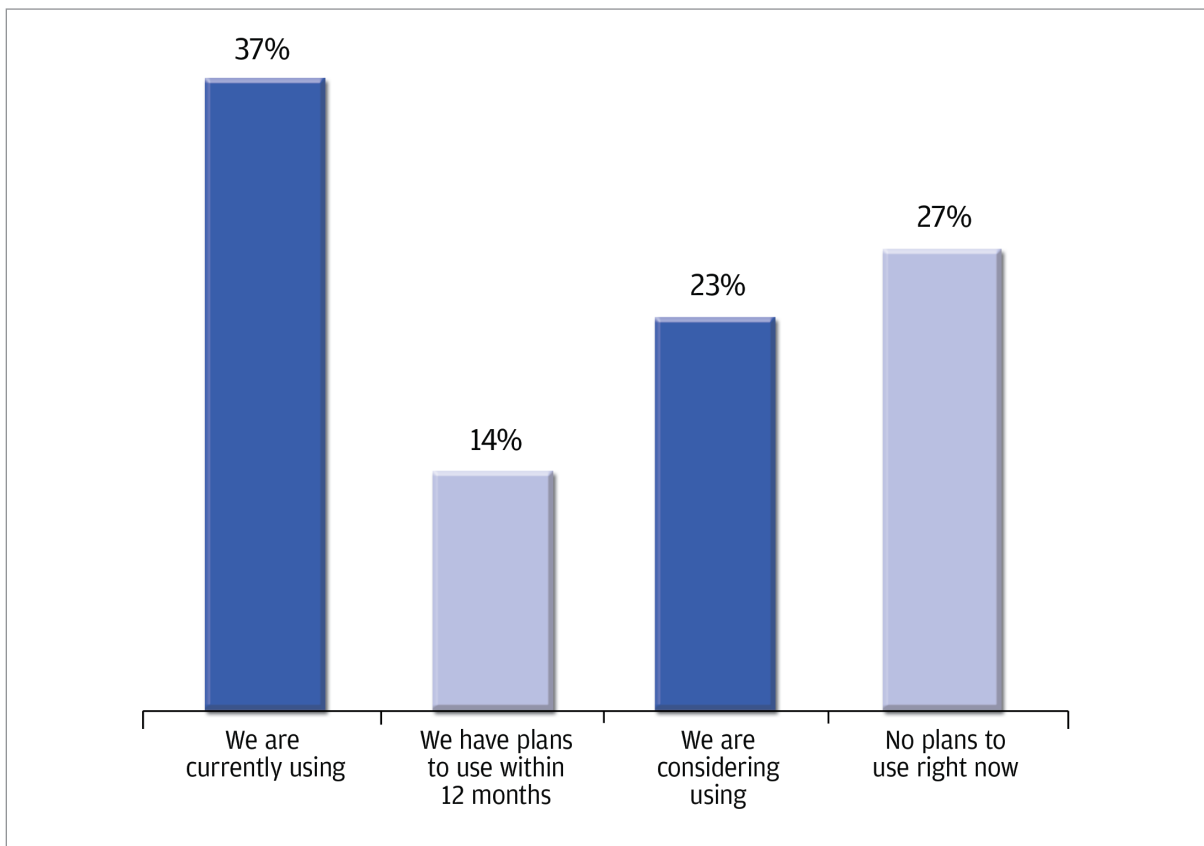


Figure 2: Use of WAN Optimization for Branch Offices

As the data in Figure 2 indicates, within 12 months roughly half of The Survey Respondents will be using WAN optimization technology to help them to successfully deliver applications to branch offices. The technologies that they will use include techniques such as compression, de-duplication, caching, Quality of Service, and protocol acceleration.

The Survey Respondents were asked to rank the criteria that they use when choosing a WOC. Table 2 depicts the percentage of time that The Survey Respondents indicated that the criterion was either important or very important.

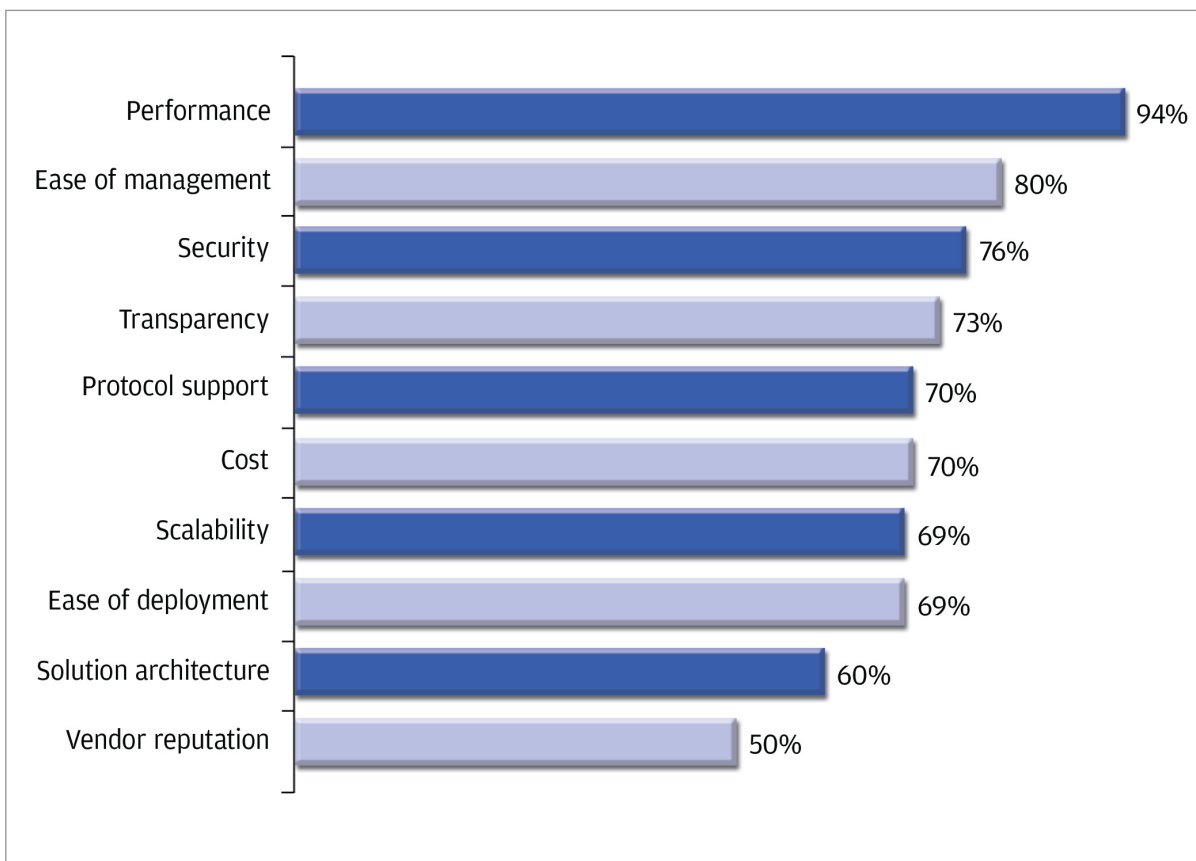


Table 2: Importance of Evaluation Criteria

The data in Table 2 indicates that when choosing a WOC that a lot of criteria are important to The Survey Respondents. The data in Table 2 also indicates that performance is the most important criterion and that network management is second in importance. The next section will discuss a new class of network equipment referred to as a branch office box. As will be discussed, the management of a branch office box is fundamentally different than the management of a WOC.

Branch Office Box

As previously noted, within 12 months roughly half of The Survey Respondents will be using WAN optimization technology to help them to successfully deliver applications to branch offices. In addition, roughly one third of The Survey Respondents intend to keep their network services, domain controllers and file services in the branch offices and over half of The Survey Respondents will keep their print servers locally in their branch offices.

Those IT organizations that intend to remove all servers from their branch offices still need a WOC in the branch office in order to ensure the successful performance of challenging applications and protocols such as those that are shown in Figure 1. Those IT organizations that intend to leave at least some servers in branch offices have a choice to make. They can either have multiple devices (i.e., WOC, print server, file server, domain controller, etc.) in their branch offices, or they can implement a branch office box (BOB).

A BOB is a server appliance that has been optimized to provide distributed support for functions (i.e., DHCP, DNS) that are required in branch offices but which the IT organization have decided should not be provided from a cen-

tralized data center. One reason to have functions provided locally by a BOB was already discussed – it avoids the performance issues that are associated with running an application over a WAN link. In addition, if a BOB provides functions locally, those functions are still available even if there is a WAN outage.

As previously noted, ease of management is a top buying criteria for a WOC. It is important to keep in mind that management of a BOB is fundamentally different than management of a WOC, since a BOB combines multiple branch functions. In the case where the BOB is consolidating functionality that was previously running on dedicated servers, the BOB may need to easily integrate with existing management systems.

The Survey Respondents were asked if their organization would prefer a dedicated WAN optimization product in their branch offices or an integrated solution which combines WAN optimization with other branch functionality. Their responses are shown in Figure 3.

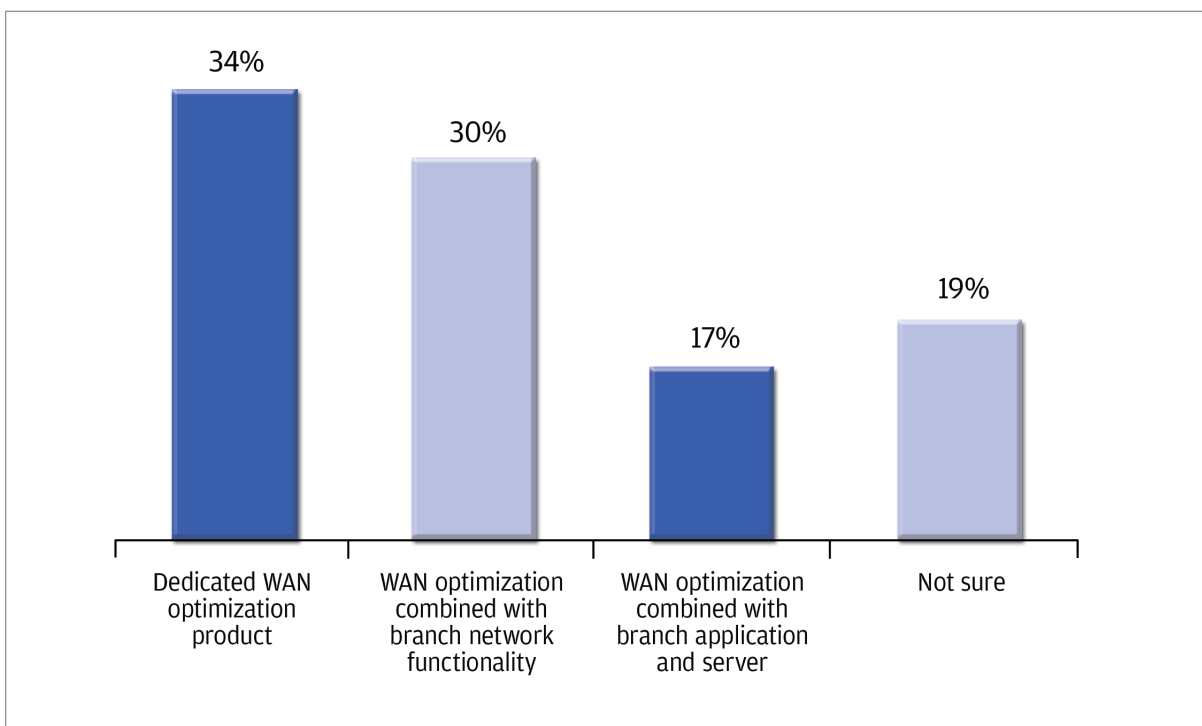


Figure 3: Interest in a WOC vs. a BOB

The data in Figure 3 shows that one third of The Survey Respondents prefer a dedicated WAN optimization product while almost a half of The Survey Respondents prefer a BOB. Citrix and Microsoft recently announced¹ the joint development of a BOB that is referred to as Citrix Branch Repeater™ with Windows Server®. This product provides four key classes of functionality:

1. Store Streamed Applications at the Branch Office

Windows applications that are streamed to branch office employees by Citrix XenApp™ (previously referred to as Citrix Presentation Server™) can be stored in the branch by Citrix Branch Repeater with Windows Server. These applications are then delivered to the branch office employees over the branch office LAN vs. over the WAN that connects the branch office to the data center.

2. Consolidate Windows Services

As the name implies, Citrix Branch Repeater with Windows Server is built on Windows Server. This allows IT organizations to provide locally native Windows services such as file, print, Active Directory, domain name system (DNS), and dynamic host configuration protocol (DHCP) as well as Microsoft's Internet Security and Acceleration (ISA) Server 2006 Web caching.

3. Accelerate Applications and Protocols

Citrix Branch Repeater with Windows Server optimizes the performance of applications and protocols, such as the ones listed in Figure 1, by providing WAN optimization techniques such as compression, de-duplication, caching, QoS, protocol acceleration.

4. Manage Using Existing Mechanisms

The IT organization can use native Windows management tools, such as Microsoft System Center Operations Manager and WMI, to remotely manage Citrix Branch Repeater with Windows Server. Ease of management is achieved by having a single management path for all branch functionality.

Summary

Given that the majority of employees work in branch offices, the efficient and effective operation of branch offices is central to the success of any enterprise. IT organizations, however, face a number of challenges relative to ensuring acceptable application delivery to branch office employees. One component of this challenge is to determine which servers should be left in branch offices and which servers should be consolidated into centralized data centers. Centralizing servers can result in lower cost, more control and easier compliance with industry and governmental regulations. Centralizing servers can also result in unacceptable performance and increased downtime.

Over the last few years, many IT organizations have overcome the performance issues associated with branch office employees accessing centralized applications by deploying WOCs. That option is still available, and as shown in this special report, roughly half of The Survey Respondents have either already have, or soon will, deploy WAN optimization technology in order to ensure the successful delivery of applications to branch offices.

However, IT organizations have a new option – they can also deploy a BOB such as Citrix Branch Repeater with Windows Server. This solution performs all of the functions of a WOC and in addition it stores streamed applications at the branch office and also supports key Windows services such as file, print, Active Directory, domain name system (DNS), and dynamic host configuration protocol (DHCP) as well as Microsoft's Internet Security and Acceleration (ISA) Server 2006 Web caching. As shown in this special report, while the interest in deploying dedicated WOCs remains high, there is even greater interest in deploying BOBs.