

Optimizing your Microsoft application and infrastructure investments with Citrix CloudBridge

Businesses of all types and sizes worldwide rely on a variety of Microsoft solutions, from key productivity and collaboration applications, to client and server infrastructure, virtualization platforms and Windows Azure cloud services. However, just like with those of its competitors, these solutions are not immune from the performance challenges of operating over Wide Area Networks (WANs) and supporting mobile/remote users with low-bandwidth, high-latency network connections.

Citrix® CloudBridge™ is a unified platform that delivers superior user experiences and lower TCO by accelerating applications, reducing bandwidth utilization and enabling sophisticated quality of service (QoS) management. As the only WAN optimization solution with integrated, secure and transparent cloud connectivity, CloudBridge also allows enterprises to augment their data centers with the infinite capacity and elastic efficiency provided by public clouds.

This paper briefly explains how CloudBridge broadly applies to all types of computing environments. A detailed discussion is then provided of the many capabilities that make CloudBridge an ideal fit for enterprises with a significant investment in Microsoft applications and infrastructure. Specific features and benefits of CloudBridge that pertain in this regard include:

- Intelligent, protocol-specific optimizations for Windows file sharing and Microsoft Exchange traffic
- Extension of the core application performance, bandwidth reduction and traffic management capabilities to individual/isolated Windows PC and laptop users – such as telecommuters and roaming employees – using CloudBridge Plug-in
- The ability to securely and seamlessly connect to Windows Azure in support of your enterprise's cloud computing initiatives
- The ability to deploy CloudBridge as a low-cost virtual appliance running on Microsoft Hyper-V
- The option to deploy CloudBridge with an integral Windows Server, thereby enabling consolidation and simplification of branch office infrastructure
- The ability to leverage existing, familiar Microsoft tools to manage CloudBridge Hyper-V virtual appliances and integrated Windows Servers

The net result is an enterprise-class solution for application acceleration and infrastructure optimization that covers all aspects of your Microsoft environment, from mobile/remote users and branch offices to enterprise datacenter and cloud hosted applications and services.

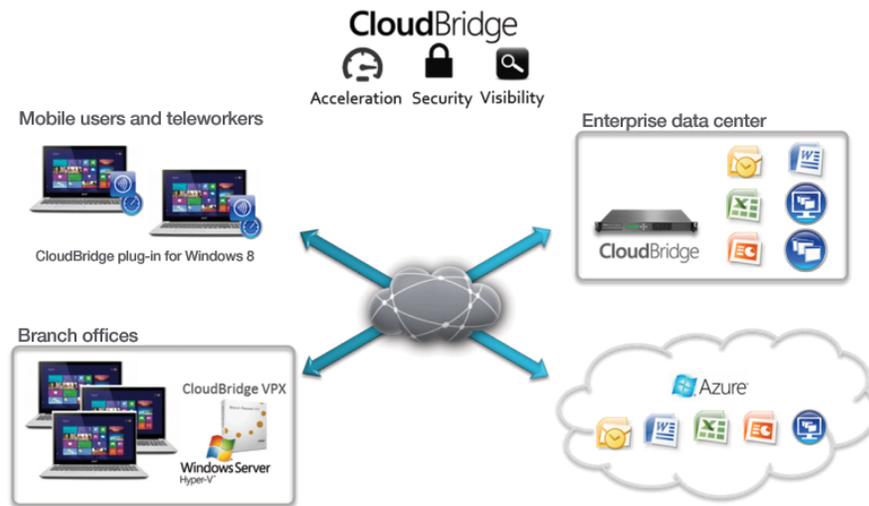


Figure 1: Citrix CloudBridge supports all major aspects of your Microsoft environment

Microsoft environments need performance help too

From client, server and virtualization platforms to key business applications and cloud services, IT solutions from Microsoft have been deployed by countless organizations worldwide. The popularity of Microsoft's offerings, however, in no way makes them immune to prevailing trends, including:

- The increasing geographic dispersion and mobilization of today's workforces;
- Ongoing initiatives to cut costs by centralizing and consolidating IT infrastructure; and,
- The resulting need to increasingly deliver key services not only over WANs, but also to individual users with relatively low-bandwidth Internet connections.

For applications and services that have not been designed to operate in this way – whether they are from Microsoft or not – this situation typically leads to sub-par user experiences and inefficient use of available bandwidth. The net result is another set of problems for IT departments to solve, at the same time they're working to streamline operations, reduce capital expenditures, better accommodate mobile users and navigate the transition to cloud computing.

Citrix CloudBridge

The only solution available in the market that combines a comprehensive set of WAN optimization features with the ability to securely connect private and public cloud networks, CloudBridge helps organizations with Microsoft-laden computing environments address the performance and other related challenges discussed above in two distinct ways.

CloudBridge first provides multiple foundational capabilities that apply equally to both Microsoft and non-Microsoft applications and environments. These include:

Adaptive TCP flow control. Designed to overcome networks characterized by high packet loss rates and high latency, this technology employs a collection of standards-based techniques to override conservative, default TCP flow control settings and more thoroughly utilize available bandwidth.

Adaptive compression. Depending on the type of traffic being sent and the current network conditions, CloudBridge dynamically selects among multiple compression, caching and data de-duplication algorithms to dramatically reduce bandwidth consumption.

Sophisticated QoS management. CloudBridge enables IT administrators to monitor network congestion and delays, while also assessing network usage on a per user and application basis. Specific findings can then be used as the basis for configuring available traffic prioritization features to granularly control bandwidth consumption.

Optimized video delivery. To manage the demand placed on enterprise WANs by the growing consumption of video, Citrix CloudBridge provides enterprise IT with a suite of features to optimize video delivery for both internal enterprise and external video content to branch offices, including video classification, caching and de-duplication.

Storage replication acceleration. By optimizing and tightly controlling related traffic transiting the WAN, CloudBridge enables storage replication to continuously run in parallel without adversely impacting critical application traffic.

The second way CloudBridge helps is by providing several specialized capabilities focused specifically on accelerating Microsoft applications or otherwise optimizing and enhancing support for Microsoft infrastructure. These additional, Microsoft-centric features and benefits are covered in detail in the sections that follow.

Accelerating key Microsoft applications

In addition to the broadly applicable optimizations already discussed, CloudBridge provides three protocol-specific mechanisms for improving the network performance of Microsoft Exchange and Windows file sharing.

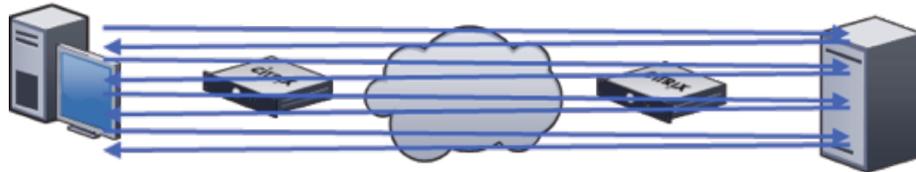
Intelligent protocol acceleration. Microsoft Exchange and Windows file sharing use the MAPI and CIFS protocols, respectively, for network communications.

These protocols are inherently “chatty” in that they require numerous round-trip transmissions to establish and maintain a session. This characteristic can lead to intolerably slow response times, particularly for users accessing messages, calendars and data files over high latency connections.

CloudBridge resolves this issue by incorporating intimate knowledge of the MAPI and CIFS protocols that allows it to confine chatty operations to low latency Local Area Networks (LANs) and complete data transfers with a minimum number of round-trip exchanges over the WAN. The result is accelerated transfer speeds and

a vastly improved user experience. For CIFS, the ability to analyze request patterns and predict subsequent actions allows CloudBridge to also perform safe read-ahead and write-behind operations, yielding aggregate response time reductions of up to 97 percent. (Note: CloudBridge also provides intelligent acceleration for a wide range of other protocols, including HTTP, FTP, NFS, ICA and more.)

Without CloudBridge



With CloudBridge

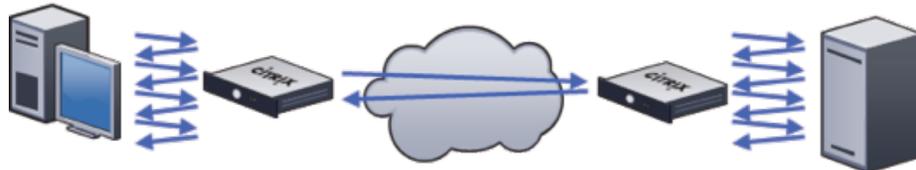


Figure 2: CloudBridge accelerates the performance of chatty applications

Encrypted traffic optimization. Many versions of Windows file sharing and Microsoft's email applications use signing and encryption to ensure the

confidentiality of network communications and prevent certain types of attacks. For example, Windows Vista and Windows 7 use signed SMB for protected access to file and print shares over the network. Similarly, Microsoft Outlook 2007 and Microsoft Outlook 2010 use encrypted MAPI to communicate with Microsoft Exchange.

With the launch of Microsoft Exchange 2013, the default protocol for communication between Exchange server and Outlook clients changed to the RPC over HTTPS protocol. CloudBridge appliances now optimize this RPC over HTTPS traffic starting with firmware version 7.3. The secure peering configuration required for CloudBridge to optimize this traffic is similar to the configuration done for encrypted MAPI and signed SMB protocol optimization.

Although encryption improves security for these applications, it is a significant obstacle to conventional WAN optimization solutions. Many products available in the market are almost useless in such cases, as they are unable to perform any meaningful degree of protocol acceleration or compression/de-duplication for encrypted traffic.

In comparison, CloudBridge includes functionality that allows it to employ all of its traffic optimization mechanisms on both signed SMB and encrypted MAPI traffic. By leveraging the “Delegate User” capability supported in Microsoft domains, CloudBridge is essentially able to participate in the key exchange process between client and server, and subsequently “see into” the encrypted traffic streams.

As a result, IT no longer has to compromise by choosing between security and performance, and users continue to receive the enhanced, accelerated experience they have come to expect.

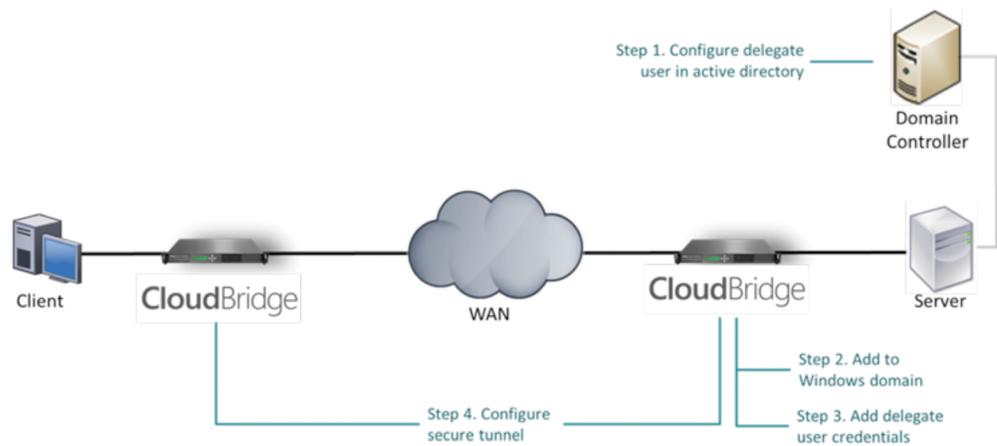


Figure 3: CloudBridge set-up for optimizing encrypted Microsoft applications

Optimization for encrypted traffic spanning authentication domains. In a variation of the previous capability, CloudBridge can also access and accelerate encrypted Microsoft application traffic in cross-domain scenarios (assuming there two-way trust has been established between the domains). These types of scenarios – where the client is a member of one Active Directory domain and the server is in a different domain – are commonly encountered during mergers and acquisitions. Supporting them is critical to maintaining smooth business operations during the interim period between when merging entities first start to work together and when they finally have the opportunity to more fully integrate their computing environments.

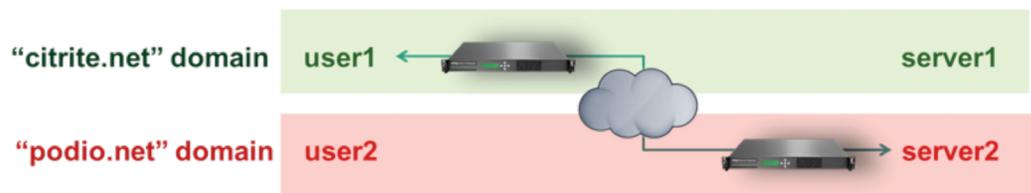


Figure 4: CloudBridge optimizes encrypted traffic across different domains and geographies

Simplifying and consolidating branch office infrastructure

Citrix helps simplify and reduce the cost of branch office infrastructure by enabling deployment of CloudBridge with an integrated Windows Server, or as a Microsoft Hyper-V virtual appliance.

CloudBridge with integrated Windows server. Microsoft-centric shops have the choice of simplifying their branch office infrastructure by deploying a physical CloudBridge appliance that incorporates a full-featured Windows Server. This “branch-in-a-box” approach delivers comprehensive CloudBridge WAN optimization alongside essential branch office networking services, including:

file, print, DHCP, DNS, WINS and Active Directory (e.g., for setting up a read-only domain controller that provides local authentication and authorization services). An extensible architecture also provides the opportunity to run other applications needed for your branch office environments on the same physical device.

By reducing the need for distributed server hardware, CloudBridge allows IT to simplify operations and significantly cut branch office costs.

CloudBridge CSX solution: Apart from the Microsoft services, CloudBridge also offers the ability to run third party workloads on the CloudBridge appliances with the integrated Windows Server. The CloudBridge CSX Solution combines the new CloudBridge WS appliances with applications provided by Citrix Ready® partners, including Qumu, Talon and Cortado, to offer the services needed at the branch such as video distribution and streaming, multi-site file collaboration, and localized print services. Additionally, enterprise IT can deploy other applications on the integrated Windows Server instance as part of their goal of simplifying branch networks.

CloudBridge for Microsoft Hyper-V. In general, server virtualization provides enterprises with the opportunity for hardware consolidation and greater flexibility when scaling supported workloads, while also opening the door for increased automation and streamlined operations. Given these benefits and the fact that Microsoft Hyper-V is now recognized by Gartner as a leading solution – see “[Magic Quadrant for x86 Server Virtualization Infrastructure](#)” – it comes as no surprise that IT departments are increasingly embracing Hyper-V for branch office scenarios.

To support these scenarios, CloudBridge can conveniently and cost effectively be deployed as a virtual appliance running on Hyper-V. Ideally suited for branch office use cases, this option can be licensed for throughput levels ranging from 2 to 45 Mbps. A configuration wizard enables quick and easy installation, and having the same code base as that used for all other CloudBridge physical and virtual appliances ensures complete feature-function consistency. In addition, administrators can continue to take advantage of Citrix Command Center for configuration and monitoring of CloudBridge functionality.

By combining the proven features of CloudBridge with the benefits of virtualization, CloudBridge virtual appliance for Microsoft Hyper-V provides today's enterprises with an affordable, easy-to-install and highly scalable WAN optimization solution that is ideally suited for small to medium branch offices.

Extending performance gains to remote/mobile users Telecommuting is already a widely adopted practice, and user mobility is clearly on the rise too. More often than not, however, remote users are forced to contend with sluggish access to datacenter-based applications and other centrally deployed resources.

CloudBridge Plug-in for Windows PCs solves this dilemma. With support for a wide range of Windows client platforms – including Windows XP, Windows Vista, Windows 7 and Windows 8 – this solution provides remote and mobile employees with precisely what they need: a WAN optimization client that incorporates all of the major CloudBridge features. When used in conjunction with a CloudBridge appliance located at the corporate datacenter, the result is a high-performance access experience rivaling that of physically being “in the office” and directly attaching to the local network.

Unleashing the power of the cloud

Finally, CloudBridge also enables enterprises to take full advantage of Windows Azure cloud services. Integration effort undertaken by Citrix allows the CloudBridge Connector to establish a secure tunnel between a Microsoft front-end gateway in the Azure cloud and a datacenter-based CloudBridge appliance. In this way, all data is automatically protected when transiting between the two environments. As result, the Azure cloud effectively becomes a seamless extension of your enterprise datacenter. Potential use cases are practically endless and include: application hosting, shifting low-risk or seldom-used workloads to a lower cost environment, and offloading your test/dev environment to the cloud.

With CloudBridge, enterprises can augment their data centers with the infinite capacity and elastic efficiency provided by Windows Azure – not to mention other public clouds too!

Conclusion

The only solution in the market to combine WAN optimization with secure, transparent cloud connectivity, CloudBridge is also an ideal fit for enterprises with a heavy concentration of Microsoft products and technologies. Such organizations benefit not only from numerous optimization mechanisms that generally apply to all TCP/IP applications, but also from several features and capabilities focused specifically on accelerating Microsoft applications or otherwise optimizing and enhancing support for Microsoft infrastructure. Examples include:

- Intelligent, protocol-specific optimizations for Windows file sharing and Microsoft Outlook/Exchange;
- The ability to deploy CloudBridge as a low-cost virtual appliance running on Microsoft Hyper-V; and
- The ability to securely and seamlessly connect to Windows Azure.

For more information on Citrix CloudBridge, please visit:
<http://www.citrix.com/products/cloudbridge/overview.html>

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