CITRIX®



Supercharging your XenApp® and XenDesktop® user experiences with NetScaler SD-WAN™

2 Delivering great virtual experiences for remote users

You already know the advantages of virtual applications and desktops: secure digital workspaces delivered from the cloud or data center or the cloud that can be securely accessed from anywhere, on any device.

But to maximize their benefits, you need to be able to ensure a great experience for users wherever they work—including branch sites, home offices, and mobile locations far from the server—and however they connect. Software-defined WAN (SD-WAN) technology makes it possible to deliver a great user experience, even over challenging connections. It's a natural fit for virtual app and desktop delivery—in fact, that's one of the reasons for its rapid growth.

Maximizing your virtual experiences

Citrix® NetScaler SD-WAN delivers a game-changing, integrated solution that optimizes the value of Citrix XenApp® and XenDesktop® virtual app and desktop delivery, which lets you:

1. Provide more bandwidth over available connections.
2. Optimize performance for real-time network conditions.
3. Ensure always-on connections with the highest-possible-quality experience.

This eBook explores the integration between NetScaler SD-WAN and XenApp and XenDesktop, along with the benefits the combined solution can deliver to every user, everywhere.

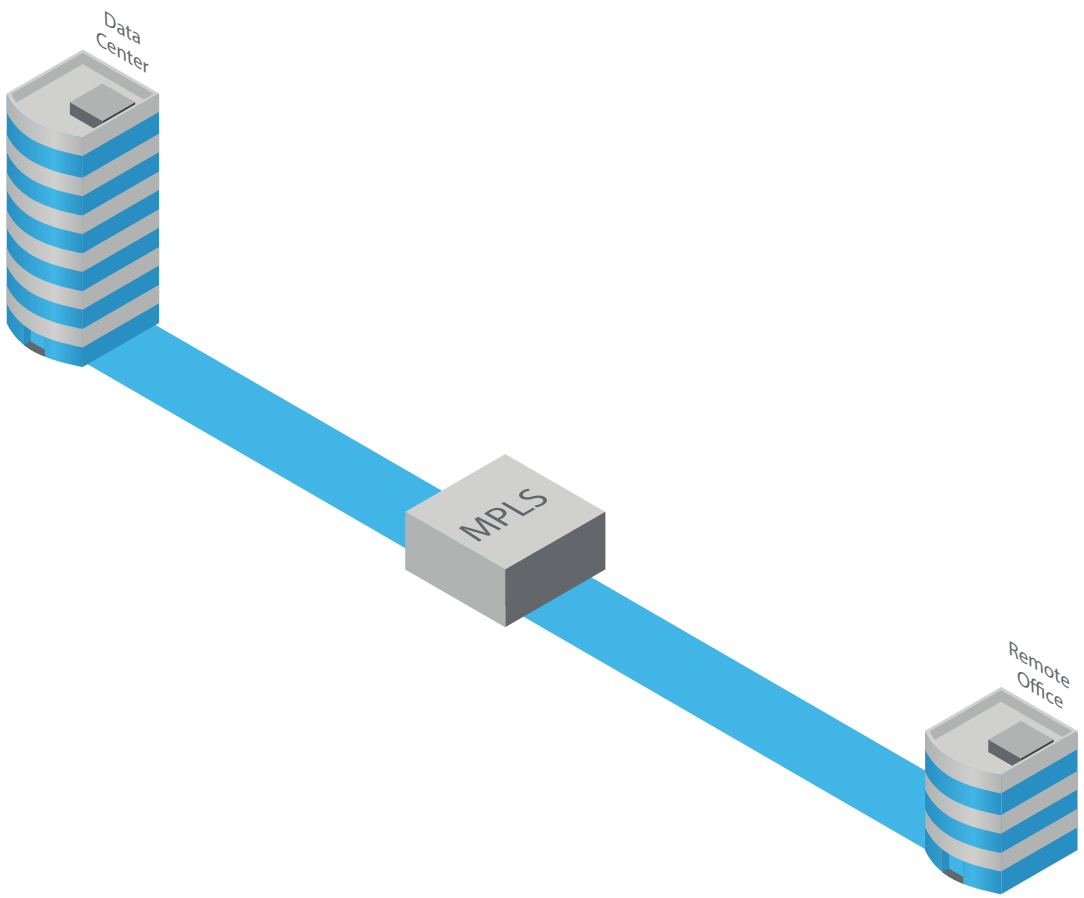
> "Organizations deploying VDI and DaaS should consider deploying SD-WAN to increase useful capacity and resilience."

From "VDI and DaaS Demand That Enterprise Architects Rethink Their Network Architecture," Gartner report, 2016, available at http://emeahub.citrix.com/the-growth-in-virtual-apps-and-multimedia-place-challenges-on-the-network-2/.

3 Why WANs have trouble keeping up

Quality of experience can make or break a virtualization initiative. To increase user adoption, it's important to deliver comparable or even better performance with that of a traditional PC. This is more than just a matter of convenience; if people can't be productive from any location, both users and your whole business become less mobile and flexible.

Most often, the problem isn't your virtualization software — it's the WAN. A failed or degraded network link can slow down or even disconnect a user's session, even when a backup link is configured. WAN latency and congestion can stretch round-trip time (RTT) hundreds or even thousands of times longer than a corporate LAN. The increasing bandwidth demands of virtualization, video, teleconferencing, and other rich media can slow business apps using the same links.



4 The need for a better solution

Traditional methods to overcome problems like these simply aren't effective anymore.

What you probably already considered	Why it falls short
Adding a backup link	• Can't ensure fast enough failover to preserve the user's session. • Fails to relieve congestion in situations short of an outage.
Adding bandwidth	• Results in high-cost MPLS upgrades. • Consumer-grade DSL and cable lack predictability. • Without aggregation, you may not be able to use all the bandwidth simultaneously, wasting capacity.
Adding branch office servers	• Trades bandwidth issues for new burdens. • Added costs around remote management and data replication.
Creating local virtual desktop infrastructure (VDI) in branches	• Adds cost. • Fails to help remote and mobile workers connecting via WAN.
Activating generic router Quality of Service (QoS) optimization	• Lacks application awareness. • Leaves the network unable to differentiate between quality-dependent traffic like desktop virtualization and less critical activity like background printing.

5 What NetScaler SD-WAN delivers

Citrix customers rely on NetScaler SD-WAN to maximize the value of their XenApp and XenDesktop investments. The solution lets you:

- Aggregate all available bandwidth into an active/active connection, providing more bandwidth.
- Use the unique HDX Quality of Experience technology to optimize performance and tune network policies.
- Ensure always-on connections for XenApp and XenDesktop users with the highest-possible-quality experience—even for rich media and high-definition video.

Increasing ROI on your app and desktop virtualization investment

This translates into key benefits that increase the return on your app and desktop virtualization investment for your business and your users.

Reliability

Whether users access XenApp or XenDesktop from a data center or from any public cloud, NetScaler SD-WAN makes sure that no underlying network issues impact users' access to or experience with their virtual applications.

Bandwidth

More bandwidth becomes available to support an optimal experience for all applications, including XenApp and XenDesktop as well as other business-critical apps.

Quality

NetScaler SD-WAN creates a better user experience through session fairness, best path selection, and local media caching, improving productivity and alleviating IT issues.

Visibility

Deep visibility into the WAN helps administrators understand the quality of experience they are delivering with an easy-to-use platform for monitoring, troubleshooting, and data-driven policy tuning.

Customer Story

Rehab Management | Healthcare

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Improving branch productivity and security while lowering costs

Rehab Management provides return-to-work, injury management, ergonomics, and psychological services through a network of offices and field locations across Australia. With only 2M of bandwidth, the company's MPLS-based WAN was unable to deliver video content and XenDesktop virtualized applications. This raised concerns about user productivity and security as well as the prospect of rising IT costs.

NetScaler SD-WAN allowed Rehab Management to eliminate its MPLS connections and make more effective use of the broadband already deployed at remote locations. The company now uses NetScaler SD-WAN and XenDesktop to replicate its Windows® environment to employee devices in remote areas throughout the country, improving the quality of services provided to patients and increasing workforce mobility and security.

Results

- Increased bandwidth 10 times to support XenDesktop and video traffic
- Avoided the $2,000-per-location monthly cost of an MPLS upgrade
- Reduced costs from $500 per month per location to $100 by switching to three asymmetric digital subscriber lines (ADSLs)
- Mitigated the performance risk by bonding three ADSL WAN links



"Tackling the connectivity issue at its core means no office is at a disadvantage, with cost-effective tools that complement our existing IT infrastructure empowering employees to do their job remotely."

Boris Kotevski, National IT Manager | Rehab Management

7 Maximize the value of XenApp and XenDesktop

NetScaler SD-WAN accelerates ROI and time to value for XenApp and XenDesktop by making it possible for a single infrastructure to provide an excellent experience for all users regardless of location or network conditions. Video, rich media, voice, and other demanding applications perform just as well for remote, branch, and mobile users as they do over the corporate LAN, so your whole organization becomes more flexible and productive.

Use XenApp and XenDesktop in more places

Free of the constraints of network limitations, you can extend your XenApp and XenDesktop implementation wherever your users work. The ability to use bonded broadband connections means that you don't have to wait for MPLS service in a given location to deliver virtual apps and desktops, and your virtualization initiative can go where MPLS can't. The use of wireless links as primary, secondary, or fallback links ensures that users will always have a connection.



8 Four central NetScaler SD-WAN benefits for virtual app and desktop delivery

1. Improves reliability.

Whether users access XenApp or XenDesktop from a data center or cloud, NetScaler SD-WAN makes sure that underlying network issues don't interfere with their access to and experience with virtual apps. The solution enables a self-healing network, automatically rerouting traffic off of poor-quality or failed links—and doing it instantly, so that user sessions don't disconnect.

NetScaler SD-WAN uses two or more links to create a virtual connection between the branch and the server. If there is a failure on one of the links, or if one begins to degrade, all traffic will be immediately moved to the remaining link, preserving the user sessions and user productivity.

2. Ensures quality.

NetScaler SD-WAN creates a better user experience for every type of app, in all kinds of network conditions, to improve productivity and reduce IT issues. Fine-grained, application-aware control over QoS helps you ensure a good experience for every application people use.

Session fairness ensures that no single user affects others on a constrained WAN by making sure that traffic is forwarded evenly from all users. A priority queuing engine reserves a configured percentage of bandwidth for each class of traffic or queue to ensure minimum bandwidth utilization.

Best path selection chooses the ideal network path for each HDX subsession. Lower-priority HDX subsessions such as printing and file downloads can be moved to slower links to leave the best-performing links available for more latency-sensitive traffic such as screen refreshes and mouse movements.

Local media caching accelerates performance and video download times by up to 45 times because media is delivered at LAN speeds. At the same time, WAN link usage for redundant transfers is minimized.

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3. Increases bandwidth.

With NetScaler SD-WAN, you can augment MPLS with broadband—all logically bonded into a single link—to add bandwidth more quickly, flexibly, and at a lower cost than an MPLS upgrade. Because all bandwidth is active, your current unused backup links become available as well, immediately increasing available bandwidth and allowing you to support more users, more apps, more video and other rich media, and more of all the other traffic your business runs on.

With NetScaler SD-WAN, the bandwidth you do have is used efficiently. Intelligent bandwidth reservation ensures the critical applications such as virtual desktops and applications have sufficient bandwidth when needed during peak usage times, while allowing other applications to use that bandwidth during other times. And the unique dual-ended QoS feature makes sure that datacenter links are never oversubscribed. And for additional bandwidth at the branch, NetScaler SD-WAN can make use of wireless links with an understanding of monthly usage limits and varying bandwidth availability. All these work together to ensure that you have abundant bandwidth for critical applications and aren't wasting money on unused capacity.

4. Increases visibility.

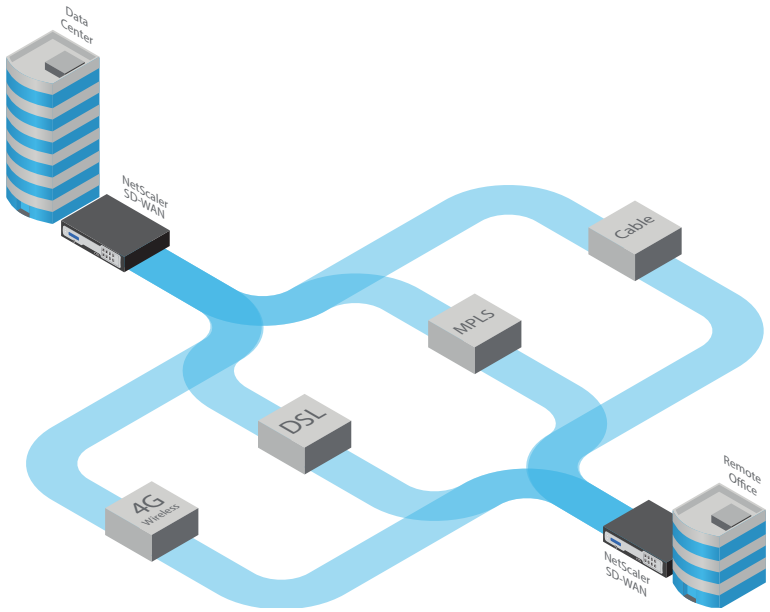
NetScaler SD-WAN provides deep visibility into the WAN, helping administrators understand the quality of experience you're delivering, with an easy-to-use platform for troubleshooting and data-driven policy tuning.

HDX Insight™, powered by NetScaler SD-WAN Insight Center, shows latency in detail, even for individual users, for each step in the application delivery flow. Admins can view both real-time and historical data for users, sessions, and sites, with drill-down capabilities to discover the source of any ongoing, imminent, or potential future application performance issues. Knowledge of how current SD-WAN policies are impacting the user experience helps guide further fine-tuning. You can even apply QoS rules to individual HDX flows for specialized handling of each type of data.

Within the Insight Center dashboard, HDX QoE gives you instant visibility into the QoE parameter for each application based on performance metrics such as latency, jitter, packet loss, and packet drops.

10 Extend XenApp and XenDesktop wherever your workforce goes

With NetScaler SD-WAN, you can extend your XenApp and XenDesktop implementation wherever people work. A more reliable network adapts to application demand and provides granular visibility into WAN traffic while optimizing performance where it counts the most. Users gain a great experience for every app, every time, and your business gains the flexibility and mobility to become more productive than ever.



To learn more about NetScaler SD-WAN and its benefits, please visit http://www.citrix.com/sdwan

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