Virtual desktop infrastructure Tutorial: Part 1

While most IT shops focus on data recovery in their DR plans, it’s equally important to ensure that users have access to that data after a disaster. That’s where virtual desktops come into play. Desktop virtualization allows users to regain access to important data quickly and easily after a disaster scenario.

This tutorial explains how virtual desktops resolve data access concerns and provide time- and money-saving benefits, including:

- Drastically reduced recovery times after a disaster
- Consolidated data pools for easier management
- Technical support made easier and more efficient
- And more

Download this tutorial to learn more about Virtual Desktops.
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Carol Sliwa, Features Writer

Data storage is no small consideration for any organization that decides to implement a virtual desktop infrastructure (VDI).

Taking the VDI approach, an IT department can deliver a full desktop image to its users from virtual machines (VMs) running on servers in the data center. Ideally, the users won't notice a difference between the virtual and traditional PC desktop experience. But the company could opt for less costly thin-client devices or even repurpose aging PCs/laptops because there's no need for local storage of the operating system, applications and data.

VDI considerations

Desktop images and user data are stored and backed up centrally, and the potential demands on back-end systems are not inconsequential, especially in a large virtual desktop infrastructure environment.

"It requires an infrastructure build-out to occur in all the other disciplines of infrastructure," including servers, networks and storage, said Mark Margevicius, a research vice president at Gartner Inc., Stamford, Conn. "You can't just go forth and say, 'This is a PC replacement, and it's only about a PC.' On the contrary, this is really about building out your data center to support all those clients."

Storage costs sit like the solid mass below the water line of an iceberg, Margevicius said, and centralized storage is more expensive than PC-based storage. It must also be backed up, he noted.

"Network storage is very important in this virtualized environment," said Mark Bowker, an analyst at Enterprise Strategy Group (ESG) in Milford, Mass. "Where many machines are running on the same physical server for availability purposes and even for mobility purposes, it's essential to have some type of network storage in place so those images can be quickly restarted on a different physical machine or easily move between physical machines."

One of the leading virtualization vendors, VMware Inc., a subsidiary of EMC Corp., agrees that shared storage is beneficial in a virtual desktop infrastructure environment, but the company offers no directive on what form that storage should take. Jon Bock, a senior manager in product marketing, indicated via an email interview that the company has seen large virtual desktop infrastructure deployments in both storage-area network (SAN) and network-attached storage (NAS) environments.

"There remains a fair amount of debate in the industry regarding whether NAS or SAN scales better, including for VDI environments, but no universally accepted answer," Bock wrote. He added that customer's choices tend to be driven by their comfort level with managing iSCSI or Fibre Channel (FC) SANs, or block storage vs. NAS system or file-based storage.
Virtual desktop infrastructure case study: Metro Health

The storage issues that are more critical in a VDI environment include capacity planning and management and performance, as illustrated by a case study of early adopter Metro Health, an independent health care system serving the greater Grand Rapids area and western Michigan.

On the surface, Metro Health’s VDI effort has produced a number of beneficial results. Doctors, nurses and other staff members gain faster access to applications no matter where they are. Fewer users call the help desk. IT has improved tools to centrally manage user desktops and to ensure information stays secure in the data center rather than on laptops or PCs. Even electricity usage fell, with the elimination of CRT monitors and desktop PCs.

But Metro Health is still looking for answers on the storage side of the VDI equation, particularly in the area of cost reduction.

When Metro Health launched its VDI initiative two years ago, it found no white papers to consult for guidance. The IT group carefully weighed CPU and memory needs and sized its storage environment to accommodate 1,500 virtual machine disks of 10 GB each, equipped with Windows XP and the applications a user might need.

Metro Health soon learned the hard way that it should have taken into account the disk I/O requirements of 1,500 Windows XP desktops, according to Chris House, a senior network analyst. Performance suffered whenever the user sessions concurrently attempted high disk I/O operations, such as Windows and antivirus updates, because Metro Health’s pair of Hewlett-Packard (HP) Co. EVA 8000 arrays lacked adequate cache to deal with the onslaught of write requests, House said.

To address the problem, Metro Health had to move off the EVAs and expand its HP StorageWorks XP1024 Fibre Channel SAN arrays by 15 TB apiece. They also had to max out the cache of each one at 50 GB to accommodate the VDI sessions and handle the occasional high I/O bursts, according to House.

But the heavy cost of using high-end enterprise storage for VDI is a problem, and the IT group plans to look into less-expensive alternatives, such as cheaper mid-tier SAN, scale-out systems and local storage of virtual machine sessions within its VMware ESX servers, House said.

Conserving disk space

Another option under consideration is the latest version of VMware’s View, which Metro Health sampled last year as part of a private beta test. The View 3 portfolio, which became generally available in December, includes a new Composer management component that uses VMware’s Linked Clone technology to create desktop images that share virtual disks with a master image to conserve storage space by as much as 70%, according to VMware.

In addition, any desktops that are linked to the master image can be patched or updated by simply updating the master image, with no effect to a user’s settings, data or applications. Because a user’s data and settings are separate from the desktop image, they can be administered independently, according to VMware.
House said View 3 could help Metro Health to reduce imaging time from weeks to potentially a few clicks. Metro Health currently re-images all 1,500 desktops when it needs to push out a Windows service pack update or an important application upgrade. The client architecture team spreads the re-imaging over several weeks to avoid storage bottlenecks because bandwidth is limited for replication between the XP arrays, which are located in separate data centers in Grand Rapids, House noted.

Antivirus updates now go out at random times over the course of a week, so those are no longer a problem, he added.

House recommends that potential VDI users undertake a pilot project to analyze the average I/O per second of a block of actual production desktops and to monitor performance during routine tasks, such as patching desktops and installing software. Then, he suggested, they should look for and test arrays that can deliver the necessary performance, especially during peak I/O times.

"The most important thing to consider when planning a VDI deployment is storage. You have to size it for performance instead of just sizing it for capacity," House advised. "Storage is the No. 1 common denominator across the entire environment and if it doesn't perform well, everyone suffers."

Virtual desktop infrastructure (VDI) technology is still a work in progress, and capacity planning and management remain among the greatest challenges confronting any IT department that elects to employ hosted virtual desktops. Check out Part 2 of our VDI tutorial to find out which new products promise to make VDI simpler.