



Client Virtualization: The Path to the “Instant-On” Desktop

Executive summary: Even before the era of the tablet computer and smart phone, corporate IT found the management, maintenance and support of corporate desktops challenging. Today, as mobile devices proliferate and more employees demand to use their personal devices in the workplace, the situation is becoming untenable. A new model is needed: desktop as a service. Client virtualization is the way to get there. This white paper explains what client virtualization is and how it can enable simpler, optimized and more flexible desktop management in today's enterprise. It also offers an overview of the trends driving adoption of client virtualization and offers tips on what to consider as you evaluate the technology options.

Picture this: A pharmaceutical company salesperson's laptop computer crashes minutes before a presentation to a major customer. She can't access the customer relationship management (CRM) system to get the latest information on the account. She also can't access the PowerPoint presentation on her laptop. She scrambles to find another computer so she can access the CRM system and the presentation on the corporate network. But other PCs are not authorized to connect to the network. All of this means a major account may be at risk.

This situation is increasingly insupportable. Today's employees work from anywhere and everywhere, using many different types of devices. From laptop and tablet computers to smartphones, workers expect a corporate network connection to be available no matter where

COMPUTERWORLD
Custom Solutions Group



"Employees are saying, 'I want my data available from multiple locations and it shouldn't matter what device I'm on.'"

MARK BOWKER,
SENIOR ANALYST
AT ENTERPRISE
STRATEGY GROUP

they are. And it doesn't matter if the device is company-owned or personal.

Anywhere, anytime, any-device availability can be a boon to companies, boosting employee productivity and reducing costs—but only if IT can manage the process. Many corporate IT departments today are overwhelmed by the growing numbers of devices, many of which run different operating systems. The traditional way of managing desktops, which gradually grew more complex and expensive over the last decade, is breaking down under the weight of these demands. Faced with a growing number and type of devices, applications and operating systems, corporate IT is finding it increasingly difficult to maintain, manage and secure everything.

And yet, saying "no" to the instant-on needs of users may not be wise. In today's competitive business environment, employees need every advantage to stay productive and efficient. Customers and business partners expect immediate responses to their requests. What's more, companies that don't provide employees with easy and ubiquitous access to their desktop, applications and data may alienate the latest generation of workers, who expect anytime, anywhere access.

Companies need a new foundation that enables IT to keep up with these demands. They need a desktop-as-a-service model focused on users, not devices. Rather than struggle to adapt the old desktop management paradigm to new realities, many companies are using client virtualization to establish the service. By virtualizing clients, organizations can improve their ability to manage desktops, improving total cost of ownership, security, availability and agility.

The Promise of Client Virtualization

Most IT departments are familiar with virtualization as it applies to servers. Just as server virtualization separates the actual server processing from physical server hardware, client virtualization separates the user data from the end-user device. Client virtualization encapsulates a user's desktop, including operating system, applications, data and personalization, and stores it in the data center, rather than on the end device. The technology provides access and flexibility for the end user—because the desktop

is now centrally located, an employee can access it from various devices at any time—while enabling IT to maintain, control and secure the desktop. Rather than being dispersed and uncoordinated, the desktops live at the data center, where they are better protected and more easily managed by IT.

A combination of business pressures and technology improvements is leading IT departments to take a close look at client virtualization. In an ongoing poll of IT organizations over the last several years, client virtualization has steadily risen as a priority, says Mark Bowker, senior analyst at Enterprise Strategy Group. In 2009, virtualization didn't appear in ESG's survey of top 10 priorities of IT organizations. In 2010, client virtualization showed up as number 10. In 2011 it rose to sixth place. Analysts agree that consumerization of IT and the proliferation of mobile devices over the last several years are the major factors. A 2011 Morgan Stanley report said, "We think tablets are increasingly being used as a secondary method of accessing virtual desktops both in the work environment and on the road, and the popularity of tablets will likely be a material driver of desktop virtualization penetration and adoption."

Indeed, pressure from users may be the single biggest factor, says Bowker. When ESG asks IT organizations what's driving the adoption of alternative endpoint devices, end-user demand is by far the number-one answer, he says. "Employees are saying, 'I want my data available from multiple locations and it shouldn't matter what device I'm on,'" Bowker notes.

Fortunately, improvements in technology are enabling performance and reliability levels in client virtualization that merit serious consideration by corporate IT departments facing these pressures. This includes better streaming and graphics capabilities as well as the ability to virtualize and encapsulate different parts of the desktop stack, allowing prioritization of the operating system, applications and/or data. When combined with a storage infrastructure optimized for the technology, client virtualization can now handle some of the most demanding applications. "We're seeing big improvements in how the technology runs on the infrastructure in the data center," says Bowker. "It is taking better advantage of features of the infrastructure so that the system runs more efficiently and at a higher scale." For example,

Citrix XenDesktop and VMware View are both making more efficient use of storage, he notes.

LG CNS, a global IT service provider, has honed in on the storage aspect early in its investigation of technologies for client virtualization. The company realized that its existing storage infrastructure would not deliver the performance required. "We made the decision to introduce virtual desktop infrastructure [VDI] when we identified that we needed to improve the overall performance of our existing storage system," says Lee Euideok, manager of the cloud service team at LG CNS. (See related story on [page 4](#).)

Meanwhile, some companies are looking at their Windows 7 migration as an opportunity to evaluate a new way of delivering and managing desktops. Rather than replace Windows XP PCs with more powerful desktops, why not use client virtualization and thin clients? Indeed, although Windows 7 wasn't its primary reason for virtualizing clients, Commerz Direktservice GmbH, the call center for the second-largest bank in Germany, expects migration to Windows 7 to be a breeze.

"The migration will be quick and easy, because all we have to do is update the master image and reboot the virtual clients," says Joerg Kritzen, IT project manager at Commerz Direktservice. "We'll be able to migrate everyone in one night, instead of taking a month of IT staff time and disrupting users." (Read more about Commerz Direktservice on [page 6](#).)

As IT departments examine the capabilities of client virtualization, they are realizing that the technology can deliver a host of benefits, such as:

- **Easier lifecycle management and lower administrative costs:** Managing desktops at the data center reduces the time and effort IT has to spend. In its analysis of a hypothetical use case—a healthcare company with 200 employees that needed to access sensitive patient data from anywhere—Alinean, a creator of interactive sales and marketing tools for B2B, found that instituting a common virtualized desktop for each employee reduced helpdesk support by 27 percent, systems management cost by 30 percent and IT administration cost by 51 percent annually.



HP VirtualSystem

HP's VirtualSystem is designed to reduce deployment complexity and enable IT to get client virtualization implementations up and running quickly. A single cabinet includes everything needed to support desktop virtualization: the HP BladeSystem, converged storage, cabling, power distribution units and HP Insight Control. The solution comes in two versions:

HP VirtualSystem CV2 with VMware View

- Supports up to 1,200 users
- Includes plug-in for VMware vCenter
- Bundled with VMware View 5 Premier and vSphere for Desktops
- Available in two SAN configurations: base and extended

HP VirtualSystem Client Virtualization for Citrix XenDesktop on Microsoft Hyper-V

- Supports up to 2,000 users
- Includes plug-in for Microsoft System Center
- Includes installation of customer-purchased Citrix XenDesktop 5.5 Platinum
- Includes Microsoft Windows Server 2008 R2 with SP1 (which includes Hyper-V)
- Available in base and extended DAS and SAN configurations.

■ **Increased security:** Security risks increase as mobile devices proliferate and employees use personal devices for work. According to a recent Ponemon Institute report, 329 organizations lost more than 86,000 laptops over the course of a year. That doesn't even include tablets or smartphones. But if data and applications reside at the data center rather than on the device, the risk of data breaches due to lost or stolen devices can be greatly reduced.

■ **Greater data availability, better business continuity and disaster recovery:** Because data is kept on data-center class equipment and backed up regularly, there is much less chance that a user will lose critical data. If something happens to a user's laptop, whether it be theft or just technical difficulties, users can access their desktop and data from any other device. In addition, there is less chance of end-user device problems interfering with productivity, since a user's desktop can be accessed from any device. In the Alinean use case, system downtime was reduced by 80 percent.

■ **Lower operating costs and smaller carbon footprint:** Replacing desktop PCs with thin clients not only reduces hardware costs (thin clients cost less and typically last longer than PCs), but also lowers energy costs. In the Alinean case study, power and cooling costs were reduced by 20 percent over five years.

■ **Improved user experience and increased productivity:** Because the technology is centrally controlled, users experience a more reliable and stable desktop. And end-user-instigated problems are easily rectified by simply rebooting.

■ **Increased productivity of IT staff:** Moving to centrally managed desktops saves hours of IT staff time, allowing departments to redeploy IT personnel to work on value-added projects rather than desktop maintenance. While the main goal with VDI was to increase security, LG CNS also got improved work efficiency, says Sham Sang Deok, architect of LG CNS' cloud service team. "The main services of LG CNS include system integration and system maintenance," he explains. "In the past, services had to be provided by physically sending our employees on-site. VDI has improved our practices significantly as employees can work at home or on the move, increasing employee efficiency and customer satisfaction."

Client Virtualization Use Case: Service Provider

LG CNS, a global IT service provider, was facing mobility, regulatory and environmental challenges. Increased use of mobile devices was driving higher customer expectations. The company had to comply with a growing number of regulations worldwide. And this was all set against a backdrop of the need to reduce IT's power consumption and CO2 emissions.

As IT staff looked for a solution tailored for virtual desktop infrastructure (VDI), it realized that storage architecture is a critical element of the solution. With increasingly large volumes of data generated by thousands of employees and officials working at its foreign subsidiaries, there was a risk of creating a damaging bottleneck. Information would need to be stored in a central storage system, instead of on individual PCs. But the company's existing storage architecture was creaking and unlikely to be able to handle client virtualization storage requirements.

"We wanted a storage solution more suitable for VDI," says Sham Sang Deok, architect of LG CNS' cloud service team. "We contacted HP and they provided an optimized solution with four times higher performance than our previous system, at just one-third of the cost. In particular, the high-performance HP storage P4000 series met the performance levels we needed and offered a lower cost than other solutions in the same class."

In addition to improved data management at greater capacities, the overall VDI solution increased security, improved access to critical data, and, by enabling staff to work remotely, improved flexibility and raised customer service expectations.

HP
Virtual-
Systems
have the
simplicity,
optimization
and
flexibility
to get
your client
virtualization
project
up and
running in
50 percent
of the
normal six
to 12-month
timeframe.

The Shorter Path to Desktop-as-a-Service

Achieving these benefits, however, takes careful planning. Architecting and installing the right infrastructure at the data center, the engine that will power all those virtual desktops, is critical. If performance is low or unreliable, a client virtualization project can be a disaster. Imagine the anger and frustration of users who can't access their desktops when they need to. Selecting the right equipment and technologies, and getting them all to play together, can be a challenging and time-consuming task.

The first order of business is for IT to research and evaluate client virtualization and related technologies. While virtualization software is important, networking, computing and storage components are also critical, as is the solution's ability to maintain high-quality service levels. Storage, in particular, should be designed and optimized specifically for the client virtualization environment. The storage infrastructure can impact your capability to consistently deliver high performance, management and deployment costs, your ability to scale the system and the efficiency of your capacity utilization. Storage has to be highly efficient and extremely reliable, notes Bowker.

"If that storage system has a problem, it's going to affect hundreds or even thousands of users, so it has to have redundancy, fault tolerance and high performance at all times," Bowker says.

Once you've designed the project, selected the technology and vendors, and received all the necessary approvals, there is typically a fairly lengthy procurement process. Then the team assembles, configures and tests all the components, ironing out performance issues and compatibility problems among different vendors' products. This can consume another large chunk of time, delaying the project's launch and eating up many hours of IT staff time.

HP has shortened and simplified the process with its VirtualSystem solution. This solution integrates best-in-class HP servers, storage, networking and management into one rack, which is delivered pretested, preconfigured and ready to install.

Both models of HP VirtualSystem—one integrated and optimized for Citrix XenDesktop and one for VMware View—are designed so IT departments can achieve faster time-to-value. HP VirtualSystems have the simplicity, optimization and flexibility to get your client virtualization project up and running in 50 percent of the normal six to 12-month timeframe. HP VirtualSystem's strengths include:

- **Simplicity:** With support for the entire solution from one vendor, HP VirtualSystem incorporates server, storage, software and networking all in one rack. The solution is ready to go: all APIs and drivers between the various components have already been tested to assure compatibility using HP Factory Express. It also includes HP's management software, HP Insight Control, which plugs in to VMware and Microsoft management consoles so IT managers can view both hardware and software from one console.
- **Optimization:** The computational, storage, networking and systems management components are specifically tuned utilizing up to 64 scripts HP has developed to optimize client virtualization, and have undergone hundreds of hours of testing by HP labs. Because the storage and blades are integrated, no virtualization data exits the rack, boosting security as well as performance.
- **Flexibility:** VirtualSystem has options to scale out as customer needs require by adding an additional rack of CV2 equipment.

VirtualSystem is part of HP's overall Converged Infrastructure approach, a blueprint for the data center that accelerates provisioning of IT services and applications by integrating servers, storage, networking, security, power, cooling, and facilities into shared pools of interoperable resources. Typical client virtualization projects retain the traditional IT silos of servers, storage and networking, with each silo requiring its own administrator. HP VirtualSystem requires one administrator for the entire solution, which reduces costs over time and increases efficiencies.

HP: Your Partner in Client Virtualization

Client virtualization is an important technology that shifts the management and maintenance of desktops to a new model. The model enables corporate IT to maintain critical controls and allows employees the freedom and flexibility they need to use their devices safely and productively. As the technology matures, more corporations are exploring its capabilities and benefits as a way to enable the instant-on enterprise. But as IT departments evaluate client virtualization strategies, they should carefully evaluate not only the technology but also the amount of work and time required to implement and maintain the complete solution.

HP is the only vendor with the depth, breadth and expertise to bring together all the components to enable true desktop-as-a-service. The company has been involved in the client virtualization space for decades, and has strong partnerships with leading client virtualization vendors. HP has been conducting tests to evaluate client virtualization environments for more than seven years, covering all sorts of users, applications and use cases. It was the first to offer reference architecture for client virtualization, a reference architecture that provides open and heterogeneous management across the data center of the future.

HP VirtualSystems are built on leading infrastructure building blocks across every level of the virtualization stack, including its industry-leading blade architecture, unique converged scale-out storage and common management software. These best-in-class products and services are integrated to accelerate the efficiency and high-availability benefits of virtual infrastructure and increase business agility. These proven innovations are delivered, serviced and supported by a single vendor.

For more information, visit

www.hp.com/go/clientvirtualization

www.hp.com/go/virtualsystem/vmwareview

www.hp.com/go/virtualsystem/xendesktop



Client Virtualization Use Case: Call Center

After a merger made Commerzbank AG the second-largest bank in Germany, its call center swelled by 30 percent and was given a daunting task: improve customer service while reducing IT staff by 40 percent.

The call center, Commerz Direktservice GmbH, turned to HP Client Virtualization with VMware View. Now, instead of PCs, each call center worker uses a diskless thin client.

One reason the company went with HP was because IT wanted to keep VDI traffic off of their bandwidth-limited local area network.

"We were not aware of any other vendor besides HP that could offer a converged infrastructure solution with all the processing and storage resources we required to host virtual desktops," says Joerg Kritzen, IT project manager at Commerz Direktservice. "We get high-performance, high-availability storage within a standard blade enclosure, with its own isolated and secure storage network."

The project has exceeded the company's expectations. The call center now operates with 40 to 60 percent fewer IT staff, says Kritzen. Where it previously took two people three business days to roll out monthly software updates, for example, it now takes one person one evening. The technology has also reduced operating costs. Power use is down 35 percent, and the HP solution uses 50 percent less rack space than if they'd used standalone servers and storage to host the virtual desktop infrastructure.