Best Practices in Desktop Virtualization

The pundits have declared that client virtualization is one of the next big trends in enterprise IT, so it's time for IT decision makers to take a serious look. What will you find? A lot of hype, that's for sure. But you'll also find a technology solution that holds a lot of promise, even if it still comes with a lot of questions. This white paper will explore some of the different approaches to client virtualization to help enterprise IT professionals determine which path makes the most sense for their organization.

Plotting the Future of Desktop Virtualization

The drums are banging, the bandwagon is rolling, the horses are being let out of the barn. Use whichever cliché you like, but the reality is this: The pundits have declared that client virtualization is one of the next big trends in enterprise IT so it's time for IT decision makers to take a serious look. The potential benefits of client virtualization are too compelling to ignore so it definitely makes sense to start getting smart about the topic and begin formulating answers to the questions of what, where, when and how much client virtualization makes sense for your organization.

In fact, if you are just starting to get up to speed on client virtualization, you are probably already behind many of your peers in enterprise IT. A recent survey of IT professionals in North America and Western Europe by the consulting firm Enterprise Strategy Group (ESG) indicated that more than 30 percent of respondents said their organizations have either already deployed a desktop virtualization solution or planned to do so within the next 12 months. In another ESG survey, 24 percent of enterprise-class businesses—defined as organizations with 1,000 or more employees—cited "desktop virtualization/thin client initiative" as one of the top IT initiatives that would shape their infrastructure purchasing decisions over the next 12-24 months.

If that's not enough evidence of a rolling bandwagon, consider

this: Gartner Inc. predicts that the worldwide hosted virtual desktop market will grow from 500,000 units in 2009 to 49 million units in 2013. The worldwide revenue from this market will grow from about $1.5 billion in 2009 to more than $65 billion in 2013—which Gartner claims will be more than 40 percent of the worldwide professional PC market. Gartner ranks client computing as third on its list of Top 10 strategic technologies for 2010 and notes that one of the core issues is "the progression of desktop virtualization technology."

It's enough to take your breath away.

But before you breathlessly jump onto the bandwagon – or, worse, get pushed onto it by overzealous business executives hot to try on the latest new technology fashion—take the time to understand what is behind all of the fuss and what the pundits are actually talking about. Even in the research cited here, ESG refers to a "desktop virtualization solution" and Gartner refers to a "hosted virtual desktop market" and these are not necessarily one and the same things.

Why Client Virtualization Is A Hot Topic

To be sure, there are any number of compelling reasons why the concepts behind client virtualization are capturing the fancy of industry analysts and some decision-makers within enterprise IT. By deploying virtualization capabilities at the client level, enterprise IT is seeking to accomplish some of these critical strategic goals:

• **Centralized Control:** Enterprise IT likes to be in control. The concept behind the hosted virtual desktop is that all of the functions of the traditional PC—the operating system, applications, files and data—would reside in the data-center instead of locally on the client system. In this idealized world, users would have virtually no control (pun intended) other than what IT chooses to provide for them. If IT were to choose to do so, it could provide a separate, segregated

virtual space for personal uses, so as to reduce security risks for the corporate network.

• **Flexibility:** If there's anything IT likes as much as control, it is flexibility. With client virtualization the enterprise can support multiple operating systems and a wider assortment of applications: It can isolate users by job function, by department, by security risk, by any measure IT chooses.

• **Reduced Total Cost of Ownership (TCO):** Ostensibly, if there is less functionality on the client device, the client devices can be less expensive. However, there will be requirements for more resources in the datacenter, so the real cost savings in client virtualization come more from reduced administrative and support costs. IT can easily and quickly provide centralized updates, patch management and maintenance. Machines can be remotely fixed and rebooted rather than replaced, which can provide significant savings in personnel costs. It also results in far fewer instances of desk-side visits for maintenance and support, which can be quite expensive and add a lot of unnecessary overhead to IT budgets.

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• **Improved Security:** In addition to controlling what users can access on their device, client virtualization also helps to minimize security risks because important, mission critical data is stored centrally as opposed to locally. Therefore, if a client device is lost or stolen, the risk to the enterprise is reduced significantly. Compliance is another area closely related to security in which client virtualization can provide significant benefits in enabling IT to meet various government requirements that have become an increasing burden and challenge as enterprises have become more mobile and global.

• **Scalability and Speed:** If all of the devices within the corporation are controlled

centrally, then scaling up is a much simpler process. New client devices can be deployed quickly and efficiently and, in many cases, user training can be consolidated as well. In addition, new applications can be deployed much faster across the enterprise. Because devices can be deployed more quickly and efficiently, this can be a real benefit in areas such as business continuity and disaster recovery. If data and applications are sitting on servers as opposed to individual desktops it can be much more efficient in limiting downtime during emergencies, or getting the network back up and running without loss of mission-critical data.

No One-Size-Fits-All Solution

If those are the inherent benefits of client virtualization, the question becomes: How do we get there from here? In the growing world of client virtualization, it is already clear that there will be no one-size-fits-all solution. A recent report from Forrester Research delineates the issue pretty well. The report states that 2012 is the year Forrester's clients predict that their next-generation desktops will be up and running. However, the report notes: "No one company defines this new desktop the same way."

How do these IT decision-makers see it? Well, they all agree that some level of client virtualization will define the next generation of desktops, but in several different potential permutations. "Some believe that this desktop will be fully supported in a data center and accessible from any device; others see this desktop as only a set of applications delivered to a user when required, and others just look at this desktop as a more manageable, supportable and lower cost environment than today."

In a hosted virtual desktop environment, such as that described in the Gartner research above, everything is run in the data center—the operating sys-

tems, applications, storage, files—and users can connect to that virtual desktop from any Internet-enabled device in the world. As organizations think about the type of client hardware they would utilize in this kind of environment, the consideration would be for thin client devices, such as the Dell OptiPlex FX160.

Intel conducted a series of studies last year analyzing the benefits of some of the technologies that deliver client virtualization capabilities. The studies were designed to determine how client virtualization would fit into its own IT organization. It noted that its own users were accustomed to the mobility and responsiveness of a rich client. It also said a virtual hosted desktop environment would require significant investments in building out server and network infrastructure.

Intel's study tended to yield a preference for other technologies that support virtualization within a client environment comprised of more traditional and robust desktops and laptops. Among these technologies, two showed a lot of promise: (1) Client-based virtual containers and (2) Streaming, for both operating systems and applications.

The virtual container approach is the one that has been pioneered by some of the leaders in the client virtualization market, most notably Citrix and VMware. With this approach, each user defines preferred operating systems, applications and data, which are separated from the virtualized systems and applications. This way users can employ any type of platform and could run their own personal applications outside of the portion managed by the IT organization.

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With streaming, software is downloaded on demand to the client for local execution. The software is stored and managed on centralized servers and the system can be configured so that users obtain a clean, consistent and current build each time they log on. Intel states that application streaming and OS streaming for desktops is the next evolutionary step for rich clients.

A Flexible Computing Approach

Any time IT undergoes a significant change in management or philosophy, there is usually some up-front investment required. Moving to a virtual desktop environment is no exception and organizations can expect to spend money to upgrade their server and network infrastructures. However, this type of investment will make sense over the long haul because it will actually improve productivity across the board for the organization—not just within the virtual desktop infrastructure, but for all of the organization's rich clients, applications and databases.

In addition to recognizing the need to invest in a more robust infrastructure, IT organizations must consider creating a positive experience for end users: If we've learned through the years that IT likes control, we've also learned that users like their freedom just as much. The idea in moving toward virtualized client computing is to build an environment that works for both IT and end users as well.

That is why many experts and vendors are advocating a "flexible computing" approach to client virtualization. With flexible computing the digital identity of the user is managed on a server and not on a client device. The idea is to cost-effectively deliver a desktop based on the needs of each user.

This approach allows organizations to take advantage of the benefits of centralized control while also enhancing the user experience by providing mobility as well as a wider range of choices in

both devices and applications. It also offers flexibility in the types of solutions available to enterprise IT, such as:

Virtual Remote Desktop: A hosted virtual desktop environment where the storage and processor functionality are offloaded to the server and virtualized. In today's world of client virtualization, devices need to be attached physically to the network. In the next iteration, coming this year, users can be mobile and take the hosted environment with them, work on it, and then hook back into the network, seamlessly.

On-Demand Desktop Streaming: The storage is moved from the client to the server, but each client retains processor, graphics processing and user interface functions.

Dedicated Remote Workstation: The entire physical workstation is located centrally and the display is accessed through a portal device.

Another option available to organizations is to utilize a hosted environment, whereby the desktop virtualization services are provided through an outsourced, hosted subscription model. This can be efficient in moving quickly to

Future-Proofing Your Hardware With Intel's vPro Technology

If you are at the stage now where you are buying new client devices—either in preparation for a shift to client virtualization or not—it is important to make sure you "future-proof" your hardware so that, even if you are not ready for client virtualization now, you will have the ability to be flexible if you decide to make the move in the future.

It is important, therefore, to make sure that any client devices you purchase now are equipped with vPro technology from Intel. vPro provides a wealth of benefits, including enhanced security, energy-efficient performance and remote management capabilities. In a virtual environment, computers with vPro technology can be isolated and repaired even if the operating system or hard drive has been disabled.

For environments that utilize a virtual container approach, vPro technology offers a hardware solution that isolates streamed operating systems and applications. vPro is an underlying technology for both Citrix and VMware, so it will be important to have computers with vPro as those companies launch new software solutions in the future. vPro also offers virtualization of processor and memory, as well as virtualization of I/O hardware.

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a new environment, but some organizations may object to the idea of not hosting their own virtual client environment.

Which solution makes sense for your organization, and how quickly do you need to move on it? As with any IT innovation, it makes sense to take your time and do a proper analysis. There are many potential challenges in moving to this next generation of client computing, so it is wise to consult with your trusted vendors and understand all of the various options. As one of the consulting companies put it, "The Virtual Desktop Revolution is Coming!" If, indeed, that is the case, you may not be ready to join the front lines, but you certainly don't want them to start the revolution without you.

Coming To Terms With Client Virtualization

We are using the generic term client virtualization broadly to describe the concept of bringing virtualization technology to enterprise end-user devices. One of the reasons this works is that there is still a developing lingua franca that hasn't yet settled upon within the field. Client virtualization, desktop virtualization, hosted desktop virtualization and virtual desktop infrastructure are some of the terms that often get used interchangeably but don't necessarily mean the same thing. We'll defer to the experts for definitions:

Desktop Virtualization (from Wikipedia): The concept of separating a personal computer desktop environment from the physical machine through a client-server computing model. The resulting "virtualized" desktop is stored on a remote central server, instead of on the local storage of a remote client. Thus, when users work from their remote desktop client, all of the programs, applications, processes and data used are kept and run centrally, allowing users to access their desktops on any capable device, such as a traditional personal computer, notebook computer, smartphone or thin client.

Virtual Desktop Infrastructure (from Citrix): Refers to the process of running an end-user desktop inside a virtual machine that lives on a server in the data center. It is a powerful form of desktop virtualization because it enables fully personalized desktops for each end user with all the security and simplicity of centralized management. It is important to understand, however, that VDI is only one form of desktop virtualization.

Hosted Virtual Desktops (from Wikipedia): Hosted virtual desktops are desktop virtualization services provided through an outsourced, hosted subscription model. Hosted virtual desktop services generally include a managed desktop client operating system configuration. Security may be physical, through a local storage area network, or virtual through data center policies.