



# Desktop Virtualization and Independent Computing

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## OVERVIEW

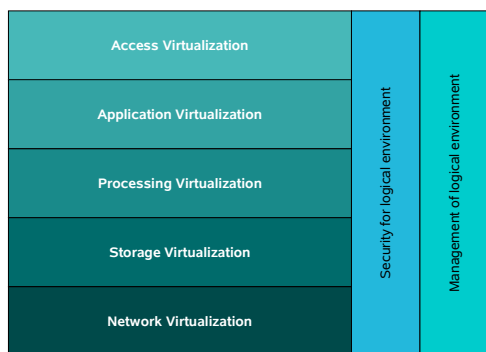
Virtualization has been around for a long time and takes many forms. Each of the forms is designed to move one aspect of an application system from a physical environment into a logical or virtual environment. Virtual environments can be created to provide an ideal environment for a function or application that may be strikingly different from the underlying physical environment.

When speaking to IT executives, however, Kusnetzky Group analysts often hear concerns about the experience staff members have with virtual machine-based environments. This, the Kusnetzky Group thinks, is one of the reasons for the limited adoption of this technology on the desktop. The Kusnetzky Group expects each new wave of technology to improve upon that experience.

This paper is meant to introduce desktop virtualization and explain how it makes independent computing possible.

## WHAT IS "DESKTOP VIRTUALIZATION" ?

As with other uses of the term "virtualization", desktop virtualization could really mean the use of several different virtualization technologies (see the Kusnetzky Group model of virtualization to the left) including the following:



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☒ **Access virtualization** - Individuals access applications running in virtual machines on servers or blade PCs that are located in the datacenter. Sometimes this access virtualization technology is known as "presentation services." Individuals use a PC running special software or a very lightly configured limited function computing device known as a "thin client" to access their applications and data. Benefits of this approach include greater levels of security and reliability; lower costs of client administration and, in the case of thin clients, the device can be seen as an information appliance rather than a computer. A network connection, however, is required to make this approach work and so, highly mobile staff members would not be able to use this as their primary means of using application solutions.

☒ **Application virtualization** - Another approach to desktop virtualization is for individuals to access applications that have been encapsulated and streamed, in whole or in part, down to their local computing device. Once the individual has completed the task, the application could be automatically removed from the local machine and made available for reuse on another machine or it could remain on the local machine. Streaming applications often require broadband network connections. Not all applications work well in an encapsulated form. This also usually means that the target machine is running the operating system and provides a computing environment that streamed applications find hospitable.

- ☒ **Processing virtualization** – Processing virtualization is a range of technologies that allow a single computer to appear as many (virtual machine software) or many computers to appear as a single computing environment (clusters, grids, and the like). If we limit the discussion to virtual machine software, one of the five different forms of processing virtualization technologies, a whole computing environment can be encapsulated into a virtual machine. The virtual machine could then be run on a remote server or migrated to the client machine from shared network storage, copied or streamed to the target machine and then executed on the target machine. The target machine need not run the same operating system that supports the application. This approach is the foundation of independent computing.

#### HOW DOES DESKTOP VIRTUALIZATION CREATE AN “INDEPENDENT COMPUTING” ENVIRONMENT?

“Independent Computing” is an architecture that is different than traditional PC or Server-based architectures for a variety of reasons. Although each application may be encapsulated in a virtual machine environment, the individual using the application is given an experience that is very much like a traditional PC environment but enhanced in many ways. The key driver is giving staff members the same experience regardless of whether the computing is being done locally or somewhere in the network via the corporate wide area network, the local area network or through a server that’s directly connected to the client machine..

- ☒ Individuals may be given the impression that they have access to many different PCs. Each of them attuned to a different function, well managed and providing a reliable, secure environment.
- ☒ Access to each of these virtual desktops is controlled by the organization’s policy guidelines
- ☒ If a given virtual desktop is damaged or destroyed, it is easily replaced with little or no downtime.
- ☒ Updates to applications, tools or even the operating system itself can be implemented without requiring administrative staff to visit each machine or for staff members to be without tools they need to work.

Unlike server-based access virtualization technology that offers access to individual applications, an independent computing environment offers access to a complete desktop environment. Staff members are not expected to learn how to navigate through different system environments in order to do their work.

#### WHAT’S ACTUALLY NEEDED TO MAKE INDEPENDENT COMPUTING A REALITY?

A number of core services are required to provide staff members with an independent computing environment. Examples of the type of services required follow:

- ☒ A component that makes it possible for Windows XP, Windows 2000 or Linux virtual desktops to be hosted on top of a Linux server environment, each in their own virtual machine. This component should also contain the capability to optimize resource utilization allowing staff members to see a highly responsive, highly manageable environment.
- ☒ A component that controls and manages virtual desktops. This component creates virtual desktops, provisions them with the appropriate software, and manages the connections to physical client systems. It should also provide the advanced capabilities of supporting a high availability/failover service so no single server outage would make virtual desktops unavailable.
- ☒ Finally, a simple, effective, high performance protocol communications methodology must be deployed to create a highly responsive environment.

## QUMRANET SOLID ICE™

Qumranet has developed a virtual desktop solution that is called Solid ICE™ that has been designed to meet these requirements. This software supports industry standard systems running high volume operating systems. Solid ICE™ is comprised of the following 3 components:

- ☒ Virtual Desktop Server (VDS) — this component uses KVM as the virtual machine hypervisor.
- ☒ Virtual Desktop Controller (VDC) – this component controls and manages all of the KVM images.
- ☒ Simple Protocol for Independent Computing Environments (SPICE™) — this component provides a very efficient, high speed, highly secure communications platform allowing clients to work with virtual desktops.

## WHAT ARE THE BENEFITS OF DESKTOP VIRTUALIZATION?

Many IT executives remember mainframe and midrange computing solutions. Installation, administration and updates were all done back in the datacenter. Devices were put on staff members' desks and were useful through many application lifecycles without requiring administration, updating or changes. These executives would like to recapture this environment without losing the benefits of a responsive, graphical desktop environment. Desktop virtualization makes this possible.

There are a number of other benefits this approach offers. Pools of virtual desktops would minimize loss of productivity and potential customer dissatisfaction in the case of a failure. Work environments can easily be created and provisioned for newcomers to the organization's staff. Secure, limited environments can be created for partners and consultants. Administrative tasks, such as installation of operating system or application updates, can be done without requiring IT staff to spend time at each desktop system.

With the help of an intelligent, graphical management portal, any of the virtual desktops or objects they contain can be discovered and easily managed.

The net result is a more agile, more flexible, more highly secure environment.

## S U M M A R Y

Organizations needing the ability to deploy controlled, managed and highly responsive desktop environments for staff members, partners or customers have often experimented with access virtualization or application virtualization. Some have been happy with this technology and have deployed it. Others have found that this form of remote computing took too long to set up, took too many types of expertise, required broadband network connections to be effective and required the purchase of special-purpose thin client machines.

In the end, many organizations felt the need to deploy separate desktop environments for their power users, their knowledge workers, their developers and their task-oriented workers. Each of these classes of computer users had strikingly different needs and traditional access virtualization technology really only addresses the needs of a few classes of users.

If an organization is seeking a computing environment that is movable, consistent, reliable and secure and will support all of these different usage cases, these organizations need the combination of access virtualization and processing virtualization that Qumranet provides with Solid ICE. Learning more about this technology would be a good first step.

For more information, please visit <http://www.qumranet.com>