End-User Computing in Today's Virtual Era

The Pros and Cons of Desktop Virtualization

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Executive summary

Organizations of all sizes are exploring desktop virtualization as a way of addressing key business and IT challenges. By delivering operating systems, applications, and enterprise data from the data center out to a wide range of computing devices, IT groups can foster employee mobility, flexibility, and productivity while simplifying desktop management, improving security, and reducing costs.

Desktop virtualization can provide an array of important benefits, yet the potential complexity of desktop virtualization could seem overwhelming for many small and medium businesses (SMBs). IT administrators need to select, configure, and manage servers, storage, networking equipment, virtualization software, and more. The time, costs, and resources required to deploy and run a virtual desktop infrastructure (VDI) could discourage organizations from undertaking such a project.

Before implementing a VDI, organizations should thoroughly evaluate the potential benefits and challenges of desktop virtualization. They must clearly understand the business and IT value of virtualizing desktops and find ways to overcome potential obstacles.

This paper surveys possible use cases for desktop virtualization and identifies several business and IT changes (such as the migration to the Microsoft® Windows® 7 operating system) that could justify a move to desktop virtualization. The paper notes the potential benefits that SMBs could experience, and it highlights a full range of factors and decisions that SMBs should consider before embarking on a VDI project.

Finally, the paper introduces Dell™ Desktop Virtualization Solutions (DVS) Simplified—an integrated appliance solution that can help organizations quickly deploy and easily manage a VDI environment. As part of a broad portfolio of Dell DVS solutions, DVS Simplified is designed specifically to facilitate the move to desktop virtualization for organizations with simple use cases and simple IT environments.

End-user computing—today's challenges and opportunities

Small and medium businesses face an array of pressing challenges as they strive to succeed in today's increasingly global business environment. To compete with large corporations, these organizations must maximize business agility to create innovative solutions and capture new market opportunities rapidly. To attract and retain customers, they need to stay focused on responding to customer needs, creating customer value, and developing customer-centric strategies for expanding the business. At the same time, SMBs must optimize internal efficiencies, improving employee productivity while reducing operational costs so they remain competitive with organizations of all sizes.

Technology can help medium-size organizations gain "first-mover" advantages. In fact, technology can be a secret weapon for helping them become more agile and flexible than their larger competitors. As SMBs look toward technological solutions to accelerate business success, many are considering desktop virtualization solutions. From law firms, bank branches, and specialized manufacturing companies to K–12 schools and doctors' offices, a wide variety of public and private sector organizations now recognize the potential for desktop virtualization to increase employee flexibility and mobility, improve productivity, enhance security, simplify desktop management, and streamline operations.

However, for smaller organizations especially, the implementation of a desktop virtualization solution can seem daunting. These organizations, most of which have small IT groups, might not have the expertise or resources to design, orchestrate, and implement the multiple interconnected technology components required for desktop virtualization, including servers, network storage, high-speed networking, connection brokers, client systems, and virtualization software. Before making the move to desktop virtualization, all organizations will benefit from a careful assessment of the pros and cons, and a thorough review of several key considerations.

To help assist and inform business decision makers, this white paper examines some of the use cases for desktop virtualization as well as the possible benefits and potential drawbacks. It also discusses key business and technical considerations that should be explored before diving into a desktop virtualization initiative.

Use cases for desktop virtualization

Desktop virtualization supports multiple use cases in a range of industries, with an array of organization types. For example:

- A small bank or financial services firm could deploy desktop virtualization to provide employees in remote or branch offices with secure access to desktops and applications that are running in a centralized data center. That approach could help drive down IT costs and free up time by reducing the need for IT staff to travel to remote locations to support users.

- A healthcare clinic could provide doctors, nurses, and administrators with secure access to electronic healthcare records, billing, and other information systems from any client device workstation within the facility. Desktop virtualization could strengthen protection of sensitive patient data.

- Organizations with call centers could provide employees with all the applications and data they need while reducing vulnerability to viruses and decreasing the resources needed for deskside support.

- A K–12 school district could support next-generation learning initiatives by using desktop virtualization to provide access to applications and school resources from today's "smart" mobile devices, including tablets and mobile phones.

- In higher education, desktop virtualization could reduce the need to build large-scale physical computing labs. Desktop virtualization could provide students with flexible anytime, any-device access to lab applications—all while streamlining support operations for the school's IT group.

The move to desktop virtualization could be triggered by several technical or organizational changes. For example, a migration to Windows 7—which might require upgrading desktop systems and conducting significant administrative work to install new software—

could provide an excellent opportunity to change the way desktop computing is handled and supported. Similarly, a PC refresh might prompt an organization to streamline desktop administration. New government or industry regulations related to data protection and privacy could spur an organization to find ways to avoid storing data on laptops and individual PCs.

A need to reduce the time, resources, and costs required to support traditional PC desktops also could lead to a move to desktop virtualization. In addition, IT groups might see desktop virtualization as an opportunity to take a next step in a virtualization journey, extending virtualization technology beyond servers into end-user computing.

Enabling employees to use the latest and greatest mobile and "smart" devices to access work resources could also provide a key employment benefit differentiator, supporting recruitment and retention of tech-savvy employees. Desktop virtualization streamlines and secures the integration of all types of end-user devices into an organization's IT environment.

Changing organizational structures or shifting business needs could also lead SMBs to consider desktop virtualization. For example, a business merger or acquisition might lead an organization to standardize the desktop environment across business divisions and consolidate desktop management. In addition, organizations might want to make a change to create more flexible work models and support an increasingly mobile workforce by providing access to data and applications on tablets, smartphones, and other mobile platforms.

For some organizations, the way the business operates could dictate a more flexible, efficient approach to deploying employee desktops. For example, a company that employs short-term contractors might require those contractors to use their own PCs to access corporate resources, rather than supplying corporate-owned systems.

Desktop virtualization: How it helps

Whatever initiative or business change prompts the exploration of desktop virtualization, medium-size organizations can realize several advantages for their business, their users, and their IT staff by adopting a virtual desktop infrastructure.

Streamlined desktop management

Desktop virtualization centralizes desktop management, enabling IT administrators to deploy desktops, install updates and patches, and update applications without having to physically travel to each PC (see Figure 1). SMBs with small IT groups can free up IT staff from performing routine PC maintenance and give them time to focus on more strategic projects.

- User profile
- User data
- Applications
- OS

End-user devices
Display point for the virtual desktop—anywhere, anytime on virtually any device

Virtual desktops
Desktop OS, applications, and user personalization delivered to the user device on-demand

Centralized
Server, network, storage, and virtualization infrastructure host client OS and user data in a secure data center
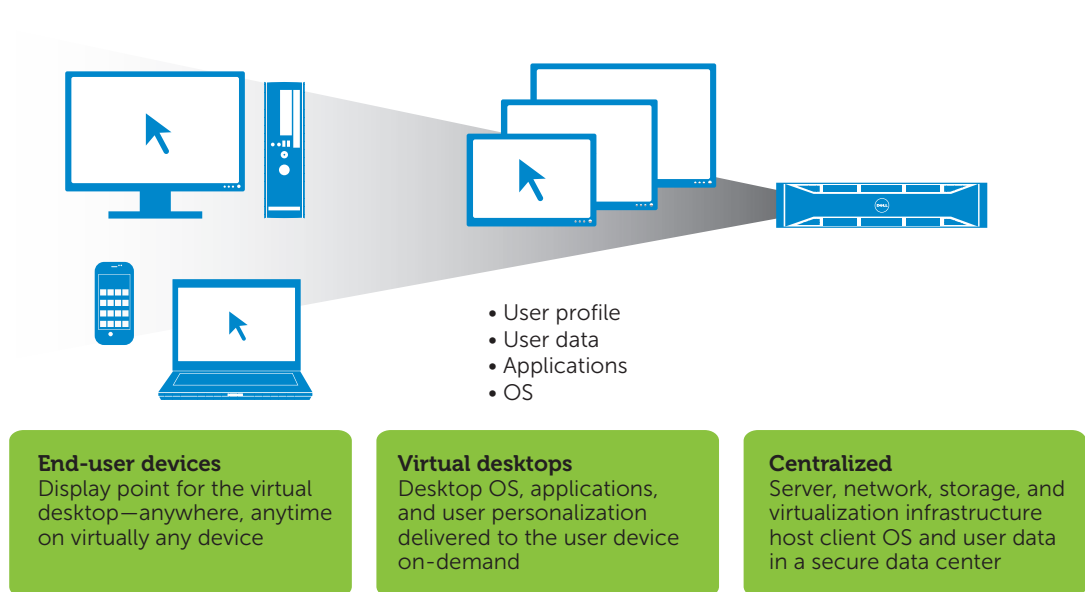
Figure 1: Desktop virtualization centralizes PC management, delivering virtual desktops (including applications and user data) to a variety of end-user devices from the data center

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Improved worker flexibility, mobility, and productivity

Implementing desktop virtualization can give workers the flexibility to work anytime, anywhere, from a broad array of computing platforms. With desktop virtualization, data and applications are maintained in and delivered from the data center; they are not stored on the local PC. Employees can access the information and software they need while at home or on the road using mobile computers, their own personal home computers, tablets, smartphones, or even the public kiosks found in hotels and airports—employees no longer need to be tied to a company PC to work.

At the same time, IT staff can more easily deploy software, providing access to the latest applications. With greater flexibility and mobility, and easier access to new software, employees and their companies can benefit from greater productivity.

Enhanced security

Organizations can deliver that anytime, anywhere access while tightening security. With desktop virtualization, company data and software remain secure in the data center. Corporate data, customer data, and intellectual property do not need to be saved or stored on PCs, thumb drives, or external hard drives—that data can stay where it is safest. Organizations can reduce the concerns that a stolen laptop or lost mobile device will expose sensitive information. Because desktop virtualization centralizes operating systems, user data, and application data, IT staff can simplify the implementation of data security, backup, and archiving solutions.

Assessing whether desktop virtualization can work in an organization

Desktop virtualization can provide some significant benefits, but SMBs should take the time to conduct due diligence before embarking on a desktop virtualization project—or any technology project for that matter. They must establish goals, define strategies, and consider a full range of potential challenges.

Business priorities and objectives

Organizations should define their business and IT objectives for end-user computing and user productivity, and they should be prepared to measure their progress against those objectives. By doing so, they can determine whether and when to expand desktop virtualization beyond the initial group of desktops and users.

IT complexity

Deploying, managing, and supporting a desktop virtualization solution can be a complex undertaking, especially for a small IT group. While many organizations have some experience with server virtualization, desktop virtualization requires some distinct skills. Administrators must be able to manage not only virtual servers and storage systems but also networking, connection brokers, client systems, and an array of new software, including the desktop virtualization software and its management tools.

Employees and applications

While desktop virtualization can enhance worker flexibility and mobility, organizations might still encounter resistance to change from employees. Employees might have strong preferences related to their PC computing workspace. Attempts to change that workspace can trigger strong reactions. Organizations must be aware of the employee culture, anticipate possible challenges, and address reluctance to change in order to ensure a successful deployment and ongoing user experience.

Employees often use applications not supported by the corporate IT group to get their work done. Organizations should carefully

assess users and their applications to gain a complete and full picture of how users are using computing systems.

Costs

While SMBs may not be averse to increasing IT spending, they need to make sure they are spending wisely on projects that will deliver the greatest results. Desktop virtualization does reduce costs for support and maintenance over time, but implementing a desktop virtualization solution does require an up-front investment. Clearly understanding needs, objectives, and existing resources can help an organization make the most efficient and effective use of a virtualization project budget.

Deployment considerations

Having an accurate assessment of the number and types of virtual desktops to be deployed, and the performance requirements that must be met, will be critical in designing and deploying the solution. To help ensure accurate sizing of a solution, organizations should assess desktop workloads to determine which desktops and applications should—or should not—be virtualized.

Security

Desktop virtualization can enhance security and help organizations address security gaps related to end-user computing and the connection of end-user devices to the corporate network. In fact, many organizations are adopting desktop virtualization primarily because of the security improvements it delivers. Before implementing a desktop virtualization solution, however, organizations should be sure that they have in place a clear security strategy that defines user access policies and the approaches for protecting corporate and customer data within the data center.

After identifying the goals, strategies, and potential challenges of a desktop virtualization project, an organization must find a desktop virtualization solution that can address its specific needs. The solution must maximize the benefits of desktop virtualization while minimizing the time, costs, and resources required to deploy and manage it.

New appliance-based solutions for simple, practical desktop virtualization

Dell now offers an integrated, simple plug-and-play appliance designed to help SMBs realize the benefits of desktop virtualization while avoiding high costs and complexity. Dell Desktop Virtualization Solutions (DVS) Simplified brings together an enterprise-class Dell PowerEdge™ server and Citrix® VDI-in-a-Box desktop virtualization software to help organizations rapidly deploy and easily manage desktop virtualization.

Fast deployment

DVS Simplified helps organizations dramatically accelerate the deployment of desktop virtualization by including a preinstalled hypervisor and VDI management software plus preconfigured hardware in a single, complete appliance solution. A simple, wizard-based initial deployment process streamlines setup. Most organizations can be up and running in as little as an afternoon. Optional remote or on-site deployment services from Dell can help further accelerate deployment and migration of existing desktops into the new virtual environment.

Streamlined architecture

The DVS Simplified architecture eliminates complex infrastructure components typically used for enterprise desktop virtualization solutions, such as large-scale shared storage solutions, high-speed interconnects, and separate management, load-balancing, and connection broker servers (see Figure 2). The entire solution is run and managed with a practical, easy-to-use server-grid architecture, which can help save money and reduce systems complexity.
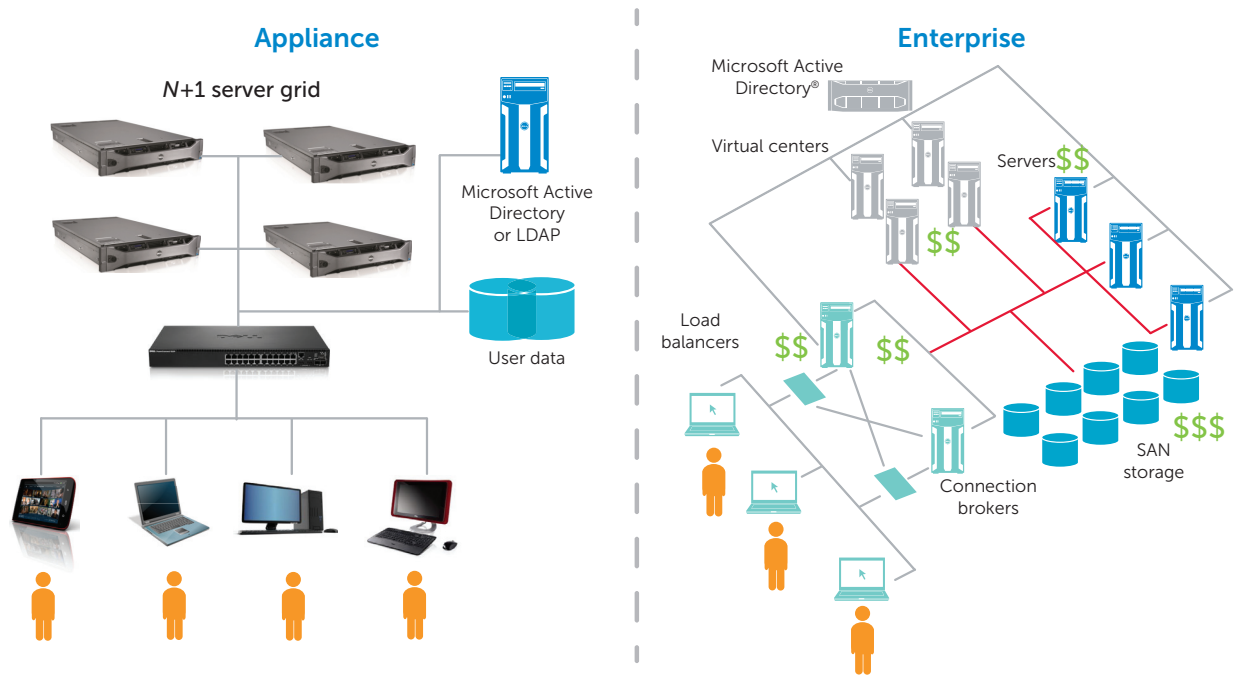
Figure 2: The Dell DVS Simplified appliance architecture helps eliminate the complexity of traditional VDI solutions

Simplified management

The appliance combines all of the core VDI management functionality needed to provision and manage users, images, desktops, and the server grid in one intuitive, centralized management console. Administrators can manage the solution with existing Microsoft Windows skill sets—there is no need to learn complicated new tools or management systems.

Rich user experience

DVS Simplified provides users with personalized desktops on a broad range of devices, including Windows and Apple computers, tablets, and iOS/Android/RIM/Windows smartphones. Users gain the flexibility and mobility they need in a familiar environment that will help address any reluctance to change. Citrix HDX™ technology helps deliver a robust user experience that is comparable to using a traditional local desktop, no matter which supported device is used.

Easy sizing and modular scalability

The modular, grid-based DVS Simplified architecture facilitates linear, predictable scalability. After beginning with a single appliance, an organization can easily add appliances to expand the deployment to more users (see Figure 3). As appliances are added, the solution automatically load balances the virtual desktops across all servers in the grid.

Cost-effectiveness

The DVS Simplified appliance slashes the costs of purchasing and implementing a VDI solution. In most cases, organizations can use the appliance to implement a VDI solution while staying within their existing PC refresh budget. Organizations can repurpose existing PCs while creating a modern virtual desktop environment.
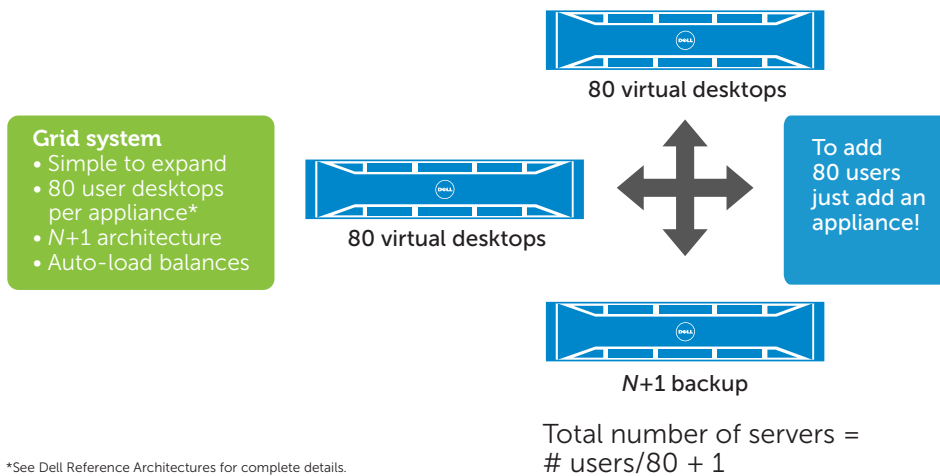
80 virtual desktops

Grid system
- Simple to expand
- 80 user desktops per appliance*
- *N*+1 architecture
- Auto-load balances

80 virtual desktops

To add 80 users just add an appliance!

N+1 backup

Total number of servers = # users/80 + 1

*See Dell Reference Architectures for complete details.

Figure 3: The modular, grid architecture of the Dell DVS Simplified solution enables organizations to scale linearly, in a predictable manner

Single-source, integrated support

The DVS Simplified appliance includes Dell ProSupport, which offers comprehensive hardware and software support. Dell ProSupport provides access to highly trained Dell experts 24/7/365 to help resolve any issue quickly and effectively. Additionally, Dell ProSupport includes access to bug fixes, patches, and software updates for a full three years. With Dell ProSupport, IT support staff can spend less time on issue resolution and more time on revenue-generating and strategic initiatives.

Dell also offers the following optional value-add services in support of DVS Simplified.

- **JumpStart Training**—Available as a four-hour Web-based course, JumpStart Training for DVS Simplified includes guidance and hands-on exercises that help IT administrators of all levels master appliance configuration and administration activities quickly and effectively. The curriculum can be customized to fit an organization's specific needs. Training is also available as a two-hour option when combined with Remote Advisory Services.
- **Remote Advisory Services**—Dell Remote Advisory Services provides remote assistance for configuring the DVS Simplified appliance. The four-hour service also includes an option for additional training.

Dell end-to-end solutions

The Dell DVS Simplified desktop virtualization appliance solution is one of a broad portfolio of Dell virtualization solutions and services that can benefit SMBs. Dell solutions integrate best-of-breed components such as Dell PowerEdge servers, Dell EqualLogic™ storage, and the comprehensive Dell portfolio of business PC computing solutions, such as thin clients, workstations, laptops, and the Dell XPS Ultrabook™ series.

Conclusion

Just like large corporations, many small and medium businesses are investigating desktop virtualization as a way to simplify desktop management, enhance user flexibility and mobility, and improve security. Before embarking on the journey to desktop virtualization, these organizations will benefit from a thorough assessment of the pros and cons of desktop virtualization. The Dell DVS Simplified solution is designed to address cost and deployment challenges, enabling SMBs to realize the same benefits from desktop virtualization that larger organizations enjoy while controlling costs and complexity.

For more information about the Dell DVS Simplified solution, contact your Dell representative or visit: **dell.com/dvssimplified**

For more information about Dell Desktop Virtualization Solutions, visit: **dell.com/virtualdesktops**