

4 indicators of accelerated desktop virtualization adoption and the Dell response

A Dell thought-leadership white paper

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Executive summary

Desktop virtualization can provide clear and quantifiable benefits to organizations of all sizes. However, many organizations have approached adoption of desktop virtualization with caution because deployments are perceived to be complex, and there are lingering concerns about security, performance, and cost. This paper illustrates why desktop virtualization is quickly approaching an adoption inflection point because of the following four converging indicators: progression of desktop virtualization technology, consumerization, acceleration of thin-client deployment, and wide adoption of server virtualization and cloud services.

Dell is responding to this opportunity by committing resources to create a powerful customer-centric portfolio of desktop virtualization solutions in two delivery systems—Simplified and Enterprise—that target organizations with IT infrastructures that vary in levels of complexity. Two delivery methods—on premises and hosted—are available for these offerings. Dell leverages its expertise in servers, storage, networking, clients, software, and services to provide preconfigured, end-to-end infrastructure and services. Dell also leverages its powerful data center network to offer a virtual desktop-as-a-service platform for organizations that prefer to outsource their entire desktop virtualization operation.



Introduction

After enjoying widespread adoption and success in the server arena, virtualization is now expanding to end-user computing, from application virtualization to increasingly versatile desktop virtualization that includes personalization tools and persistent environments. Today, virtualized desktops regularly meet expectations of end users while streamlining management. In an era in which end users are increasingly influencing IT decisions and IT departments are increasingly challenged by external forces such as compliance, resource optimization, and flexibility, virtualized desktops are emerging as valid alternatives for balancing the sometimes conflicting demands of IT organizations and end users.

Adoption drivers for desktop virtualization can be categorized into four groups (see Table 1). These drivers are constant across all industry segments, but their degree of emphasis can change based on specific use cases. For example, the financial industry may emphasize enhanced security, while education may be primarily concerned with end-user productivity.

Total cost of ownership (TCO) can be a good measure of the cost-effective benefits of desktop virtualization deployments over a period of time that includes operating and capital expenditures. Factors incorporated in TCO include power savings, desktop support, idle time, end-user devices, end-user downtime, and others. Some instances of cost savings are described in Table 1.

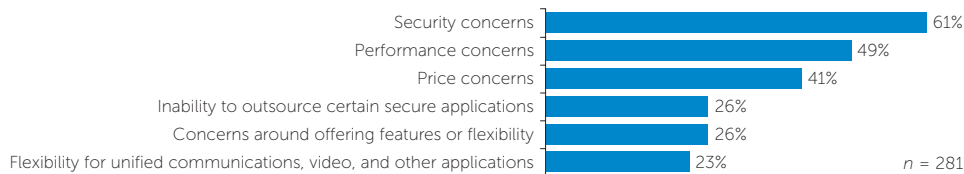
Successful deployments start with evaluating desktop usage in an organization and identifying the appropriate target end users—workloads—who will have a clear and immediate benefit from desktop virtualization. Virtual desktop infrastructure (VDI) is a strategic execution of desktop virtualization that hosts a desktop OS within a virtual machine running on a hosted, centralized, or remote server. Typically, deploying VDI virtualizes only a limited percentage of the total desktop end-user base. Often, a strategic analysis of end users can be accomplished through an in-depth professional assessment of the desktop environment by seasoned virtualization experts such as the Dell Desktop Virtualization Solutions (DVS) Group.

	Deliverables	Virtualized desktop benefits compared to nonvirtualized desktops during a 12-month period*
Enhanced end-user productivity	<ul style="list-style-type: none"> • Enable the mobile workforce • Accelerate availability of applications and performance • Enhance service-desk support 	23.4 percent reduction in desktop downtime
Enhanced security	<ul style="list-style-type: none"> • Help ensure regulatory compliance • Control access to data flow • Provide virus protection • Help secure data records 	76.7 percent reduction in average time to recover from data loss
Efficient data center management	<ul style="list-style-type: none"> • Enable OS migration, patching, and deployment • Help reduce downtime • Offer easy data backup 	20 percent reduction in time for routine maintenance
Enhanced cost control	<ul style="list-style-type: none"> • Extend desktop refresh cycles • Provide desktop support cost • Offer desktop scalability 	11.7 percent reduction in desktop support spending

* Source: "Analyst insight: Measuring the returns from a desktop virtualization program," Aberdeen Group, Inc., September 2011.

Table 1. Desktop virtualization adoption drivers and associated benefits compared to nonvirtualized desktops





Source: "Understanding motivation for implementing virtual desktop solutions," Market research conducted by UTech Consulting, Dell Inc., January 2011.

Figure 1. Inhibitors to adoption of hosted desktop virtualization deployments

Despite tangible benefits, desktop virtualization is still in an early life-cycle stage.

Complexity often emerges as a highly relevant inhibitor, slowing the expansion of current implementations to broader ranges of desktop end users. Organizations that are still in an exploratory phase often point to security, performance, and cost as significant barriers to not considering hosted desktop virtualization (see Figure 1).

Complexity can be defined as the inability of an organization to integrate the different ingredients of the approach that drive a predictable deployment both from cost and performance perspectives.

An inflection point for desktop virtualization adoption

An early version of desktop virtualization ran on the Microsoft® Windows® NT Server 4.0 OS when Remote Desktop Services (RDS), formally Terminal Services, was introduced. While the concept is not new, today four converging indicators reveal a significant impact in the acceleration of VDI adoption. These indicators include

the progression of desktop virtualization technology; consumerization, which is transforming large sectors of the workforce; acceleration of thin-client deployment; and wide adoption of server virtualization and cloud computing services. This wide adoption has shifted attention to corporate and third-party data centers as hubs of performance, optimization, and control.

"I really believe that VDI will bring significant efficiencies to my operation. Six months ago I decided to pilot the technology with a sample of 50 users. During the POC (proof-of-concept) implementation I realized that it was not as straightforward as I thought. Each vendor pitched me the goodness of his/her individual product, but I didn't have a sense of the implications of each vendor selection in the overall project."

—IT director at a leading-edge, global health care organization in Austin, Texas

October 2011



Accelerated desktop virtualization adoption

According to IDC, the total number of virtual desktop seats shipped is estimated to grow from 11 million in 2010 to 37 million by 2014, which represents approximately 7 percent of all enterprise-installed PCs.¹ Although these growth projections are a good benchmark of the acceleration of adoption, a series of events taking place in the industry point to 2011–2012 as the inflection point in the adoption of desktop virtualization—in particular, VDI adoption.

Indicator 1: Progression of desktop virtualization technology

Historically, a prominent indicator of the acceleration of VDI adoption was the degree in which new technologies attract innovation and capital. This indicator is increasingly valid during periods in which the economy is stressed and investors are less risk-tolerant than in better economic times.

Pillars of expertise can be used to classify and filter these investments. These pillars can be defined as sectors with high influence in the growth of the VDI category because of their emphasis on areas critical to the end-user experience, cost, or efficiency. Pillars of expertise include:

- **Delivery systems:** Innovation that facilitates the delivery of virtual desktops including desktop as a service and appliances
- **Brokering and session management:** Efficient management and allocation of virtual machines
- **End-user experience management:** Policy and personalization management
- **System monitoring:** End-user and infrastructure performance management
- **Endpoint devices:** Terminals used as part of desktop virtualization approaches
- **VDI management and storage optimization:** Image and storage efficiency management
- **Security features:** Protection of confidential data in the data center, network, and endpoints

Several organizations that were founded or aligned through acquisitions toward desktop virtualization during a 10-year span are shown in Figure 2. After an early cycle of innovation, acceleration of investment

¹“Market analysis perspective: Worldwide enterprise virtualization software – client virtualization,” by Ian Song, IDC, March 2011.

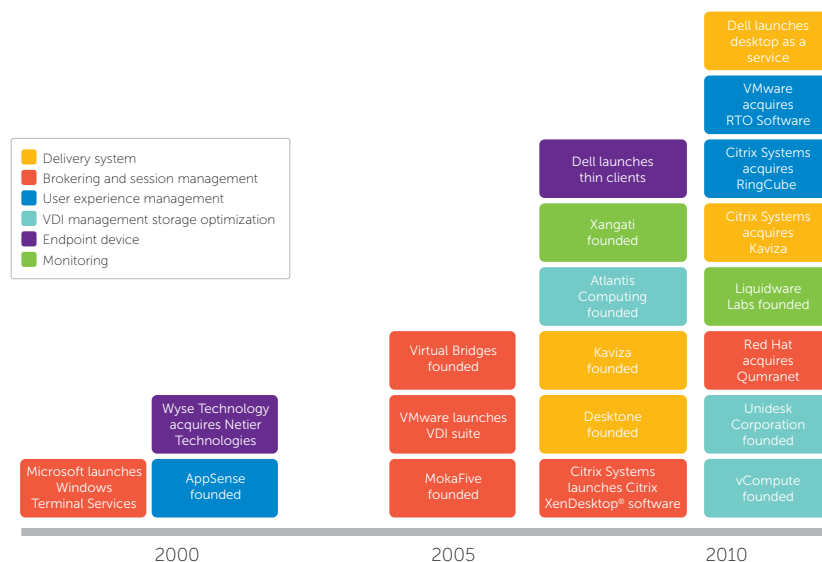
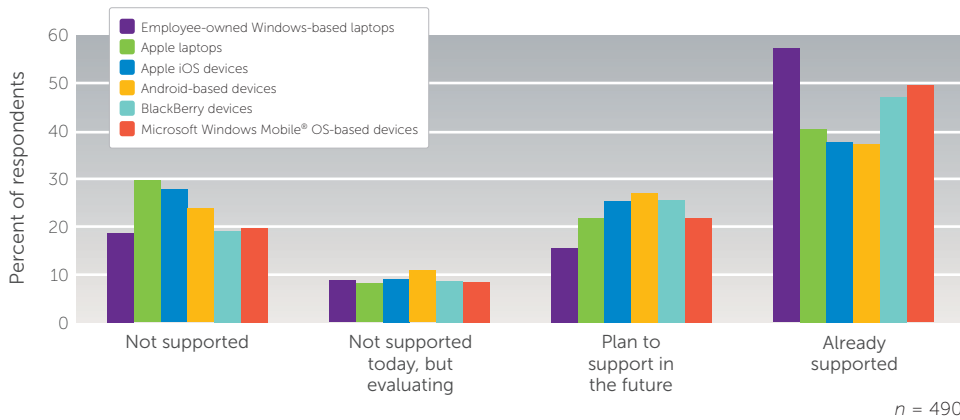


Figure 2. Organizations investing in desktop virtualization between 2000 and 2010





Source: "Consumerization of IT: An IDC survey," by IDC, Doc #227925, April 2011.

Figure 3. Adoption of end-user devices and supporting technology

toward the end of the same 10-year span was evident, which supports the increased total available market that typically precedes acceleration in the rate of adopting new technologies.

Indicator 2: Consumerization

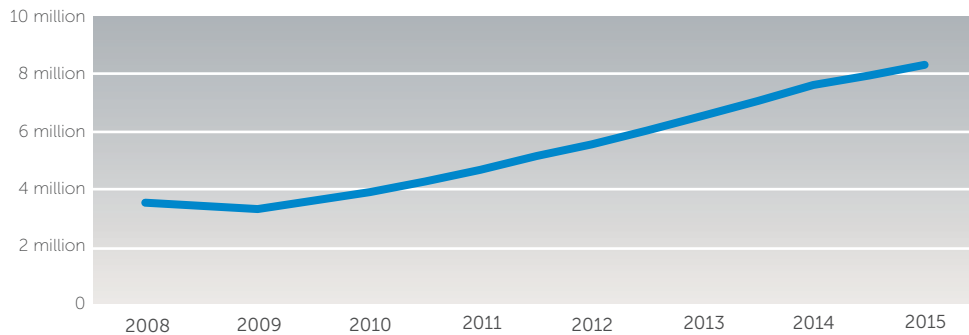
From widespread use of the Internet in the 1990s to the growing use of consumer devices in the workplace, the needs of end users have influenced corporate IT decisions. Today, the proliferation of increasingly sophisticated smartphones, tablets, and other mobile devices is motivating IT departments to further redefine policies that support employee-owned technology. And desktop virtualization is expected to both drive and derive benefit from this trend. It provides a secure separation of personal and organizational workloads while enabling the coexistence of personal and work environments for the chosen devices of end users.

² Source: "Consumerization of IT: An IDC survey," by IDC, Doc #227925, April 2011.

On average, nearly 50 percent of organizations already support or plan to support employee-owned devices (see Figure 3). This level of commitment is expected to increase employee satisfaction and enterprise productivity but can also increase the complexity and resources of already constrained IT departments, especially given the diversity of device operating systems that in many cases are not supported.

To balance the sometimes conflicting goals of end users with the security, management, and resource constraints of organizations, IT departments are opting to deploy VDI and cloud-based approaches as the driving technologies to enable the productivity benefits of consumerization.² These virtualization approaches require deployments that include hardware, software, and services with predictable cost and performance to help achieve successful deployment. Dell DVS offers an approach that is aligned with the needs of these emerging demands.





Source: "Market analysis: Worldwide enterprise thin client 2011–2015 forecast and analysis," by IDC, Doc #228252, May 2011.

Figure 4. Global thin client shipments, increasing from 3.8 million units in 2010 to an estimated 8.3 million units in 2015

Indicator 3: Acceleration of thin-client deployment

An argument can be made that there is a correlation between the growth of thin client deployments and the growth of interest in hosted desktop virtualization such as VDI. Traditionally, thin clients have been associated with server-based computing—such as blade PCs—but if the growth of server-based computing remains flat, then VDI can be a primary driver of the increase in thin clients.

Thin-client technology is not the only client option for VDI; in fact, most VDI deployments today use repurposed legacy PCs in initial implementations. The point in these development cycles at which these repurposed PCs approach replacement offers a good opportunity for growth in thin clients, thereby reinforcing the close correlation of growth in thin-client and VDI approaches.

³Source: "Consumerization of IT: An IDC survey," by IDC, Doc #227925, April 2011.

Accelerating shipments (see Figure 4) and deployment of thin-client devices—demonstrating a five-year compound annual growth rate (CAGR) of 16.7 percent—supports the increase in the current adoption rate of VDI as well as its expected adoption. Dell offers a portfolio of thin-client devices as part of its end-to-end desktop virtualization portfolio.

Indicator 4: Wide adoption of server virtualization and cloud services

Organizations experiencing positive results deploying x86 processor platforms are increasingly open to considering on-premises VDI infrastructure projects.

IT departments tend to be increasingly tolerant of cloud services from organizations such as Microsoft, Google, and Amazon. According to IDC, 93.6 percent of respondents surveyed are "proactively moving forward or still evaluating the idea." Only 6.4 percent of the respondents reported they "have no plan to utilize cloud in any fashion."³



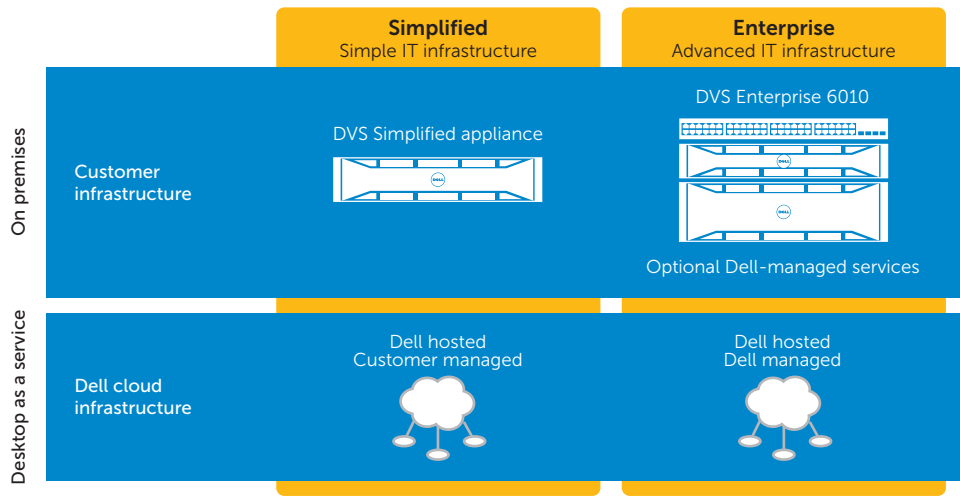


Figure 5. Dell desktop virtualization delivery systems

Accelerated adoption of VDI and the openness of IT departments to allow access to applications through cloud services create a fertile environment that stimulates interest in virtual desktop technologies.

The Dell approach to Desktop Virtualization Solutions

Dell has considerable experience and expertise developing desktop virtualization solutions by investing resources ahead of the industry adoption curve. The result is a well-implemented, mature portfolio that leverages this expertise and investment in data center hardware, software, endpoints, and services. Dell helps reduce complexity and improve predictability of each deployment by creating end-to-end solutions that scale according to the needs and expansion of each customer and help maximize productivity for IT departments and end users.

No single desktop virtualization approach can serve the needs of all organizations in the same way. Based on global quantitative research and use-case expertise acquired with customer engagements, the Dell DVS group

identified common patterns in two customer segments. Dell targets organizations having limited IT complexity with the Simplified line of solutions, and it targets organizations with increasingly complex IT departments with the Enterprise line of solutions (see Figure 5).

The Simplified line of solutions includes easy-to-install and operate plug-and-play appliances for organizations that prefer to manage their own desktops, or a desktop-as-a-service offering for organizations that prefer to outsource hosting of their virtualized desktops to Dell data centers. The Enterprise line of solutions is designed to scale to high numbers of users (5,000 or more) with enhanced levels of redundancy, availability, management, and mobility. On-premises Enterprise solutions include a preconfigured and pretested infrastructure comprising server, networking, and storage using either VMware® or Citrix® software (brokers) and Dell Services to design, implement, and support the overall infrastructure. DVS leverages Dell investments in data centers worldwide to offer desktop-as-a-service approaches for both the Simplified and Enterprise delivery systems.



Accelerated desktop virtualization adoption

To construct robust end-to-end solutions, Dell has identified the following nine pillars of expertise. Going forward, Dell is developing solutions or partnering with leading-edge organizations to provide approaches that incorporate these elements to enhance the end-user experience and help simplify management of virtual desktops:

- Delivery systems
- Brokers and hypervisors
- End-user experience management
- End-user and system monitoring
- Endpoint devices
- VDI management and storage optimization
- Data center hardware
- Security
- Services

The DVS portfolio includes vertical segment approaches found mainly in the education and health care industries. This portfolio, along with a dedicated DVS organization, is in process and is expected to launch globally. The response from customers is reflected in a substantial adoption rate during a recent six-month period.

Summary

Converging indicators reveal the uptake in demand for desktop virtualization. This demand is being fueled by

consumers, innovations in virtualization technology, and adoption of adjacent technologies to help improve end-user and IT productivity. Many organizations are looking for end-to-end approaches that help reduce deployment complexity and ensure predictable outcomes are delivered through a diverse portfolio that offers the flexibility to adjust to their specific requirements.

In anticipation of this shift in demand, and leveraging its expertise in servers, storage, networking, clients, software, and services, Dell created an organization dedicated to streamlining desktop virtualization deployments by delivering a portfolio of end-to-end approaches. Organizations having limited IT complexity can deploy appliances provided in the Simplified delivery system; organizations with increasing IT complexity can utilize robust desktop-as-a-service platforms provided in the Enterprise delivery system.

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For more information

To learn more about desktop virtual solutions (DVS) at Dell, including access to a calculator for determining the economic impact of desktop virtualization, visit dell.com/virtualdesktops.

