

Endpoint Virtualization for Everyone: Solving the Desktop Lifecycle Management Challenge

An ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) White Paper
Prepared for Citrix and Dell

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Executive Summary

Maintaining physical desktops and applications typically requires time-consuming desk-side visits, reduces user productivity, delays support response, allows configuration drift, exposes data, reduces mobility, and increases costs. Automation software helps, but really just masks the fundamental problems of traditional physical desktop management.

Endpoint virtualization – including server-hosted or local desktop virtualization, application virtualization, and streaming technologies – solves many of these problems by separating the user environment from the physical hardware. The virtual desktop or application environment is maintained or even hosted centrally, and delivered to the end user across the network, eliminating many of the problems of maintaining distributed desktop systems.

Dell and Citrix together provide an excellent end-to-end solution for endpoint virtualization.

Dell and Citrix together provide an excellent end-to-end solution for endpoint virtualization, called Dell Virtual Remote Desktop (VRD). Combining Dell's intelligent OptiPlex FX160 flexible computing client, OptiPlex 760 and 906 FLX systems and support services with Citrix's advanced XenDesktop and XenApp desktop and application virtualization solutions, Dell VRD provides a desktop replacement that is better than a standard desktop in

many ways by centralizing management, making IT resources more efficient, improving data security and control, reducing support times, improving staff mobility, facilitating OS migration (e.g. to Windows 7), and improving the end-user experience.

This ENTERPRISE MANAGEMENT ASSOCIATES[®] (EMA[™]) white paper provides analysis and advice on how endpoint virtualization can deliver substantial benefits, simplifying lifecycle management, and driving ongoing cost and productivity benefits.

The Problems with Typical Endpoint Management

EMA has identified many essential maintenance activities in the typical desktop and application lifecycle. These include discovery, asset (hardware, software) recording, hardware and software provisioning, software updates and patch distribution, configuration management and control, and problem remediation.

In a typical lifecycle management paradigm each of these activities is essentially a one-to-one relationship – IT administrators must attend individually to each activity, with a specific effort for each physical desktop, laptop, notebook, or other endpoint client machine.

As a result, traditional endpoint clients are often costly to procure, deploy, provision, support, and secure. For example:

- The business need for complex installations with multiple software packages and hardware options ends up creating a level of diversity that requires a new specialist for every new deployment, increasing staffing and training costs, and delaying resolution times for problems
- The need for IT administrators to provide local support with desk-side visits to repair hardware and software increases costs not just for IT (including travel time and costs), but also for users (as they must wait for the desk-side visit to solve their problems, often unable to work)

- With complex local software deployments that expand over time, performance, availability, and failure rates typically tend to increase over time, limiting end user productivity and further draining IT support resources
- Beyond maintenance costs, edge desktops with local applications and content can expose data and systems to security and compliance risks, putting corporations at risk of fines, loss of reputation, downtime, and legal costs
- Localized deployment reduces effective mobility, as users are ‘chained’ to a specific physical system and/or location, so the business cannot use human resources efficiently in multiple roles or locations
- The reality of business means that a single standard is not possible; rather, multiple distinct configurations are required (e.g. to support different departments or user roles), resulting in duplicated efforts to maintain each system type separately
- Large-scale upgrades – such as the impending upgrade from Windows XP or Vista to Windows 7 – are particularly difficult, as they require massive, distributed, and complicated system, application, and configuration changes, draining administrator effort and damaging user productivity

Automation software (e.g. for imaging, software upgrades, patches, etc) certainly addresses some key productivity issues to an extent, but in a sense only masks the problem. Endpoint lifecycle management remains a set of multiple one-to-one activities, even though those multiple activities happen without human intervention. Automation, therefore, does not eliminate the fundamental problems associated with the traditional physical desktop.

Solving Lifecycle Management Problems with Endpoint Virtualization

An emerging (and rapidly maturing) solution to this problem is endpoint virtualization – a range of virtualization technologies aimed at abstracting the end user experience, including the logical desktop, application, and/or workspace environments, from the physical systems they rely on to provide that experience (typically a physical desktop or laptop PC). There are several implementations of endpoint virtualization, including server-hosted (or ‘remote’) desktop virtualization, client-hosted (or ‘local’) desktop virtualization, local and remote application virtualization, desktop or application streaming, isolation, and client-side hypervisors. In many of these models, the virtual desktop or application is hosted on a remote server, typically inside the data center, and delivered across the network to a PC, a thin client, or a hybrid device.

Endpoint virtualization fundamentally changes the management paradigm, effectively swapping a one-to-one management paradigm for a one-to-many (or few-to-many) paradigm, resulting in:

- Easier deployment, update, and maintenance – by abstracting the OS, applications, customizations, and data from the physical hardware, IT can maintain fewer base images, and customize them dynamically, reducing the complexity of desktop management
- More efficient OS upgrades - OS upgrades become as easy as upgrading a single, global template, allowing a single administrator to deliver a new OS like Windows 7 to thousands of users literally overnight, with minimal management effort or user disruption

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management paradigm.**

- Faster, cheaper support – centralized maintenance of virtual desktops and applications, and the ability to instantly swap out a failed image means the end of the desk-side visit, faster resolution for problems, and lower support costs
- Legacy OS and application support – end users can quickly swap between Windows XP, Vista, or even Windows NT, all on the same endpoint device, without installation hassles or downtime
- Better security and compliance – without a local installation, no corporate data ever needs to leave the data center, ensuring centralized audit and control to maintain data security and regulatory compliance
- Balance of control and usability – separating personal and corporate desktops also permits end users to customize their personal applications (e.g. iTunes, games, IM, etc.) without interfering with corporate applications, data, or settings
- Improved efficiency & productivity – users can access more powerful environments or new applications at the click of a mouse, to take advantage of faster processing and new business solutions at the drop of a hat
- Better availability, DR, BCP – virtual desktops can be migrated in seconds to bypass failing endpoint devices (or even entire locations), maintaining business continuity in the case of minor mechanical problems or even major disasters
- Improved workforce flexibility and mobility – workers can access their personal desktop and applications from any department or location, even on the road (without carrying a laptop) or from PDAs and wireless devices, and if they change roles can access a new standard virtual desktop in minutes

Endpoint Virtualization for Windows 7 Migration

Windows 7 is going to be a major upgrade for most organizations, and it will be happening sooner rather than later. While some organizations will continue to hold back, many have pent up demand from running Windows XP (or older) systems, or are keen to move off Windows Vista following some questionable user (and administrator) experiences.

Desktop virtualization provides substantial advantages over traditional upgrades using imaging or provisioning. Just some of the benefits of endpoint virtualization for a Windows 7 migration include:

- Easy deployment – a granular desktop virtualization solution can build unique user environments ‘on the fly’, based on a single, common template, so building out multiple Windows 7 user environments is greatly simplified
- Fast deployment – the ability to deliver a brand new desktop to multiple users from a single template means that end users can get Windows 7 at an incredible rate, with potentially thousands of users being upgraded literally overnight
- Dual desktop environments – server-hosted desktops can be delivered to end users on top of, or alongside, existing desktop installations, allowing users to run Windows 7 in an XP or Vista desktop, or vice versa, so they can revert to their old environment if they have problems, reducing the potential for user rejection or productivity problems

- Legacy application support – desktop and application virtualization can be used to run older applications on Windows 7 with limited or no regression testing, and can even allow fully unsupported legacy applications (such as Internet Explorer 6) to run on a Windows 7 desktop
- No travel or downtime – centralized delivery of server-based virtual desktops essentially eliminates travel costs and downtime for administrators, as no desk-side visits are required, and eliminates downtime for end users as upgrades can be performed without lengthy download and install processes
- No desktop hardware upgrade – with server-based desktop virtualization, there is no need to upgrade desktop hardware to deploy Windows 7, because all the processing power is delivered by server-based resources
- Phased upgrade – with endpoint virtualization, it is relatively easy to phase migration, by first upgrading the OS to Windows 7 running legacy applications, then upgrading non-critical applications, then upgrading critical applications, to reduce the productivity disruption of a ‘big bang’, or avoid additional application license costs

Dell Virtual Remote Desktop (VRD) brings together Citrix and Dell ... with a synergy and combined value that is more than the sum of its parts.

Endpoint Virtualization with Citrix and Dell

Dell Virtual Remote Desktop (VRD) brings together Citrix and Dell – two mature companies with a strong relationship and a long history of innovation – to deliver a unique desktop and application virtualization solution, with a synergy and combined value that is more than the sum of its parts.

Dell Hardware and Services

The solution starts with the Dell OptiPlex FX160 flexible computing node, an intelligent multi-purpose client device that is an excellent desktop replacement. With power consumption closer to that of a thin client than a full PC, it will reduce desktop power consumption; an initiative that EMA research shows provides the highest average cost saving of any green IT initiative.

With onboard flash storage options, the OptiPlex FX160 functions as a client appliance accessing remote desktops from Dell’s Virtual Remote Desktop, or Citrix XenDesktop or other server-based virtualization solutions. With Dell’s EasyConnect diskless option, The FX160 FLX can be provisioned with a complete operating environment using Citrix Provisioning Server for Desktops, available as part of another combined Dell-Citrix solution called Dell On-Demand Desktop Streaming (ODDS). This is a uniquely flexible hardware combination that is perfectly suited to provide the OS flexibility provisioning abilities of Citrix XenDesktop.

Dell also contributes networked, virtualized storage with the Dell EqualLogic PS Series iSCSI SAN arrays. XenDesktop has specific features to integrate seamlessly with PS Series SANs, making deployment with XenDesktop simple, fast, and flexible.

Dell also provides essential support services – the single point of contact for hardware and software – and a refreshingly modular offering of implementation services such as an introductory workshop, identification of user requirements, a comprehensive environmental assessment, and design and deployment of a complete desktop virtualization solution.

Citrix Software Solutions

Citrix is focused on an over-arching message of simplifying desktop & application delivery in all its forms. It therefore brings a range of technologies to the virtual desktop environment – not just a hypervisor and a connection broker – including:

- Exceptionally flexible provisioning of virtual desktops and applications (called Citrix FlexCast), including dedicated blade PCs, shared systems, or common desktops; remote hosted or streamed applications; or even a centrally managed OS that is streamed and executed on the local machine
- The high-speed ICA communications protocol, coupled with dedicated WAN acceleration, data compression, and intelligent hardware allocation technologies, for faster processing and presentation of audio, graphics, and other complex user streams
- Innovative High-Definition eXperience (HDX) technology, that delivers high-resolution graphics, voice, flash, multimedia, and 3D applications over LAN, WAN, or Internet connections, using the best combination of server and desktop capabilities
- Support for a range of important end-user peripherals, including local printers, USB devices, soft-phones and physical VOIP handsets, bi-directional audio devices, etc.
- Broad end user device support, including support for Citrix Receiver and Citrix Dazzle on Windows PCs, Apple Macs, a wide variety of thin clients, and smartphones including Apple iPhone and iPod Touch
- Intelligent role-based allocation of virtual desktops, fully integrated with traditional user management tools like Active Directory
- Independent server-side support for virtual desktops on multiple server virtualization platforms (including Citrix XenServer, Microsoft Hyper-V, and VMware ESX/vSphere), leveraging existing server deployments, skills, resources, training, etc.

XenDesktop also includes Citrix XenApp, the perfect complement to XenDesktop.. XenDesktop delivers a complete operating environment, with the OS and core applications (word processor, PDF reader, e-mail, etc.) for all users, all from a single ‘golden image’, while XenApp can add virtual applications for one-off or permanent use for individual users.

Citrix also continues to innovate. It has formally announced XenClient, a client-side hypervisor that allows multiple independent operating environments to run side-by-side on the same endpoint, further increasing the options for flexible desktop and application delivery. It has also released a technology preview of Citrix Dazzle, which promises to provide an iTunes-like experience, allowing any end user to access authorised applications ‘on demand’, further improving user experience and relieving overworked demonstrators from routine provisioning tasks.

More than the Sum of Its Parts

As a result of the unique synergy, this is more than just a desktop replacement – it is actually better than a standard desktop in many ways:

- Desktops are more flexible, able to move from remote virtual desktop to a local streamed desktop in minutes

This is more than just a desktop replacement – it is actually better than a standard desktop.

- Corporate data can be stored locally, centrally, or both, balancing control and usability, security and accessibility
- Users can enjoy faster logon times, regardless of location, driving even more productivity than normal desktop users
- Users get the best possible performance for each role or location by accessing the best delivery mechanism from any (or all) of six different options
- Users get faster support for problem resolution, system upgrades, application installation, and more, without waiting for desk-side visits
- Power users can transition seamlessly to faster hardware, leveraging server-side resources for improved performance without any local hardware upgrade
- Virtual desktops and applications provide a flexibility and mobility that is impossible with a standard desktop, with universal access to a personalized system in every location, without lugging a laptop

EMA Perspective

Without doubt, endpoint virtualization can deliver substantial benefits, simplifying lifecycle management, and driving ongoing 'hard dollar' cost benefits from distributed hardware cost reduction, reduced support costs, staffing efficiency, and more. And it is certainly beneficial for many, if not all, end users, delivering productivity, uptime, and performance that often surpasses a traditional desktop.

Endpoint virtualization can deliver substantial benefits, simplifying lifecycle management, and driving ongoing 'hard dollar' cost benefits

Endpoint virtualization does not need to be an expensive rip-and-replace project either, and can show positive returns even in smaller, phased deployments. As existing desktops reach their end-of-life, desktop virtualization with flexible computing nodes can reduce hardware replacement costs. Newer devices can use streamed OS or virtual desktops and still deliver substantial benefits without any desktop replacement costs. Departmental deployments can be converted over their lifecycle, while new departments can go virtual immediately to avoid traditional lifecycle headaches altogether. The key is to approach endpoint

virtualization with a long-term strategic plan, but focus in the short term on pragmatic and tactical deployments that address specific lifecycle problems.

Whether in healthcare (for compliance and mobility); call center (for hardware cost reduction); sensitive departments like mobile banking (for data security); agent, channel, or consultant networks (for security and agility); remote access (to support offshore, home-work, or DR/BCP initiatives); or shared environments like schools or training rooms (for rapid, low-cost repurposing), the Virtual Remote Desktop eliminates the most vexing problems created by local, physical desktops. Between them, Citrix and Dell deliver the server, storage, client, software, services, and support components for an excellent end-to-end endpoint virtualization solution.

About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that specializes in going “beyond the surface” to provide deep insight across the full spectrum of IT management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help its clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise IT professionals and IT vendors at www.enterprisemanagement.com or follow [EMA on Twitter](#).

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