desktone

Desktone™ and Desktops as a Service™ (DaaS™)

Transforming the Corporate PC

4/21/08
Jeffrey Fisher
Sr. Director Strategic Development
Desktone, Inc.

Contents

I. Introduction

In an era where the Internet is continually redefining the way we compute, the traditional corporate PC increasingly seems out of place. While still a gateway to many of the applications and services provided by IT, PCs are having trouble keeping up with the high-paced and dynamic nature of today's global business environments. IT departments find PCs harder and more costly to manage than ever before while users, who are demanding greater computing mobility and flexibility, are often frustrated by the limitations of their current desktop systems.

At the same time, emerging trends in cloud and utility computing are reshaping the way in which corporations consume and manage IT. The ability to outsource non-strategic IT assets and purchase them as a service can help lower the cost of IT while allowing corporate technologists to focus more on applications and technologies that provide their organizations with a true competitive edge.

Desktone sees the emergence of cloud and utility computing as an opportunity to transform the corporate PC from a static, distributed device into a virtualized and centralized asset. By leveraging innovations in both machine virtualization and remote computing technologies, Desktone is delivering on its vision of Desktops as a Service or DaaS. Desktone DaaS is not simply about transforming a PC into an internally delivered network service, but rather about enabling the corporate desktop as a truly outsourced subscription service.

II. The Challenge of Physical Corporate PCs

Corporate PCs have become a millstone of modern IT departments. On one hand they are required to deliver an ever-increasing number of critical applications and services to end-users. On the other, they have become increasingly costly and complex to manage and secure, while at the same time further underutilized in terms of their physical capacity.

There are many different views on what's so complex about managing corporate PCs. While there are a number of challenges inherent in managing the software layers of these devices (primarily the OS, applications and data), it is the physical aspects of PCs that create many headaches for IT. The following IT challenges are associated with the management of physical PCs:

- **IMAC (Install, Move, Add and Change)** – Although it is possible to automate portions of PC management, there are many elements of a PCs lifecycle that have to be handled in person. Prime examples include provisioning a new PC, moving the location of a PC or upgrading its physical resources (i.e. CPU, memory or disk)
- **Security** – Physical PCs are inherently insecure because of their portable nature. Laptops can be easily lost or stolen as can desktops, especially those in less secure branch facilities.
- **Underutilized** – While most research pegs average x86 server utilization at around 10-15%, estimates put the average utilization of corporate PCs at less than 5%.
- **Rapidly depreciating assets** – According to a study by the Federal Reserve Board of San Francisco, PCs depreciate in value roughly 50% per year.

Users are also challenged and limited by the physical nature of their corporate PCs. They have come to demand much greater flexibility from IT and, thanks to the advances in communications services, expect to be able to work at anytime from anywhere. However, due to the physical makeup of their corporate PCs, end-users still struggle with the following limitations:

- **Mobility** – Many of users' application and data assets are tethered to their physical machine, making them difficult to access from other locations either inside or outside the office.
- **Availability** – The physical and distributed nature of today's corporate PCs make them hard to troubleshoot in the event of a system failure. In many cases, getting a user back online requires a desk side visit.
- **Managing multiple devices** – Users are amassing an increasing number of devices (i.e. multiple PCs, Smartphone, etc.) and having a separate physical machine for work is becoming more and more burdensome.

- **Separating personal and business computing** – Users are increasingly using computing for their personal needs and, in many cases, are forced to physically switch between different environments throughout the workday to perform different computing tasks.

Virtual Desktop Infrastructure (VDI) – The Answer?

Many organizations have experienced firsthand the transformational power and benefits of server virtualization. Those same organizations and many others are expecting to be able to realize similar benefits by moving to a virtual desktop infrastructure (VDI) model, which Desktone defines as client computing architectures that leverage server-hosted virtual machines.

The Promise of VDI

VDI is seen as a way to change the notion of a physical PC into a virtual one and, thereby, solve many of the aforementioned challenges associated with today's physical desktops. Some of the key benefits of VDI are:

- **Dramatically reduced desktop deployment complexity** – With VDI, provisioning new desktops is about deploying virtual machines as opposed to physical desktops. For example, an IT admin can copy an existing golden VM image, assign it to a user and the process is done. This is in comparison to having to target a physical machine with a traditional OS image and all the complexity that entails (i.e., device drivers, location of the machine, etc.)
- **Improved management, security and compliance** – Because all VDI desktops are centralized into well-connected data centers, their software layers (OS, applications and data) become easier to manage. In addition, because users access their virtual desktops via PC remoting technology, it is possible for IT to finely control the movement of data either into or out of these systems. Finally, having all the desktops in a centralized location makes implementing and managing compliance systems and policies simpler.
- **Customizable end-user experiences** – Unlike shared services server-based computing solutions which deliver an alternate and locked down client experience, VDI enables users to work in an authentic client OS environment and to personalize that environment to their liking.
- **"Instant-on" desktops** – With VDI architectures, it is possible to offer a "instant-on" desktop experience by enabling users to reconnect to their server-hosted virtual machines without the need to wait for the system to boot or to wait for the traditional logon process to complete. When the user reconnects to their system, it's in the same state that they left it the last time they used it (down to the last letter they may have been typing).

The Challenges with VDI

Despite the many promise of VDI, the solution has some significant challenges, most of which ironically are associated with the physical aspects of deployment.

- **Solution stack complexity** – In-house VDI deployments are by their nature multi-sourced, involving component technologies that are provided by different vendors. This makes it very difficult to put together a reliable end-to-end solution.
- **Cost structures** – Today's enterprise data center and virtual infrastructures are optimized for hosting servers, not for desktops. Therefore, enterprises that implement VDI on their existing virtual infrastructure quickly learn that it will be almost impossible for them to meet their TCO objectives.
- **Operational complexity** – Because VDI solutions span many organizational silos, no single team is responsible for managing and troubleshooting. This can create disputes between internal IT departments that can leave end-users worried about the overall quality of service delivery.

Therefore, while many organizations believe in the promise of VDI, those that have started implementation realize that an innovative approach is needed if they are going be able to reach the scale and TCO that they desire.

III. Desktops as a Service (DaaS) – Transforming the Corporate PC

Clearly, the transformation of the corporate PC from a physical device to a virtual machine provides tremendous benefit to both IT and end-users. However, as we've seen, deploying VDI internally can be both complicated and costly. While it is the combination of the hypervisor and remoting technologies which fundamentally make it possible to transform a PC into a network-delivered service, simply enabling PCs as an internally provisioned network service is not enough. In order for organizations to truly harness the power of VDI, they must be able to outsource the hosting of their virtual desktops to a service provider. Only in this way will they be able to achieve both their operational and economic goals.

In order for organizations to truly harvest the power of VDI, they must be able to outsource the hosting of their virtual desktops to a service provider. Only in this way will they be able to achieve both their operational and economic goals.

The Fundamentals of DaaS

Anytime in history when there was a general purpose technology (GPT) that could be delivered via a network, the formation of centrally generated utility services ultimately became the dominant way those technologies were offered and consumed. Electricity is probably the best-known historical example and is a comparison made by noted author Nicholas Carr in a number of his published works, including "The End of Corporate Computing" and The Big Switch. IT is also recognized as a GPT and, as Carr notes, we are currently living through the shift of computing from being 100% internally generated to being delivered more and more as an outsourced utility service.

In the past decade, we have already seen specific examples within the IT sector where GPTs have transformed from something IT originally managed internally to something that it outsourced. Web hosting is probably the earliest instance. However, many mission-critical communications services, such as email and telephony, have also already been outsourced by a large number of organizations.

The PC represents a general purpose technology whose time to be delivered as an outsourced utility service has finally arrived. At the physical layer, the majority of corporate PCs are almost identical. Their "personality" or differentiation comes from a combination of their specific software configuration and user-level customization. It is exactly these software layers that can be preserved in the move from physical to virtual desktops by leveraging machine virtualization (hypervisor) technology. Therefore, as we have seen with historical examples such as electricity, the goal is to move the generation of capacity (in this case, client

The PC represents a general purpose technology whose time to be delivered as an outsourced utility service has finally arrived.

computing cycles) from being internally produced to being consumed as an outsourced service, and doing so without disrupting the tool ultimately being delivered to the employee (in this case, traditional desktop computing environments). Desktone's DaaS model allows just this – for a service provider to own and operate the physical infrastructure that powers virtual desktops while enterprises retain control over the provisioning, management and licensing of the virtual desktops they use.

Interestingly enough, most utility computing pundits have predicted that server-side solutions would be the most logical starting point for outsourced computing. However, the challenge with this approach is the relationship most server workloads have with their data. In many cases, the data must sit "close" to workload, making the separation of the two difficult if not impossible. In contrast, desktop environments have been designed to work with applications and data that are remotely hosted in a data center, and this has become the standard configuration in most enterprises. Desktone's DaaS model takes advantage of this design principle and transforms a service provider data center into a well-connected and highly secure branch office of the enterprise.

This is in contrast to Software as a Service (SaaS) models, which provide cloud-hosted delivery at the expense of the existing client application model. While SaaS makes sense and has been proven for a number of client-facing applications, the wholesale replacement of rich Windows applications for enterprises is just not feasible. Therefore, what Desktone seeks to do is marry the benefits of a cloud-hosted service with a traditional rich Windows client experience.

What Desktone seeks to do is marry the benefits of a cloud-hosted service with a traditional rich Windows client experience.

The Benefits of DaaS

DaaS provides a number of benefits that go well beyond those associated with internally deployed VDI solutions.

Benefits for Enterprises

- **Dramatically reduced desktop TCO** – Because they outsource the physical infrastructure powering their virtual desktops, enterprises are immediately able to achieve a positive ROI. In addition, they are able to convert CAPEX (in the form of the multi-sourced components of an internal VDI deployment) into OPEX, where they pay only for the virtual desktops that they use. All of this translates into reduced desktop TCO that's achieved at the outset of a VDI deployment as opposed to being a goal that most enterprises hope to achieve in 18 – 24 months when deploying VDI internally.
- **Improved manageability & flexibility** – With DaaS, enterprises are able to quickly deploy and scale virtual desktop environments. Again, this is because the physical infrastructure is already available from the service provider. This capability enables

IT to deliver on many challenging types of projects (both short- and long-term), such as scaling up desktop environments for seasonal work or quickly deploying desktops for offices in new geographic markets.

- **Reduced environmental impact** – DaaS allows enterprises to minimize their carbon footprint on both the back- and front-end of their VDI environment. On the back-end, because the physical infrastructure is hosted by a service provider, the enterprise data center is relieved of the additional power and cooling requirements normally associated with VDI. On the front-end, enterprises can either extend the life of their existing PCs by repurposing them as VDI-only clients or can transition to true thin clients and greatly reduce power consumption on end-user desks.
- **Improved end-user productivity** – Because DaaS is delivered by a service provider with a Service Level Agreement (SLA), users can expect better availability of their desktops than can be delivered with physical PCs, which often require a desk side visit when things go wrong. In addition, because Desktone DaaS provides global availability across a service provider's entire network, users can gain access to their virtual desktop from just about anywhere.

Benefits for Service Providers

- **Provide an offering that enterprises want but aren't equipped to implement** – The interest in VDI solutions across many different industries is becoming increasingly evident. However, also becoming clear is the challenge of deploying VDI internally. Service providers have the unique opportunity to build a VDI infrastructure free from the constraints of the enterprise data center and also to leverage economies of scale to enable DaaS as a low-cost service for many different vertical markets.
- **Leverage existing assets** – Service providers have the core assets (in the form of hosting facilities and data networks) that are critical for enabling DaaS. They also have extensive experience in offering related hosting services and, therefore, have the backend management and billing systems necessary to provide desktops as a monthly subscription service.
- **Capture new service revenue** – Service providers currently use many of their hosting assets to power commodity service offerings that are under increasing competitive pressure. DaaS allows service providers to use the same infrastructure to offer a new and unique offering that is highly differentiated from anything else in the marketplace.
- **Flexible service offerings** – DaaS can be delivered either as a hosted offering in a service provider's data center or a managed service offering on a customer's premise. In either case, the service provider owns and operates the physical virtual desktop infrastructure and the enterprise consumes the offering as a service. In addition, service providers can layer value-added services on top of the base DaaS offering. These could be in the form of network-based offerings, such as remote

access to the virtual desktops, or managed desktop offerings such as OS and application deployment, level 1 end-user support, etc.

Outsourcing is a Key Enabler

The outsourcing of physical infrastructure that powers virtual desktops allows the unique opportunity to design a purpose-built architecture from the ground up.

The outsourcing of physical infrastructure that powers virtual desktops allows the unique opportunity to design a purpose-built architecture from the ground up. Enterprise IT organizations are constrained by internal policies and procedures and it's always been hard for them to shift their operational models to take advantage of new technology and computing trends. In the case of the VDI, they are taking the logical approach by trying to run early VDI deployments on their existing virtual infrastructure. While this works for relatively small deployments, enterprises are quickly discovering the economic and technological barriers that present themselves when these environments are scaled. This is due to the fact that all current virtual infrastructure is designed to support server workloads and are built with components that are priced accordingly. For instance, simply moving hard drives from the desktop to the data center can increase storage costs more than 100 times. In addition, because server workloads support many simultaneous users, they require more advanced functionality when it comes to capabilities like high availability. Clearly, the economics and functionality that are appropriate for hosted virtual server workloads are not the same for hosted virtual desktops.

Shifting the ownership of the physical VDI infrastructure from the enterprise to a service provider allows a purpose-built and optimized architecture to be designed. The system has only one goal – to support virtual desktops at the highest service level with the lowest cost. This affects every aspect of the hosting environment, from the hardware chosen (both servers and storage) to the virtualization software (hypervisor) used and how all those components are implemented and tuned.

Why Desktone and the Virtual-D Platform™

In order for organizations to realize the promise of DaaS, service providers must be able to deliver desktops as a cost-effective, reliable service. On the surface, it might seem like using the VDI solutions available to enterprises would work fine for service providers. After all, they provide the range of core technologies for enabling desktops to be transformed into a network service. However, after closer examination, it becomes clear that enterprise VDI solutions are not sufficient for service providers to build a true DaaS offering. The primary reasons include service providers' need for:

- **Carrier-class scale and reliability** – Service providers will be offering DaaS to large numbers of enterprises customers and, therefore, need a platform that supports carrier-class scalability measured in the 100,000s or even millions of users (as opposed to the enterprise scale which is measured in 1,000s). In addition, these

providers will be delivering DaaS with SLAs similar to other hosted offerings they provide. Therefore, the platform powering their DaaS environment must offer unprecedented scalability and reliability.

- **Global distribution** – Service providers have large network footprints and data centers that span national (and sometimes international) geographies. Therefore, they need a VDI platform that was designed to accommodate numerous points of presence (POPs) and which allows them to optimize their physical virtual desktop infrastructure across these POPs and their network.
- **Multi-tenancy** – In order to achieve appropriate economies of scale that will allow service providers to offer low-cost DaaS to enterprises and realize a profit at the same time, the providers must achieve high-levels of asset utilization. This is only possible with a platform that supports multi-tenancy. The multi-tenancy capabilities of the platform must be flexible enough to support customers that require varied levels of isolation.
- **Optimized cost of operation and consumption** – A system that operates at carrier-class scale must leverage a high level of automation (vs. administration). In addition, it must be agnostic when it comes to both hypervisors and remote desktop protocols. Only in this way can service providers have the flexibility to migrate to the commercial software components that offer the best price-performance.

A close look at the successful web and email hosting providers reveals the need for a purpose-built software platform for enabling and managing any hosted offering at scale. While these hosting companies provide common enterprise web and email platforms (like IIS and Exchange), they do not use traditional enterprise technologies as the basis of their own service delivery and management systems. Normally, these providers have been forced to develop their own in-house systems. However, due to the complexity of deploying and scaling VDI, Desktone believes that service providers would prefer to buy vs. build when it comes to implementing a platform for offering virtual desktops.

A close look at the successful web and email hosting providers reveals the need for a purpose-built software platform for enabling and managing any hosted offering at scale.

Desktone's Virtual-D Platform™ is the industry's first solution designed specifically to enable service providers to offer virtual desktops as an outsourced subscription service. It was architected and designed from the ground to meet the specific needs of service providers and to enable them to deliver virtual desktops as a cost-effective and reliable service. The platform allows enterprises to realize the promise and benefits of VDI without the cost and risk associated with building an internal infrastructure to host their virtual desktops. At the same time, it enables service providers to help enterprises realize their VDI TCO goals and, in doing so, to build a new and highly differentiated service offering.

IV. Conclusion

The key takeaways from this paper are as follows:

- Physical corporate PCs are having difficulty keeping up in today's dynamic business and IT environments
- VDI promises to make PCs more cost effective, manageable and secure by transforming them into internally delivered network services
- Enterprises are struggling with their internal VDI deployments due to solution complexity and cost. as well as internal IT organizational challenges
- Desktone's vision of desktops as a service (DaaS) allows enterprises to consume VDI as an outsourced subscription service delivered by service providers
- Desktone DaaS allows enterprises to realize the benefits of VDI without the cost and risk associated with deploying their own internal solution
- Desktone DaaS allows service providers to build a new and highly differentiated service offering that meets the growing need of enterprises
- The Desktone Virtual-D Platform™ is the only solution that enables DaaS or virtual desktops that are delivered as a truly outsourced subscription service

For more information about Desktone, DaaS and the Virtual-D Platform, please visit us online at www.desktone.com and www.desktopsasaservice.com.