Virtual Desktop Infrastructure – Planning Overview

Contents

What is Virtual Desktop Infrastructure?

Virtual Desktop Infrastructure or VDI is the name given to a collection of technologies and processes that dramatically extend the concept of a remote desktop. The point of VDI is to address the spiraling costs of managing large numbers of physical desktops across an enterprise, without compromising the service users of those desktops enjoy.

VDI enables a user's desktop to run on central servers, with just the building of the screen image left to the machine sitting in front of the user. All profile settings, installed applications and patches etc execute, and are managed, in a central location.

The concept of desktop instances running on a central server is nothing new; companies such as Citrix and Microsoft have enabled remote access to desktops for over 10 years. Yet these early implementations have not been universally adopted – some of the reasons are as follows:

- Poor performance – since most mouse movements, clicks and keystrokes require a server roundtrip, network contention and server delays can have an undesirable impact on the interactive experience of users who are used to the instant response of locally running applications.

- Low-consolidation ratios – traditional remote desktop implementations that support multiple-users within a single operating system instance are unable to support particularly high-levels of concurrency. Consequently, hardware cost-benefits are often eroded as multiple high-specification servers are needed to support modest consolidation targets.

- Increased user mobility – access to remote desktops outside the firewall requires complex VPN systems to be implemented and can be further impacted by poor network performance.

- Lack of support for rich media experiences – early implementations of remote desktops have negligible support for media streaming and highly interactive environments such as Flash and Java.

- Application incompatibility – having multiple users, with varying application needs coexisting within the same operating systems instance can lead to application or profile incompatibilities; this often leads to compromises in user flexibility and customization.

- Reliability – again the shared nature of the environment can lead to reliability issues. If one application fails catastrophically, it is quite possible that the operating system will crash and all users sharing that OS instance for their remote desktops would be disabled.

The advent of ubiquitous broadband connectivity, hardware virtualization and domain specific security and systems management for VDI has set the stage for this promising idea to fulfill its potential.

Physical Corporate PC's: Where's the Beef?

Corporate PCs have provided tremendous benefit to organizations since they began to supplement mainframe computing over 20 years ago. As their use has grown, and they have achieved a mission-critical position within an organizations technology landscape, vast sums have been invested in their management. Scalable, through its WinINSTALL® product line, offers many tools to make the remote management of traditional desktop and laptop computers a streamlined experience. However, addressing software installation, patch management, OS provision, backup and personality migration is only part of the challenge:

- Rapidly increasing Laptop use, to support remote or traveling employees, has created a security exposure; lost or stolen machines can put corporate data or credentials into the hands of the unscrupulous and most public broadband networks do little to prevent random hacking attempts.

- Physical provisioning of new hardware, either complete machines or memory upgrades often requires an in-person visit from an expensive MIS employee. Such upgrades are usually required to support the peak resource utilization from new applications or the mobility demands of employees that work mostly outside the firewall.

- Despite upgrades to support the peak requirements of certain workloads, studies have shown that most corporate PCs have average utilization rates of less than 5% despite being switched on (in conjunction with the screens) for at least 8 hours a day.

- Upgrade cycles, and their impact on depreciation rates, make corporate PCs a very expensive asset to purchase and maintain.

The Benefits of VDI

Various technologies are used to implement VDI but almost always there will be a hardware virtualization layer on the server, and a desktop remote network protocol such as Microsoft's Remote Desktop Protocol (RDP) or Citrix' Independent Computing Architecture (ICA). In addition, a range of proprietary management technologies are deployed in conjunction with the base components to enable rapid desktop deployment, load balancing and other service and security features, details of which can be found in the many excellent web resources on VDI. VDI can address the shortcomings of the traditional physical desktop corporate PC model, and the early remote desktop attempts identified at the beginning of this document.

- Centralizing the desktop images, applications and files makes data security a more manageable task regardless of whether an employee is accessing the virtual desktop from outside or within the firewall.

- VDI eliminates any physical management issues for desktops. Since all resources (CPU, memory, storage etc) a virtual desktop can exploit are managed centrally, visits by a trained IT employee to increase a machines capacity no longer occur. In addition, the challenges of deploying and patching software over a network are also eliminated.

- VDI enables a true 'golden master' desktop environment to be built. This is in direct contrast to managing physical desktops where device-driver issues often dilute the effectiveness of application-layer golden-master initiatives.

- Operating System isolation enables an authentic personal desktop experience. Users are free to configure their environment to the extent permitted by organizational policies, rather than the artificial constraints often imposed by traditional shared remote desktop systems.

- Continued improvements in bandwidth, optimizations in remote desktop protocols, such as the Citrix 'SpeedScreen' ICA enhancements; the VESA Net2Display initiative; the collaboration between VMWare and Teradici to add the Teradici PC over IP stack into the VMWare VDI stack; and server technologies such as Calista (acquired by Microsoft in early 2008), have brought the user-experience of interacting with virtual desktops much closer to that of physical desktops.

  In addition to the above list of naturally enjoyed benefits of implementing VDI, most organizations look to VDI to dramatically drive down the hard-cash cost of ownership of the desktop estate. ***However hard-cash savings, while potentially substantial, can evaporate rapidly without careful planning***.

Planning for VDI

In order to capture the maximum cash benefit from deploying VDI, while ensuring the user community has an outstanding experience in moving to a virtual infrastructure, an organization must thoroughly understand its software and hardware usage profile ahead of the implementation of VDI.

Microsoft is beginning to address the issues of licensing its software when VDI is the chosen desktop implementation model. It introduced Vista Enterprise Centralized Desktop (VECD) model for OS licensing with two variants depending on whether existing licensed workstations or true physical thin-clients are used to access the VDI. In its document describing how its desktop application products are licensed in a remote desktop environment, http://www.microsoft.com/licensing/resources/volbrief.mspx (it uses the example of Terminal Services), it says that a license is required for each device that uses an application remotely over the network. It does not say a license is required for every device that could 'potentially' use an application. In the case of applications installed on physical machines, a license is required for every device that could 'potentially' access an application because Microsoft charges a license based on the software being installed, regardless of whether it's used. This difference in philosophy of licensing is where one of the biggest opportunities for hard-cash savings can be uncovered. However, it requires the organization to understand the usage profile of software across the estate before renegotiating software licenses to support VDI.

In addition, by focusing on application use and the impact on underlying desktop hardware utilization, it is possible to build up an accurate profile of those desktops that can be most easily migrated to a virtual environment. Furthermore, information on utilization within the existing physical estate ensures that server hardware specifications are capable of supporting the migrated workload, yet are not over specified.
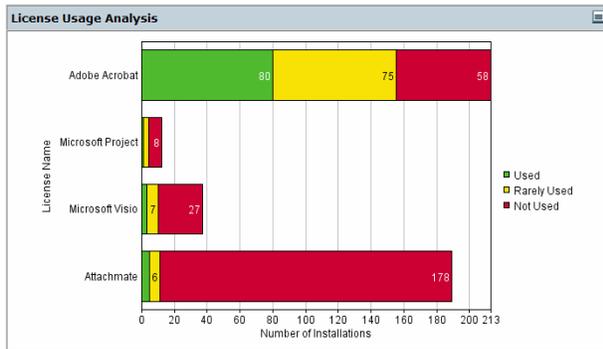
Using Survey from Scalable

Scalable's Survey product has been designed to analyze the intensity and profile of desktop hardware and software usage. Trying to successfully plan for a migration from a physical to virtual desktop infrastructure, without knowing the extent to which the physical environment is being used prior to the migration, is like trying to size an ERP system without knowing how many people will use it.

No other technology provides the depth and focus on desktop hardware and software asset utilization as Survey. The following screens and annotations give a sample of the considerable benefits to the success of your VDI migration that can be secured by implementing Survey.

License Planning

Identifying real application usage in an automated and reliable fashion is the only way to accurately size the

License Usage Analysis

License Name	Purchased	Installed	Used	Used Rarely	Not Used	Percentage Low Usage	Purchase Cost	Cost Impact
Adobe Acrobat	185	213	80	75	58	62.4%	$351.00	$36,855.00
Microsoft Project	50	12	1	3	8	91.7%	$656.28	$32,157.72
Microsoft Visio	18	37	3	7	27	91.9%	$370.34	$5,555.10
Attachmate	25	189	5	6	178	97.4%	$90.00	$1,800.00
Total Cost Impact:								**$76,367.82**

license requirements of the virtual estate. As previously stated, licensing in a VDI environment presents the organization with opportunities to move from a licensing model based on potential usage, to one based on actual usage.

License Usage Analysis

These cost benefits can only be realized if an accurate understanding how the applications are used on the physical desktop is achieved prior to establishing the basis for VDI licensing. Survey has unique facilities to not only identify the exact number of licenses, but also offer guidance on the cost benefit. This information can be used to assist in justifying the move to VDI. The screens shown here give a glimpse of how easy it is to identify the

cost savings from software licensing alone that moving to VDI can realize.

Managing licenses in preparation for migration to VDI is not the end of the story. Since most migrations result in the original physical workstations being used as thin clients to the virtual desktop, there is plenty of scope for physical software deployment to creep back into an organization in the event certain user groups are dissatisfied with their virtual desktop experience.

Application Usage Statistics

| Machine/Application Name	Thin Client Usage	Desktop Usage	Action Recommendation
Microsoft Word for Windows (WINWORD.EXE)			
SSI\DP00203	20:33	12:05	Recommend uninstall from Desktop
SSI\DP00408	12:09	2:05	Recommend uninstall from Desktop
SSI\DD00100	4:45	2:28	Recommend uninstall from Desktop
SSI\DP00107	0:10	0:19	Recommend limiting Thin Client access from this Machine
SSI\DP00201	19:31	0:54	Recommend uninstall from Desktop
SSI\DP0521	8:41	0:13	Recommend uninstall from Desktop
SSI\DD00128	14:31	1:49	Recommend uninstall from Desktop
SSI\EVO00636	1:09	0:38	Recommend uninstall from Desktop
SSI\EVO00635	3:11	0:45	Recommend uninstall from Desktop
SSI\DP00288	3:13	0:00	Uninstall from the Desktop
Microsoft Excel for Windows (EXCEL.EXE)			
SSI\DP00203	1:14	0:29	Recommend uninstall from Desktop
SSI\DP00408	10:59	0:42	Recommend uninstall from Desktop
SSI\DD00100	19:53	4:10	Recommend uninstall from Desktop
SSI\DP00107	6:09	1:03	Recommend uninstall from Desktop
SSI\DP00201	2:32	0:30	Recommend uninstall from Desktop
SSI\DP0521	1:30	0:00	Uninstall from the Desktop
SSI\DD00128	12:46	2:01	Recommend uninstall from Desktop
SSI\EVO00636	3:58	0:47	Recommend uninstall from Desktop
SSI\EVO00635	1:26	0:06	Recommend uninstall from Desktop
SSI\DP00288	0:25	0:00	Uninstall from the Desktop

Failure to be vigilant for such conditions can create unexpected liabilities in the next software license true-up event. Survey has facilities designed to identify such conditions. The report shown here directly identifies those workstations, enabled for virtual desktop exploitation, that maintain and use local copies of applications.

Hardware Sizing

VMWare, in its excellent document entitled "VDI Server Sizing & Scaling" available at the VMWare website location http://www.vmware.com/pdf/vdi_sizing_vi3.pdf, explains in detail the impact of certain desktop workload profiles on server resource consumption. Results were shown from a VMWare test harness and the conclusions reached show a very clear and direct correlation between the nature and type of desktop workload, not simply the number of users, and the amount of resource required to provide a satisfactory experience to the user community. Survey provides the information necessary to complete this analysis in advance of the specification of the VDI hardware.
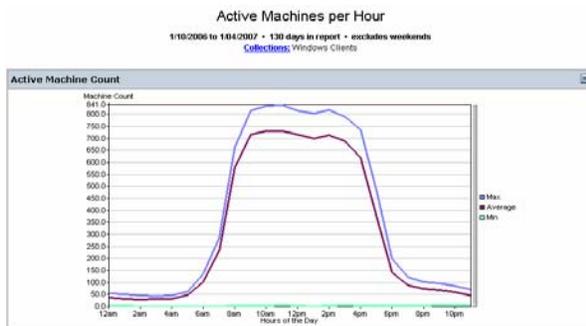
This summary display shows the number of active workstation machines during the course of the day. In this context active means machines that have individuals sitting in front of them typing or using the mouse – both of which impact the resource needs of the network and VDI server environment. It is possible from this display to drill-down to the detail of which machines are active, and the extent to which they are being used. Furthermore, detailed hardware inventory is available that helps understand the resource requirements of each of the heavily used desktop machines; clearly a desktop being used for 60% of the time with 8gb of memory and quad-core chip, will have a higher impact on the virtual environment than a machine with 512mb and a 1.3ghz P4. A similar report can be used to identify those machines that are rarely used further refining the sizing exercise. This data can be used to build VDI profiles, for use within the VDI configuration, which ensure that correct resources are applied to right machines at the right time of day.
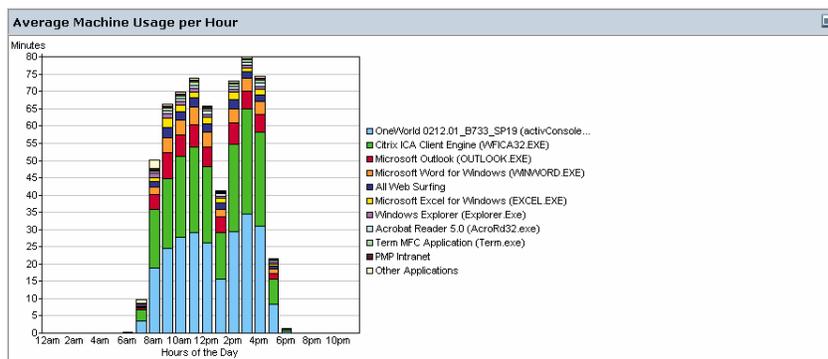
As a further refinement, it is possible to review concurrent application use at various times during the day. With this analysis an organization can determine if there will be resource issues on the virtual server based on concurrent use of resource hungry desktop applications.

A snapshot is not always an ideal tool for planning purposes, so Survey provides extensive trending on an application by application basis. Using these tools it is possible to plan for the impact of new or recently introduced workloads.

Summary

Virtual Desktop Infrastructure can yield significant benefits to organizations in terms of service provision, manageability, security and cost. Yet these benefits can only be fully realized with adequate planning. Much has been written on this subject by many VDI commentators, and all agree that accurately understanding the type and intensity of desktop application use, and its impact on the underlying hardware, in the physical desktop environment prior to specifying the VDI environment is essential. Survey's unique asset utilization technology provides exactly the information necessary to support the VDI planning process.

Visit www.scalable.com/vdi.aspx to learn more and download a free Survey evaluation.