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Purpose

VMware’s Virtual Desktop Infrastructure (VDI) is a relatively new method of implementing centralized computing. This white paper presents a brief overview of VDI and compares it to Server Based Computing (SBC), the current widely recognized method for implementing centralized computing.

This paper highlights several advantages that VDI has over SBC, which may establish as a viable alternative to SBC. However to achieve this, several VDI limitations and shortcomings must be addressed. This white paper explains these limitations and discusses how they may be addressed utilizing solutions and technologies that are currently available for SBC.

Virtual Desktop Infrastructure – VDI

Virtualization is one of the hottest trends in IT, and VMware’s Virtual Desktop Infrastructure (VDI) is the latest hot topic of that trend line. The concept behind VDI is straightforward: instead of installing users’ desktops on local computers, why not host these desktops inside virtual machines that are running at a data center? The users then access these desktops from a local computer or a thin client, using a remote presentation protocol such as RDP or VNC. This consolidation provides multiple advantages compared to local desktops, such as improved security, easier management, regulatory compliance, disaster recovery and reduced maintenance costs. These benefits and, in fact, the entire operational model of VDI are very similar to Server Based Computer (SBC). Indeed VDI can be used in scenarios where previously SBC would have been the preferred option.
VDI vs. SBC

When comparing VDI to SBC two significant differences become apparent. The first difference has to do with how user sessions are managed on the server. With SBC, multiple users connecting to the same Terminal Server access multiple sessions running within the same Operating System (OS). In contrast, with VDI, each user accesses a distinct OS instance having a single session running inside a unique virtual machine. Multiple virtual machines run on top of the same Hardware Virtualization Layer, such as VMware ESX Server. This difference provides VDI with several advantages over SBC:

- With VDI each user can have a totally customized and personalized desktop, with a unique set of installed applications and configurations. With SBC users share a common set of application per Terminal Server, and there are limitations on personalized configurations.
- VDI sessions are much more isolated than SBC sessions. Many of the adverse session interactions that can occur on a Terminal Server simply cannot happen on VDI. Overall this makes VDI more robust than SBC.
- The same session isolation characteristics make it possible for VDI to host applications that are not compatible with SBC, or behave poorly in an SBC environment.
- It is possible to mix several operating system types or versions within a single VDI environment. For example some desktops can be Windows Vista, others will be Windows XP or even Linux.

Recent advances in virtualization technologies enable VDI to provide these advantages without incurring extraneous costs in terms of scalability and performance.

The second difference between VDI and traditional SBC has to do with the maturity of these two approaches. SBC has been around for over a decade. Thus, IT has a good understanding of the requirements of such implementations. Several companies provide products that satisfy these requirements, making SBC both applicable and desirable. VDI, on the other hand, is a new technology and there are few off-the-shelf solutions available to provide equivalent functionalities. As a result, organizations often attempt to implement VDI simplistically, utilizing only the basic virtualization infrastructure and without considering the additional requirements for an affective enterprise solution. This results in partial solutions that do not provide all the expected benefits, or worse, in failed implementations.

Fortunately, it is possible to enhance properly designed SBC solutions to support VDI. In doing so VDI can instantly gain all the capabilities that are available for SBC, such as centralized management, load balancing remote printing and more. These solutions and products make VDI an applicable alternative to SBC. In fact, such solutions can be used to implement enterprise-wide access architectures which utilize both VDI and SBC in conjunction, providing the best of both technologies.

Let’s further examine some of these required capabilities:
Managing User Access

On its own, VDI is like having numerous PCs installed at a central location. Individual users then access those PCs remotely over a network infrastructure. An obvious issue that must be addressed is how to associate each user with an appropriate virtual desktop. An overly simplistic approach, which is nonetheless used by some organizations, is to provide each user with a specific IP address or computer name of a virtual desktop. This approach results in wasted server resources since idle sessions must be kept active so that users can connect to them. In addition, performance degradation can occur due to imbalanced server usage.

The appropriate approach is to leverage the fact that in most organizations, users do not require totally individualized desktops. Instead, most users belong to particular groups that require similar or identical desktops. By adding the capability to provide load balancing of pools of identical virtual machines, users will be directed automatically to available desktops on the least loaded servers. A solution that implements this approach can provide performance and enhanced scalability. In addition, managing a limited set of pools of identical desktops is much easier than managing a huge number of individual desktops.

User Authentication and Single Sign-On

In order to assign users to appropriate desktop pools, users must be identified prior to the actual desktop logon. A specialized broker is required that identifies and authenticates users before they are assigned to specific desktops. Once identified, a user’s group association in a Directory Service can be queried to determine the appropriate desktop pool for that user. An additional benefit of this approach is that the broker can add enhanced authentication policies, such as RSA SecurID, thus improving system security.

An effective implementation of such a broker needs to support single sign-on so that the user is not required to manually sign on to the virtual desktop after signing on to the broker. Instead the user needs to be signed on to the virtual desktop using the same identity automatically. The broker can also implement single sign-on from the user’s local PC, so if the user was authenticated at that point no additional sign-ons will be required at all.

Centralized Management and Control

One of the most important SBC enhancements is a centralized console for managing an environment consisting of multiple servers and supporting numerous users. Such consoles make it possible to apply configuration changes across the entire environment, monitor user activity on any server and control active sessions.

VDI requires, but currently lacks such a console, without which, it is either difficult or impossible for VDI to implement centralized management capabilities on its own. Moreover, without an appropriate management console, VDI management may become more tedious—and in fact— more difficult, than managing individual PCs.

However, integrating an access management broker enhances VDI with the centralized console capabilities required for performing these important administrative functions:
• View connected users and active sessions
• Monitor VM server activity
• Locate which VM server a user is connected to
• Remote control a VM state: reboot, suspend, stop
• Provide remote assistance and support, including session shadowing
• Etc.

In addition to real-time management capabilities, such access management consoles may provide logging and auditing features. This allows the organization to continuously monitor user activity over time, and is often a requirement for regulatory compliance.

Application Publishing

As its name implies, VDI is currently used almost exclusively to provide remote access to entire desktops. Providing the capability to publish individual applications from VDI significantly enhances the capabilities of that platform. Application publishing enables:

- Overcoming application conflicts by allowing the user to access multiple applications that cannot reside on the same desktop
- Providing On-Demand access to required applications without installing them on all the desktops. This can also reduce licensing costs
- Leveraging local client capabilities by allowing the user to run applications both locally and remotely

Effective application publishing requires support for Seamless Windows so the remote applications are properly integrated into the local desktop. This allows the user to easily and naturally use multiple applications residing on several desktops, both local and remote.

For the users to access published desktops and applications, an easy-to-use Graphical User Interface (GUI) is required. For SBC, this GUI is often implemented as a Web Interface or a local application that displays the icons of applications and desktops available for a particular user. The user can then easily launch such desktops and applications by clicking on the appropriate icons. These icons can also be placed on the user’s local desktop for immediate access.

There are numerous additional SBC related features that are also relevant for VDI. These features include:

- Secure remote access, including single point of entry, server-side certificates and more
- Local printing and access to local peripherals
- Portal integration
Summary – Making the Best of VDI

VDI has the potential to realize the benefits of centralized computing beyond what is currently provided by SBC. In order to deliver on this potential VDI needs to be significantly enhanced beyond the basic concept of hosting virtual desktops on servers. Properly applying solutions and technologies that have evolved for SBC to VDI can provide these required enhancements.

Ericom is very interested in receiving your feedback to this paper, and knowing what other white paper topics would be useful to you. Please write to WhitePapers@ericom.com
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