

Application Virtualization Solutions Overview and Feature Compare Matrix



Eenvoud in ICT

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DOCUMENT OVERVIEW

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1. INTRODUCTION

More and more people are asking to themselves the following: When do we need application streaming, application virtualization or application isolation? What are the main application virtualization players and how do these solutions fit into the application delivery market space?

1.1 PURPOSE OF THIS DOCUMENT

In April 2007 Ruben released the first Application Virtualization Feature Compare Matrix, aka 'The Matrix'. In December 2008 a modernized whitepaper is released.

This document will provide information about the various application- and desktop delivery solutions, application virtualization in general, the main application virtualization vendors and a matrix with feature details of the different virtualization solutions.

It's important to understand that the vision of application- and desktop delivery and the focus of the vendor is more important than only comparing the features of each solution. Despite of that, comparing features can help in finding the right application virtualization solution that fits in the business and technical requirements of your organization.

Frequently customers are wondering which solution is the best? it's impossible to give a general answer to that question. It depends on the demands of IT management, customers needs, business case and the current ICT infrastructure.

This document is created to help people finding their right solution for dynamic application delivery!

1.2 ABOUT THE AUTHOR

Ruben Spruijt, born in 1975, studied Computer Science in Ede and started his career as a Systems Engineer at A-Tree Automatisering. He has been operative as a Solutions Architect at PQR since 2002.

Focusing on Server & Storage, Virtualization and Application Delivery solutions, PQR advises, designs, implements and migrates advanced ICT-infrastructure and has achieved the highest certifications of its most important partners: HP Preferred Partner Gold, Microsoft Gold Certified Partner, Citrix Platinum Solution Advisor, VMware Premier and Consultancy Partner.

In his job, Ruben is primary focused on Application and Desktop Delivery, hardware and software Virtualization. He is a Citrix Certified Integration Architect (CCIA), Citrix Certified Enterprise Administrator (CCEA) as well as Microsoft Certified Systems Engineer (MCSE+S). Ruben has been awarded with the Microsoft Most Value Professional (MVP), Citrix Technology Professional (CTP) VMware vExpert and RES Software Value Professional (RSVP) title.

At various local and international conferences Ruben presents his vision and profound knowledge of 'Application- and Desktop Delivery' and Virtualization solutions. He is initiator of PQR's conceptual modes of 'Application and Desktop Delivery solutions' and originator of www.VIRTUALL.nl, the solutions showcase of PQR. He has written numerous articles that have been published by professional magazines and informative websites such as brianmadden.com.

1.3 ABOUT PQR

PQR is the specialist for professional ICT infrastructures with a focus on server and storage, virtualization and application availability.

PQR stands for simplicity, freedom and professionalism. We provide our clients innovative ICT solutions that ensure that application availability and management are optimal: We have

demonstrable references and a wide range of expertise in the field, as witnessed by our many high partner statuses and certifications.

PQR is an HP GOLD Preferred Partner 2009, HP Enterprise Specialist Partner 2007/2008, VMware Premier Partner and Gold Authorized Consultant Partner, Citrix Platinum Solution Advisor, Microsoft Gold Partner Advanced Infrastructures & Security, RES Platinum Partner, NetApp Platinum Partner, Cisco Partner, CommVault Value Added Reseller, HP ProCurve Master Partner, Platespin Platinum Partner and Websense Platinum Partner.

As a Trusted Advisor for our clients, we also provide advice about new technologies with which it is even easier for clients to keep their ICT environments running, whereby optimal performance is important and the user can always access the information from anywhere. This not only applies to system administrators but also to users. By using application and desktop virtualization, for example, users experience the ease and speed with which they can access applications and the associated data that they need. We therefore offer our clients an ICT environment that is manageable and well-organized and, above all, entails significant cost decreases, not only in management but also as regards energy use. This way PQR provides medium-sized and larger companies and institutions an ICT infrastructure that is stable, flexible and ready for the future.

PQR also has extensive experience in designing and developing Storage Area Network (SAN) environments. Large storage environments have been our specialty for quite some time, and this ensures that we work efficiently. Our approach is clear for all processes. We begin with an inventory of needs and a preliminary examination. We carefully map out what is required in terms of functionality – naturally, taking into consideration future plans – and we give advice regarding which changes are needed and feasible. During the entire project, from design through implementation, PQR takes responsibility for on-time delivery of sub-projects and for the end result. We usually do this for a price that is agreed upon in advance and with the associated guarantees. This way you always know where you stand from the very beginning. We call this simplicity in ICT. And *that* is the PQR approach that delivers success – and has been doing so since the company's founding in 1990.

PQR is headquartered in De Meern and has some 100 employees. In fiscal year 2006/2007 the company posted sales of € 72.3 million and a net after-tax profit of € 4.3 million. PQR's clients are active in all sectors of society. A significant part of our sales is achieved by non-profit organizations, the health care industry, education and local and federal government.

1.4 CREDITS

Jurjen van Leeuwen, one of my ex- colleagues, investigated some of the features of the different Application Virtualization solutions. Without Jurjen this whitepaper won't be that detailed as it should be. Jurjen, thanks for your time and effort! Contact Jurjen?

Jurjen@leodesk.no

1.5 WE NEED FEEDBACK

We try to provide accurate, clear, complete, and usable information. If you have any comments, corrections, or suggestions for improving this document, we want to hear from you! Please send e-mail to ruben.spruijt@pqr.nl Include the product name and version number, and the title of the document in your message

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2. UNDERSTANDING ALL THE APPLICATION AND DESKTOP DELIVERY SOLUTIONS IN 30 MINUTES – UPDATED-

2.1 INTRODUCTION

PQR created this "Application & Desktop Delivery Solutions Overview" to provide a full at-a-glance outline of the various application and desktop delivery solutions. Reading this document, which accompanies the Overview, will only take about 30 minutes, and will give you a complete outline of the diagram* and all the application and desktop solutions that are included in it. There are so many delivery solutions available on the market that - often due to a lack of knowledge - their functionalities are frequently mixed up. This article does not aim to describe all application scenarios or their technical advantages and disadvantages, but to give a general idea of the state of affairs in the application and desktop delivery segment, independent of vendors. I hope this overview will be of some value to you.

*)<http://www.virtuall.nl/download-document/pqr-application-and-desktop-delivery-solutions-a4-v2>

2.2 TRUSTED AND UNTRUSTED WORK PLACE SCENARIOS

Trusted work places are devices that are connected to the existing IT backend infrastructure via wired or wireless LAN/WAN. *Untrusted work places* are devices that do not have a secure wired or wireless LAN/WAN connection to the existing IT backend infrastructure. This is, for example, equipment that is connected to a separate network segment for security reasons or because it is used from home or at a work experience location.

Each organisation has different work place and application delivery scenarios. For the IT department, it is important to have a good overview of the various work place and application delivery scenarios, since this indicates how the various users work with the applications or what their requirements are.

2.3 SECURE ACCESS

Secure Access solutions provide secure access for untrusted devices to corporate IT. The two parts of the symbol stand for secure (the shield) and access (the traffic light). Depending on the chosen solution, secure access can also be fine-grained. Solutions that can be used to realise secure access scenarios include Cisco ASA, Citrix Access Gateway, Microsoft Intelligent Access Gateway, and Juniper SSL VPN.

2.4 WEB APPLICATION ACCELERATION

Web Application Acceleration appliances accelerate and secure web-architected applications. We are all confronted with these solutions nowadays: internet applications such as Google, MSN and eBay all use them. Web application acceleration solutions are not just useful for large organisations; however, you could also use them for your own web applications. Solutions that facilitate web application acceleration and security include packages such as Citrix Netscaler en F5 BigIP.

2.5 CONNECTION BROKER

The connection broker determines which server-hosted remote desktop will be made available to the client. When using a server-hosted virtual desktop infrastructure for this, it is possible to

either designate dedicated desktops or a pool of remote desktops. The desktop broker can automatically create, remove or pause remote desktops. There are a number of connection broker suppliers. Citrix with XenDesktop, Microsoft with Remote Desktop Services, and VMware with View are the best-known total solutions. Depending on the supplier, the connection broker may have additional functions, such as a web interface that can create secure (SSL) connections to remote desktops, and also Directory Services integration, Full USB support, support for various display protocols and integration with Terminal Services. Depending on the rules, it is possible to execute applications centrally on a server-hosted VDI or on a terminal server.

2.6 APPLICATION STREAMING AND VIRTUALIZATION

Through application streaming and virtualization, Microsoft Windows applications can be used without changing the local operating system or installing application software at a particular work place. In other words; the application can be executed as if it had been installed locally and can save data and print without the need of any modifications to the local client. Resources such as the CPU, memory, hard disk and network card take care of the execution of these applications.

Application Streaming and Virtualization can make applications available to desktops, laptops, server-hosted VDIs and terminal services platforms. The applications are executed on a "client" platform, without needing to modify the platform.

The advantages of Application Virtualization include: installation, upgrade, roll-back, delivery speed and the ease of application support (management). Installation of applications is no longer necessary, eliminating the possibility of conflicts. The result is a dynamic application delivery infrastructure.

Application Streaming and Virtualization solutions include: Microsoft App-V, VMware ThinApp, InstallFree, Symantec Workspace Virtualization and Citrix XenApp client side virtualization.

2.7 OS PROVISIONING

OS Provisioning allows workstations to boot up and run from a central image. A single image can be used simultaneously by multiple workstations. The advantage of this is that complete operating systems, including applications and clients, can be made available quickly and securely. It is possible to make a single image available to multiple VDIs, TSs and physical desktop environments without causing conflicts. As a result, it is possible to upgrade or roll-back an OS quickly, simply, and without significant risks. When virtual desktops use OS streaming, (valuable) storage is saved, and the management of virtual desktops becomes relatively simple. This means that virtual or physical machines using OS Provisioning can become "stateless devices". Citrix Provisioning Server and the VMware View Composer are both solutions that facilitate OS Provisioning.

2.8 SERVER-HOSTED VDI

VDI, Virtual Desktop infrastructure = Dedicated Virtual Desktop

There are two kinds of VDI: server-hosted and client-side. A Server-Hosted Virtual Desktop Infrastructure (VDI) is a dedicated remote desktop solution providing remote access to Windows XP/Vista/Win7 or Linux desktops. The virtual machines are run from the data centre. The virtual infrastructure increases the system's independence, availability and manageability. The implementation of Server-Hosted VDIs means that desktops are no longer bound to a location or end-user appliance. Each user has his/her own unique, personalised, fully independent work place. Programs run and data is processed and stored on a centralised personal desktop. The information is sent to the client screen via a remote display protocol such as Microsoft RDP, Citrix ICA, Teradici/VMware "PC-over-IP" or VNC.

The protocol used for displaying the correct information depends on the operating system, bandwidth, the type of application, and the technical facilities. As with other desktop delivery solutions, VDI consist of various infrastructure components that facilitate management, load balancing, session control and secure access to virtual work stations. Microsoft, VMware, Quest and Citrix are all important suppliers within the server-hosted VDI segment.

2.9 SERVER-HOSTED VDI, GPU ACCELERATION

The "Graphical Processor Unit (GPU) acceleration" functionality can be added to the server-hosted VDI solution. It provides each (virtual) machine with enough graphic performance to run multimedia, 2D/3D, NextGen and Unified Communications.

Display data is presented to the client device via an optimized remote display protocol. To ensure that the end-users experience the best possible performance, the bandwidth, latency, or local (software) components have to meet extra requirements.

2.10 TERMINAL SERVICES (TS)

Terminal Services (TS) = "Shared Remote Desktop"

Terminal Services is a solution for the remote access to desktops and applications that are run on a terminal server in a data centre, where every user has his or her unique terminal server session. Access to the desktop or application is not tied to a location or end-user machine, and programs are executed centrally on the terminal server.

The data appears on the client screen through a remote display protocol such as Microsoft RDP or Citrix ICA. Terminal Services consists of various infrastructure components for management, load balancing, session control and support. It has the advantage that applications are made available quickly and securely, the TCO is low, and applications can be accessed irrespective of location or work place. Suppliers of terminal services include Microsoft, Citrix and Quest.

2.11 CLIENT-SIDE VDI

VDI, Virtual Desktop infrastructure = Dedicated Virtual Desktop

There are two kinds of VDI: server-hosted and client-side. Client-side Virtual Desktop Infrastructure (VDI) is a dedicated local desktop. The virtual machines are run locally on the client device. The hypervisor ensures that each virtual machine is hardware-independent, and makes it possible to simultaneously use a number of virtual machines at the same workstation. The hypervisor plays an essential part in client-side VDI solutions. There are two kinds of hypervisor: a bare-metal client hypervisor and a client-hosted hypervisor. The client-hosted hypervisor is installed on the Windows, Apple or Linux operating system as an application. The bare-metal client hypervisor is installed on top of the hardware, with the operating system installed on the hypervisor. The main differences between the hypervisors are hardware support, performance, manageability and end-user experience.

Citrix XenClient, VMware Client Virtualization, Neocorus Virtual Computer are all bare-metal client VDI solutions. Microsoft VirtualPC or MED-V, VMware ACE and Fusion, Parallels Desktop, and Sun VirtualBox are client-hosted VDI solutions.

2.12 CLIENT MANAGEMENT

Any self-respecting professional IT organisation is bound to use a Client Management solution, as it is needed to facilitate things such as OS deployment, patch management application and client deployment, asset management, service desk integration, and remote control. Examples of client management systems are Microsoft System Center Configuration Manager (SCCM), RES Wisdom, Altiris Deployment Solution, LANdesk Client Management and Novell ZENworks Configuration Management.

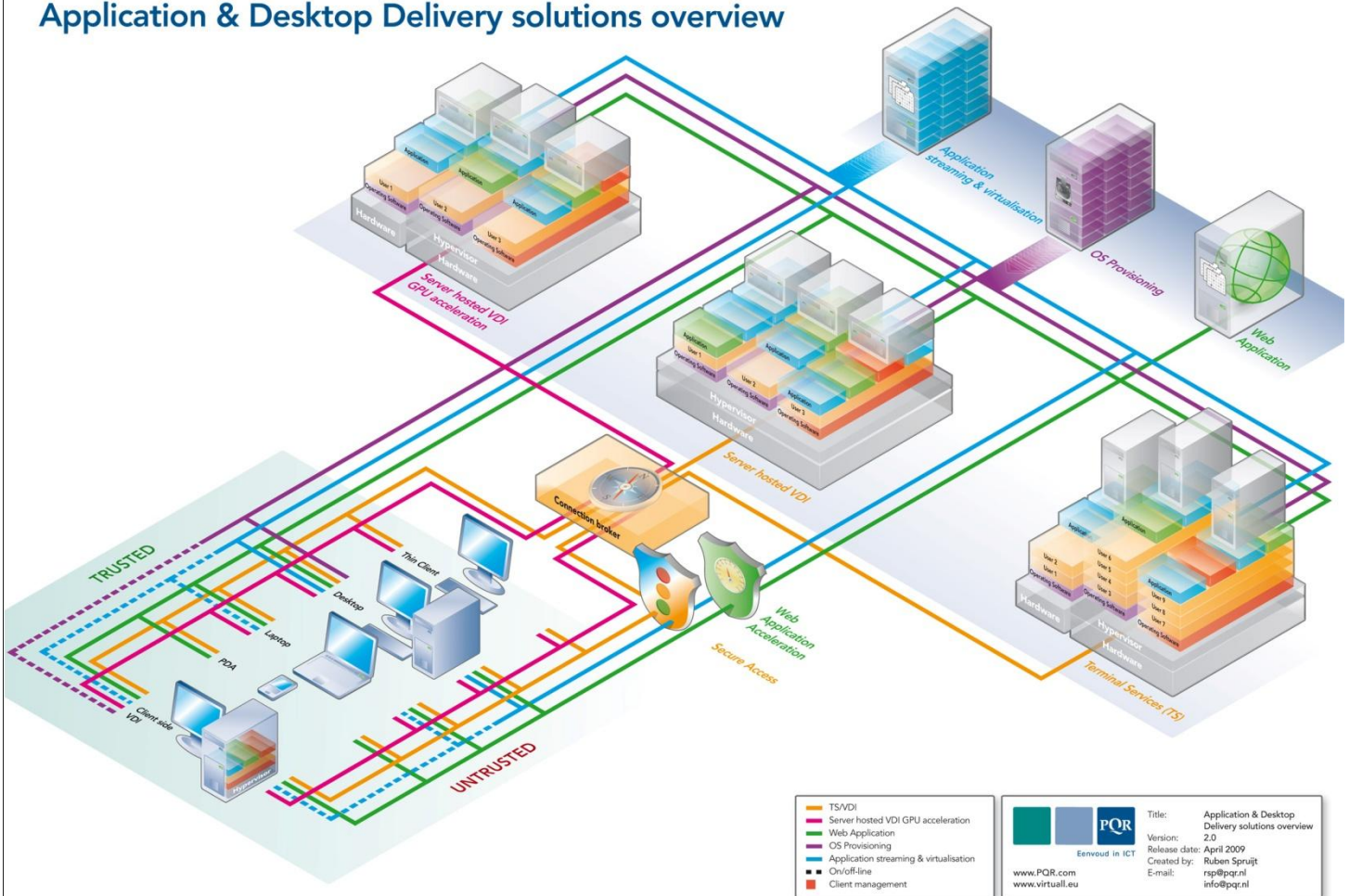
2.13 AND FINALLY

The solutions given in this overview all provide different ways of making applications and desktops available effectively and dynamically.

Which solution is best for your organisation depends on a number of variables. Each company has different requirements and different technological circumstances, and together they determine which solution is best.

To ensure an organisation makes the right choice, it is essential to know the pros and cons of the various solutions. To help your organisation reach the right conclusion, PQR organises workshops that discuss all the options. In addition to this, our consultants have also written a number of detailed technical articles.

Application & Desktop Delivery solutions overview



3. APPLICATION VIRTUALIZATION SOLUTIONS

virtualization the act of isolating or unbinding one computing resource from others. Server Virtualization is the solution of hosting an entire computer environment within the operating system of another computer. The dynamic delivery of applications is an essential functionality and part of a broader strategy of an optimized ICT infrastructure. Making applications available to the end user is probably the most important functionality of an ICT infrastructure. With the help of application virtualization, the end user can use their Windows applications without requiring adjustments to the local operating systems.

In conversations with customers and during workshop sessions I regularly receive the question, "What is the difference between application deployment and delivery?"

With application deployment, the applications are installed on the execution platform. The execution platform could be a local desktop or laptop, a central virtual desktop, a bladePC or a Terminal Server. When speaking of application delivery in the context of application virtualization, the applications are no longer installed, but they are made almost instantly available and executed on the execution platform. The execution platform does not undergo any alterations.

Application Virtualization enables fast application delivery in a central and local environment whereby mutual application conflicts are excluded. This considerably reduces the throughput times of application packaging and delivery compared to the traditional deployment methods. The packaging of applications with the help of the Application Virtualization is a lot simpler than making traditional MSI packages.

What are the primary reasons for applying application virtualization?

- Applications are no longer installed on the workstations;
- No more conflicts between applications;
- Eliminates the need for regression testing;
- Multiple versions of applications can be used simultaneously;
- Supports Web, Client-Server and Server Based Computing applications;
- Consolidation of Terminal Servers;
- Fast application roll-out and upgrades;
- Stabilizes Windows profiles;

Creates a dynamic application delivery infrastructure which allows applications to be used online, offline, on-site, off-site, locally and centrally.

Over the past years Application Virtualization has out-grown the niche market and has become the main solution for application delivery. Over the past years customers, from small to large enterprises see the benefits of application virtualization. Nowadays there are several proven, well-known virtualization solutions. These vendors and also the upcoming vendors are from a Feature point of view described in the next paragraphs.

3.1 ALTIRIS SVS PROFESSIONAL

Altiris Software Virtualization Solution (SVS) Professional is an on-demand application distribution and license management platform that puts the priority on user productivity. It is the optimal solution to serve the application management needs of diverse and dynamic enterprise environments, providing high productivity with controlled, guaranteed access to any Microsoft Windows® based applications from any location at any time, including remote and mobile users. With the option to virtualize some or all applications, users will have more reliable applications and more stable systems

SVS PROFESSIONAL MEANS BETTER MANAGEABILITY

Virtualization enables the separation of key desktop elements for better manageability and instant desktop configuration that is based on the user who logs in and their role in the enterprise.

SVS Professional leverages three distinct technologies to provide the best on-demand environment for the user and save time and effort for IT managers:

- Virtual distribution—streaming allows the user to acquire applications from any endpoint, according to his productivity needs, while minimizing bandwidth requirements and optimizing license consumption.
- Virtual execution—layering applications on disk ensures that each application includes all of its appropriate resources, eliminates conflicts with other applications and the base operating system, and enables instant repair.
- Rule-based management—Proactive license compliance and optimization is achieved by applying a set of rules to govern the consumption and use of applications by the right people, and automatically recovering unused licenses.

STREAMING WITH SVS PROFESSIONAL

SVS Professional is an on-demand application distribution and license management platform that provides an optimal solution to serve the application management needs of enterprise environments, providing high productivity with controlled, guaranteed access to any Windows based applications from any location at any time, including remote and mobile users.

VIRTUALIZATION WITH SVS PROFESSIONAL

SVS Professional provides a robust and secure environment for applications with a revolutionary approach to software management. By placing applications and data into managed units called Virtual Software Packages, SVS Professional instantly activates, deactivates or resets applications and completely avoids conflicts between applications, without altering the base Windows installation.

3.2 CITRIX XENAPP CLIENT-SIDE VIRTUALIZATION

Client-side application virtualization technology in Citrix XenApp is comprised of two main functionalities: *application streaming* and *application isolation*. The application streaming feature enables applications to be delivered to client devices and run in a protected, virtual environment. Applications are managed in a centralized Application Hub, but are streamed to the client device and run in an isolation environment. Applications become an on-demand service that is always available and up-to-date.

THE CHALLENGE

The reality today is that many companies are hitting a wall of complexity when it comes to managing their ever-growing number of desktop applications and diverse access scenarios. This complexity translates into a huge amount of time and money spent providing what amounts to a patchwork solution.

APPLICATION STREAMING OVERVIEW

Client-side application virtualization reduces the cost of testing, installing and supporting applications. Using isolation and application streaming technologies, client-side application virtualization enables local virtualized applications. Rather than installing applications on each user's PC, applications are streamed to a protected isolation environment on their client device. The isolation environment controls how applications interact on the user device, which prevents application conflicts.

Streaming applications into the isolation environment greatly accelerates their delivery by reducing regression testing and simplifies management with streamlined maintenance, upgrades and de-provisioning. In fact, using streaming for de-provisioning an application is the most efficient method of removing all traces of an application. Caching technology makes applications available even when users are not connected to the network.

With server-side application virtualization, the server acts as the client. Applications are streamed to a protected isolation environment on the server as opposed to the local device. This has many of the same benefits of client-side application virtualization and also helps reduce application silos and greatly improves management of XenApp farms.

KEY BENEFITS

As a key component of both client-side and server-side application virtualization, Application streaming enables IT to:

- Eliminate application conflicts and OS instability resulting from desktop application installation
- Reduce the costs associated with regression testing, deployment, maintenance, updates, and de-provisioning for applications running locally on users' machines
- Offer applications as an on-demand service
- Lower support costs by automatically updating and repairing applications every time they are used
- Speed regulatory compliance by eliminating the need for extensive testing to certify applications
- Enhance security by giving IT administrators complete control over applications delivered to desktops, even those of unmanaged partners and users

3.3 ENDEAVORS APPLICATION JUKEBOX

Application Jukebox - Enterprise Edition is the next generation of application virtualization designed to deliver any Windows application to any PC, anytime, from anywhere, without the need for downloads or installs. Application Jukebox is an out of the box technology solution for instantly delivering existing Windows software across the enterprise. Application Jukebox Studio creates stream able and virtualized application sets from an original installer. Application Jukebox Server controls and delivers those application sets to the clients. Application Jukebox Player runs on the client machine creating a virtual environment to run the application. Instead of using traditional push technology such as Microsoft Systems Management (SMS), or client-server based solutions to install or run entire applications, Application Jukebox responds to user requests for applications and immediately pulls the application to a user's desktop.

The new features of Application Jukebox are:

CONFIGURABLE VIRTUALIZATION

Applications held in Application Jukebox can be fully integrated with the end user client environment, fully isolated or any combination in between. This unique functionality gives the administrator complete control on how applications are delivered and interact with client devices. A simple example being, an application that is shipped with fonts only licensed for use with that application. The application could be streamed as a fully integrated application, interacting with local system resources and other locally installed software. The fonts, however, could be streamed in an isolated virtual environment, hidden from the resident OS and installed applications, and therefore only available by the licensed application. The four layers of virtualization are

- Layer 1 – Installed Permanent – this copies the file to the specified location on the users system when the application is first virtualized and the file is left behind even once the application is removed. We generally use this for the data files that might

come with an application, like an .mdb file or personalization registry settings. It is also used for things that you would want to be persistent should the application be virtualized again in future as the files are not overwritten if already present.

- Layer 2 – Installed Temporary – this copies the file to specified location on the users system when the application is first virtualized but the file is then deleted when the application is removed from the player. This might be used for files that you want to have on the machine but put outside of the control of Jukebox, but then remove them when the app is removed in order to leave a clean state.
- Layer 3 – Virtual Integrated – this is a virtualized file or key that can be seen by the rest of the system and is visible in the file system and registry, as if locally installed but its use is restricted by Application Jukebox
- Layer 4 – Virtual Isolated – this is a virtualized file or key that is isolated (sandboxed) and is only visible from within the virtualized application

An important thing to understand is that applications do not have to be either all isolated or all integrated; the level of virtualization can be set for each file and registry key. For example Alternatively you might have a fully isolated application but have the files and registry keys for a PDF printer plug-in as integrated. Or you can have all of the application integrated or isolated as a whole if you want to.

MIXED MEDIA STREAMING

Application Jukebox makes it possible to stream applications from different media sources; CD, USB stick or network delivery. This gives the Enterprise increased flexibility in deploying applications. For instance, if a user is in a remote location with limited network access, they can receive a preloaded application on a CD containing only the necessary data to launch the application and then stream any additional data blocks as needed, on-demand from the network.

MULTISTAGE PROGRESSIVE STREAMING

Applications can have additional blocks of data streamed using macros once the activation and prefetch have taken place. An Enterprise can publish an application with a small prefetch allowing users to start working more quickly, while in the background additional data is being streamed.

INCREMENTAL PATCHING

When bug fixes and minor point versions of applications are released, Enterprises need to get the updates to their users in a timely manner; Application Jukebox makes it possible to quickly and easily patch the application and stream only the differential, not the whole application saving time and effort.

ANYTIME – ANYWHERE

Application streaming and virtualization gives users on-demand access to desktop applications anytime, from anywhere. Application Jukebox dramatically reduces the cost and complexity of delivering applications to desktop and laptop computers across the enterprise.

REDUCED TOTAL COST OF OWNERSHIP

Most organizations deploy and manage their business applications using methodologies that were introduced over a decade ago prior to the 'digital age' and the internet phenomenon as we know it today. The exponential growth of our dependence on the PC, and the increase in remote workers, has led to a spiraling application and hardware Total Cost of Ownership (TCO).

Application Jukebox allows organizations to rapidly deliver desktop applications, upgrades and patches. It gives users access to software as they need it, when they need it and where they need it on a "pull-based" application delivery model. Maximizing existing infrastructure organizations can serve many more users per server, dramatically reducing TCO.

AVOID COMPATIBILITY AND STABILITY ISSUES

Application Jukebox avoids application compatibility issues by isolating the streamed application from other application's configuration/run-time environment and dramatically reduces the cost and complexity of delivering applications. Software delivery becomes an on-demand service – one where the latest release of the application is always accessible, where application maintenance releases are automatically detected and instantly made available. Central administration eliminates the need to recall or visit the client computer. By isolating the streamed applications, the enterprise can guarantee software stability with an immediate roll out of new builds to their users. This reduces the need for complex and lengthy regression testing procedures and the need for an intricate testing infrastructure.

3.4 INSTALLFREE BRIDGE AND MINI BRIDGE

InstallFree products enable organizations to virtualize applications and dynamically deploy them to any Windows environment based on user login credentials and with no dependencies or installed components. InstallFree products enable IT departments to virtualize and separately package various desktop elements such as applications, add-ons, plug-ins and updates and download or dynamically stream them as compact, clientless, virtual executables for local processing on any XP or Vista based PC regardless of the host's operating system settings and language, server-based solutions such as Citrix XenApp, Windows Terminal Server and Windows-based Virtual Machines. Implementing InstallFree products do not require any software, or client to be installed on the host PC or at the datacenter and enables full application functionality and complete user autonomy on any Windows-based computing environment including non-dedicated and locked-down computers with both on and off-line availability.

Using InstallFree products, corporate IT personnel can perform mass application deployment and on-the-fly patching by easily assigning applications, add-ons and updates to Users, Groups and Organizational Units (OU) listed in the organization's Active Directory (AD). These dynamic applications function without installing anything anywhere – providing a true end-to-end software distribution solution covering the entire scope of the organization's computing scenarios. This enables IT Departments to provide end-users with their own true customizable application whether they log-in to a traditional managed desktop, a Citrix Session, or non-dedicated public PCs in airports, hotels, internet cafes, etc.

InstallFree provides three platforms for deploying InstallFree Virtual (IFV) applications across the enterprise and beyond – The IFV MiniBridge, The IFV Bridge, and the IFV Desktop.

The InstallFree MiniBridge allows IT managers to create standalone executables of InstallFree Virtual (IFV) applications and deploy them using the organization's existing Electronic Software Distribution (ESD) or Terminal Server based solutions while maintaining centralized management capabilities including updates, incremental patching and dynamic binding of add-ons, toolbars and other virtual applications. This simplifies application life cycle tasks by eliminating the need to install applications and ultimately streamlining IT operations. The MiniBridge does not integrate the IFV Application into the host PC environment yet allows it to operate with complete functionality without limitations.

The InstallFree Bridge is a clientless platform that deploys IFV applications to the host PC seamlessly and transparently to the end-user, based on the customer's existing infrastructure, allowing virtual applications to function as if they were installed on the host computer. By assimilating applications into the host's environment, the InstallFree Bridge provides the end-user with a natural user experience and conventional application behavior. The InstallFree Bridge does not need an agent to be installed on the host computer in order to function and does not alter the host PC in anyway. The platform includes complete integration with Active Directory (AD) or any LDAP application and the capability to deploy applications, add-one,

patches as well as control the entire application life-cycle through a centralized management application.

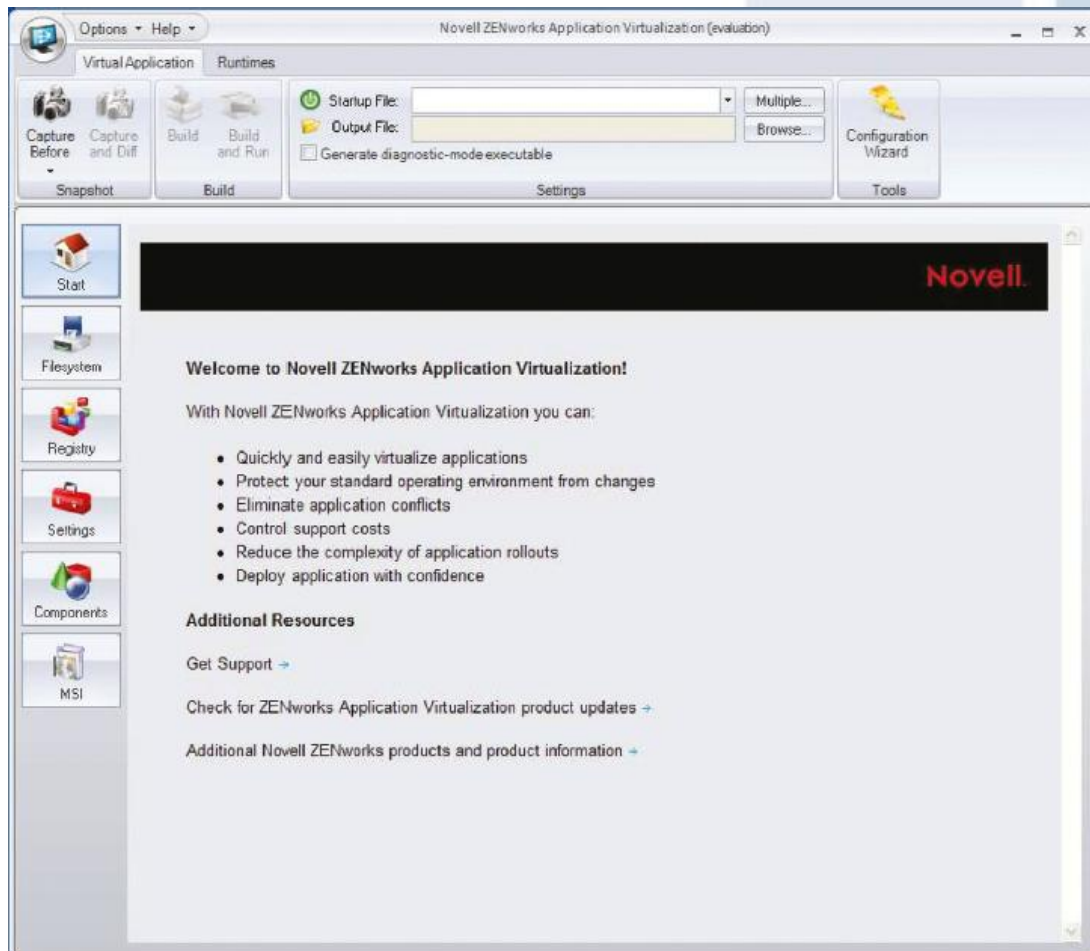
When a user logs in to any Windows computer through AD, a simple logon script downloads a small executable (The Bridge Agent) and runs it on the host PC with no installation process at all. The Bridge Agent then streams or downloads the decoupled Dynamic Desktop Elements (applications, add-ons and updates) and dynamically binds them in the runtime execution environment together with the user's own personal settings creating an IFV Application. The IFV Application integrates with the local non-virtual desktop elements, applications and environment, thus providing the IFV Application with all the conventional points of contact such as start menu and desktop shortcuts, right-click menu options, file association and uninstall information (for use with license tracking applications).

3.5 NOVELL ZENWORKS APPLICATION VIRTUALIZATION

Novell ZENworks Application Virtualization is an easy-to-use solution for deploying your Windows*, .NET and Java-based applications in compact, preconfigured virtual executables that run in your existing IT environment. Distribute the executables via the Web, USB keys or from your existing desktop management infrastructure. There are no additional agents or device drivers to support, and no virtual machines to set up or manage. ZENworks Application Virtualization also offers application compression and the ability to distribute patches for a virtual application

independently of the application itself. Of course, if you prefer to build MSIs and deploy them using MSI distribution tools.

ZENworks Application Virtualization is capable of doing that, too. Using this approach to application deployment, you can dramatically reduce deployment and maintenance costs associated with traditional application setup and distribution while ensuring a high-quality end-user experience.



Novell ZENworks Application Virtualization offers three ways to create and configure virtualized applications. The best method in a given situation depends on the nature of the application.

Novell ZENworks Application Virtualization includes a number of auto-configuration wizards for popular applications, which can be built and customized using a guided, step-by-step process. This simple method is recommended for first-time users.

- Snapshot an application installation. The snapshot captures a system's state before and after an application is installed and automatically configures virtual application settings based on observed system changes. This method is ideal for virtualizing off-the-shelf applications.
- Manually configure an application. This method is most often used by developers who are virtualizing internally developed applications. While manual configuration requires a high degree of technical knowledge about the application's inner workings, this does allow extremely finegrained control over virtual application settings. Because of the tremendous number of variables involved, users should refer to product documentation for additional help and insight.
- Convert ZENworks AXT-based applications. Novell ZENworks Application Virtualization makes it easy to convert your legacy ZENworks applications to virtual applications and make them a fully integrated component of your virtual application environment.

Each of these configuration methods allows additional configuration and customization to be performed once the initial virtual application configuration has been constructed.

Once you have built a virtualized application, you can distribute it with all the control and automation of Novell ZENworks, or from the Internet or intranets. You can even choose to

optimize the virtual applications to run directly from DVDs, USB thumb drives or other portable media—all of which can still be controlled by ZENworks policies to insure efficiency and security. This integration with ZENworks Configuration Management makes it possible to create a single unified lifecycle management solution for managing all your physical and virtual applications.

Bottom-line: Novell is OEM-ing the Application Virtualization engine from Xenocode and has added specific functionality, such as deep integration with ZENwork Configuration Manager, to the solution.

3.6 MICROSOFT APP-V

Microsoft Application Virtualization (App-V) transforms applications into centrally-managed virtual services that are never installed and don't conflict with other applications. App-V streams applications on-demand to desktops, servers and laptops. It changes application management from a series of tedious, manual tasks into an automated, streamlined process. App-V dramatically accelerates application deployment, upgrades, patching and terminations by eliminating time-consuming processes and simplifying the application management lifecycle.

With App-V, applications run reliably without failure—no matter what other software is running on that computer. All applications are instantly available on any licensed device. App-V even allows controlled application use when users are completely disconnected. Because App-V centralizes management of applications, users can only get the applications they have the rights to; application usage and license metering are managed centrally so that administrators can ensure compliance. Centralized control also enables IT to patch or upgrade once to the server and the next time the users access the network, their applications are updated without impacting their productivity. App-V provides various delivery mechanisms including http and file streaming, terminal services integration, and standalone mode which provide application caching on the local client for offline usage.

Microsoft Application Virtualization fully integrates with Microsoft System Center Management products, providing both users and administrators a seamless experience for running and managing applications in the enterprise.

Application virtualization is at the heart of Microsoft Application Virtualization (App-V). It decouples applications from the operating system and enables them to run as network services. Application virtualization can be layered on top of other virtualization technologies—network, storage, machine—to create a fully virtual IT environment where computing resources can be dynamically allocated in real-time based on real-time needs. App-V's patented application virtualization, dynamic streaming delivery, and centralized management technologies make everything from deployments and upgrades to migrations and business continuity initiatives easier and faster with better agility:

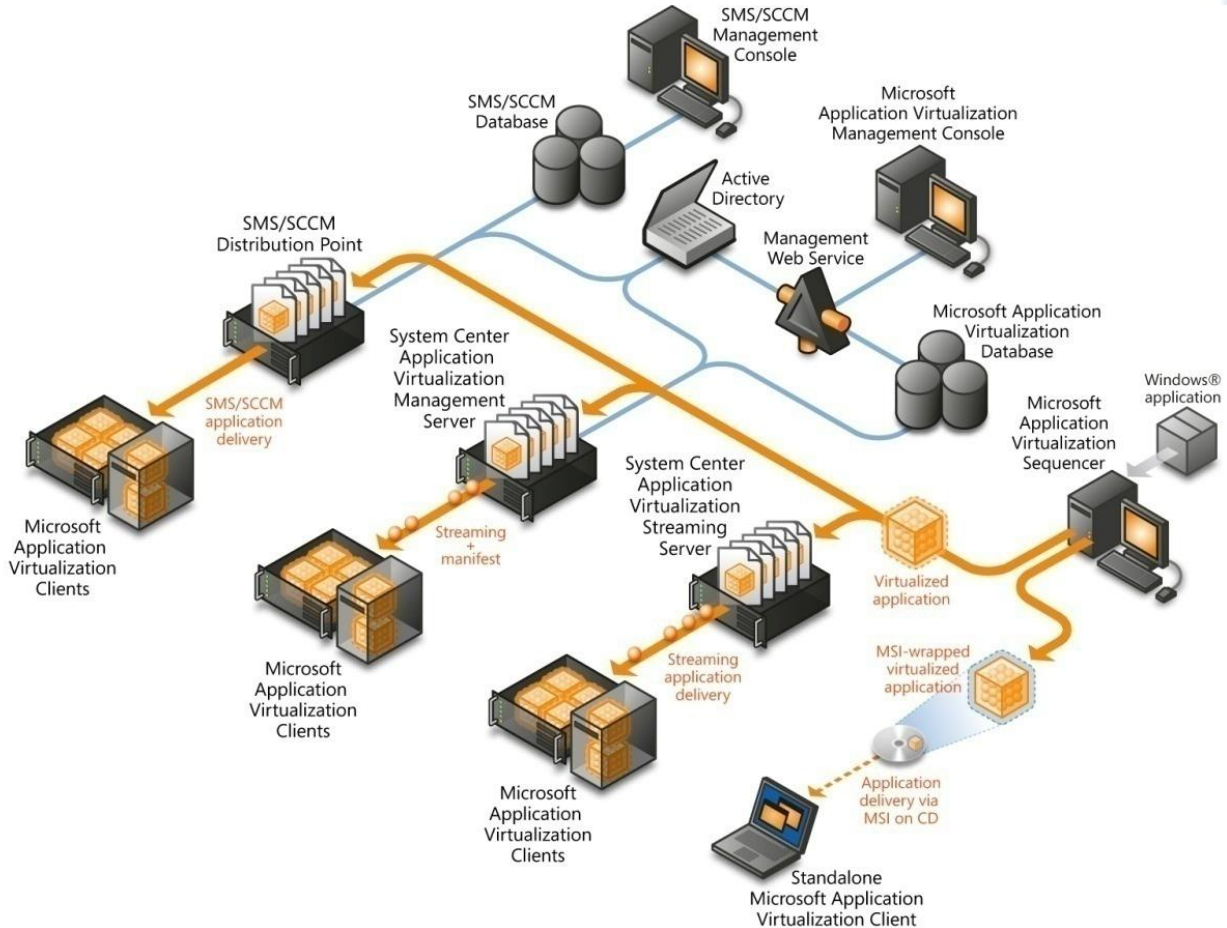
Application virtualization: Enable applications to run without the need to visit a desktop, laptop, or terminal server. Applications are no longer installed on the client—and there is minimal impact on the host operating system or other applications. The most extensive virtualization technology on the market, App-V virtualizes per user, per application instance, as well as key application components. As a result, application conflicts and the need for regression testing are dramatically reduced.

Dynamic streaming delivery: Applications are rapidly delivered, when needed, to laptops, desktops, and terminal servers. In most cases only a small percentage of the application is needed to launch the application. Additional components are delivered when transparently requested by the application. This results in faster delivery of the application when needed.

Centralized, policy-based management: Virtual Application deployments, patches, updates, and terminations are more easily managed via policies, and administered through the App-V console or via your ESD system. Use Microsoft App-V Application Virtualization to help

reduce the complexities inherent in enterprise application management. With App-V you can reduce challenges and transform your computing environment into a dynamic, services-oriented infrastructure.

The diagram illustrates the key components of Microsoft App-V Application Virtualization.



3.7 VMWARE THINAPP

Run any version of virtually any application on a single operating system without conflicts. You can even run multiple versions of the same application. Plug VMware ThinApp, formerly known as Thinstall, into your existing management infrastructure and accelerate your software development and desktop deployment. Deliver and deploy applications more efficiently, more securely, and more cost-effectively with agentless application virtualization.

ELIMINATE INSTALLATION CONFLICTS WITH APPLICATION VIRTUALIZATION

Application virtualization encapsulates the applications from the OS and each other; eliminating costly regression testing and conflicts from badly behaving applications. Just plug in an .MSI or .EXE file to deploy a virtual system environment, including registry keys, DLLs, third-party libraries, and frameworks without requiring any installation of agents or applications on the underlying operating system.

PACKAGE ONCE, DEPLOY EVERYWHERE (NETWORK, USB, PHYSICAL OR VIRTUAL DESKTOPS)

Deploy virtualized applications in user mode, without administrative rights. No device drivers are installed and no registry changes are made because the entire application and its virtual OS

are delivered as a single EXE file. Transparently stream large applications from a shared network drive with no server or client software to install. Upgrade or roll-back applications while they're running. The new version will execute the next time the user starts the application

CATER TO YOUR MOBILE WORKFORCE

Let your users run applications on virtually any computer they have access to, including kiosk and hotel PCs. They won't need to install software or device drivers and won't need admin rights. Applications run directly from portable storage devices, including Flash drives.

IMPROVE YOUR SOFTWARE DISTRIBUTION PROCESS

Deliver software that protects the local OS from modifications that might cause instability or breach security using your existing configuration management tools. Even restricted user accounts can safely run virtualized applications without requiring a local installation, making it much more appetizing for IT staff concerned about security.

EASE OS AND APPLICATION MIGRATIONS

ThinApp agentless application virtualization eases OS migrations by enabling applications to run side by side on the same operating system. Users can continue with business as usual without disruption from problematic applications. Furthermore, if an application needs to be removed from the endpoint—it is a simple file-remove with no mess left to clean up in the system registry.

LANDesk is OEM-ing the Application Virtualization engine from VMware and has added specific functionality, such as deep integration with LANDesk Client Management Suite, to the solution.

3.8 XENOCODE

Xenocode OS virtualization technology give your users instant access to all of your applications, pre-configured and ready to run. Virtualized applications can be deployed on file shares, intranets, the Internet, portable USB flash drives, or existing infrastructure, including SMS/SCCM, Altiris, LANDesk, ZENWorks and Unicenter.

By isolating applications from the host operating system, Xenocode OS virtualization allows applications to execute on locked-down desktops which are immunized against potential failures due to application collisions, upgrades, or Vista migration.

Xenocode Virtual Application Studio allows IT professionals to virtualize existing applications quickly and easily. Xenocode virtual applications work immediately within your existing infrastructure, with no specialized servers or client installations required. You will begin enjoying the benefits of your virtualization investment via enhanced employee productivity and reduced administrative costs almost immediately

Xenocode is a next-generation virtualization technology that allows applications to be deployed in lightweight, pre-configured, single-executable files that execute instantly on any Windows desktop. The core of Xenocode virtualization technology is the Xenocode Virtual Operating System kernel, a compact implementation of Windows operating system APIs, including the filesystem, registry, process, and threading subsystems, completely implemented within the user mode space. The Xenocode Virtual OS kernel is embedded directly into each virtualized application executable, allowing applications to be executed immediately without any client software, device drivers, or player installations.

Applications executing within the Xenocode Virtual OS environment interact with a virtualized filesystem, registry, and process environment, rather than directly with the host device operating system. The virtualization engine handles requests within the virtualized environment internally or, when appropriate, routes requests to the host device filesystem and registry,

possibly redirecting or overriding requests as determined by the virtual application configuration.

4. APPLICATION VIRTUALIZATION FEATURES

Each application virtualization solution has its own feature-set which is dependant off the version of the virtualization solution. This chapter describes all the features in a very detailed way. This matrix is developed with the following virtualization versions:

4.1 PRODUCT VERSION

Product	Version
Altiris SVS Pro	SVS 2.1 SP2 Streaming System 5.2.2 SP3
Citrix XenApp	5.0; Streaming Profiler 1.3.1
Endeavor Application Jukebox	8.1.4,Enterprise Edition in virtual isolated mode
InstallFree Bridge Suite	1.9.2.6
Microsoft App-V	4.5.0 CU1
VMware ThinApp	4.0.3.3313
Xenocode	Virtual Application Studio 2009 (build 7.0.162)

4.2 FEATURE COMPARE MATRIX

	Application Virtualization solutions and features
Goal:	Detailed description of virtualization features
Requirements:	Hands-on-experience, vendor involvement
Result:	Whitepaper
Method of Execution:	Hands-on experience, read articles, communicate with vendors and discuss with colleagues

Legenda:

✓ = Applicable;

✗ = Not applicable;

↔ = It depends;

= Under development; **Public announced functionality/feature available <6 months**

4.3 FUTURE ADDITIONS

- Novell ZenWork Application Virtualization will be added;
- Altiris SVS 2.1 will be updated to Symantec Workspace Virtualization v6.x;

Category	Functionality	Altiris SVS Pro	Citrix XenApp	Microsoft App-V	VMware ThinApp	InstallFree Bridge	Endeavors	Xenocode	Remarks
Virtualization Characteristics									
	The solution isn't limited to file system en registry redirection only	X	~	✓	✓	✓	✓	✓	<i>This is virtualization 'vs' redirection</i>
	There is no need for application regression testing	X	~	✓	✓	✓	✓	✓	
	Applications will operate without any chance of conflicts	X	~	✓	✓	✓	✓	✓	
	Applications integrates and communicates seamless with the OS	✓	X	X	X	✓	X	X	
Manageability									
	Central management platform for application delivery	✓	✓	✓	X	✓	✓	X	
	The solution is usable in SaaS scenario. SPLA licensing is available, applications are on-demand streamed and delivered as a service, pay per-use.	X	X	✓	X	X	✓	X	
	Application is delivered in a very efficient way, quick up-and running. Stream only data which is needed to start application.	✓	X	✓	✓	✓	✓	✓	
	Application specific license metering, track application usage	✓	X	✓	X	✓	✓	X	
	Application Virtualization Solution license usage metering	✓	✓	~	X	✓	✓	X	
	Role based administration	X	✓	X	X	✓	X	X	
	Application 'rollback'	✓	✓	✓	✓	✓	✓	✓	
	Application upgrade	✓	✓	✓	✓	✓	✓	✓	
	Application upgrade, centrally managed	✓	✓	✓	✓	✓	✓	✓	
	Application upgrade while in use	✓	✓	✓	✓	✓	✓	✓	
	Application upgrade using deltas	✓	✓	✓	✓	✓	✓	✓	
	The Communication between server and client can be secured without additional solutions	✓	✓	✓	~	X	✓	X	

Category	Functionality	Altiris SVS Pro	Citrix XenApp	Microsoft App-V	VMware ThinApp	InstallFree Bridge	Endeavors	Xenocode	Remarks
	Native integration with 2+ Client Management solutions; No difference in manageability, support, deployment scenario's and inventory between installed and virtualized applications.	✓	✗	✓	✓	✗	✗	✓	
	Native integration with Access Gateway A/E edition and Citrix Web Interface	✗	✓	✗	✗	✗	✗	✗	
	Native integration with other vendor solutions	✓	✓	✓	✓	✓	✗	✓	RES, Scense, DVS4SBC, BMC, LANdesk and Quest
	Pre-launch and post-exit scripting	✓	✓	✓	✓	✗	✓	✓	
	Pre-launch and post-exit scripting, centrally managed	✓	✓	✗	✗	✗	✓	✗	
	Determine virtual application pre-requirements	✓	✓	✓	✓	✓	✓	✓	
	Determine virtual application pre-requirements, centrally managed	✓	✓	✗	✗	✗	✓	✗	
	Limit application usage based on AD security groups	✓	✓	✓	✓	✓	✓	✓	
	Limit application usage based on AD computer objects	✗	✗	✗	✗	✓	✓	✓	
	Limit application usage based on AD OU's	✗	✗	✗	✗	✓	✓	✓	
	Machine targeting, centrally managed	✗	✓	✗	✗	✓	✓	✗	
	Machine targeting, application runs dependent of target OS, centrally managed	✓	✓	✓	✗	✗	✓	✗	
	Machine targeting, application runs dependent of target OS/language/service pack, centrally managed	✗	✓	✗	✗	✗	✗	✗	
	Application streaming source can be based on client IP-subnet	✗	✓	✗	✗	✓	✗	✗	
	Application streaming source can be centrally managed	✗	✓	✓	✗	✓	✓	✗	
	Offline application usage can be time limited	✓	✓	✓	~	✓	✓	~	
	File Type Association (FTA) centrally managed	✗	~	✓	✗	✓	✓	✓	
	File Type Association (FTA) locally managed	✓	✗	✓	✓	✓	~	✓	
	Support for protocol handlers; (MAILTO://, FTP://, FILE:// etc.)	✓	✗	✗	✗	✓	✗	✗	
	Manageable by scripting; command-line	✓	✓	✓	✓	✗	✓	✓	
	Manageable by API	✓	✓	✗	✓	~	✓	✓	
	Integration with Add or Remove programs	✓	✗	✓	✓	✓	✗	✓	

Category	Functionality	Altiris SVS Pro	Citrix XenApp	Microsoft App-V	VMware ThinApp	InstallFree Bridge	Endeavors	Xenocode	Remarks
	Group policies can never, from a security point of view, be omitted	✓	✓	✗	✓	✓	✗	✓	
	Roaming user profile support	✗	✓	✓	✓	✓	✓	✓	
Usability									
	Desktop and/or Laptop Online	✓	✓	✓	✓	✓	✓	✓	
	Desktop and/or Laptop Offline	✓	✓	✓	✓	✓	✓	✓	
	Microsoft Terminal Services supported	✗	✓	✓	✓	✓	✓	✓	
	Applications can run anonymous, without authentication with a directory service	✓	✓	✓	✓	✗	✓	✓	
	No Microsoft Active Directory or NT4.0 domain required for management platform (management is key)	✓	✓	✓	✓	✗	✓	✓	
	Usable in a Novell NDS environment	✓	✓	✓	✓	✗	✓	✓	
	Usable in a Novell eDirectory environment	✓	✓	✓	✓	✗	✓	✓	
	Application and user preferences can run from removable storage without installing a client/agent component	✗	✗	✗	✓	✓	✗	✓	
	Application package is portable and can be stored on and imported from removable storage	✓	~	✓	✓	✓	✓	✓	
	Support for EN localized Windows client operating systems	✓	✓	✓	✓	✓	✓	✓	
	Support for EN/DE/FR/ES localized Windows client operating systems	✓	✗	✓	✗	✗	✗	✗	
	Support for JP/Simple Chinese localized Windows client operating systems	✗	✗	✓	✗	✗	✗	✗	
Application Characteristics									
	Compression of virtual application package	✓	✓	✓	✓	✓	✓	✓	
	Dynamic path relocation	✓	✓	✓	✓	✓	✓	✓	
	Possible to package and deliver application with build-in kernel mode drivers	✗	✗	✗	✗	✗	✗	✗	
	Virtualization of applications with user mode services	✓	✗	✓	✓	✓	✓	✓	
	Virtualization of applications with boot time services	✗	✗	✗	✗	✗	✗	✗	
	Application package can be digitally signed	✗	✓	✗	~	✗	✗	✓	
	Files and Registry virtualization	✓	✓	✓	✓	✓	✓	✓	

Category	Functionality	Altiris SVS Pro	Citrix XenApp	Microsoft App-V	VMware ThinApp	InstallFree Bridge	Endeavors	Xenocode	Remarks
	COM virtualization	X	✓	✓	✓	✓	✓	✓	
	COM+ virtualization	X	X	X	X	X	X	X	
	DCOM virtualization	X	X	✓	✓	X	✓	✓	
	Named Pipes isolation	X	✓	✓	X	✓	✓	X	
	Virtualization of fonts on desktops	X	X	✓	✓	✓	✓	✓	
	Virtualization of fonts on terminal server	X	X	✓	✓	✓	✓	✓	
	Communication between different application virtualization environments	✓	✓	✓	✓	✓	X	✓	
	High Performance impact when virtualized applications communicate with each other	#	#	#	#	#	#	#	
	Side by Side(SxS) support for virtualized applications	X	X	✓	✓	✓	✓	✓	
	Run application with elevated privileges(RunAs)	✓	✓	✓	✓	X	✓	✓	
	Compatible with Windows Vista User Account Control	✓	✓	✓	✓	✓	✓	✓	
	Windows long filename support	✓	✓	✓	✓	✓	✓	✓	
	Microsoft .NET framework virtualization	X	X	?	✓	✓	✓	✓	
	Virtual reboot during packaging supported	X	✓	✓	✓	✓	✓	✓	
	Terminal Server drive remapping supported	X	X	✓	✓	✓	✓	✓	
	Windows Dynamic disks support	✓	X	✓	✓	✓	✓	✓	
	Software development kit(SDK) available	✓	✓	X	✓	✓	✓	✓	
	Different versions of Internet Explorer can run simultaneous on the same client platform	X	X	X	✓	✓	X	✓	
	No maximum application package file size limitation	✓	✓	X	✓	✓	✓	✓	
	Win16 application support on x32 platform	X	X	✓	✓	✓	✓	X	
	Win16 application support on x64 platform (Windows limitation)	X	X	X	X	X	X	X	
	Win32 application support on x64 platform	X	✓	#	✓	X	X	✓	
	Win64 application support	X	X	#	X	X	X	X	
	MSI to virtual application package conversion with 3rd party tools	✓	✓	✓	✓	X	X	X	

Category	Functionality	Altiris SVS Pro	Citrix XenApp	Microsoft App-V	VMware ThinApp	InstallFree Bridge	Endeavors	Xenocode	Remarks
	Support for virtual drive letters	X	X	X	✓	X	X	X	
	Support for virtualized internalization & code pages	X	X	X	✓	X	X	✓	
	Support for virtual drive serial numbers	X	X	X	✓	X	X	X	
Architecture									
	Management platform is included	✓	✓	✓	X	✓	✓	X	
	Application delivery using (streaming) HTTP/S protocol	✓	✓	✓	X	✓	✓	X	
	Application updates delivered using (streaming) HTTP/S protocol	✓	✓	✓	✓	✓	✓	X	
	Application delivery using proprietary protocol (RTSP/s)	X	X	✓	X	X	X	X	
	Application delivery using SMB	X	✓	✓	✓	✓	X	✓	
	No need for client/agent installation	X	X	X	✓	✓	X	✓	
	Virtualization with client-code in user-mode	X	X	X	✓	✓	X	✓	
	Virtualization with client code in kernel-mode	✓	✓	✓	X	X	✓	X	
	Original Microsoft Windows API's are used by application	✓	✓	✓	X	X	✓	✓	
	Multiple concurrent client or agent versions on the same platform	X	X	X	✓	✓	X	✓	
	No need for a license service	✓	X	✓	✓	✓	X	✓	
	No need for a file share	✓	✓	✓	✓	X	✓	✓	
	No need for dedicated server	X	✓	~	✓	✓	X	✓	
	MSI wrapper to deploy virtualized applications with ESD	X	X	✓	✓	X	X	✓	
	No need for ESD infrastructure for enterprise wide deployment	✓	✓	✓	X	✓	✓	X	
	Data store can be on: Microsoft SQL	✓	✓	✓	X	X	✓	X	
	Data store can be on: Oracle	✓	✓	X	X	X	X	X	
	Data store can be on: IBM DB2	X	✓	X	X	X	X	X	
	Data store can be on: MySQL	✓	X	X	X	X	✓	X	
	Data store can be on: Other	Altiris: PostgreSQL, App-V-SQL EE							
	Data store is XML based	X	X	X	X	✓	X	X	
	The Application package is not a proprietary format	✓	✓	X	X	X	X	X	

Category	Functionality	Altiris SVS Pro	Citrix XenApp	Microsoft App-V	VMware ThinApp	InstallFree Bridge	Endeavors	Xenocode	Remarks
	Client-side persistent cache	✓	✓	✓	✗	✓	✓	✗	
End user experience									
	Full Windows Explorer context menu integration	✓	✗	✗	✗	✓	✗	✗	
	User driven application repair	✓	✗	✓	✗	✓	✓	✗	
	Self service application provisioning	✓	✗	✗	✗	✓	✓	✗	
	No change in how users make use of applications	✗	✓	✓	✓	✓	✓	✓	
	Performance impact	#	#	#	#	#	#	#	www.virtualrealitycheck.net Q4/2009
	Automatic shortcut and file type association creation centrally managed	✓	✓	✓	✗	✓	✓	✗	
	User settings are preserved between application launches	✓	✓	✓	✓	✓	✓	✓	
	User settings can be redirected and stored on the network	✗	✓	✓	✓	✓	✓	✓	
	User settings can be streamed between user and server	✗	✗	✗	✗	✓	✗	✗	
	Localized client interface available, 4+ languages (EN/DE/FR/ES)	~	~	✓	✓	✗	✗	✗	
	Auto start application at user logon	✗	✗	✗	✗	✓	✗	✗	
	User Self Provisioning portal	✗	✗	✗	✗	✓	✗	✗	
Supported Client Platforms									
	Windows NT 4 – Workstation	✗	✗	✗	✓	✗	✗	✗	
	Windows NT 4 - Terminal Server Edition	✗	✗	✗	✓	✗	✗	✗	
	Windows 2000 - Pro	✓	✓	✗	✓	✗	✗	✓	
	Windows XP - Pro (SP2 and up)	✓	✓	✓	✓	✓	✓	✓	
	Windows XP - Embedded	✗	✗	✗	✓	✓	✓	✓	
	Windows 2000 - Server	✓	✓	✗	✓	✗	✗	✓	
	Windows 2000 - Terminal Services	✓	✓	✗	✓	✗	✗	✓	
	Windows 2003 - Server	✓	✓	✓	✓	✓	✓	✓	
	Windows 2003 - Terminal Services	✓	✓	✓	✓	✓	✓	✓	
	Windows Vista	✓	✓	✓	✓	✓	✓	✓	

Category	Functionality	Altiris SVS Pro	Citrix XenApp	Microsoft App-V	VMware ThinApp	InstallFree Bridge	Endeavors	Xenocode	Remarks
	Windows Server 2008 - Server	✓	✓	✓	✓	✓	X	✓	
	Windows Server 2008 - Terminal Services	X	✓	✓	✓	✓	X	✓	
	Windows Server 2008R2 – Terminal Services	X	X	X	X	X	X	X	
	Windows 7 (RC)	X	X	✓	X	X	X	X	
	MacOS, running Win32 applications on MacOS	X	X	X	~	X	X	X	
	Linux, running Win32 applications on Linux	X	X	X	~	X	X	X	
Licensing Model of Solution									
	Concurrent	✓	✓	X	✓	X	✓	✓	
	Device	✓	✓	✓	✓	X	✓	✓	
	Unlimited	✓	X	✓	✓	✓	✓	✓	
	Per named user	X	✓	✓	✓	✓	✓	✓	
	Free for personal usage (FFPU)	X	X	X	X	X	✓	X	Altiris SVS (only) has FFPU license; Endeavors Jukebox Lite
Solution in general									
	Proven technology, the solution is being used for 2+ years in enterprise production environments. Packaged 1000+ different apps, various deployment scenarios	~	~	✓	~	X	X	X	
	Variety (10+) of public available enterprise references in Europe	✓	✓	✓	✓	X	X	X	
	Variety (10+) of public available enterprise references in US	✓	✓	✓	✓	X	X	X	
	Very low learning curve	X	X	X	✓	✓	X	✓	
	Very quick up and running	X	X	X	✓	✓	X	✓	

Category	Functionality	Altiris SVS Pro	Citrix XenApp	Microsoft App-V	VMware ThinApp	InstallFree Bridge	Endeavors	Xenocode	Remarks
	Time needed for packaging OpenOffice, compression and package	#	#	#	#	#	#	#	
	Time needed for packaging OpenOffice, NO compression used and package	#	#	#	#	#	#	#	
	Time to load initial instance of OpenOffice	#	#	#	#	#	#	#	
	Difficulty for packaging an application, "the art of packaging"	✓	✓	✗	✓	✓	✓	✓	
	Doesn't require a clean OS during packaging process	✗	✗	✗	✗	✓	✗	✗	
	Possibility of creating a High Available platform; additional services needed	✓	✓	✓	✓	✓	✓	✓	
	Load Balancing is part of the solution	✗	✗	✗	✗	✗	✓	✗	
	Official application virtualization training classes available	✗	✓	✓	✓	✗	✓	✓	
	Official Certification program, VUE or Prometric	✗	✓	✓	✗	✗	✗	✗	
	Large community resource	✓	✓	✓	?	✗	✗	?	

4.4 PRICE

Price is end-user list price based in Euro's (November 2008) excl. support

Solution	Price/user
Altiris SVS Pro	
Altiris SVS for DT clients basic (per endpoint)	32.40
Altiris SVS for Terminal Servers Basic	27.75
Altiris SVS Professional for DT clients Basic (per endpoint)	41.78
Altiris Pro SVS for Terminal Servers Basic	29.55
Citrix	
Citrix XenApp Enterprise Edition, minimum of 5 users are needed	445.50
Citrix Application Streaming for Desktops (concurrent user)	60.00
Endeavors	
Endeavors Application Jukebox (named user)	25
InstallFree	
InstallFree Mini Bridge, 100-500 users	41.67
InstallFree Bridge, 100-500 users	83.33
Microsoft	
Microsoft App-V Client Access License for Terminal Server OPEN	18.95
Microsoft App-V Client Access License for Terminal Server OPEN + SA	28.00
Microsoft App-V Client for Desktops (part of MDOP)	11.45
Microsoft App-V Client Access License for Terminal OPEN VALUE	10.75
VMware	
VMware ThinApp Suite, once per customer includes 50 clients	4.583,33
VMware ThinApp Client License (based on endpoints)	35.75
VMware ThinApp Client License (for TS based on concurrent usage)	35.75
Xenocode	
Xenocode Studio 2009	40



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