To Virtualise Applications or not that was the Question

Comparison of SoftGrid Altiris SVS and Citrix Streaming Server

Application virtualisation is becoming increasingly popular, and the number of solutions for it is on the increase. Ruben Spruijt, a Sr. Consultant for PQR, has embraced it with great enthusiasm, and he is of the opinion that it is the perfect method for making applications available. In this article he would like to share his enthusiasm with you, and show which solutions are available, how they differ from each other, what they need, and how to make the right choice.

Ruben Spruijt

What is Application Virtualisation?

By using application virtualisation, you can use Windows applications without having to change anything in the local operating system, let alone install application software at the workstation. In other words: the application is executed, stores data and prints as if it has been installed locally, without having to modify the local client. Sources such as the CPU, memory, hard disks, and network cards are used for the execution of the application.

Why application virtualisation?

- Applications will no longer have to be installed on the clients
- Conflicts between applications are a thing of the past
- It eliminates the need for regression testing
- It is possible to use different versions of applications simultaneously
- Support for Web, Client-Server and Server Based Computing applications
- Consolidation of Terminal Servers, more different applications possible
- Fast roll-out and upgrade of applications

Each application virtualisation solution will try to realise what has been mentioned above in a different way. To be able to choose the right solution it is necessary to have an in-depth knowledge of it.

There are three developers of serious application virtualisation software that are already supplying this software or will be supplying it in the near future:

- Citrix Streaming Server (a.k.a. project Tarpon)
- Altiris Software Virtualization Solution (SVS)
- Microsoft Softricity (SoftGrid and ZeroTouch)

For each solution, the article will clearly explain:

- The essence of the solution
- Applicability
- Architecture
- Strong and weak points
- Licensing

Microsoft Softricity

Softricity was taken over by Microsoft on 17th July 2006, which gives Microsoft a boost on the application virtualisation market. Especially after the releases of Windows Vista and Office 2007, SoftGrid will start playing an important part, since, amongst other things, application migration to Vista will be simplified when using SoftGrid.

Microsoft Softricity contains two solutions: SoftGrid and ZeroTouch.
SoftGrid is the “engine” and takes care of application virtualisation, on-demand delivery, centralised policy-based application management and software license metering.
ZeroTouch is the “front-end” and offers location-independent access to applications, self-service IT with which the end user can arrange access to applications independently via a workflow, reports about software use, and application deployment through intelligent policies.
SoftGrid is most similar to the other two solutions, and therefore ZeroTouch will not be included in the comparison.

SoftGrid can be applied to desktops, laptops and terminal servers. Microsoft Active Directory Service (ADS) ensures that the SoftGrid infrastructure services can function and that authentication for application access is possible.

SoftGrid can be applied in a Novell environment, although there is no direct Novell NDS integration, which means SoftGrid applications cannot be linked to NDS user groups. In this configuration, ADS is still necessary for the SoftGrid infrastructure services.

Architecture

Sequencer

An application is prepared (once) with the SoftGrid Sequencer. First of all, the Sequencer creates the SystemGuard environment for the application. It registers all interactions between the application and the operating system using "Active Watch". It also builds up the application by registering the system settings, DLLs, ini files and other system parts used by the application. The Sequencer then organises the application start-up codes so they can be sent to the clients on request. The application codes that not needed for starting the application are put into a separate folder, ready for the moment they are needed. Lastly, the application is placed on the SoftGrid VAS server, ready for distribution.

Virtual Application Server

At user login, the SoftGrid client communicates with the SoftGrid Virtual Application Server (VAS) to obtain the applications. When a user wishes to start an application, a check is made to see if the user is authorised to start the application and whether a valid license is available.
The first time a user starts an application, the software checks whether the application code is present in the client cache, and if this is not the case, the VAS server will stream the application code to the user using the Real Time Streaming Protocol (RTSP, TCP554).
When around 20 to 40 percent of the application code has been supplied, the application will start up. When the user needs more application functionality, it will be automatically streamed to the user. The SoftGrid client includes the possibility to use file type association or to show the applications, including their icons, on the desktop or in the start menu.

SystemGuard

When the application is executed on the client, the software checks whether it has been installed locally. The application has not actually been installed, but runs within the SystemGuard, a virtual layer that protects the operating system against modifications by applications and ensures that applications can be executed on a random computer without needing installation or configuration. Each application has its own configuration within SystemGuard, independent from the configuration of the default computer. The application's user settings are stored separately for each application. The default location is the user profile, but this can be modified, so the data is stored in the user's home directory.
Using SystemGuard, applications can be executed next to each other without conflicts. The streamed or imported application code will be stored locally in a cache file for reuse, which saves network bandwidth. Applications saved locally in the cache will start up immediately.

SoftGrid Clients

SoftGrid for desktops makes it possible to centrally manage and roll out applications to desktops and laptops. The client can be installed on Windows 2000, Windows XP-Pro and Windows Server 2003. The SoftGrid client for Terminal Servers enables applications to use a Terminal Server environment via SoftGrid.

SoftGrid Datastore

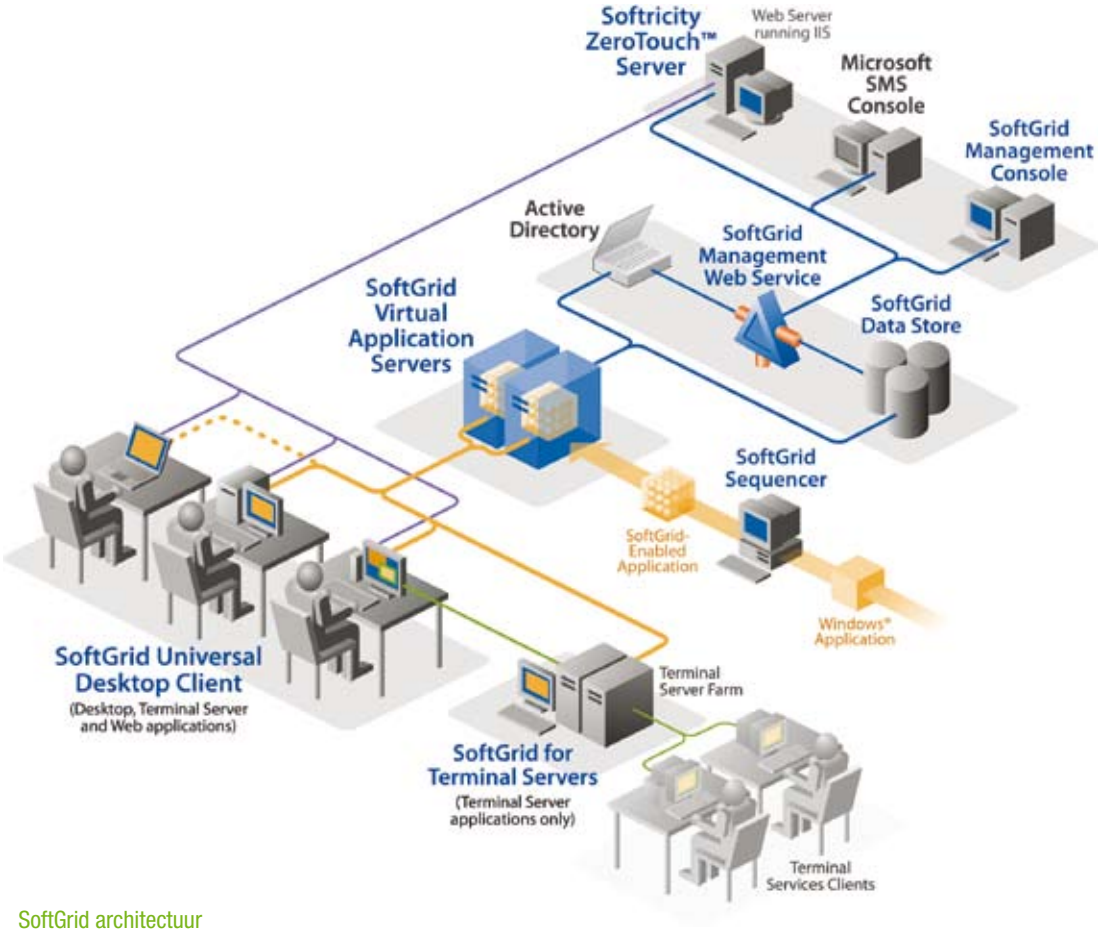
The SoftGrid Datastore stores specific settings such as provider policies, server groups, the server configuration and account authority configurations. It must be installed on Microsoft SQL 2000/2005, because currently no other databases are supported.

Advantages and Disadvantages of SoftGrid

Advantages

- Applications no longer need to be installed on desktops, laptops or terminal servers
- Application conflicts are a thing of the past
- A reduction in the need for regression testing
- It is possible to use different versions of applications simultaneously
- Centralised administration: applications are offered to the end user transparently as a service

Application Virtualisation



SoftGrid architectuur

- Real-time centralised administration of application licenses
- Support for Web, Client-Server and Server Based Computing
- Makes non-multi-user applications suitable for use within a Server Based Computing solution
- Sequencer supports “DLL rebasing” which means the internal memory is used more efficiently.
- Consolidation of Terminal Servers, making server silos redundant
- Quick roll-out, rollback and upgrade of applications
- Applications are made available to desktops, laptops and terminal servers from one deployment platform
- Sequencer uses “Active Watch”, which ensures that only the application code needed is transferred. As a result, applications will start up more quickly for the user
- Low overhead (~2%) of SystemGuard on client
- Only one application package needed
- Integration with Microsoft SMS2003 (SoftGrid for SMS2003);
- Virtualised applications are portable and can (usually) be used on desktops laptops and terminal server environments
- Self-service application provisioning and intelligent dynamic application access (ZeroTouch)
- Proven technology, many references in various national and international sectors

Disadvantages

- Applications that need the installation of drivers, such as anti virus programs, IPSec VPN clients or printer drivers cannot be virtualised.
- Applications that are directly incorporated into the operating system, such as Internet Explorer and Windows Media Player, cannot be virtualised. IE plug-ins, however, can be virtualised.

- Applications needing product activation that use hardware characteristics cannot be virtualised. When the application is started on another machine, the hardware characteristics will have been changed.
- Applications using advanced functionality such as COM, DCOM or DDE (enabling components to communicate) must be sequenced together, or parts of it must be made available in the source OS.
- SoftGrid can only be used when Software Assurance for Windows XP is available.

Licensing

The take-over of Softricity by Microsoft has directly resulted in a reduction of the license costs and changes in the license model.
There are two license types:

- **SoftGrid Desktop Licence** - From January 1st SoftGrid Desktop Client Access Licenses can only be sold within the Microsoft Desktop Optimization Pack (MS DOP). This is only possible when the customer has a Microsoft Software Assurance contract, e.g. Open Value, Select, Enterprise Agreement. The cost per year per user for MS DOP is $ 11,00. The contractperiod is 3 years. For customers that don't have a Software Assurance contract, they first need to purchase Microsoft SA for their Desktop environment.
- **SoftGrid Call for Terminal Services** - this license costs 17 Euros(only once) per named device user. This used to be 112 Euros per concurrent user (a reduction of 85%).

Use of ZeroTouch or SoftGrid for SMS2003 is included in the SoftGrid license.

Citrix Streaming Server

Citrix Streaming Server has been made available to a small number of Citrix Partners through an early adaptor program. This means that the documentation, technology or functionality may change before the product is actually available! Once the Citrix Streaming Server has been released, an in-depth article about it will be published.

Citrix's vision is to make web, desktop and Presentation Server applications available in a simple, safe and cost-effective way. Application virtualisation, or streaming technology, as Citrix calls it, make applications available on desktops and laptops in an isolated environment. Streaming technology is used in two Citrix solutions: the enterprise version of Citrix Presentation Server v4.5 (code name Ohio) and in Citrix Streaming Server. This article focuses on Citrix Streaming Server, since no public information is available for "Ohio".

Streaming Server can be applied to both desktops and laptops. Amongst other things, Microsoft Active Directory Service (ADS) is needed to support authentication for application access. For certain reasons, using Streaming Server in a Novell infrastructure is not (yet) recommended. Microsoft File Replication Service (FRS) and Distributed File System (DFS) can easily be used for making application profile shares available.

Architecture

Streaming Profiler

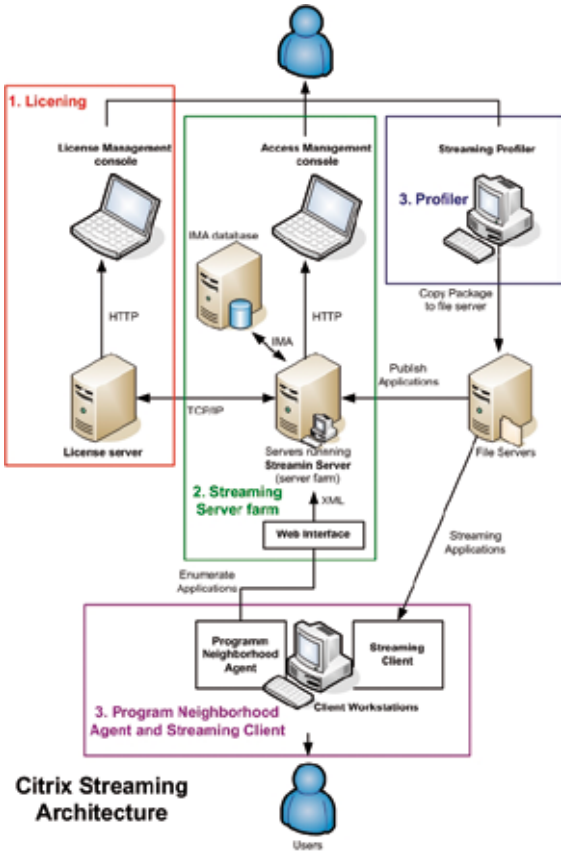
The profiler is a program that prepares (Windows) applications, web applications, browser plug-ins, files, folders and registry settings for streaming. Software applications prepared like this are called "profiles". Profiles are made by executing the application, or other modifications, on a work station on which the profiler is installed. The profiler knows which files and configurations have been changed using "snapshot" technology, and saves these as a package. The package consists of a number of specific files. When the user uses the application, the files are "streamed" to the workstation and saved locally (to improve performance, for instance).
It is possible to use the profiler to meet certain workstation requirements. These requirements could be Operating System, language, Service Pack level, or drive letter. Depending on the requirements, specific applications can be made available to specific users.

Licensing

License management of the Citrix Access Suite components, such as Streaming Server, is realised by the Citrix license server, which is managed by the License Management Console. In a Citrix Streaming Server environment it is possible to use named or concurrent user licenses. Users

who only work with streaming applications online need a concurrent user license. Users who can use the streaming applications offline need a named user license. It is possible to centrally set a license time-out period and to ensure that an application can work offline for a certain number or days (2-365 days).
The price of Citrix Streaming Server is currently unknown. The software will probably become available in the first half of 2007. Customers who are using the Enterprise Edition of Presentation Server and have a valid Software Assurance agreement can use Streaming Server for there Presentation Server environment.

Clients
With the *Program Neighborhood Agent* (PNA) the streaming applications are fully integrated into the user environment, and can also be used offline.
The *Webclient* makes it possible to use streaming applications displayed through the Web Interface. When a user executes an application made available by the PNA or the Web Interface, the *streaming server* will find the correct application profile on the file server and create an "isolation environment" on the workstation. The application is then streamed to the workstation from the file server. Application files are cached on the workstations. The various clients can be used on Windows 2000 and XP Professional.



Citrix Streaming Server architectuur

Advantages and Disadvantages of Citrix Streaming Server

Advantages

- Applications no longer need to be installed on desktops and laptops
- It is possible to use different versions of applications simultaneously
- Centralised administration: applications are offered to the end user transparently as a service
- Support for Web and Client-Server applications
- Quick roll-out, rollback and upgrade of applications
- Applications are made available to desktops and laptops from one deployment platform
- Concurrent user license model for online application use
- Good integration with Citrix Access Gateway Advanced Edition, enabling the realisation of finely controlled access to Streaming applications
- Good integration with other Citrix solutions, meaning the administration of Streaming Server and other Citrix solutions can be centralised
- Profiles can be signed digitally
- Handy wizards with which it becomes easy to virtualise single applications, multiple applications, IE plug-ins, files, folders and registry settings
- Pre-launch and post-exit script for a profile can be configured centrally
- For existing Citrix Presentation Server users, Citrix has a lower TCO due to the overlap with the existing Citrix Access Infrastructure
- Interaction between virtual applications possible
- When Citrix Presentation Server 4.5 has been released, one infrastructure is created in which Desktops, Laptops and Terminal Servers can use Streaming Technology; it is expected that the profiles will be portable between both solutions

Disadvantages

- No application virtualisation but isolation, filter driver takes care of redirection
- Application conflicts can still occur, COM/DCOM and named pipes components are not isolated
- Regression tests still necessary
- Applications for which drivers need to be installed, such as anti virus programs, IPSec VPN clients or printer drivers cannot be virtualised
- Applications that include the installation of a service cannot be virtualised
- Applications that are directly incorporated into the operating system, such as Internet Explorer and Windows Media Player, cannot be virtualised. IE plug-ins, however, can be virtualised.
- Applications needing product activation that use hardware characteristics cannot be virtualised. When the application is started on another machine, the hardware characteristics will have been changed.
- No integration with other Management solutions such as Microsoft SMS or Altiris Deployment Solution
- Self-service application provisioning and intelligent application access not present
- No application license metering
- Not proven technology (yet): still in Early Adaptor Program!

Altiris SVS

With Altiris Software Virtualization Solution (SVS) it becomes faster and easier to make applications available on desktops, and it also becomes easier to manage them. SVS offers a new way to use software. Because applications and data are placed in blocks (Virtual Software Packages (VSP)), it is easier to activate, reset or deactivate them.

Applicability

Altiris SVS offers support for desktops and laptops. The use of SVS in a Terminal Server environment is not supported. SVS does not need a Directory Service or database, and can be applied to all environments in which laptops or desktops use Windows 2000/XP/2003.

Architecture

The SVS installation consists of an agent (1.8 MB) and an administrator console. During the agent installation, a filter driver (150 kB) is installed, which redirects calls to the file system. The calls are redirected to the SVS cache file, which becomes an “overlay” on top of the file system. According to Altiris, the overhead of the driver is 3%, and not noticeable when using the applications.

The SVS agent must be installed to be able to use virtual applications. The console can be selected and installed during the agent installation. Selecting a “New Layer” in the SVS Admin console creates a new virtual application.

- Layers are visible to the system and the user as soon as they are activated
- For the user, there is no visible difference between a layer or normally installed software
- Because all application code is stored in the layer, the Host OS does not need to be modified
- Integration with the OS is present (context menus, Start Menu etc.) due to the fact that virtual application code can also be “seen” by the OS

A layer can contain one or more applications or data and consists of a Read-Only and a Read-Write sub-layer. The console surrounds the application set-up, including registry settings and application files and saves these to the Read-Only sub-layer in the redirection area. The redirection area is a separate folder (\fslrdr) on the workstation, in which the application or data files are stored. User modifications to each application are stored in this folder. During a reset of the application, the contents of this sub-layer are removed. Settings or files that are created while the application is used will be deleted. Folders or certain file types can be “excluded” during the creation of the package, so that this information does not get lost when an application is reset. The capture of the application can be exported to a Virtual Software Archive (VSA) file, which can be distributed to the workstation and imported and activated via the admin console or command line. When the application is activated, a shortcut is added to the desktop, the start menu or the context menu.

Advantages and Disadvantages of Altiris SVS

Advantages

- Applications no longer need to be installed on desktops and laptops
- It is possible to use different versions of applications simultaneously
- Support for Web and Client-Server applications
- Quick roll-out and rollback of applications
- SVS can be made operational in no time
- Integration with Altiris portfolio, license metering, inventory and application use reporting. Additional costs necessary
- Wise Package Studio (WPS) can easily prepare MSI for SVS
- WPS can take care of conflict management for SVS
- Private use of SVS is free
- Active community

Disadvantages

- No application virtualisation, filter driver takes care of file redirection and registry
- Application conflicts can still occur
- Regression tests may be necessary
- No Terminal Server support
- No roaming profile support
- No easy package upgrade
- Application security based on domain users/groups is not available
- Applications not available on demand, because there is no built-in deployment solution
- No built-in application license metering
- Applications for which drivers need to be installed, such as anti virus programs, IPSec VPN clients or printer drivers cannot be virtualised
- Applications that are directly incorporated into the operating system, such as Internet Explorer and Windows Media Player, cannot be virtualised. IE plug-ins, however, can be virtualised.
- Applications needing product activation that use hardware characteristics cannot be virtualised. When the application is started on another machine, the hardware characteristics will have been changed.
- SVS only virtualises the file system and registry. Applications using named pipes, COM and DCOM cannot function simultaneously
- No self-service application provisioning and intelligent application access
- Not proven technology, few active references in The Netherlands (which is only a matter of time)

Licensing

Altiris SVS for business use costs 32 Euros per managed device. Volume licensing is possible depending on the organisation. Private use of Altiris SVS is free, which means it is easy to start working with SVS!

Links

In addition to the corporate websites on which one can find information and download it, there are other sources that may help give an idea of the various solutions.

- (Freeware) application downloads, forum, knowledge sharing for Altiris SVS.
  http://www.svsdownloads.com and
  https://www.svsdownloads.nl
- Altiris Community
  www.altiris.com/juice
- Softricity Community.
  http://www.SoftGridguru.com
- (Freeware) application downloads for SoftGrid
  http://www.sftdownloads.com
- "To Install or not to Install" is an article written by Douglas Brown. The article describes the advantages and disadvantages of ESD and application virtualisation.
  http://www.dabcc.com/downloadfile.aspx?id=152
- Virtuall is PQR's solutions showcase in which the visitor him/herself can work in a live environment with application virtualisation solutions. "..Seeing is believing.."
  http://www.virtuall.nl

And Finally

We hope we have made it clear that there are various good application virtualisation solutions. There is currently a lot going on in this market, and Altiris SVS and Microsoft SoftGrid will introduce new versions in the near future. The fact remains, that it is very important to know exactly what certain applications do, ensuring the right choice is made to suit the application availability requirements of the organisation.

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