



# Accelerating Microsoft Windows Vista migrations with Citrix XenApp



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## Introduction

For many organisations, migration to Microsoft® Windows Vista® is not a question of “if” but “when.” This inevitability is causing companies to start asking the difficult questions, such as: When will our mission-critical applications support Vista? When will enough PCs be upgraded to meet system requirements? When can we complete regression testing and workarounds for any uncovered compatibility issues? Where can we get the budget and IT cycles to make all of this happen?

What if there were ways to circumvent these Vista migration challenges? What if the same applications in use today could be delivered to users on Vista machines – without requiring native Vista support? What if clients that did not meet the system requirements for the Microsoft® Office 2007 system could access all the newest applications anyway? What if DLL conflicts and other compatibility challenges became non-issues? Migration would be much faster, easier, and more affordable.

Recent developments in the application virtualisation capabilities of Citrix XenApp™ (the new name for Citrix Presentation Server™) can be leveraged to accelerate adoption of Windows Vista.

This white paper describes how XenApp can help companies simplify and accelerate their migration to Windows Vista by delivering both older legacy applications that are not Vista compatible, as well as newer applications being introduced with the Vista rollout, such as the Office 2007 system. This paper explains how XenApp can benefit both sets of applications to ensure that Vista deployments are as fast, cost-effective and painless to the company and end users as possible. It explores the new features of XenApp, which enable applications to be delivered to end users for both online and offline use. Additionally, this paper discusses how XenApp applications integrate with the Windows® desktop to allow users to move seamlessly among applications that are locally installed, running on XenApp server farms and virtualised on client devices.

## Separating the applications from the operating system

XenApp is an end-to-end application delivery system that provides application virtualisation for both servers and client devices to enable the best access experience for any user, with any device, working over any network.

### Server-side application virtualisation

With server-side application virtualisation, Windows applications run on a server in the data centre and the user interface is virtually delivered to the end user by passing only screen pixels, keystrokes and mouse actions between the client and server over the network. XenApp enhances and extends Microsoft® Terminal Services with features, benefits and value in the following key areas: application compatibility, end-user experience, manageability, scalability, security, and connectivity. XenApp application virtualisation technology results in lower bandwidth use and faster application performance. Since the application is not installed or executed on the endpoint device, you gain broad compatibility with client devices, networks, and operating systems, as well as eliminating the headaches of application compatibility and lockdown on the endpoint. Consequently, there is no dependence on the local operating system or device drivers, and hardware requirements are minimal.

### Client-side application virtualisation

Citrix recognises there are times when users require applications to execute locally on the workstation, such as when they are disconnected from the network. New client-side application virtualisation capabilities extend the value of XenApp to applications running on desktops and laptops. Applications are cached locally in an "isolation environment," rather than installed on the device. This eliminates application conflicts and the need for extensive regression testing. Users get all the flexibility they require and IT administrators get all the benefits of centralised application management that they have come to expect from XenApp.

In short, client-side application virtualisation enables IT to:

- Eliminate application conflicts and operating system instability resulting from desktop application installation
- Reduce the costs associated with regression testing, deployment, maintenance, updates, and de-provisioning for applications being run locally on users' machines
- Enable IT to offer applications as an on-demand service
- Lower application 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

### Dual-mode application virtualisation

XenApp combines application virtualisation for both the server side and client side, giving IT the flexibility to dynamically define how to deliver applications under various scenarios. Understanding that user needs change depending on the application, the device or the network, XenApp offers a policy-based virtual fall-back for client-side applications. This feature enables applications to be streamed to the workstation and run in isolation by default, but to automatically fall back to server-side virtualisation when certain conditions exist, such as unavailability of the client, IP address or workstation operating system. With dual-mode application virtualisation, users receive the best application experience, no matter the circumstances.

## Accelerating migrations with XenApp

Organisations are already considering their strategy for upgrading their desktop PCs to Windows Vista. Upgrading to a new operating system is a complex project that entails many steps, from evaluating computer hardware to re-certifying applications for the new platform. Gartner states that:

“The initial issues companies will face in migrating to Windows Vista will be compatibility testing between the application and the operating system and issues of vendor support of their applications on Windows Vista. We think a good deal of the 18 months before companies begin mainstream deployment of Windows Vista will be spent waiting for vendors to fix compatibility issues between their applications and Windows Vista and develop official support policies.”<sup>1</sup>”

Instead of waiting up to 18 months or more for software vendors to certify their applications on Windows Vista, companies can leverage XenApp virtual application delivery to move to Vista today. This approach dramatically simplifies the process and speeds up the migration of applications to the new platform, while improving user experience. There are different strategies for using XenApp to achieve migration. The solutions can help with both incompatible applications and newly deployed applications that need to be available to all users during the migration.

### Migration strategies

Organisations typically migrate to a new operating system (OS) either all at once or in stages coinciding with hardware refresh cycles. Migrating all at once can require a substantial up-front investment of personnel and budget, and can increase strain on IT staff as users abruptly change to new applications. The upside of this approach is that the overall transition is shorter.

For a simultaneous migration, application virtualisation can deliver applications that do not yet support Windows Vista, allowing the migration to happen sooner. Old and new applications, whether they are running locally or on a server farm, can be offered concurrently to help smooth user transition.

Organisations that migrate in planned phases face different opportunities and challenges. For example, gradual migration can maximise the value of older client systems before retirement, and can help reduce budget spikes. However, it can also create delays when a large fraction of users have migrated to Windows Vista. Supporting multiple versions of the same applications across multiple operating systems can also become a problem.

For gradual migrations, application virtualisation can deliver new applications to old clients and old applications to new clients. This flexibility allows users to migrate applications at their own pace, independent of the OS on the client. Application virtualisation for both servers and clients helps maximise business continuity.

### Vista-incompatible applications

As application compatibility is one the most important challenges faced by organisations when deploying a new operating system, Microsoft has taken steps to ensure that applications will run correctly on Windows Vista. Three of the tools that Microsoft offers to assist customers are:

- The “Windows Vista Program Compatibility Assistant”, which enables Vista to detect applications that need to run in compatibility mode for Windows XP
- The “Microsoft’s Application Compatibility Toolkit V5”, which assists customers in understanding the scope of the application environment, identifying applications that will need enhancements and fixing those applications
- The Business Desktop Deployment (BDD 2007) toolset, which delivers end-to-end guidance for efficient planning, building, testing, and deployment of Windows Vista and Microsoft Office, including planning and testing for application compatibility

While these tools can help, there are still many applications that will need to be updated to run natively on Windows Vista. Microsoft has identified a number of changes in Vista that are known to cause application compatibility issues:

- User Account Control – Applications will need to support new standard user permissions.
- Windows Resource Protection of system files and protected registry locations – Applications that persist in protected areas will need to be modified.
- Internet Explorer® executes with lower rights, typically not allowing access to the machine’s files.
- 64-bit Windows Vista – 16-bit applications and 32-bit drivers will not be supported in the Windows Vista 64-bit environment.

<sup>1</sup> “Windows Vista: What’s Next: Will Application Virtualisation Technologies Accelerate Windows Vista Deployment?”, <http://vista.blog.gartner.com/blog/index.php?itemid=899>

<sup>2</sup> “The Windows Vista Developer Story: Application Compatibility Cookbook”, <http://msdn2.microsoft.com/en-us/library/aa480152.aspx>

- New system application programming interfaces (APIs) expose the layers of the Windows Vista operating system to anti-virus software and firewall manipulation. Applications that perform these functions will need appropriate modifications using the new system APIs.<sup>2</sup>

XenApp allows applications that are not compatible with Windows Vista to work in a Vista environment, either through the Citrix® ICA® client or by streaming them to a local client. Even 32-bit applications can run in a 64-bit Vista environment on XenApp. Organisations can continue to run their critical line-of-business applications and limit the disruption caused by the migration. This keeps their new PCs free of misbehaving applications and enables them to save time and resources by avoiding the need to create workarounds for problem applications.

Once a new version of the application is available or an alternate Vista-compatible application is chosen, a company can either install that application on their Vista desktops or virtualise it on the server side or client side with XenApp. Many organisations will want to continue to deliver their applications via XenApp to provide access from a multitude of devices and locations. Once the new application is available to all users, the old version delivered via XenApp can be immediately retired without having to make any changes to the Vista desktops. This not only saves time by not having to uninstall the application from the local workstation, it also enables a company to have control over the application's availability and ensures that all users are running on the correct version of the application at all times.

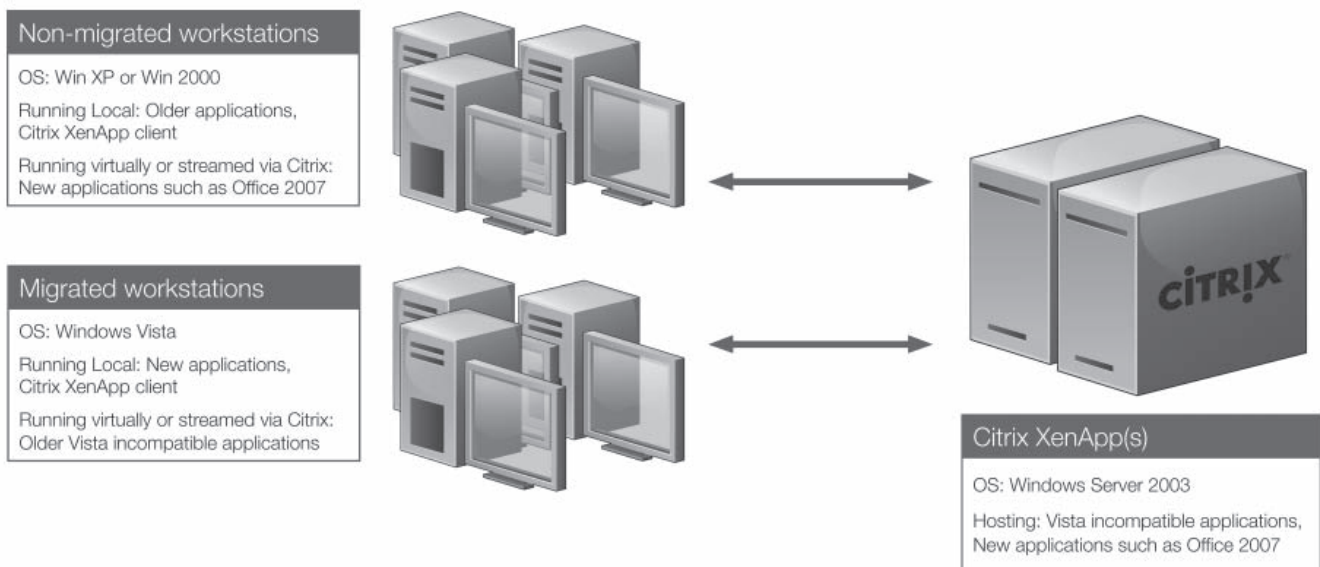
### New and upgraded applications

Most companies take the opportunity during a Windows upgrade to evaluate and upgrade many of their applications, including Microsoft Office. As Microsoft has introduced new file formats with their release of the 2007 Microsoft Office system, it is vital that all users run the same version of Microsoft Office so that they can continue to collaborate and share information effectively. By leveraging XenApp to make the 2007 Microsoft Office system instantly and unilaterally available to the organisation, users experience less disruption as IT goes about locally updating machines with the new versions of Windows and Office. It also eliminates the urgent need to deploy the Microsoft Office 2007 Compatibility Pack to non-migrated desktops. As with Microsoft Office, any application a company is planning to upgrade during the migration can be made available to non-migrated users via application virtualisation to enable everyone to benefit from new applications immediately.

Delivering new applications via XenApp can also be beneficial for applications that require all users to be on the same version, such as applications that connect to a back-end database. Instead of installing the old version onto Vista and waiting for all users to be migrated prior to upgrading the application, the application can be upgraded immediately and made available to all users via server-side or client-side virtualisation. As an added benefit, when applications are delivered virtually, remote users will most likely find that they run faster because the XenApp servers hosting the applications are located on the same high-speed data centre network as the back-end databases, and no data has to traverse the LAN, WAN or Internet.

The figure below illustrates a typical deployment scenario utilising XenApp.

### Migration from XP to Vista using Citrix XenApp



## Delivering applications with XenApp

There are two options for delivering Vista applications with XenApp: Server-side Application Virtualisation and Client-side Application Virtualisation.

### Server-side application virtualisation

Deployment of a virtual application on XenApp consists of simply installing the application onto one or more Windows servers running both Terminal Services and XenApp. From the Access Management Console, you then “publish” the application to the group of users authorised to access the application, which makes it instantly available.

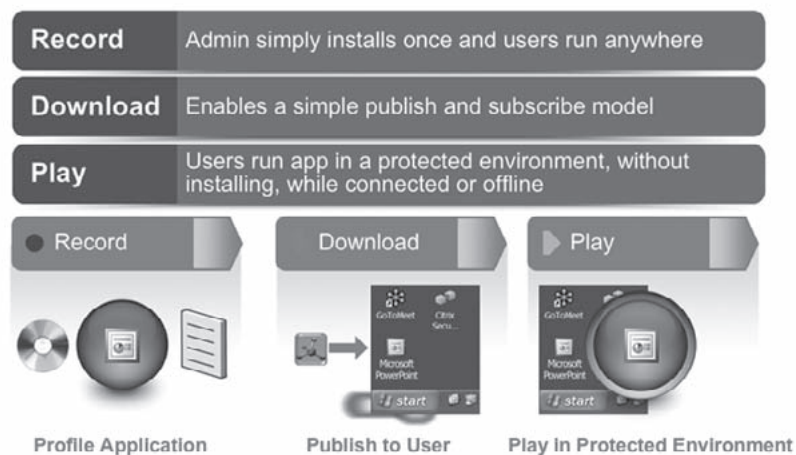
To access the application, users need to establish a connection using the Citrix ICA protocol, which can be achieved with either a lightweight Citrix Program Neighborhood Agent client (which provides a fully integrated desktop experience) or Web Interface (which pushes the XenApp Web client on connection and provides access from practically any scenario). Users who access their virtualised applications using the

Program Neighborhood Agent client will immediately see new applications alongside their other published and local applications under the Start menu. Those who get their applications via Web Interface for XenApp will see it appear in the list of applications the next time they authenticate to the secure site. Retiring an application is as fast and simple as disabling users’ access to the application within the Access Management Console.

### Client-side application virtualisation

Just like streaming and downloading music from iTunes, client-side application virtualisation delivers applications to a client device for use whenever and wherever users want – even when they are not connected to a network.

Preparing an application to be virtualised on a Vista client involves three steps: profiling the application (Record), publishing the application to users (Download), and playing the application in a protected, isolated environment on the user’s workstation (Play), as illustrated in the following diagram.

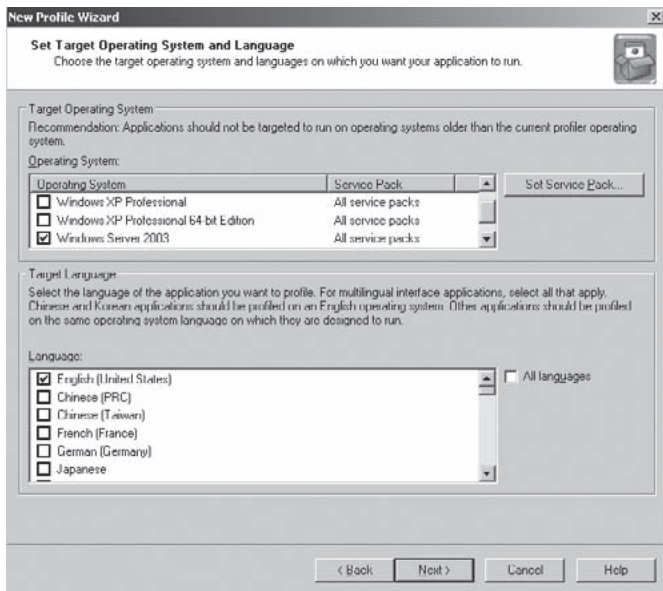


## Record

Applications are packaged using the Profiler, a standalone utility, which determines the components and the system resources the application requires and then defines a set of rules for running the application in isolation on the endpoint device. The resulting package is a standard cabinet (.CAB) file that is transparent and is easy to work with and debug.

To profile an application, simply install the Profiler on a clean system (no installed applications or files left behind from uninstalled applications) that matches the operating system of your users. Then use the wizard to step through the application installation for the application.

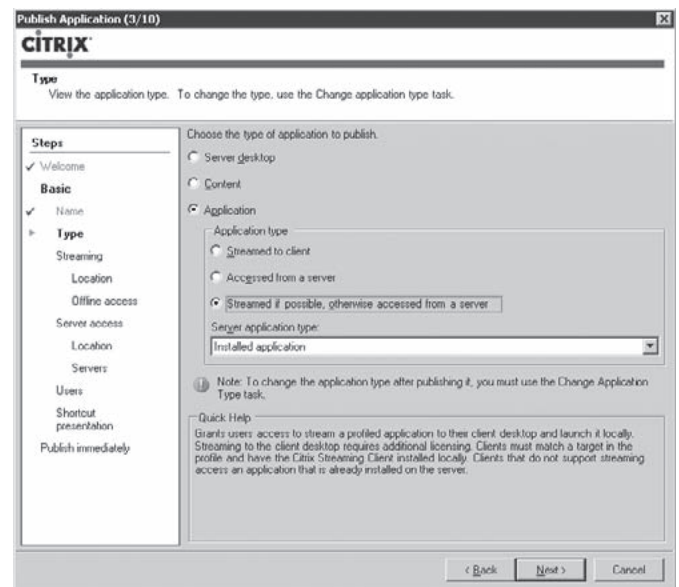
Once the application installation has been run within the Profiler, you are prompted to select the target operating systems, service packs, and languages for the users, as shown below.



Once the wizard finishes, the profile is saved to a file share that the users can access.

## Download

The next step is to publish the application. This is done within the Access Management Console in the same manner as you would an application virtualised on the server side. When publishing the application, simply select the application type as "Streamed to client." Next, enter the file share location where the profile is stored. Finally, select the users who should have access to the application. Alternatively, to enable dual-mode application virtualisation, select the delivery type as "Streamed if possible, otherwise accessed from the server." as shown in the following figure.



This selection enables policy-based logic to determine the best method of application delivery. For instance, applications can be virtualised on the server for users connecting remotely, but virtualised on the client for users who need to work disconnected from the LAN.

Once the application is published to users running the Citrix Program Neighborhood Agent client on their workstation, the application will instantly appear under their Start menu. Alternatively, if users access their Citrix applications from Web Interface, the new application will appear the next time they authenticate to Web Interface.

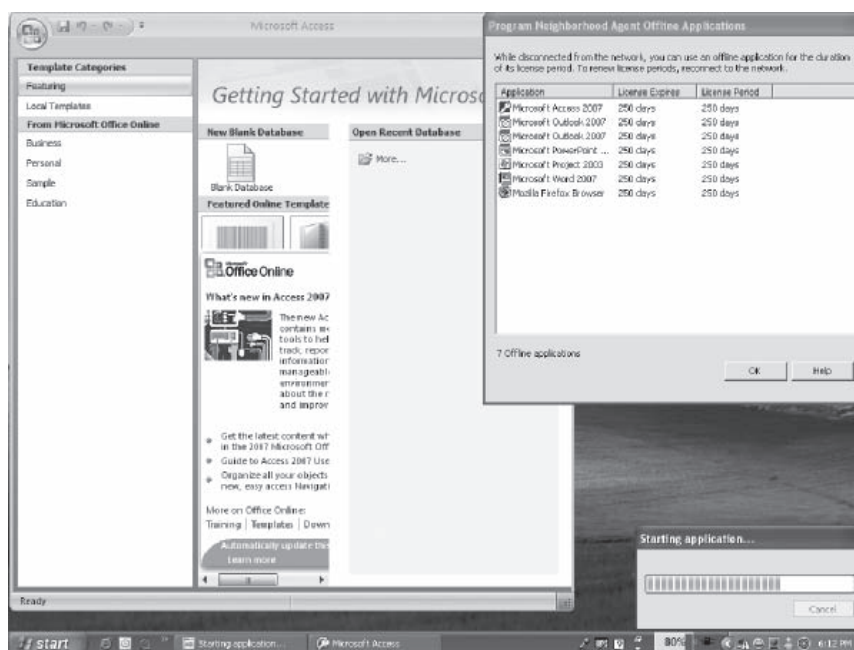
## Play

The final step is to play the application. Users run the application by simply clicking on the application from their Start menu (Program Neighborhood Agent), just as they would to launch locally installed applications. In order to execute a client-side application, the Citrix Streaming Client must be installed on users' workstations. Once the user launches the application, the core application files are streamed to the user's workstation, cached locally in an isolated environment, and then launched from the isolated environment. The user is able to start working in the application as additional files are streamed in the background. By isolating it on the workstation, the application is never actually installed. Instead, it is able to run in its own isolated environment, just as if it were installed locally, without the worry of conflicting with other applications installed locally or virtualised on the client device.

As with locally installed applications, users are able to take advantage of their workstation's local resources and peripherals such as USB attached storage. This enables resource-intensive applications such as CAD to take advantage of the local CPU, memory and high-end graphics cards. All files can be saved locally or on network shares. Additionally, users' personal settings are preserved and available the next time they launch the application. Because the application is managed centrally, every time it is run, the Streaming Client checks for updates and delivers them automatically, ensuring that users are always running the most up-to-date version of the application. Administrators simply update the central profile to allow users to receive the update automatically the next time they launch the application.

Additionally, applications can be enabled for offline access, which requires additional configuration in the application and farm properties. Offline access enables users to run the client-side applications while disconnected from the network, ensuring that they always have access to their applications. Microsoft Office is an excellent example of an application suite that would benefit from being configured for offline use, especially for mobile workers.

The figure below displays Microsoft® Office Access 2007 running while being streamed to a user's workstation. The status bar in the lower right displays the status of the application being streamed. Please note how the application is able to run after the core application files are streamed to the workstation, while the remainder of the application is streamed in the background. This is similar to a streaming video file you may view from the Internet. Once the video is launched, the viewer is able to begin watching the video while the remainder of the video is downloading. The "Program Neighborhood Agent Offline Applications" dialog box displays the applications which are available to the user for offline use.



## XenApp benefits and features

XenApp provides many benefits when migrating to a new operating system:

- Seamless integration with the Windows desktop – Provides a consistent, intuitive end-user experience.
- Technical assistance with applications – Maintain, manage and support users from a central location.
- Mitigate compatibility issues – Even applications that are incompatible with Terminal Services can often be delivered via XenApp. In addition, XenApp supports access from diverse PCs (32-bit and 64-bit) laptops, thin clients and mobile devices.
- Application usage monitoring – Prioritise application revisions based on actual application usage.

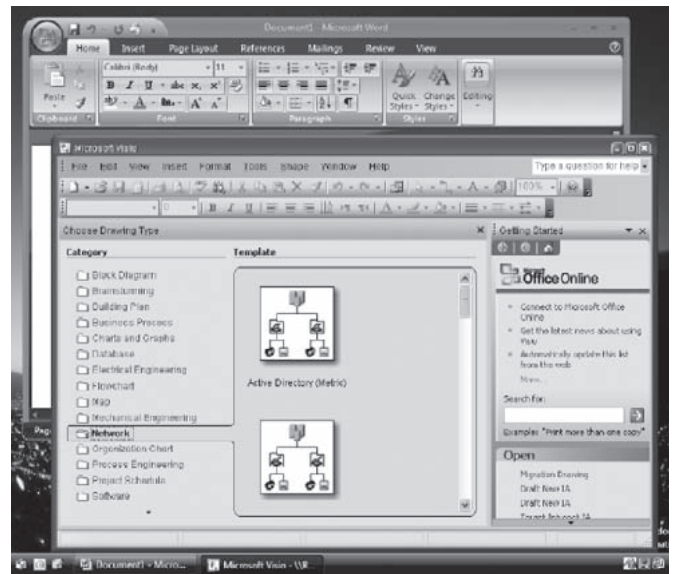
### Seamless integration with the Windows desktop

XenApp incorporates many features to ensure that users of Citrix-delivered applications enjoy an experience similar to having applications installed on their local workstations:

- Seamless Windows
- Desktop Integration
- Local Drive Mapping
- Printer Mapping
- Seamless Copy and Paste

### Seamless Windows

Citrix Seamless Windows enables virtual applications running on a XenApp server to appear as if they are running locally on the user's workstation. After a user launches an application, the application is displayed on the user's task bar so that the 'minimise', 'maximise' and 'alt-tab' commands work in the same way as for locally running applications. The figure below illustrates a Windows Vista desktop with Microsoft Office Word 2007 running locally and Microsoft® Visio® 2003 running within a XenApp session. Please note that this does not mean that Visio 2003 is incompatible with Windows Vista. It simply illustrates that a virtual application launched from Citrix will look and feel like a locally installed application.



### Desktop integration

With the use of the Citrix Program Neighborhood Agent client, users are able to launch their Citrix applications in the same way that they launch locally installed applications: via their Start menu or from a shortcut on their Windows desktop. The only difference users will notice is a message during application launch that displays the connection or streaming status.

## Local drive mapping

When running a virtual XenApp application, the drives on the user's local workstation are mapped so that the user can access their local hard drive(s), DVD\CD drive and floppy drive from within their Citrix-based applications. In fact, as shown in the figure below, the Citrix administrator can configure the Citrix environment so that users will see their local drives mapped as the same drive letters they use locally.



All network drives mapped within a user's logon script will also be available. A user can map additional network shares to which they have access.

Applications virtualised on the client are run locally on the workstation, and all local and mapped network drives are available as if the user were running a locally installed application.

## Printer mapping

All locally configured printers can be made available to virtual applications within Citrix. The Citrix administrator can map all locally configured printers (both locally attached and network printers) or just the locally defined default printer. With the use of the Citrix Universal Print driver, all local print options are made available to users.

For applications virtualised on the client, all locally configured printers are available to users without additional configuration.

## Seamless copy and paste

Through the Clipboard Redirection feature of XenApp, users can copy, cut and paste information via the Windows clipboard between applications running remotely on the server and applications virtualised on the client or installed locally on the desktop.

## Technical assistance with applications

### Shadowing

XenApp includes a feature called Shadowing. This feature enables IT support personnel to view and interact with a user's XenApp virtual application session. When a user calls for support, the support person can ask for the user's permission to shadow them. With the user's permission, the support person can see the user's application window and interact with the application to either resolve the issue or provide training to the user.

### Mitigate compatibility issues

#### Established Operating System

XenApp runs on Windows Server® 2003 and Windows Server 2003, x64 Edition. Windows Server 2003 is well-established and runs most applications currently deployed on Windows XP and Windows 2000 Professional. As Microsoft Office is the number one application delivered on XenApp, many organisations will likely take advantage of the benefits of XenApp to deliver Microsoft Office 2007 to their users now that it is released. This latest version of Microsoft Office has not only been successfully tested to run on XenApp, but also Microsoft is using XenApp virtual application capabilities to enable their customers to try the Microsoft Office 2007 system prior to purchase with their Test Drive program.

To test drive the 2007 Microsoft Office system, please visit <http://www.citrixtestdrive.com/> or <http://www.microsoft.com/office>.

## 64-bit Support

XenApp supports Windows Server 2003, x64 Edition, as well as Windows Vista x64 clients, for applications virtualised on both the server side and the client side. This provides the broadest application support by enabling both 32-bit and 64-bit applications to run successfully on either 32-bit or 64-bit clients. For example, you may have 64-bit applications but only 32-bit clients. By deploying those applications on 64-bit XenApp, administrators are able to virtually deliver those applications to all users. This provides benefits from the scalability and performance gains of 64-bit, while enabling users to continue to work on 32-bit workstations.

Additionally, line-of-business applications can be delivered via XenApp to users who require Windows Vista x64 on their local workstations, even if the applications are not supported by the local operating system.

## Isolation 2.0

XenApp isolates applications from the operating system on both XenApp servers and client machines. This feature greatly expands compatibility with applications that were not written for multi-user Terminal Services environments. This solution also allows the installation of different versions of the same application on a single XenApp server without conflicts, reducing server silos and underutilised resources. By isolating Microsoft Office 2007 and Microsoft Office 2003, they can be deployed on the same server, client workstation or laptop. By sharing server resources between multiple applications and leveraging isolation, a company can leverage the full computing power of their environment.

## Application usage monitoring

One of the challenges companies face during a migration is determining the actual usage of their applications. This knowledge can be valuable in prioritising which Vista-incompatible applications they should focus on first to upgrade or replace. By leveraging XenApp for the incompatible applications, and activating the Resource Manager Summary Database feature, a company can create reports that detail how often an application is launched and by which users. You will then be able to determine which applications are most important to the user community and should take priority in working with vendors to update. Conversely, applications that are not being used can also be identified and their licenses reduced.

Citrix XenApp, Platinum Edition includes an additional feature called Application Performance Monitoring – powered by Citrix EdgeSight™ for XenApp – which enhances IT visibility into the performance of virtualised applications delivered through XenApp over the ICA protocol. EdgeSight offers visibility into application usage as well as application performance monitoring, which enables a company to understand how well their applications are running for the end user. By providing real-time data and visibility that is both broad and deep, EdgeSight transcends traditional device and network management tools, capturing the entire spectrum of IT resource performance from the end-user perspective. This comprehensive understanding empowers IT professionals to quickly identify, source, resolve, and intercept problems, and helps maximise performance and availability throughout the enterprise. Additionally, Citrix EdgeSight™ for Endpoints is available to extend Application Performance Monitoring to applications virtualised on the client side and installed locally on the Windows desktop.

For more information about Application Performance Monitoring, please visit <http://www.citrix.com/xenapp> or <http://www.citrix.com/edgesight>.

## Citrix Clients

When possible, it is recommended to install the latest versions of the XenApp Client and the Citrix Streaming Client onto desktops as they are deployed. This will ensure that all desktops have the proper clients installed and are ready to launch Citrix applications on both servers and clients as soon as they become available. For Windows Vista via server-side application virtualisation, the XenApp Client version 10 or higher should be deployed. To enable client-side application virtualisation, the Streaming Client package is required, which includes the Program Neighborhood Agent and the Streaming Client.

For more information about delivering applications with XenApp, please visit <http://www.citrix.com/xenapp>.

## Conclusion

When planning your migration to Windows Vista, adding XenApp to your plan will help accelerate your migration while saving money and resources, minimising disruption, and leading to greater user satisfaction. XenApp can be used to deploy both Vista-incompatible applications and new or upgraded applications you are introducing with the Vista rollout, enabling all users to benefit from new applications even before they are locally migrated. Through the many features in XenApp, such as seamless windows, and local drive and printer mapping, users can work seamlessly between applications virtualised on the server side and client side and installed locally.

If you are interested in learning more about XenApp, please contact your Citrix partner or Sales representative here: <http://www.citrix.com/partners>.

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