

# Citrix XenApp on Windows Terminal Services: A Feature Analysis

This document illustrates how Citrix® XenApp extends the Microsoft® Windows Server® 2008 Terminal Services platform in order to provide greater scalability, an enhanced user experience, and simplified management of complex application delivery challenges.

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# Centralized Control

Citrix provides administrators with the tools they need to take control of their Application Delivery infrastructure. This results in more control, less downtime, and a better user experience. Centralized Management features provide administrators the tools they need to manage their entire Application Delivery infrastructure from a centralized location while providing the monitoring and control systems that enterprise deployments need. Printer Management is critical for server-side virtualization. In server-side virtualization, users access their applications on a central server but often have local printers attached to their client device. Seamless integration and performance optimizations ensure that they will experience seamless integration between application and printer.

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<b>Centralized Management</b>				
Centralized Publishing	Allows administrators to deliver server resources – such as applications, content, and server desktops – to thousands of users from a single wizard-driven console.		Single Server only	✓
Delegated Administration	Allows administration tasks and permissions to be assigned across multiple groups within an IT department. This allows organizations to break up and control management tasks among groups like the help desk, level 2 support, and the Terminal Services administration team.			✓
Centralized Access Policies	Administrators can configure settings for user sessions as policies that can be applied to sessions based on username, group, server name, server management container, client IP address or subnet, zone, or client name (or partial name). Priorities can be applied to these policies depending on specific user session situations.			✓
Administrative Logging	Keeps a running log of changes made to system configurations - for audit trail and root cause analysis purposes.			✓
Basic Server Health Monitoring	Monitor the health of server components and report any failures when they happen.		✓	✓
Advanced Server Health Monitoring	Automatically monitor the health of multiple terminal servers and components and report any failures when they happen. If an issue is detected, initiate automatic server recovery actions, such as restarting the server, or preventing it from accepting user sessions until the problem is resolved.			✓ Enterprise / Platinum Editions only
Integration with Desired Configuration Management	A Configuration Pack is available for Microsoft System Center Configuration Manager 2007 that evaluates configurations against predefined security and best practice guidelines specific to Terminal Services environments. This provides administrators with a tool for automated configuration management.			✓
Integration with Operations Manager	A Management Pack is available for Microsoft System Center Operations Manager 2007 that provides integrated monitoring and alerting capabilities specific to Terminal Services environments.	✓	✓	✓ Enterprise / Platinum Editions only
Integration with Multiple 3 <sup>rd</sup> Party Management Systems	Integration with 3 <sup>rd</sup> party management consoles like Microsoft System Center Operations Manager, IBM Tivoli <sup>®</sup> NetView, Hewlett-Packard <sup>®</sup> OpenView <sup>®</sup> , and Computer Associates <sup>®</sup> UniCenter <sup>®</sup> TNG allows administrators to leverage existing infrastructure to manage their application delivery infrastructure.			✓ Enterprise / Platinum Editions only
Centralized Resource Monitoring	Enables monitoring and evaluation of server performance. Custom threshold-based alerts and reports can be generated to enhance management and allow administrators to optimize the Terminal Services farm.			✓ Enterprise / Platinum Editions only

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<a href="#">Centralized Management continued...</a>				
Application Performance Monitoring	Allow IT to identify poorly performing applications, manage system resources to remove bottlenecks, and report on application utilization. EdgeSight™ for XenApp provides administrators with visibility into the end user's perception of application performance allowing them to be proactive instead of reactive. XenApp 5.0 adds the ability to simulate client loads, providing administrators the ability to ensure metrics are within agreed service levels.			✓ Platinum Edition only
Session Recording and Playback	Provide administrators the ability to monitor user sessions for auditing, regulatory compliance, or troubleshooting needs. SmartAuditor™ technology provides a built-in record / playback facility for XenApp 5.0 sessions which is unique to the industry.			✓ Platinum Edition only
<b>Printer Management</b>				
<a href="#">Client Printer Redirection</a>				
Client Printer Auto-Creation	Automatically create a mapping of client-attached printers into the user's session when connected to a server-side virtualized application.	✓	✓	✓
Client Printer Session Isolation	Ensure that client-attached printers are isolated to the user's session and not available to other users on the same server.		✓	✓
Inheritance of Printer Properties	Rather than just displaying the default printer settings for auto-created client printers, this provides the ability to inherit the existing printer settings. This provides the user with a seamless experience when printing to their local printer.		✓	✓
User Self-Provisioning	Allows the user to define additional printers available to the Terminal Services session and have them be available in the session without requiring the user to logoff and logon to use the printer.			✓
Retention of Printer Properties	Users can configure settings for client-attached printers and have those settings stored on the client device or in their user profile.			✓
Controlled Security Rights for Client Printers	Provide users with access to the printer device settings for their client-attached printers. The default ACL on redirected printers in Terminal Services does not allow the user to adjust device settings because it would also allow the user access to additional settings like driver, port, etc. With custom security filtering the user can be provided access to manage the printer properties without exposing the full rights.			✓
<a href="#">Universal Printing</a>				
XPS-based Universal Printing	Provide client-side printing support where the Microsoft XML Paper Specification (XPS) protocol is available without requiring a printer driver to be installed on the server.		✓ XP SP2 or Vista SP1 only	✓
EMF-based Universal Printing	Provide client-side printing support through the Enhanced MetaFile (EMF) print format without requiring a printer driver to be installed on the server.			✓
PCL/Postscript Universal Printing	Provide client-side printing support on non-Windows clients (e.g. Macintosh, Linux, etc.)			✓

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<b>Printer Provisioning</b>				
Default Printer Provisioning	Restricts the available client-side printers to only the default printer.		✓	✓
<b>Printer Provisioning continued...</b>				
Client Printer Provisioning	Provides administrators with the ability to control client-side printer auto-creation based on policy.			✓
Network Printer Provisioning	Enables users within a specified IP address range to automatically access the network printing devices that exist within that same range. This increases user productivity and lessens the IT support burden.			✓
Generic Universal Print Driver	Reduces printer creation overhead by allowing a single generic printer to be created in the session that can target any client-side printer.			✓
<b>Printer Driver Management</b>				
Automatic Driver Installation	Automatically install in-box printer drivers when they are needed.	✓	✓	✓
Printer Driver Mapping	Allows an administrator to define a mapping of server printer drivers to use for given client printers.	✓ configured via text file	✓ configured via text file	✓
Fallback Printer Driver	Provides a 'printer driver of last resort' ensuring printer availability with basic printing functions when a matching driver does not exist on the server and a 'universal' print driver is not available.	✓ SP1 and above only	Replaced by TS Easy Print	✓
Driver Replication	Allows administrators to automatically or manually replicate installed print drivers across servers.			✓
Driver Compatibility Control	Allows administrators to manage a list of print drivers that can be used on the server for client-side printers. By supporting both inclusion and exclusion lists administrators have the ability to only allow known 'safe' drivers or to block known 'unsafe' drivers.			✓
<b>Printing Bandwidth and Network Management</b>				
Printer Bandwidth Limit	Control how much network bandwidth print jobs can consume within the ICA channel.			✓
Print Traffic Routing	Allows administrators to choose between the traditional network printing path or the ICA printing path when using client printer auto-creation for provisioning of printers. In cases where the client can connect to a network print server for their local printer this can offer significant reduction in bandwidth and overall time required to print. Policies provide administrators the control necessary to ensure this is only applied in situations where it makes sense.			✓

# Application Compatibility

Citrix addresses the needs of today's heterogeneous IT environments with technologies that ensure applications can work together in a secure manner on a variety of OS platforms. Flexible Application Delivery means working with a variety of server platforms easily integrating application delivery from anywhere in the data center. Application Virtualization is about allowing the IT administrator to control where and how applications are deployed to provide the best access experience for the end user.

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<b>Flexible Application Delivery</b>				
Comprehensive Server Farm Support	Multiple servers can be grouped together as a logical unit even when they are not running the same application delivery or OS platform. Applications can be configured to be delivered from all servers in the farm or any subset easily from the application publishing properties allowing for simple configuration of load balancing across the available platforms.			✓
Unified Application Delivery	Applications can be delivered from multiple server platforms (Windows Server, HP-UX, IBM AIX, or Solaris) in a single view to the end user.			✓
<b>Application Virtualization</b>				
Virtual IP Address Support	Applications that require a unique IP address for each application instance may not work properly in a Terminal Services environment. Virtual IP address support allows an administrator to define a range of IP addresses so that each user session can have a unique IP address. This is especially useful for customer service applications that integrate into VoIP telephony systems. It is also useful when using third-party tools to monitor internet traffic from Terminal Server users.			✓
Server-Side Application Virtualization	Streams applications into an isolated environment running on the server to ensure compatibility between applications. This minimizes or eliminates regression testing for applications and eliminates the need to create server silos to address application compatibility issues. It is especially useful for applications that require a network connection or for applications that provide access to critical or proprietary business information (e.g. CRM or ERP apps). Server-side application virtualization prevents business data from ever leaving the data center.	Requires Microsoft Application Virtualization for Terminal Services	Requires Microsoft Application Virtualization for Terminal Services	✓
Application Virtualization	Streams applications into an isolated environment running on the user's machine to eliminate potential conflicts between applications. This offloads the resources required to run applications from the server to the user's machine. It is especially useful in Windows environments for applications that can be or must be used while disconnected from the network (e.g. synchronized e-mail, Microsoft Office Suite, etc.)	Available in the Microsoft Desktop Optimization Pack (MDOP)	Available in the Microsoft Desktop Optimization Pack (MDOP)	✓ Enterprise / Platinum Editions only
Communication Between Application Virtualization Environments	Enables virtualized application isolation environments to communicate with each other, providing customers with simplified maintenance of streamed applications as well as decreasing the time it takes to update/patch these applications.	Available in the Microsoft Desktop Optimization Pack (MDOP) & Microsoft Application Virtualization for Terminal Services	Available in the Microsoft Desktop Optimization Pack (MDOP) & Microsoft Application Virtualization for Terminal Services	✓ Enterprise / Platinum Editions only

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<a href="#">Application Virtualization continued...</a>				
HTTP(S) Based Application Streaming	Enables application streams applications to be streamed using the HTTP protocol. HTTP(s) is WAN friendly and can leverage a company's existing HTTP infrastructure. This feature also supports secure connections for streaming applications over HTTPS.	Available in the Microsoft Desktop Optimization Pack (MDOP) & Microsoft Application Virtualization for Terminal Services	Available in the Microsoft Desktop Optimization Pack (MDOP) & Microsoft Application Virtualization for Terminal Services	 Enterprise / Platinum Editions only
64-bit Platform Support	Allows administrators to deploy application virtualization technology to the latest 64-bit OS platforms for both client-side and server-side virtualization scenarios.			 Enterprise / Platinum Editions only
Support for Complex Application Virtualization Needs	Some applications require access to system components that make them more difficult to stream. Support for the isolation of services, COM+, DCOM access, and printer drivers allow more complex applications (or portions of applications) to be streamed without the need for complex profiling customizations.	Available in the Microsoft Desktop Optimization Pack (MDOP) & Microsoft Application Virtualization for Terminal Services	Available in the Microsoft Desktop Optimization Pack (MDOP) & Microsoft Application Virtualization for Terminal Services	Available when using Microsoft Application Virtualization for Terminal Services with XenApp

# Optimized User Experience

Citrix enhances the usability and performance of applications running on Terminal Services. Simplified Access is about providing the same user experience for applications delivered from Terminal Services as local applications. An Optimized Experience results from a set of technologies that provide significant productivity and performance enhancements for server-based applications. This results in higher user satisfaction and eased support requirements for IT. Web Based Delivery options provide administrators with flexibility in how they provide users with access to their applications, allowing them to easily gain access over the Internet or from existing web portal deployments.

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<b>Simplified Access</b>				
<b>Local Desktop Integration</b>				
Support for High Color	Enables applications running on Terminal Services to display in 24 or 32-bit color depth.	✓ 24-bit	✓ 32-bit	✓ 24-bit
Seamless Applications	Enables applications running on Terminal Services to look and feel as if they are running locally.		✓	✓
Connection Resiliency	Automatically reconnects user sessions when the network connection is temporarily lost.	✓	✓	✓
Session Reconnect	Allows users to reconnect to their Terminal Services sessions without going through the time-consuming logon process again.	✓	✓	✓
Support for Multiple Monitors	Allows applications running on Terminal Services to be displayed across multiple local monitors connected to the client workstation forming a single virtual display.	✓ Windows XP/Vista	✓ Windows XP/Vista	✓
Extended Support for Multiple Monitors	<p>Provide features that mimic the behavior of applications running locally in a multi-monitor environment including the following key features:</p> <ul style="list-style-type: none"> <li>✓ Tested and supported with up to 9 monitors utilizing high resolution displays (up to 64 MB display memory)</li> <li>✓ Dynamic display configuration – any time the client display environment changes the settings are reconfigured dynamically.</li> <li>✓ Ensures applications respect multi-monitor boundaries (applications maximize to a single monitor, dialogs center properly, menus and tooltips are positioned so they do not span monitor boundaries, etc.)</li> </ul> <p>Multi-monitor support is a common requirement in financial services environments where the typical desktop will have at least 4 high-resolution monitors on the client and often more.</p>			✓
Audio Playback	Supports audio playback on the client device for audio streams from the server session.		✓	✓
Bi-Directional Audio Support	Supports audio recording and playback on a client desktop, including use of Philips SpeechMike™ transcription devices. Bidirectional audio is a common requirement in medical and legal firms, and provides a foundation to support VoIP soft phones in the future.			✓
Pass-Through Authentication	For Windows clients connected to the company directory, the credentials used for local device logon are passed automatically to sessions running on Terminal Services. This simplifies and speeds up the user's connection process.		Domain-joined Vista clients only	✓

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<a href="#">Local Desktop Integration continued...</a>				
Basic Roaming User Support	Allows a user to roam between devices and networks while maintaining the state of their server-based applications. User will be automatically connected to their applications with the display automatically re-configured when the user re-connects.	✓	✓	✓
Advanced Roaming User Support	SmoothRoaming™ in XenApp 5.0 ensure that applications and data move with your users as they change locations, networks, or devices, so they can pick up exactly where they left off, without interruption.			✓
Desktop Icon Integration	Allows applications to appear in the start menu or on the local desktop providing a familiar application access experience for users.		Requires distribution of .msi packages	✓
Folder Management	Allows applications to be grouped within folders for easier organization for multiple user groups.			✓
Client-to-server redirection of file types	Redirects requests for a specific document or file type to a Terminal Server session. For example, clicking on a Visio® document on the client device will launch the document in a Visio application on the Terminal Sever, instead of a local application. This is a useful feature in environments where a particular application may not be installed locally.		✓	✓
Server-to-client URL redirection	When clicking on URL's (such as HTTP or HTTPS links) within an application running on Terminal Services, the link is opened with the local client browser instead of launching the browser on the Terminal Server. This feature enhances support for mixed desktop/Terminal Services environments, and ensures that the local browser and Internet connection is used for web browsing. This can reduce the data center bandwidth requirements, free processing resources on Terminal Services, and improve performance for users. In addition, for environments that track internet usage by IP address, this features preserves the ability to do so using third-party monitoring products.			✓
<a href="#">Client Device Support</a>				
USB Printer Support	Enables users to remotely print to USB printers connected to their client device		✓	✓
USB Storage Device Support	Enables remote access to most USB storage devices connected to their client device		✓	✓
POS for .NET Device Support	Enables support for Microsoft Point of Service for .NET devices.		✓	
Microsoft ActiveSync® Support	Supports the synchronization of client devices via ActiveSync where the software is running in Terminal Services.			✓
Scanner Support	Allows applications running on the server to access TWAIN-compliant scanners connected to the client device.			✓
<a href="#">Optimized Experience</a>				
<a href="#">Productivity Enhancements</a>				
Small Form-Factor Device Support	Citrix Panning (scrolling) and Scaling (magnification) technology provides an improved user experience when viewing full-screen Windows applications on small form-factor devices since many applications in today's market are not designed to support the screen resolution available on mobile devices. Using scrolling and magnification techniques on the device enables the user			✓

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
	to use these applications in their native form without the need for customized applications that support the small form-factor.			
Self-Service Password Reset	Allows users to securely and safely reset their domain password or unlock their Windows account from their PC or web browser, thus reducing help desk costs for password resets.			✓ Platinum Edition only
Enterprise Single Sign-On	Requires users to logon only once with their network credentials and automates subsequent logons to applications accessed through a Web browser, Windows client, or host terminal emulator. Specifies strong password characteristics such as length, character repetition and alphanumeric requirements on a per-application basis – applies to manual and automated password changes.			✓ Platinum Edition only
Click-To-Call	Enables users to initiate a phone call by clicking on a phone number in any application (whether delivered from the server, delivered to the client, or installed locally).			✓ Platinum Edition only
<b>Performance Enhancements</b>				
Session Sharing	When a user requests a second application on Terminal Services, the application is launched in the existing user session. This allows the application to start up almost instantly (as opposed to creating a new session) and reduces memory and CPU consumption on the server.		✓	✓
Display Data Prioritization	Offers enhanced application responsiveness with built-in quality of service for graphics applications by controlling how much bandwidth is used for display data as opposed to any other data (e.g. printing, file transfers, etc.)		✓	✓
High Resolution Graphics Enhancements	Citrix SpeedScreen Image Acceleration is a key technology in providing a rich user experience regardless of the underlying connection. It improves the delivery of remote applications that contain photographic bitmaps and highly detailed synthetic images. If a bitmap looks as if it is probably photographic or highly detailed, an extra level of lossy JPEG compression is added to reduce the bandwidth required to transmit the image to the client.			✓
Multimedia Application Support	Citrix SpeedScreen Multimedia Acceleration intercepts the request for a media file on the server, and streams the media to the client where it can be rendered using local resources. It provides synchronized audio-video delivery for applications like Windows Media Player (common with computer-based training applications.)			✓
High-Latency Network Support	Citrix SpeedScreen Latency Reduction technology optimizes performance of remote applications presented over high-latency network links (i.e. satellite). The user benefits from a more usable experience than with Terminal Services alone.			✓
<b>Performance Enhancements continued...</b>				
Web Browser Performance Optimizations	Provide enhanced performance and usability for Internet Explorer-based web applications when running on Terminal Services. Citrix SpeedScreen Browser Acceleration provides a combination of features that can automatically disable GIF animations, intercept images and pass them on before being uncompressed, dynamically re-compress JPEG images, deliver images in the background, and cache images on the client.			✓

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
Adobe® Flash® Performance Optimizations	Provide improved performance of web pages containing Flash-based content by improving the compression of the Flash content. Citrix SpeedScreen Flash Acceleration is specifically designed to optimize Flash content in web pages to improve the overall experience for users accessing web sites and applications remotely.			✓
WAN Performance Optimizations	Users can experience significantly improved WAN performance through the automatic application of the right mix of acceleration techniques based on network conditions, data flows, and application mix. These gains can be achieved without requiring any reconfiguration or modification of firewalls, monitoring tools, or applications.			✓
Session Reliability	When a network connection issue occurs, the application window remains visible on the client device and the client continues to accept keystrokes and mouse movement from the user while session re-connection is attempted in the background. For transient network issues, such as where users roam between wireless “hot spots”, the user may not even know connectivity was lost.			✓
Graphics Display Optimizations	Dramatically improves the performance and usability of graphics-intensive applications. Enables IT to centrally manage graphics-intensive applications such as PACS (used in Healthcare) and GIS mapping applications, while providing the speed and anywhere-access flexibility that users need. <a href="#">A study performed by The Tolly Group</a> comparing XenApp to earlier versions of the product showed that the latest Citrix SpeedScreen™ Progressive Display technology can provide up to 15x bandwidth reduction for two-dimensional graphical applications like PACS and GIS systems.			✓
<b>Web-Based Delivery</b>				
<b>User Experience</b>				
Web Availability	Integrated support for publishing applications to a web portal allows applications to be accessed from any web browser.		✓	✓
Multilingual User Interface	Dynamically changes the locale of the web application portal depending on the user or administrator's preferences.		✓	✓
Broad Client Platform Support	The client view of Web Interface uses standard HTML and is supported on most modern web browsers including IE 6+, Mozilla 1+, Firefox 2+, and Safari 2+ as well as some mobile platforms.			✓
Automated Client Installation	A web-based process walks the user through the process of automatically detecting the needed client software and then automatically installs the appropriate client software for the platform used.			✓
Persistent Bookmarks	Provide users the ability to create persistent browser bookmarks directly to their favorite applications. When using pass-through authentication the user can access their application without the need for additional authentication.			✓
<b>User Experience continued...</b>				
Folder Management	When applications are configured within folders the web interface maintains this grouping enabling easier organization for multiple user groups.			✓
Automatic	Automatically re-connects to all disconnected sessions at logon. This provides an automated means of reconnecting to all disconnected applications without user interaction. This			✓

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
Reconnection	functionality works regardless of how many server sessions the user has established. Administrators and users can turn this feature off and also use manual reconnection which still provides a single-click interface for this functionality.			
Disconnect or Close All Applications	A single button on the web interface provides a means for the user to suspend or exit all running applications without having to perform this action in each individual application. This functionality works regardless of how many server sessions the user has established. This is especially useful for situations where the user wants to switch devices such as when leaving the office to go home.			✓
User Controlled Network Optimizations	Users can specify their network connection speed and type for application access, thereby providing application performance optimizations based on the user's connection type.			✓
Self-Service Password Change	Provides users notification when their password is about to expire and allows users to change their domain password directly from their browser. This feature is important for remote access scenarios and other situations where user devices do not authenticate to the directory.			✓
<b>Administration and Management</b>				
Custom Branding Support	Provides the ability to easily customize the look and feel of the web application portal through GUI-based wizards in the management tools.			✓
Broad Server Platform Support	Support for IIS, Apache, IBM WebSphere®, BEA WebLogic®, and Sun Java System Application Server provides administrators with the option of hosting the server component on the infrastructure that they already have and are familiar with.			✓
<b>Third-Party Integration</b>				
Basic SharePoint Integration	Provides a web part to integrate Terminal Services application functionality directly within a SharePoint portal.		✓	✓
SharePoint Document Library Integration	Extends Microsoft SharePoint document libraries to include integrated support for accessing the documents in those libraries via an application hosted on Terminal Services. This allows users to view and edit documents in a SharePoint document library even when they do not have the necessary applications installed locally.			✓
IBM WebSphere® Integration	Provides the ability to integrate Terminal Services application functionality natively in an IBM WebSphere portal.			✓
Integration with Multiple Enterprise Information Portals	A reference implementation of a JSR168 portlet provides access to Terminal Services application functionality natively in a BEA WebLogic® Portal. This reference implementation could be used on any system supporting the JSR168 portlet standard.			✓

# Comprehensive Access

Security technologies extend the core Terminal Services platform with broader integration and more flexible access scenarios. Policy Management provides the control IT administrators need to ensure that technologies are not abused by users, but rather allow the 'right' level of access. Universal Device Access ensures that users will be able to use their applications regardless of what device they want to use, allowing IT administrators to provide broad access while remaining in control.

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<b>Security</b>				
Support for Windows Directory Services	Allows role-based access to be provided using either Windows NT domains or Active Directory®.	✓	✓	✓
Support for Novell® eDirectory™	Allows role-based access to be provided using Novell eDirectory (formerly known as Novell Directory Services®.)			✓
Secure Sockets Layer Access to Server Applications	Provides SSL/TLS encryption and multifactor authentication to provide authorized application access to appropriate users.		✓	✓
Support for Network Access Quarantine Control	Examines and validates the configuration of a remote access computer through an administrator-provided script.			✓
Support for Network Access Protection (NAP)	Allows network administrators to define network access based on who a client is, the groups to which it belongs and the degree of compliance with corporate policy.		✓	
Adaptive User Access	Dynamically determine the access policy through evaluation of multiple factors such as the user role, location, client device information, and client integrity allowing administrators to provide varying degrees of access instead of simply denying access.  Citrix SmartAccess technology provides administrators with granular access control of the specific actions that users can take with applications, files, web content, e-mail attachments, and printing. With SmartAccess, access becomes like a dimmer switch, where access is restricted based on the access scenario.			✓ Platinum Edition only
Active Directory Federation Services Support	Supports authentication using credentials from a federated Active Directory forest, thereby increasing the security of applications used by business partners.			✓
Anonymous Access	Provides the ability to grant access to Terminal Services applications without requiring explicit authentication from the user. This can be implemented simply by IT administration and enables support for additional authentication schemes like third party LDAP directories.			✓
Double-Hop DMZ traversal	Provide access to corporate resources from anywhere over SSL. Double-Hop allows the use of SSL end-to-end from the client, through the DMZ, and into the internal corporate network.		✓	✓
Secure Sockets Layer Access to All Applications / Protocols	Citrix Access Gateway is a universal SSL VPN appliance that provides a secure, always-on, single point-of-access to all applications, network resources, and protocols.			✓ Platinum Edition only

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<b>Policy Management</b>				
Policy-Based Control of Client Devices	Administrators can enhance security and intellectual property containment by controlling users' ability to connect client devices like printers and local drives.		✓	✓
Policy-Based Control of Bandwidth Usage	Administrators can configure overall session bandwidth limits and also specific limits for audio usage, printing, client storage devices, TWAIN devices, clipboard usage, COM/LPT ports, and OEM virtual channels.			✓
Policy-Based Control of Audio	Administrators can configure policy to manage client audio support, sound quality, and support for client-based microphones for recording audio.			✓
Policy-Based Control of TWAIN Device Support	Administrators can configure policy to control TWAIN device redirection including compression levels.			✓
Policy-Based Control of Application Delivery	Administrators can configure policy to control how applications are delivered – controlling whether the application is virtualized client-side, virtualized server-side, or installed on the server.			✓
Application Launch Limits	Allows administrators to control user access to applications by setting time and instance limits.			✓
<b>Universal Device Access</b>				
Broad client support	<p>Integrated support for client platforms:</p> <ul style="list-style-type: none"> <li>✓ <b>Windows x86 Platforms</b> Vista, Windows XP, Windows 2003, Windows 2000</li> <li>✓ <b>Windows x64 Platforms</b> Vista, Windows XP, Windows 2003</li> <li>✓ <b>Macintosh Platforms</b> OS X, PowerPC, 68030/40</li> <li>✓ <b>Windows Mobile Platforms</b> Windows Mobile 6, Windows Mobile 5, Windows Mobile 2003, PocketPC, Handheld PC, Windows CE</li> <li>✓ <b>Java Platform</b> J2SE 1.4.x, J2SE 1.5.x</li> <li>✓ <b>EPOC / Symbian OS</b> Series 60 3rd Edition, Series 80, FOMA M1000</li> <li>✓ <b>Unix Platforms</b> Solaris/Sparc, Solaris x86, IBM AIX, HP-UX, Linux, SGI</li> <li>✓ <b>Other Platforms</b> DOS version 4+, Windows 16-bit platforms, IBM OS/2 Warp</li> </ul>	<p>Microsoft Windows®</p> <p>Macintosh OS X (Limited to Remote Desktop only)</p>	<p>Microsoft Windows®</p> <p>Macintosh OS X (Limited to Remote Desktop only)</p>	✓

# Enterprise Scalability

Citrix enhances Terminal Services with a set of mature and easy-to-use management and monitoring tools. Simplified Configuration allows administrators to be more productive while industry-leading Performance technologies ensure the best user experience. This increases IT and user productivity while providing additional capabilities not available in the base-level Terminal Services environment.

CATEGORY/ FEATURE	DESCRIPTION	MICROSOFT WINDOWS SERVER 2003	MICROSOFT WINDOWS SERVER 2008	CITRIX XenApp 5.0
<b>Simplified Configuration</b>				
Comprehensive Server Configuration	The ability to perform actions on a group of servers from a single management point provides administrators the ability to centrally configure application access to a subset of their servers.			✓
Zone Preference and Failover	Establishes user sessions based on their proximity to and availability of a particular server. This feature enables higher performance in farms that span multiple data centers and eases disaster recovery and business continuity.			✓
Broad Database Engine Support	Integrates with existing corporate standards for IT infrastructure by supporting multiple options for the system database (i.e. Microsoft SQL Server, IBM® DB2®, and Oracle®.)			✓
Application Scheduling	Provides the ability to control delivery of applications to users based on time of day and number of sessions or application instances.			✓
<b>Performance</b>				
Enterprise Class Scalability	Supports large server farms that can span wide area networks while maintaining performance and reliability. Proven large deployment support with over 1000 servers.			✓
Enterprise Class Performance	Enterprises employ a large variety of devices, printers, and networks and when deploying Terminal Services for application delivery the end user experience is critical to success. What is necessary is a combination of performance optimizations and bandwidth reduction techniques that have been vetted in large deployments over many years.			✓
Priority Packet Tagging	Enables the prioritization of virtual channel traffic by third-party Quality-of-Service (QoS) network infrastructure providers.			✓
Comprehensive Load Management	Establishes user sessions across a group of load-managed servers based on configurable parameters like session count, application usage, CPU utilization, memory consumption, concurrent logons, IP ranges, time intervals, and more.		Session count only	✓
Preferential Load Distribution	Provides administrators the flexibility to assign higher or lower levels of service to users and applications based on their job functions, position within the company or any other such meaningful criteria.			✓ Platinum Edition only
CPU Utilization Management	In a shared, multi-user Terminal Services environment, one user's activities can adversely affect performance for other users. CPU management ensures that CPU-intensive processes initiated by one user do not degrade performance of other sessions. As a result, additional Terminal Servers do not need to be maintained to assure good user performance.	✓ Enterprise Edition only	✓ with WSRM	✓ Enterprise / Platinum Editions only
Virtual Memory Optimizations	Performs DLL rebasing for applications in order to reduce the amount of memory conflicts when loading DLLs, resulting in a reduction in overall memory requirements for some applications. This enables a single server to support more concurrent users. This results in a reduction of overall server count within a Terminal Services environment.			✓ Enterprise / Platinum Editions only

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