Enterprise Solutions

From Microsoft and Citrix
Microsoft and Citrix Systems have enjoyed a strategic relationship over the years. During the past year, Microsoft and Citrix have collaborated to create a great application access experience using Windows Server® 2003. Citrix MetaFrame XP Presentation Server software, the company’s flagship product, is ready to run on Windows Server 2003 Terminal Server. In addition, it also provides customers great assurance by meeting the rigorous standards of Microsoft’s “Certified for Windows®” program.

Microsoft’s “Certified for Windows” program is designed to provide high levels of availability, reliability, security, and supportability on Windows Server platforms. In order to meet these high standards, Microsoft and participating ISVs work closely in ensuring that key applications meet the certification criteria. The final validation is delivered through VeriTest, a third-party independent testing company who does the actual testing based on Microsoft’s specifications. Customers will soon find Citrix MetaFrame XP on the certified application list.

Microsoft and Citrix invite you to discover how we can create a better business environment and solutions through MetaFrame XP running with Windows Server 2003.

Bob Kruger
Senior Vice President, Product Development
Chief Technology Officer
Citrix Systems, Inc.

Bill Veghte
Corporate Vice President
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Microsoft Corporation
Microsoft Server Products Provide Reliable, Scalable Platforms for Mission-Critical Applications

Windows Server 2003 is designed to help customers do more with less. It builds on the strengths of the Windows 2000 Server Family to take application and hardware performance to new heights.

With Windows Server 2003 you receive:
- The most secure Windows Server release yet
- Scalability extending to 64 processors
- Overall enhancements in reliability, availability, and manageability

With Windows Server 2003, customers receive a Windows server environment that supports up to 64 processors and 512 GB of RAM on IA64 platforms (the 64-bit technology is offered on Windows Server 2003 Enterprise and Datacenter Editions), and 32 processors and 64 GB of RAM on IA32 platforms. The Windows Server 2003 family is comprised of the following four SKUs: Web, Standard, Enterprise, and Datacenter Editions.

### Microsoft Windows Server 2003 Family

| | • Supports secure Internet connectivity.  
| | • Allows centralized desktop application deployment.  |
| Windows Server 2003, Standard Edition | Windows Server 2003 Standard Edition is the reliable network operating system that delivers business solutions quickly and easily. This flexible server is the ideal choice for small businesses and departmental use.  |
| Windows Server 2003, Enterprise Edition | • Is a full-function server operating system that supports up to 8 processors.  
| | • Provides enterprise-class features such as 8-node clustering and support for up to 32 GB of memory.  
| | • Is available for Intel Itanium-based computers.  
| | • Will be available for 64-bit computing platforms capable of supporting 8 processors and 64 GB of RAM.  |
| Windows Server 2003, Datacenter Edition | • Is the most powerful and functional server operating system Microsoft has ever offered.  
| | • Supports up to 32-way SMP and 64 GB of RAM.  
| | • Provides both 8-node clustering and load balancing services as standard features.  
| | • Is available for 64-bit computing platforms capable of supporting 64 processors and 512 GB of RAM.  |
| | • Is designed to be used primarily as an IIS 6.0 Web server.  
| | • Provides a platform for rapidly developing and deploying XML Web services and applications that use ASP.NET technology, a key part of the .NET Framework.  
| | • Is easy to deploy and manage.  |
Security
Microsoft has invested heavily in the Secure Windows Initiative with the goal of delivering systems that are secure by design, default, and deployment. In addition, Windows Server 2003 is the first Windows operating system to ship under the Trustworthy Computing initiative (launched by Bill Gates in January 2002) which is based on four pillars: security, privacy, reliability, and business integrity.

Secure by Design
The improved security of Windows Server 2003 reflects Microsoft’s $200 million investment in 2003 to reduce code vulnerabilities in its platform, modify the development process, and improve accountability at every level for security. Focusing on security improvements, Windows Server 2003 includes a redesigned IIS, strong authentication protocols such as 802.1x and PEAP, and common language runtime (CLR) to create a safer computing environment.

Secure by Default
To secure Windows Server 2003 by default, the attack surface area was reduced by creating stronger default policies (e.g., file system Access Control Lists); redesigning IIS; and reducing the total number of services, reducing the number of services running by default, and reducing the number of services running as System.

Secure in Deployment
In addition to the more secure architecture design and added security features in Windows Server 2003, Microsoft offers its customers tools, prescriptive guidance, training, and services to help them deploy a secure, connected infrastructure.

Tools
- Software Restriction Policy (SRP) is a new feature in Windows Server 2003 and Windows XP that gives administrators a policy-driven mechanism to identify software running in their domain and control its ability to execute.
- Security Configuration Editor (SCE) is designed to help businesses secure Windows systems operating in various roles and deployment scenarios, such as a Web server that is connected both to the Internet and to a secure internal network. The goal of SCE is to help customers maximize the security of such systems without sacrificing functionality.
- Microsoft Audit Collection Services (MACS) is a tool used to monitor and audit systems. MACS collects security events in a compressed, signed, encrypted manner and loads them into a SQL database for analysis.

Internet Information Services (IIS) 6.0
One of the key highlights of the security enhancements in Windows Server 2003 is the complete redesign of IIS 6.0. This powerful Web service is available in all versions of Windows Server 2003. It helps to provide a highly reliable, manageable, scalable, and secure Web application infrastructure. IIS 6.0 makes it possible for organizations of all sizes to quickly and easily deploy powerful Web sites and applications, and IIS 6.0 provides a high-performance platform for all applications.

Because of the integration of the .NET framework into the IIS 6.0.

Scalability
Windows Server 2003 takes the scalability gains found in the Windows 2000 Server Family to new heights. It is designed for both scale-up and scale-out scenarios-with scale-up scenarios enabled by symmetric multiprocessing (SMP) and Cache Coherent Non-Uniform Memory Access (CC-NUMA) optimizations, and scale-out by the various types of clustering provided by Microsoft.

Internal tests indicate that, compared to Windows 2000 Server, Windows Server 2003 delivers up to 140 percent better performance in the file system as well as significantly better performance in various other features, including Microsoft Active Directory service, Web server, Terminal Server components, and networking services.

Key scalability enhancements include:
- 64-Bit Support. Support for 64-bit architecture with Enterprise and Datacenter Editions and 512 GB of RAM.
- Support for Intel Hyper-Threading. Allows a single physical processor to execute multiple threads (instruction streams) simultaneously, potentially providing greater throughput and improved performance.
- NUMA Optimization. Most Windows applications will perform optimally without modification on NUMA systems running Windows Server 2003 because of automated NUMA features in the operating system (offered only on Enterprise and Datacenter Editions).
- Hot Add Memory. Allows ranges of memory to be added to a computer that supports this feature. This was made available to the operating system and applications as part of the normal memory pool-without requiring downtime or rebooting the computer (offered only on 32-bit versions of Enterprise and Datacenter Editions).

Reliability, Availability
Reliability and availability are woven into every aspect of Windows Server 2003 design to provide for a better customer experience. Key highlights include:
- 8-Node Clustering. Increasing the number of nodes in a server cluster gives administrators more options for deploying applications and providing failover policies that match business expectations and risks. (8-node clustering is supported on the 32-bit and 64-bit Enterprise and Datacenter Editions.)
- Network Load Balancing Manager. This new utility in Windows Server 2003 provides a single point of configuration and management for NLB clusters.
- Datacenter High Availability Program. The Datacenter Program has been expanded to meet the growing customer demand for higher availability on Windows.
Manageability

Windows Server 2003 delivers enhanced management capabilities designed to simplify and automate the management of Windows environments, while providing the flexibility and reliability to meet customers’ business needs.

Key highlights include:

- Automated Deployment. New and enhanced capabilities to automate the deployment and redeployment of the operating systems and applications.
- Policy Based Management. Provides fine-grained control over the definition and enforcement of IT policies.
- Effective User Service Management. IntelliMirror® gives users consistent access to their applications, roaming user profiles, and user data, from any managed computer (even when they are disconnected from the network). IntelliMirror also gives centralized backup of user data and configuration files department.
- Enhanced Security Management. Powerful tools to establish and manage the security of their Windows environments.
- Scalable Operations Management. Remote administration is enabled via Terminal Server, Windows Script Host, and Windows Management Instrumentation (WMI), the management infrastructure that provides access to more than 10,000 system objects in Windows Server 2003 via application, scripting, and command line interfaces.
- Windows System Resource Manager (WSRM). WSRM enhances application availability and quality of service by providing control over application CPU and memory utilization, making it easier to run mixed application workloads on a single server.
- Active Directory Enhancements. Increased flexibility and manageability enhancements, such as secure credential and certificate management, provide a consistent single sign-on experience and health monitoring visibility to easily monitor trusts and replication activity.

Virtual Server

Virtual Server (acquired from Connectix) addresses customer needs for application migration and server consolidation. Virtual Server enables customers to run multiple operating systems and applications in Virtual Machine (VM) environments (a VM is essentially a computer-implemented in software-running in isolated software partitions on a physical computer).

The benefits of VM technology for application migration and server consolidation include:

- Simplicity: Virtual Server supports every major x86 Microsoft provided operating system running in the VM environment, leveraging industry-standard device drivers. This capability enables customers to run their Windows NT™ 4 based-applications (for example), without change or disruption in usage or management, on more powerful and more resilient hardware that takes advantage of the performance and reliability enhancements of Windows Server 2003.
- Automation: Virtual Server is fully extensible through a COM API that enables scripted or programmatic control over the configuration, operation, management, and integration of VM environments.
- Flexibility: Virtual Server can be configured on desktop systems and deployed on high-end Intel-based servers. Virtual Hard Drives (VHDs) are highly portable and system integrators can integrate and enrich XML configuration files for fast, economic deployment.
- Security - Virtual Server provides separate security contexts for each Virtual Server, allowing internal and external hosting environments to provide complete control of the VM to ‘owners’, without compromising the security of other VMs, or the system overall.
Focus on Terminal Services

The Terminal Server component of Windows Server 2003 builds on the solid foundation provided by the application server mode in Windows 2000 Terminal Services. Terminal Server lets you deliver Windows-based applications, or the Windows desktop itself, to virtually any computing device—including those that cannot run Windows. Terminal Server can enhance an enterprise’s software deployment capabilities for a variety of scenarios that remain difficult to solve using traditional application distribution technologies. When users run an application on Terminal Server, the application execution takes place on the server, and only keyboard, mouse and display information is transmitted over the network. Users see only their own individual sessions, which are managed transparently by the server operating system, and remain independent of any other client session.

There were many enhancements to Terminal Server in Windows Server 2003:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Increased Scalability</td>
<td>Enterprises need the ability to scale-up and scale-out. Terminal Server supports more users on each high-end server than Windows 2000; and Session Directory in Windows Server 2003, Enterprise and Datacenter Editions provides support for Microsoft’s network load balancing and other third-party load balancing technologies.</td>
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<tr>
<td>Improved Manageability</td>
<td>Terminal Server provides unsurpassed remote manageability by taking advantage of technologies like Group Policy. Complete remote management capabilities are available through a comprehensive read/write Windows Management Instrumentation (WMI) provider.</td>
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<tr>
<td>Easy-to-use Remote Desktop</td>
<td>Remote Desktop Connection is the new “Terminal Services Client” that features a much improved user interface, enabling users to save connection settings, easily switch between windowed and full screen mode, and to dynamically alter their remote experience to match the available bandwidth.</td>
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<tr>
<td>Connection</td>
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<tr>
<td>Enhanced Remote Desktop</td>
<td>When connecting to a terminal server using a TS client, many of the local resources are available within the remote session, including the client file system, smart cards, audio (output), serial ports, printers (including network), and the clipboard. These redirection facilities allow users to easily take advantage of the capabilities of their client device from within the remote session. For instance, files can be opened, saved and printed to the users local PC, regardless of whether the application is running locally or remotely.</td>
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<tr>
<td>Connection</td>
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<tr>
<td>Greater Color Depth</td>
<td>With the new TS client, color depth can be selected from 256 colors (8-bit) to True Color (24-bit), and resolution can be set from 640 x 480 up to 1600 x 1200. For example, an IT administrator can use Terminal Server to support store kiosks displaying merchandise. They can be set to provide true color images for the best product image.</td>
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<tr>
<td>and Screen Resolution</td>
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<tr>
<td>Additional Windows Server</td>
<td>Terminal Server takes advantage of many Windows Server 2003 features, such as software restriction policies, roaming profile enhancements, and new application compatibility modes.</td>
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<td>2003 Enhancements</td>
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</table>
Business people today are expected to get their work done—no matter where they are, or what computing devices or connections they’re using. Far-flung offices, legions of traveling “road warriors,” and increasing numbers of telecommuters have created virtual organizations requiring round-the-clock and round-the-world information access.

Management expects your IT department to keep everyone running at peak productivity. But the ability to provide true mobility to workers in today’s heterogeneous and distributed computing environments varies tremendously from one organization to another.

Access to the On-Demand Enterprise is the universal goal. Companies worldwide are trying to build enterprise-wide, Internet-enabled environments that deliver business-critical applications and information to users in any work scenario. But most lack the tools to deliver the On-Demand Enterprise. To manage it. To make it secure. And to provide desktop-like performance. All with the ease and simplicity that users expect.

The Citrix® MetaFrame® Access Suite, used in conjunction with Microsoft Windows Server 2003 Terminal Server, provides the ultimate presentation-serving platform. It uses the Internet to give your workers access to Windows, Web, and legacy applications, as well as other information, from anywhere, at any time, on any device, over any connection.

The flagship Citrix product and the foundation of the MetaFrame Access Suite is Citrix MetaFrame XP™ Presentation Server. It is the world’s most widely deployed presentation server for centrally managing heterogeneous applications and delivering their functionality as a service to workers, wherever they may be. Citrix MetaFrame XP embraces and extends Terminal Services functionality in Windows Server 2003, creating the most comprehensive solution for enabling people to easily and securely access the On-Demand Enterprise.

You can further extend the value of your MetaFrame XP Presentation Server with these other members of the MetaFrame Access Suite:

- Citrix MetaFrame Secure Access Manager: secure, single-point access over the Web to a wide range of internal and external information resources and applications, personalized to each user’s needs.
- Citrix MetaFrame Conferencing Manager: intuitive application conferencing that eliminates the geographical distance between team members, increases the productivity of meetings, and enables easy collaboration.
- Citrix MetaFrame Password Manager: universal password security and single sign-on access to Windows, Web, proprietary, and host-based applications running within the MetaFrame environment.

Company description
Citrix Systems, Inc. (Nasdaq:CTXS) is the global leader in access infrastructure solutions for businesses, government agencies, and educational institutions. The most trusted name in enterprise access, the Citrix® MetaFrame® Access Suite enables people to easily and securely access the On-Demand Enterprise, from anywhere, anytime, using nearly any device over any connection. Nearly 50 million people in more than 120,000 organizations around the world use Citrix every day. Citrix customers include 100% of the Fortune 100 companies, 95% of the Fortune 500 and 95% of the Financial Times European 100. Based in Fort Lauderdale, Florida, Citrix has offices in 22 countries, and more than 7,000 channel and alliance partners in more than 100 countries. For more information, visit www.citrix.com.
Inside MetaFrame XP Presentation Server and Windows Server 2003

Citrix and Microsoft have long been strategic industry partners. Citrix builds all of its key products for the Windows platform, and through its extensive knowledge of Microsoft system and application software, Citrix has become the leader in the access infrastructure computing market. Today Citrix is a Global Gold Certified Partner of Microsoft, and Microsoft is a Premier Plus member of the Citrix Business Alliance™ Program.

Nothing demonstrates the closeness of this alliance more clearly than the fact that Citrix and Microsoft co-developed the technology on which Windows Terminal Services is based. Citrix MetaFrame XP embraces Windows Server 2003 as its core platform and will take advantage of many of its new features, such as software restriction policies, enhanced scalability, and group policy enhancements. MetaFrame XP extends the value of Windows Server 2003 by adding functionality that improves manageability, scalability, security, and flexibility. Specific capabilities include: secure transmission of data across the Internet; access to applications and information from virtually any client platform; management of disparate groups of servers from a central location; optimization of Terminal Server’s scalability; and a common interface for accessing applications, information, and people.

Citrix embraces and extends Windows Server 2003 with:

**Unparalleled manageability and scale**
- Gain control over the complexities of an enterprise-class environment, supporting very large numbers of users on large server farms that improve the entire company’s productivity and profitability.
- Maximize server resources by centrally configuring load-balancing criteria for applications or servers.
- Simplify deployment across multiple servers by pushing icons—not entire applications—to users’ devices.
- Publish applications, service packs, upgrades, client software updates—or other files to or from any Citrix server on the network.
- Enhance printer management by using the MetaFrame XP universal printing capability to eliminate the need to install multiple print drivers for diverse environments.
- Simply and easily monitor and manage the health and performance of servers and applications from a central point, using out-of-the-box capability.
- Generate reports and real-time graphs to view system status and application usage for capacity planning and resource allocation and billing.
- Allow administrators to monitor MetaFrame XP and Windows Server 2003 servers from the convenience of the Microsoft Operations Manager (MOM) console.

**Ultimate flexibility**
- Bridge the worlds of Windows and the Web, and provide the same user experience for the entire organization.
- Get seamless access to applications from any device: desktops, workstations, laptops, wireless devices and other network appliances.
- Provide a more satisfying user experience with SpeedScreen™, which speeds application display and response time.
- Give users better performance and more responsive scrolling when viewing graphics-intensive Web applications with SpeedScreen browser acceleration.

**The Bottom Line**
The Citrix MetaFrame XP Presentation Server, together with Windows Server 2003, lets you manage heterogeneity and complexity by enabling your IT team to centrally provision, administer, and support secure access to applications from anywhere, anytime, using any device, over any connection.
Deliver applications in a personalized and customized way while reducing the administrator’s burden.

Instantly Web-enable existing applications and publish them to a browser.

Publish URLs, documents, and rich content in addition to applications. This provides users with access to dispersed applications and content and can be used with published applications, local applications, or both.

Ease the process of deploying Web applications by using MetaFrame XP, providing a centralized, controllable, and easily managed environment that helps eliminate potential network congestion and client incompatibility.

**End-to-end security**

- Securely access internal applications and information on demand from an external Web browser, even an Internet kiosk, without the need for a VPN or pre-installed client software.
- Use the secure gateway for MetaFrame feature to provide a single point of entry and secure access to Citrix MetaFrame servers.
- Protect client-to-server communication with strong, industry-standard Secure Sockets Layer (SSL v3.0) or Transport Layer Security (TLS v1.0) encryption technology.
- Allow easy traversal of firewalls and proxy servers without custom configuration using industry-standard TCP/IP ports that are typically open on corporate firewalls.
- Protect corporate information by preventing unauthorized access through features such as ticketing and built-in support for 2-factor authentication.

Not surprisingly, the Citrix MetaFrame Access Suite can provide significant value to organizations deploying .NET Framework applications using Windows Server 2003. Citrix MetaFrame XP Presentation Server is already playing an active role today in deploying .NET-connected applications across the enterprise to any client device across any network connection.

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**How Does Citrix MetaFrame Secure Your Access?**

With Citrix MetaFrame XP, you can protect applications and data delivered across public networks using industry-standard encryption. All communication into and out of the firewall occurs over standard SSL TCP/IP port #443. Users connect and authenticate to the Web interface server via a Web browser, optionally secured with SSL. This server authenticates the user, and provides a list of applications available to the user. When an application is launched the client makes an SSL connection to the secure gateway server, and passes a ticket generated by the Web interface. The gateway server uses the ticket to validate that the user is authenticated, and determines the address of the target MetaFrame XP server.

At this point the gateway server establishes a session to the target MetaFrame Server using TCP port #1494 (the port used by the Citrix protocol). All traffic sent over the Internet is encapsulated with SSL or TLS.

Citrix MetaFrame provides an effective solution to deliver information and applications on demand, securely across the Internet, using industry standard encryption. It does this by providing a gateway that is separate from the MetaFrame XP servers, and reduces the issues of firewall traversal by using a widely accepted port. Couple this with the ability to use this technology from nearly any client device and you have a secure, manageable, flexible solution.
Global Investment Bank Keeps Trading in Disaster’s Aftermath

When you’re an international company with offices in some of the world’s hot spots, you are vulnerable to any number of catastrophes. In the case of this banking and investment firm scenario, disaster took the form of an earthquake that completely destroyed a branch office in a major Latin American capital. Fortunately, no lives were lost, but the company had to scramble to find as many temporary offices as possible in the surrounding area, and to get its employees back to work to help finance the recovery efforts.

Here’s where the company’s smart choice of the Citrix MetaFrame Access Suite, including MetaFrame XP Presentation Server, really paid off. This solution provided access to displaced employees via any standard browser—from home, a temporary office, a library, or other location—enabling them to quickly resume work. Not only were users able to pick up where they left off, but they did not notice any change in performance; they were able to continue their work at the same levels they were used to. The combination of MetaFrame XP and Windows Server 2003 provided an environment that performed well and was available whenever or wherever the users needed it.

Secure, Web-based Access to Patient Records at the Point of Care

Optimizing patient care means giving doctors flexible access to vital medical records, while at the same time safeguarding privacy with HIPAA-compliant security. A multi-hospital division of a not-for-profit health system in the Pacific Northwest sought to give its staff physicians access to critical patient information over the Web, hoping to benefit patients and to improve its own competitive position. With a heterogeneous computing environment made up of applications from different vendors, the division faced high costs and delays associated with rewriting legacy applications.

By implementing a combination of Citrix MetaFrame XP Presentation Server with the secure gateway feature and Microsoft Windows Server 2003, the health system was able to provide nearly a thousand doctors with secure, Web-based access to applications such as Logician, Physician Portal, and Image Manager. In addition, the hospital’s 802.11b wireless network enabled doctors, nurses, and administrators to access key data on wireless laptops. The hospital also complied with HIPAA regulations in the area of remote access by providing a system that is encrypted and user-authenticated.
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Microsoft Links
Microsoft Windows Server 2003
www.microsoft.com/windowsserver2003/default.mspx

Security Services in Windows Server 2003

Internet Information Services 6.0
www.microsoft.com/windowsserver2003/evaluation/overview/technologies/iis.mspx

Active Directory Enhancements
www.microsoft.com/windowsserver2003/evaluation/overview/technologies/activedirectory.mspx

Windows System Resource Manager

Microsoft Virtual Server Technology
www.microsoft.com/windowsserver2003/techinfo/overview/virtualization.mspx

Windows Datacenter OEMs
www.microsoft.com/windowsserver2003/partners/oems/default.mspx

Windows Server 2003 Datacenter Certified ISVs
www.microsoft.com/windowsserver2003/partners/isvs/isvs.mspx

“Certified for Windows” Homepage
www.microsoft.com/windowsserver2003/partners/isvs/cfw.mspx

“Certified for Windows” Applications List
cert.veritest.com/CfWreports/server/

Citrix Links
Citrix MetaFrame XP Presentation Server
www.citrix.com/metaframexp

Calculate your TCO with Citrix MetaFrame & Windows Server 2003
www.acecostanalyzer.com

Why Migrate to MetaFrame XP?
www.citrix.com/xpmigration

Citrix Demo Room
www.citrix.com/demoroom

Citrix Solutions
www.citrix.com/site/PS/index.asp

Citrix Business Alliance - Microsoft Premier Plus Partner page
www.citrix.com/microsoft

Citrix MetaFrame Secure Access Manager
www.citrix.com/secureaccess

Citrix® MetaFrame® Password Manager
www.citrix.com/passwordmanager
Microsoft’s Certified for Windows program is sponsored by industry-leading companies such as Intel and Unisys. Microsoft and VeriTest are working closely with these sponsors to provide a better testing environment for independent software vendors who participate in the Certified for Windows program.

The objective of this certification program is to provide customers the highest level of assurance when choosing applications running on Windows 2000 Server and Windows Server 2003. In order to have an application certified, an independent software vendor and Microsoft work together to ensure that the application meets the highest standards for reliability, availability, security and supportability. These standards apply to Microsoft and third-party applications.