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Not Just Another Pretty Sticker: Exploring the Upside of 'Certified for Windows Server'

Software Logos from the Enterprise Customer Perspective

Free test tools and certification requirements help resource-strapped enterprise IT groups assess technical quality and wield buying power for better experiences deploying server applications.

By Peter Varhol

Whatever assurances are made during the sales cycle, the enterprise IT group is ultimately responsible for deploying applications successfully across the enterprise. What's more, it's the IT professional who prioritizes, troubleshoots and resolves the issue—with or without support from the independent software vendor (ISV).

While IT professionals have good reason to be skeptical of software marketing claims, one lesser-known marketing designation is flexing its technical muscles: the "Certified for Windows Server 2008" logo. The certification program just may help resource-strapped IT pros predict technical problems prior to deployment—and use buying power to ensure technical quality of the in-house or third-party applications they deploy.

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✔ Find a complete list of independently tested applications at **www.windowsservercatalog.com**.

✔ Learn about the "Works With" and "Certified For" technical bars and download free test tools at **www.innovateonwindowsserver.com**.

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Microsoft

Dismissed by some as just a "paperwork thing," Windows Server software certification actually designates applications that are subjected to 50 to 80 hours of testing by an *independent* third-party lab. Testing comprises about a hundred Microsoft-recommended practices for security, stability, reliability, availability and basic compatibility with the Windows Server 2008 and R2 versions of the operating system. Virtually all of these test cases apply to enterprise use.

Microsoft is starting to promote the certification as the ultimate technical bar for enterprise server applications. According to Venkat Krishnamachari, senior program manager responsible for the Windows Server 2008 software certification program for Microsoft, "By ensuring that all server applications install in the same manner and behave consistently, the overall server quality and reliability improves."

> "By not supporting technical shortcuts, deprecated APIs or convoluted installation techniques, certification enables enterprises to have a high level of confidence that an application will continue working as designed through operating system updates and other changes to the operating environment."
>
> **Venkat Krishnamachari, Senior Program Manager, Microsoft**

In addition, Krishnamachari notes that the certification enables applications to prepare for the future. "By not supporting technical shortcuts, deprecated APIs or convoluted installation techniques, certification enables enterprises to have a high level of confidence that an application will continue working as designed through operating system updates and other changes to the operating environment."

Starting with a detailed review of the test cases themselves, this article will explore the ways IT professionals and systems integrators can use the logo program to leverage better technical quality in third-party software.

Testing for Logo Certification

Described at length in test framework documents and free test tools available at www.innovateonwindowsserver.com (under the "Test" tab), the following sections summarize six chapters of test cases that any ISV or IT professional can investigate and, if desired, run against any server applications, commercial or otherwise:

- Windows fundamentals
- Install/remove
- Security

SOLUTION SPOTLIGHT

Aras Innovator®

CERTIFIED FOR Windows Server® 2008

Aras Innovator® is a Product Lifecycle Management (PLM) solution, built on a .NET model-based SOA framework. The software is distributed using the enterprise open source business model. Customers include Motorola, Rolls Royce, Freudenberg, Lockheed Martin, Ingersoll-Rand and ACCO Brands.

"We distribute our .NET-based PLM solution using the enterprise open source business model, selling optional support subscriptions. That means our sales depend on the IT department's first impressions after the download. **Our certification effort required significant changes to our .MSI installer, such as using only legitimate and safe registry manipulations, implementing a command-line mode, implementing a clean un-install process, adding installation logging and removing external procedures from install.** These changes noticeably improved the first impression, resulting in more enterprise support subscription sales. **In addition, the installer improvements actually reduced our overall support costs. Most companies can now install the Aras Innovator application and be ready to evaluate in less than 30 minutes.**"

Peter Schroer

President and CTO

Aras Corp.

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SOLUTION SPOTLIGHT

BMC Performance Manager for Servers

Provides a proactive monitoring solution that is extensible and scalable for your Windows, Unix and Linux operating system environments.

"One of our goals for BMC Performance Manager for Servers was to have extremely tight integration with Windows 2008 installations, including the new UAC feature. **The Windows 2008 certification process helped us align with the new security configurations.** Running the compatibility tests in Hyper-V, we were pleased to be able to demonstrate significant new levels of support for additional virtual machine states, such as recovering after save state and restore, recovering after pause or resume, surviving snapshot process and not preventing shutdown. **We eventually adopted the Microsoft certification test tools into our development QA processes and have added Windows 2008 certification as a core 'feature' requirement for future releases of the product.**"

Ajay Singh

Vice President, General Manager, BMC Service Assurance Products

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- Reliability and high availability
- Client components
- Hyper-V virtual machine compatibility

Under each chapter, Microsoft lists a number of specific areas for test, and what the results should be in order to pass the test. Server and Client components of 32-bit and 64-bit applications are tested on x64 platform of Windows Server 2008 and Windows Vista. The goal is to ensure that the application passes all of the certification tests and is highly likely to install and operate in a predictable fashion.

While Microsoft has been encouraging ISVs to use these tests in their build/development processes, IT departments can also use these tests to assess technical quality of any commercial or in-house applications, as well as custom modifications that may or may not be certified.

When the "Certified for Windows Server 2008" or similar "R2" logo appears on a third-party application's Web page, data sheets or other marketing collateral, it means that the application has been independently tested by one of the two labs authorized by Microsoft to conduct the 100 tests and certify the results.

"For any issues uncovered during certification testing, ISVs *must* satisfy all Microsoft requirements before the certification is awarded," Krishnamachari says. "Customers who discover the same issues on their own must instead rely on the priority and timeline assigned by the ISV's support department."

CHAPTER 1: TESTING FOR WINDOWS FUNDAMENTALS

There are certain fundamental characteristics that any application must exhibit in order to deliver a predictable

CHAPTER 1: WINDOWS FUNDAMENTALS

1.1	Perform primary functionality and maintain stability
1.2	Check Windows version correctly
1.3	Driver-related requirements
1.4	Identify all non-hidden files in the application
1.5	Execute appropriately in multilingual environment
1.6	Degrade gracefully when services are unavailable
1.7	Support 64-bit version of Windows running on multiple processors
1.8	Work properly in Safe Mode
1.9	Requirements for applications publicized for running in "Server Core"

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>
> **Venkat Krishnamachari, Senior Program Manager, Microsoft**

experience with Windows Server 2008 and R2. These characteristics make it possible for IT professionals in user organizations to begin to have confidence that a server application will behave as expected. Here's what applications have to do at a fundamental level in order to pass the certification tests and provide IT professionals with that initial confidence.

Perform primary functionality and maintain stability. Does the application do the tasks that it's purported to do, in a way that doesn't consume resources or disrupt the operating system? Certification tests check to ensure that the application performs basic functions in accordance with Windows applications in general, and its own functions in particular.

Check Windows version correctly. The application must make the correct call to Windows Server to determine what version and Service Pack is currently running. This enables applications to better prepare for future Service Packs and OS releases.

Identify all non-hidden files in the application. In many cases, files and descriptions that aren't readily apparent to IT professionals can't easily be checked and confirmed. This requirement ensures ISVs identify those files and provide a description, enabling IT to more easily identify, diagnose and address application issues.

Execute appropriately in multilingual environment. Many applications are run on versions of Windows Server in foreign-language or international environments. Applications that are internationalized to run on foreign-language versions of Windows Server have to ensure that installation, operation and maintenance are the same as on the English-language version.

Degrade gracefully when services are unavailable. Often, system resources such as memory or networking may not be readily available to the application, due to failures or out-of-memory conditions. Applications expecting these and similar services shouldn't fail abruptly if those services are not available. Instead, they must accomplish the work they're able to without those services, and report to the user when a particular process can't be completed.

Work properly in Safe Mode. Windows Safe Mode removes certain services, such as networking, in order to let IT professionals diagnose and address issues of applications or the OS. A server application must be able to

SOLUTION SPOTLIGHT

Centrify DirectControl

CERTIFIED FOR Windows Server 2008

Centrify's auditing, access control and identity management solutions centrally secure cross-platform systems, Web applications, databases and enterprise applications using Microsoft Active Directory.

"The Windows Server software certification process **helps us reinforce adherence to best practices by requiring scrutiny in areas we might not have thought about.** For instance, Microsoft's AppVerifier.exe tool helped identify a hidden issue in one of our C++ libraries. While it would not have seriously affected users, it directed us to properly handle a critical resource, making our solution more reliable. Additional **certification test tools help us perform testing that's difficult to do in other ways,** such as Loadgen's ability to simulate the restricted resource environment. Overall, the level of scrutiny is very reassuring for us and for our customers, and the certification has been a distinct competitive advantage in our space."

Jim Chappell

Vice President Business Development and Support

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SOLUTION SPOTLIGHT

Citrix XenApp™

Citrix XenApp™ is a Windows® application delivery system that manages applications in the data center and delivers them as an on-demand service to users anywhere using any device.

CERTIFIED FOR Windows Server® 2008

"Customers rely on XenApp as an enterprise-class virtual application delivery infrastructure, and the Windows Server 2008 Hyper-V certification process significantly helped us affirm reliability and quality. Subjecting all kernel mode drivers to WHQL certification and signing processes can be time-consuming, but it assures customers that our core functionality—executing with system-level access—performs reliably on the platform. In fact, **many of the tools, such as the Driver Verifier and App Verifier, have now become a key part of our automated test framework** to expand our existing test coverage. With the introduction of Hyper-V, XenApp is increasingly being virtualized, so our **customers appreciate that we have certified XenApp's stability and reliability within a Hyper-V environment.**"

Mick Hollison

Vice President of XenApp Product Marketing

Citrix Systems Inc.

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work in Safe Mode so that any problems with the application in normal mode can be found and addressed in the limited environment.

Sign all drivers. If the application employs device drivers, those drivers must be certified separately through the Windows Hardware Qualification Tests and certified separately. Those drivers are tested and signed separately from the application as a whole, to ensure that they are safe to run in the OS kernel.

CHAPTER 2: INSTALL/REMOVE AND CERTIFICATION TESTING

Installing a server application is often the first experience IT professionals have with that application, and the dozen test cases in this chapter enforce specific criteria to help ISVs deliver good impressions. To require otherwise is to invite an immediate reputation as a difficult application that requires special expertise and handling.

One especially irksome feature of some installations is the reboot—or even multiple reboots—often required if an application has or makes direct use of kernel mode components. If the installation is occurring on a live server, a reboot is an extremey bad thing, because it can interrupt ongoing work. At the very least, it increases the amount of time that live server is down. Some organizations have failovers or clustered systems

CHAPTER 2: INSTALL/REMOVE

2.1 Installer/Technology
2.2 Do not require a system restart
2.3 Uninstall cleanly
2.4 Comply with Windows Resource Protection (WRP)
2.5 Allow User control of installation location
2.6 Comply with kernel mode component requirements
2.7 Install shared components to correct location
2.8 Do not overwrite non-proprietary files with older versions
2.9 Support User Account Control for installation
2.10 Correctly configure package identity
2.11 Follow Best Practices for creating custom actions
2.12 Follow component rules

that make it easier to perform a live installation, but many use a single server for individual or even multiple applications. Under these circumstances, a "no-reboot" policy is essential.

Other installation test requirements deal with topics such as privilege level for installation, the locations of shared files and the need to not automatically overwrite shared files. In the past shared files have been a prescription for the unfortunately named "DLL hell," where applications overwriting DLLs of the same name have caused incompatibilities between different applications on the same server. This and similar issues have been largely addressed by enabling multiple versions of DLLs to exist, and by previous certification requirements.

CHAPTER 3: SECURITY DRIVES CRITICAL TESTING FOCUS

Security is one of the most important considerations for any deployment. Server applications with known security holes are open invitations for attackers to access the application's code and data, and possibly use it as a stepping stone to a broader attack across the organization.

"The security chapter is one of the most important aspects of certification testing, because it ensures an application's compliance with security policies that IT professionals would like to assume—such as secure network connections and support for smart card login—as well as less obvious considerations," Krishnamachari says. "For example, the application has to 'play well' with the Windows Server operating system, network and with

CHAPTER 3: SECURITY

3.1	Follow User Account Control protection guidelines
3.2	Support smart card login and secure credential management
3.3	Network connections must be secure
3.4	Do not make non-secure additions to the secure desktop
3.5	Services running as LocalSystem must not present a UI
3.6	Compatibility with virus scanning of I/O write-to files
3.7	Clustering support
3.8	All executables must be signed
3.9	Run in a highly secure configuration
3.10	Follow anti-malware policies
3.11	Active Directory support

SOLUTION SPOTLIGHT

Diskeeper 2009

Diskeeper® 2009 invisibly and automatically maintains performance. Using InvisiTasking® technology, performance is consistently maximized, hardware life is lengthened and costly upgrades and refreshes are delayed.

CERTIFIED FOR Windows Server® 2008

"For Diskeeper Corp., achieving Windows Server certification has certainly improved our product's technical quality, while adding consistency and traceability to development and build processes. For example, one requirement is to embed a manifest with specified privileges in all executables. **We now mandate that developers have a legitimate reason to increase the security tag's privileges, thereby mitigating previous user issues via the Windows UAC.** Certification requirements also ensure our developers verify each new feature as it's implemented. In fact, the AppVerifier test tool once found a previously undetected error that was hard to reproduce, despite extensive in-house and field testing. **The certification tools and requirements helped ensure that bugs like this don't pass into the final product.**"

Michael Materie

Director of Product Management

Diskeeper Corp.

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SOLUTION SPOTLIGHT

eB

Enterprise Informatics' solutions ensure corporate information assets are governed, secure, controlled and trustworthy—providing accurate data that lowers the cost of meeting compliance requirements.

> "One outcome of following the certification criteria is that we are much more vigilant about signing all files. **Previously, we tended only to sign installers. Now, we sign all required files and press our vendors to do the same.** The certification criteria serve as a solid test plan, and the tools help you get through the checklist. The process helps you align with Microsoft-recommended practices and forces you to check scenarios you may not have considered. Another outcome was that we finally identified the cause of an issue where certain files didn't always uninstall. **Preparations for certification revealed the underlying installer issue, which we managed to resolve, and now we have perfect uninstalls every time.**"

Leslie Robins

Marketing Communications Manager

Enterprise Informatics

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other applications and application components. Well-behaved applications also tend to be more secure applications."

User Account Control compliance is one such requirement. A user's Windows experience can be more secure when applications run with only the permissions they need. Unless an application is designed to be run only by system administrators, it must run with least privileges.

A new requirement for 2008 that causes many failures during certification testing is that all executables must be digitally signed. A signed executable tells the user organization that that application is valid, comes from the vendor it purports to and hasn't been tampered with.

Any application that attempts to install a Rootkit is ineligible for certification. Rootkits are generally associated with malware and in any case represent poor development practice.

Along with anti-malware practices, server applications must work well with virus scanning software and be able to continue operation while that software is running, in order to be able to serve users during regular scanning activities. Not being able to do so may result is serious disruptions of application availability to the users.

Transparency into this chapter's requirements—11 in total—is perhaps the most valuable aspect for IT professionals. By studying the certification test framework document, you can know exactly what's covered, so that you can focus limited resources on other tests that are important for your specific environment.

CHAPTER 4: RELIABILITY AND HIGH AVAILABILITY FOR WINDOWS SERVER APPLICATIONS

There's little question that a server application must be reliable and exhibit high availability during normal operation. These requirements help Windows Server 2008

CHAPTER 4: RELIABILITY AND HIGH AVAILABILITY

4.1	Demonstrate high stability under stress
4.2	Crash recovery & downtime avoidance
4.3	Use Resources and handle Exceptions appropriately
4.4	Debugging symbols/tools must be available
4.5	Do not cause services to become unavailable
4.6	Follow best practices for Windows Error Reporting, IPV6 and Firewall

applications minimize the number of crashes, hangs and reboots experienced by users. The requirements can help in the process of creating and running software that's more predictable, maintainable, resilient, recoverable and proven for the user organization.

The application has to be stable and functional under high stress. High stress usually refers to a high load on the application, server, network or other system resource. While application performance is likely to degrade under such circumstances, it must degrade gracefully—not fail abruptly—and not produce incorrect results. If an application uses system resources such as memory properly, it must be able to work and degrade gracefully under high stress.

The application also has to manage errors and exceptions gracefully, as well as recover quickly with little loss of data and processing. Such recovery must occur with-

CHAPTER 5: CLIENT COMPONENTS

5.1.1	Verify Least-Privilege Users cannot modify other user documents or files
5.1.2	Verify Least-Privilege user is not able to save files to Windows System directory
5.1.3	Verify application launches and executes properly using Fast User Switching
5.1.4	Verify application launches and executes properly using Remote Desktop
5.1.5	Verify ClickOnce application only stores data in installed user's folders
5.1.6	Does the client component installation support advertising?
5.1.7	Does the entire installation suite comply with certification requirements?
5.1.8	Are value-added extras properly identified during installation?
5.1.9	Verify the application rolls back the install and restores machine back to previous state
5.1.10	Verify the application properly handles files in use during install
5.1.11	Verify the application is Restart Manager Aware
5.1.12	Verify that the application only handles exceptions that are known and expected

SOLUTION SPOTLIGHT

PowerTerm® WebConnect

CERTIFIED FOR Windows Server® 2008

Ericom's PowerTerm® WebConnect provides secure, centrally managed access to business-critical applications and desktops running on Windows Terminal Servers, virtual desktops (VDI), blade PCs and other systems.

"Pursuing Windows Server 2008 certification for PowerTerm WebConnect gave us **comprehensive, clear guidelines on how to improve our own testing and build processes for even more thorough product quality.** We already had a massive testing battery and database, but the requirements provided quite a few additional complex scenarios. Another benefit is the repository of debugging symbols for both C++ and C# we incorporated as part of the certification process, which helps R&D remotely debug issues at customers' premises without any changes required to production sites. Overall, **Windows Server software certification testing has helped us proactively mitigate our customers' potential need for support,** while increasing our ability to resolve their issues quickly."

Ilan Paretsky

Vice President of Marketing

Ericom Software

www.ericom.com

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SOLUTION SPOTLIGHT

FalconStor Network Storage Server

FalconStor Network Storage Server technology integrates storage virtualization and provisioning across multiple disk arrays and connection protocols for an easy-to-use, scalable SAN solution.

"Certification requirements forced us to reevaluate our security context for each component as part of the installation, and to digitally sign each component to ensure that each was known to be a FalconStor component. The most recent Windows Server 2008 certification improved our upgrade process tremendously by ensuring that each component is registered with version information and locatable via the security manifest so that upgrading the correct components is assured. Also, security levels for each product components are now set by the component's role, reducing security risks in the installation. **As a result, the Windows 2008 Server certification process has improved our security and in-field upgrade reliability, as well as simplified our support."**

Fadi Albatal

Director of Marketing

FalconStor Software

www.falconstor.com

FalconStor Software

out crashing or affecting the stability of the system or other applications.

Last, the application must make debugging symbols available. Debugging symbols enable a development team to match application steps with source code within Visual Studio, providing a clear picture of what led up to the error or exception. While the symbols don't directly help IT recover from a crash, if there's an ongoing diagnosis between the user organization and the vendor, the symbols help the vendor find and fix the issue more quickly. The application must also be prepared to send Windows Error Reports on application errors.

CHAPTER 5: OPTIONAL TESTING FOR CLIENT COMPONENTS

The dozen Client Component-Only test cases comprise requirements which are not already requirements for both client and server components in other parts of the certification testing process. If a server application consists of both server and client components, and the clients have not yet been tested in the process, this is where they are tested. All client components must be installed and tested on 64-bit Windows Vista Ultimate. Additional testing on 32-bit Vista is not required, making client testing relatively straightforward.

These tests are essentially an abbreviated form of the testing described for server-based applications, including fundamental operation, installation and removal, security and least privilege operation, and error and exception handling and reporting. These tests ensure that the client operates in a similar and consistent manner to the application server component.

CHAPTER 6: OPTIONAL HYPER-V VIRTUAL MACHINE COMPATIBILITY

Virtualization is a fact of life, and Microsoft's Hyper-V is an increasingly attractive hypervisor, thanks to its tight integration with Windows Server 2008 and its pricing model. This makes it essential that server applications be tested and certified in the virtual environment.

Currently only a minimum number of tests exist for Hyper-V compatibility. These revolve around the ability

CHAPTER 6: Hyper-V Virtual Machine Compatibility

- **6.1** Recover after Save State/Restore of virtual machine
- **6.2** Recover after a Pause and Resume of the virtual machine
- **6.3** Do not prevent Shutdown
- **6.4** Survive Snapshot process

of the application to return to full functionality after restoring from Saved State, Pause or applying Snapshots.

Save State/Restore is used when administrators need to perform operations on the physical machine but do not want to lose the state of the virtual machines that are being hosted. An example of such an operation might be the installation of a new hardware device that requires the physical machine to be rebooted. In addition, if the physical server is restarted, the default action in Hyper-V is to Save State for any running virtual machines and restore them again after the restart.

To pass this optional chapter of test cases, the application must also demonstrate the ability to recover after a Pause and Resume of the virtual machine, not prevent a system shutdown and survive the Snapshot process intact. These are fundamental operations of Hyper-V virtualization and representative of the types of operations many IT groups will use in normal operation of virtualized systems.

Using Certification to Benefit Enterprise IT

Understanding the technical "muscle" behind Windows Server 2008 software certification is the first step toward leveraging the program to save time and resources in your enterprise IT.

Test in-house and non-certified applications on your own. Designed to help ISVs assess application quality prior to submitting for formal testing, the free certification test tools can help you evaluate an in-house application or any non-certified software. In fact, it's a good idea to specify that a custom software application must pass the certification technical bar (if not earn the logo itself) as the final payment milestone, which helps you ensure quality of in-house applications.

Focus resources on environment-specific testing, not the fundamentals. It takes the authorized test labs one to two weeks to run through all 100 certification test cases—and they are professionals who already know the requirements, how to run the test tools, how to interpret the results, what behaviors to expect and what the anomalies look like. Chances are, your IT department doesn't have time to scrutinize every server application for all 100 test cases prior to deployment. Certification enables you to demand that ISVs provide proof that the application meets this technical bar.

Make QA the software vendor's problem—not yours. With free test tools available during the ISV's build process—and with certification tests averaging $10,000 to $13,000 (U.S. dollars)—the certification is achievable for even small ISVs. As a result, it's reasonable for customers to expect and demand upfront proof of technical quality before the purchase decision. The alternative is discovering fundamental issues after deployment, and you'll have to rely on the ISV's support to prioritize a fix.

SOLUTION SPOTLIGHT

Random Password Manager

CERTIFIED FOR Windows Server 2008

Privileged Account Password Management (PAPM) is a solution that secures your organization from employee turnover, internal threats, and sensitive information leakage by controlling access to administrator/root accounts.

"Preparing for certification cleaned up our code base and **added more formality to our product build/release processes** by requiring code signing, consistent and required component versioning, and debug file creation designed for customer access. The certification framework prompted us to complete global localization support for not only Latin-based alphabets, but also iconographic, left-to-right and right-to-left languages internally and in the files we generate. The result was **zero impact to the customers when they moved our products to the Windows Server 2008 platform,** which is the ultimate objective of certification. An unexpected benefit is that **customers deploying our products on older Windows Server platforms now receive a better, more stable and more secure experience.**"

Philip Lieberman

President

Lieberman Software Corporation

www.liebsoft.com/Random_Password_Manager

LIEBERMANSOFTWARE

SOLUTION SPOTLIGHT

Visual KPI

Transpara's Visual KPI is on-demand operations intelligence software that provides process and utility industry users with role-based, actionable KPIs on mobile and desktop Web browsers.

CERTIFIED FOR Windows Server 2008

"Visual KPI is used by industrial customers to deliver real-time, on-demand data to decision makers. While we had a great track record for reliability and scalability, **Windows 2008 Server testing added dimensions like maintaining stability when devices are unavailable, removed or not installed.** Adding these scenarios helped us discover and fix unintended assumptions about the state of IIS that led to crashes, such as having the Managed Pipeline Mode set to Integrated instead of Classic. The required 48-hour stress testing gave us quantitative evidence of higher performance under load. **Certification also lowered our mean time to resolve support incidences, as the manifests and .PDB files we had to create accelerated debugging and reduced turnaround time on resolving issues.**"

Michael Saucier

CEO

Transpara Corp.

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Ensure the application's supportability on the platform. Choosing applications that are "Certified for Windows Server" helps you ensure a more predictable installation, maintenance and troubleshooting experience for server applications. The mandatory debugging symbols alone can shave hours or even days off your time to resolution. By specifying certification in the RFP, you're ensuring that you're going to spend less time troubleshooting and providing user support later on.

Join the conversation about what's important. According to Krishnamachari, "The certification program will continue to evolve by taking new technologies into account, expanding on features such as Hyper-V, to ensure that Windows Server 2008 applications are ready to take advantage of these technologies with little or no modification. In addition, Microsoft will expand certification to encompass more complex scenarios—such as application stacks as opposed to individual applications." He continues: "We're definitely interested in collecting customer feedback on the user scenarios that should be part of the certification technical bar."

> "We're definitely interested in collecting customer feedback on the user scenarios that should be part of the certification technical bar."
>
> **Venkat Krishnamachari, Senior Program Manager, Microsoft**

Use your buying power to influence technical quality. By setting a high quality and compatibility bar with Windows Server operating systems, the software certification program has the potential to help IT groups reduce the time required for installation and maintenance, and help ensure a high degree of uptime for users.

"The Windows Server software certification program is already helping ISVs deliver technically superior applications to the market. But in order to spread this quality throughout the ecosystem, customers must initiate the conversation with their ISVs," Krishnamachari explains.

"It's up to customers to ask whether the ISV plans to save your IT department valuable time testing and troubleshooting their applications by earning the logo before you make the purchase decision," he notes. "Especially in times of economic pressure, anything you can do to ensure a more predictable experience has the potential to yield efficiencies of scale over time. Asking for the logo in an RFP is the easiest way to let ISVs know you care about technical quality, and if they want your business, they should be able to prove their application's quality upfront." •

Mitigate Frustration and Save Time with Free, Downloadable Test Tools that Assess Software Technical Quality

Tools intended to help ISVs achieve software certification can help IT pros save hundreds of hours and avoid bad software investments. Best of all, they're free and ready for download. By Peter Varhol

IT professionals rarely have the resources to test applications as thoroughly as they'd prefer prior to deploying mission-critical applications on production servers—and discovering technical issues after-the-fact only adds complexity and urgency to the time-consuming process of troubleshooting and resolving problems.

As a result, any test tools that can help IT pros evaluate applications systematically and quickly—in exacting detail—could save hundreds or even thousands of hours testing, deploying and supporting the application over its life span on the server, not to mention helping steer clear of problematic applications before the actual purchase decision.

It's even better when those test tools are free, readily available for download and relatively simple to use.

Microsoft developed several interesting tools to make Windows Server 2008 software certification more achievable for independent software vendors (ISVs) by helping developers incorporate certification test requirements into their build and test cycles before submitting the application for certification testing by an independent test lab.

Yet the Windows Server Software Certification Toolkit potentially has far greater value for IT professionals, such as:

- Determining an application's impact on the server environment.
- Predicting how applications will behave under load.
- Systematically detecting security vulnerabilities.
- Assessing an application's basic compatibility with the OS.
- Troubleshooting an application's unpredictable behavior while awaiting ISV support.
- Guiding in-house or custom application developers toward a technical bar.
- Augmenting in-house evaluation before a software purchase decision.
- Gaining familiarity with certification test cases to understand what's already been tested in a logoed application.

Whether you're assessing an in-house application or non-certified commercial software, the following tools expand your arsenal for predicting an application's behavior in a Windows Server 2008 and/or R2 environment.

Windows Server Software Certification Toolkit

The Software Certification Toolkit can be freely downloaded on the Microsoft site at www.innovateon.com/pageLayout.aspx?pageID=WinServer_Test_CertifiedFor. This kit includes detailed instructions on how to replicate these tests in any server environment, as well as ways to capture the results and make assessments as to the ability of an application to safely fit into the existing server infrastructure.

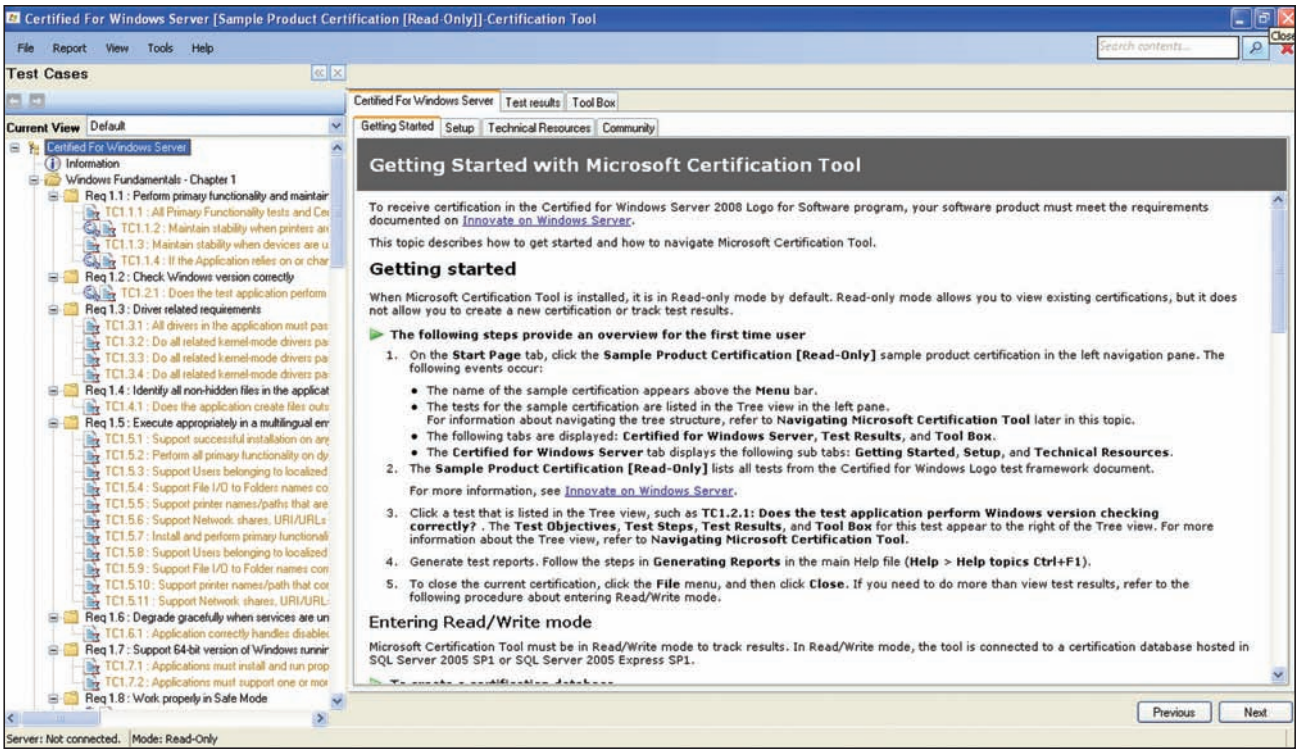


Figure 1. The Windows Server 2008 Certification Tool provides an environment for understanding certification testing and beginning a certification process.

The heart of the toolkit is the Certification Tool (see Figure 1), which helps IT professionals delineate and understand the tests, determine how to begin, set up the application and test environment, record the results, and provide a summary of test results for easy inspection and analysis. It also provides links to external technical resources for additional information on the certification process, running certification tests and interpreting the results.

The Certification Toolkit is installed onto a desktop system and can be connected to a SQL Server database and target server across the network. It drives the testing on the server and saves the results to the database. Installation and setup with the database and server take only a few minutes.

Testing Against Certification Requirements

An IT group might begin a test series on an existing or prospective application with the Certification Tool by creating a new certification test record (see Figure 2, opposite page). Once created, the new record serves as a repository and summary for a round of tests designed to assess one or more certification requirements.

The entire certification test suite covers approximately 100 test cases, involving fundamental operation, installation and removal, security, reliability and high availability, client components, and Hyper-V virtual machine compatibility. These tests are delineated in the Certification Tool, and can largely be run through that tool. In some cases, they are run with the assistance of external tools, with the Certification Tool monitoring and recording the results.

Once certain tools are installed for automated tests, you're ready to begin testing. The right-hand tabs explain the prerequisites for each test, and detailed instructions for executing those tests. Any IT person can use this information to configure the tool, run the tests, and record and analyze the results (see Figure 3, p. 14).

The Certification Tool offers great flexibility in setting up and executing tests, as well as in analyzing the results. An IT group can determine which tests it wants to run and execute only those tests. The IT group can also set up the tool to work with different types of external tests, depending on the requirements of the individual test.

An IT group can also change the order in which the tests are run. By default, when you start a new certification, these tests are presented to you by each pillar of quality they're designed to target. While this might help the IT group understand the test, it might not be the best order to execute the tests, depending on the type of application and testing environment. The IT group can create custom views in order of execution of tests that best suits their application type.

'Before and After' Application Impact on the Server

One of the biggest problems with server applications is not knowing what changes those applications are making to that server. Given the complexity of the Windows Registry, and the potential for changes and additions to servic-

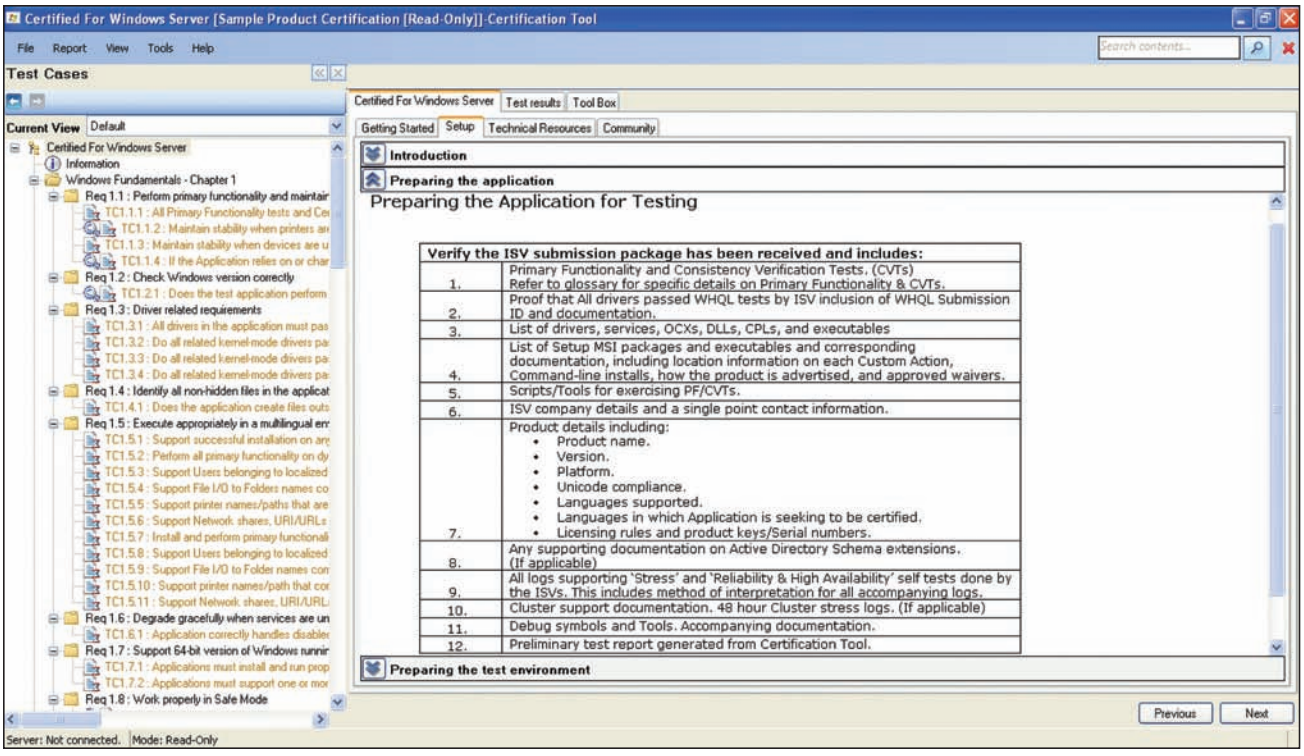


Figure 2. The Certification Tool describes in detail how to prepare an application for testing.

es and drivers, it's almost impossible for an IT professional to understand all of the implications to a server or server farm from the installation of an application.

Why is this important? Changes to the Registry have the potential to make a system less stable, depending on the number and impact of those changes. Registry changes or service additions may also open a system to security violations. Yet by their very complexity and obscurity, these changes aren't usually identified and tracked by IT groups.

In response, Microsoft provides the System State Analyzer. This tool compares the state of your server both before and after the installation of an application, and lists what has changed the installation. Using this tool, an IT group can record and track changes to the system configuration due to the installation of a new application (see Figure 4).

For new enterprise applications, the System State Analyzer lets an IT group examine the impact of a new application before the purchase decision, and compare that impact to standards established on server configurations. As an added benefit, IT groups can also use this tool to gauge the impact of custom internal applications on their server environments.

The System State Analyzer is also an essential tool in running certain certification tests because it lets IT professionals know if the installation complies with the Windows Server logo requirements. Second, it shows them precisely how the server configuration has changed.

Among the tests that require the use of the System State Analyzer for comparison purposes are many of the installer/remove tests and a number of the security tests. In these tests, it provides a means of ensuring that installation didn't change the configuration in ways that it wasn't supposed to, and especially in ways that may have opened security holes.

Testing Application Behavior Under Stress

A second tool provided with the Certification Toolkit is Loadgen, a load generator that provides a platform for generating stress on a server and the running application. The primary purpose of Loadgen is to stress a target computer to a desired period of time. For the purposes of the logo certification program, Loadgen is required to be running for a continuous 48-hour period. During this 48-hour period, the application must be tested through either automated tests or manual tests on the same computer. These tests must exercise the full primary functionality of the application in order to get a complete picture of its behavior on a stressed system.

Loadgen is launched from the command line of the administrative workstation with the following parameters:

```
loadgen.exe -config:LogoStress.xml -NonHCT:1 -
NoWTTLog   -sut:<MachineName> -
user:<Domain\User> -pwd:<Password>
```

The LogoStress.xml file provides configuration information that is used by the tool in order to set up and execute properly.

In addition to the tools provided with the Certification Toolkit, other external Microsoft tools and utilities are required as a part of the certification process, including the App Verifier, Driver Verifier, Windows Defender and Regedit. These tools are easy to use and readily available within the Certification Tool.

'Works With' Compatibility Test Tool

Another Microsoft software certification test tool determines whether a server application is basically compatible, or "Works With" Windows Server 2008 or R2. The "Works With" Tool is included in the Software Certification Toolkit. This automated tool will help IT professionals quickly determine if a prospective application has at least a baseline compatibility with Windows Server 2008.

The tool is both fast and explicit: IT professionals can expect to get results within 45 minutes to four hours, depending upon application complexity. Any pieces of the application, such as installation, primary functionality, drivers and so on, that do not meet baseline compatibility will be flagged for further investigation.

The Works With Tool enables IT professionals to identify possible compatibility issues in installation, use and removal of server applications that they're investigating. In this manner, IT groups can easily determine if an application can behave in a manner expected by the operating system and the user environment. This provides a fast analysis on any new or prospective application, either being considered for purchase or developed by an internal development group.

The tool looks for a number of different characteristics, such as the ability of an application to run in a 64-bit environment, whether it follows best practices in security and reliability, is compatible with antivirus software and uses only signed drivers. It also looks for best practices in application installation and removal, and the ability to perform its primary user functions in a predictable and stable manner.

Using the Windows Server 2008 Works With Tool is simple and straightforward. First, you start the wizard, and click through to choose whether to start a new test, resume a test, review test results or create a new submission package. While an IT group typically will not choose create a new submission package, an ISV doing so will generate a submission package that it could send to a Microsoft-authorized test vendor for review and approval.

An IT group is more likely to start a new test or review test results. If it decides to start a new test, it will fill out application information on the screen shown in Figure 1 (p. 12), and select a test sequence to perform. Once selected and initiated, the tests perform in an almost entirely automated fashion. The group can then use the tool to review

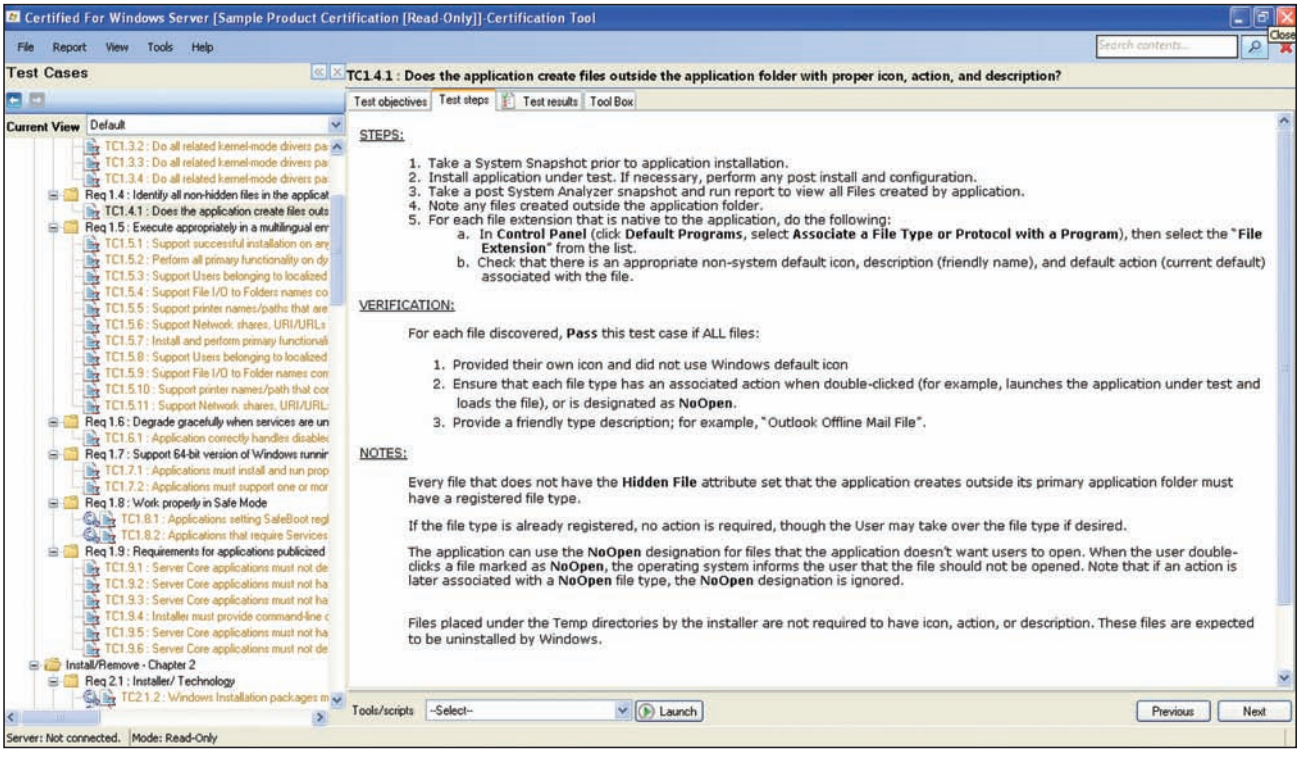


Figure 3. The Windows Server 2008 Certification Tool provides step-by-step instructions on how to execute a test, and what results constitute successful completion of the test.

the results and determine if there are specific areas that require further investigation.

The Works With Windows Server 2008 Tool enables IT groups to make a fast assessment on whether or not a new application is going to run in their enterprise environments. If this is a commercial application that has already received Works With certification, IT groups can quickly confirm that rating as a part of their due diligence. If the application was developed internally, IT can work with the application developers to better understand the requirements of the target operating system.

In either case, the Works With Tool can be a valuable addition to the testing that IT professionals perform on new applications. Its speed and ease of use make it one of the first areas of testing an enterprise IT group should consider during evaluation of a new application (see Figure 5).

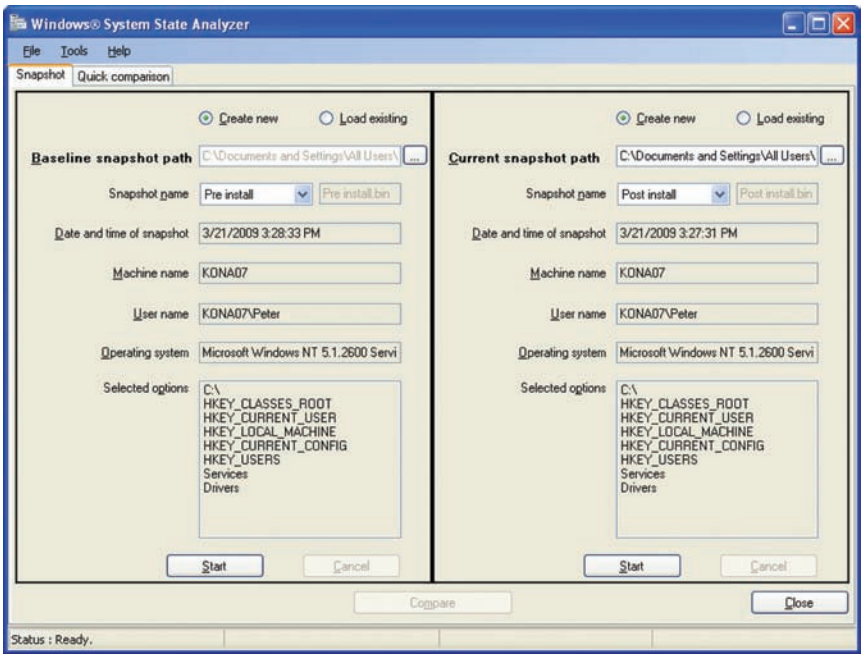


Figure 4. The System State Analyzer provides an easy way to compare the state of a Windows Server 2008 system both before and after application installation.

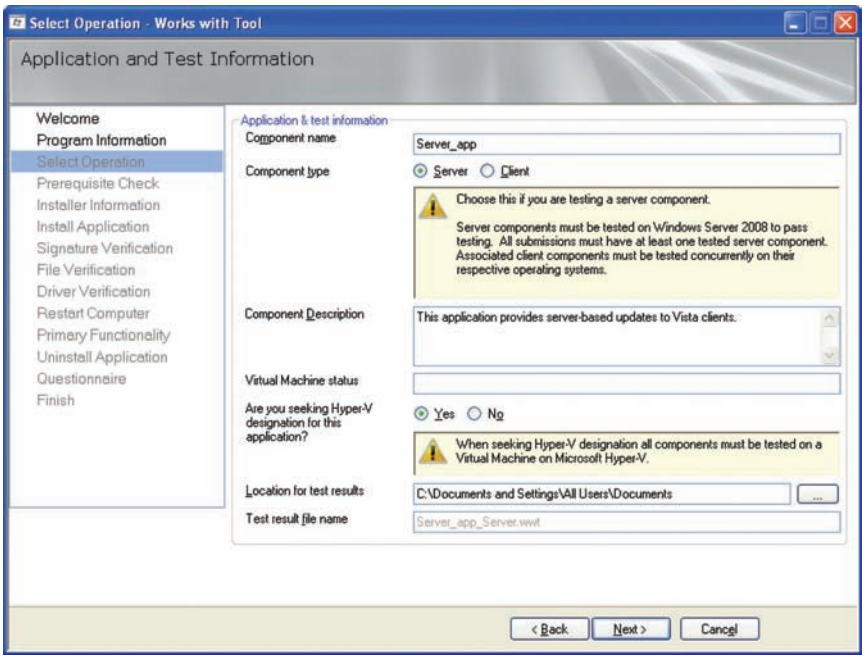


Figure 5. The Works With Windows Server 2008 Tool enables IT groups to set up a test to look at such factors as application prerequisites, install and uninstall processes, and primary functionality.

Ongoing Value for Enterprise IT

Of course, the easiest way to save time and accelerate testing is to ask ISVs to certify their software applications before you will consider deploying their solutions in your environment.

When that's not an option, the free Windows Server 2008 certification test tools offer IT users a baseline for a more complete testing regimen to accelerate testing and focus on areas most critical to their unique needs. Enthusiasts will discover a range of scenarios where these tools are helpful, such as:

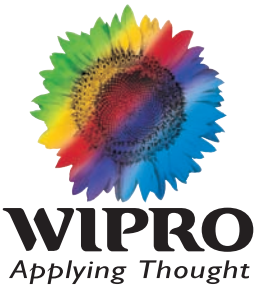
- Considering a migration and assessing how your current solutions will perform on Windows Server 2008 and/or Windows Server 2008 R2.
- Evaluating a non-certified solution for your Windows Server 2008 and/or R2 environment and you want to make sure it's compatible.
- Holding custom app development upgrade projects to a standard technical bar for reliability, security, availability, stability and basic compatibility with Windows Server 2008 and/or R2.
- Troubleshooting non-certified applications that are demonstrating unpredictable behavior in the Windows Server 2008 and/or R2 environment.

The result is quicker evaluation of the application as well as more rapid and trouble-free deployment into the production environment, saving both time and money in the process. ●

Tales from the Test Labs

Application Failures Revealed in Windows Server 2008 Certification Testing

Enterprise users asked what happens behind the scenes of Windows Server software certification, and Microsoft's two authorized test vendors share the good, the bad and the "buggy."



IT professionals are always going to test applications before deployment on a network. Why should they care whether an application has been certified or not?

Craig Bean, Certification Technical Account Manager, Lionbridge Technologies Inc.: When we test an app for certification, the ISV has to fix the issues we uncover. Even if a customer were to test it, are they going to have leverage to force the ISV to fix it? Unless you're part of a very large account, customers could test and find an issue with a noncertified app and report it to the ISV, with no guarantee that the ISV is ever going to fix it. How many customer complaints would it take before they take notice? We try to connect with ISVs during the build process, when it's efficient for the ISV to fix the problem, rather than going back through the code after every customer issue. If you deploy non-certified software, you need to evaluate how important that entire machine is to your business, because you just don't know what's going to happen.

How much time goes into testing each app?

Vijay Satyavolu, Certification Program Manager, Wipro Ltd.: Usually we deploy a tester on an application for one to two weeks, or 50 to 80 man-hours, minimum. In one case we had a tester who was involved in ongoing testing of an app for six months while we worked with the ISV to track down a problem. If that problem had shipped with the code, there is no way to predict how it would have affected customers under the right circumstances—but it would have taken just as long to figure out!

Do certain types of apps tend to fail certain tests?

Lionbridge: Install issues are some of the most common sources of application interoperability problems and they're the most common fail criteria we find. 60 to 70 percent of the failures are in this area. The checks we perform help ensure installations are properly implemented so administrators can install and run applications without requiring complex procedures, compatibility or versioning issues, or system instability.

We see a lot of older applications failing over new requirements like manifesting and signing files. Properly manifested executables that use least-privileged user accounts are fundamental to Windows security. Digital signatures help customers determine who created the package and detect any tampering. Without the identity and integrity information in a digital signature, a software customer cannot make an informed decision about whether to install or run the software.

It used to be common for developers to include a reboot request during install/uninstall, even if it wasn't necessary. With the new certification requirement around reboots, we have seen a drastic reduction in the number of applications now requesting restarts—easily 50 percent fewer. I believe the certification requirements led developers to look closer at reboots and to recognize what a danger and menace they are to a production environment. With certified applications, only valid restarts are allowed and the restart must be done in the proper manner.

Are some ISVs better informed about test standards than others? Do many ISVs perform their "certification homework" beforehand?

Wipro: Preparations are not as comprehensive or as thorough as customers might wish to believe. There are a few ISVs that really work hard before they submit for certification—several midsize apps have undergone thorough testing and submit their stress-test logs—but nearly all ISVs fail several test cases and must rework the application before proceeding.

Most software vendors haven't gone through the certification framework properly. The test cases are detailed

enough, but the ISVs haven't done enough testing in-house before they submit for certification testing. Most ISVs are not even aware of the stress testing requirement and why it is important to their customers, or how to use the Loadgen tool to simulate a low-resource environment. Many times, ISVs have no knowledge about the process of signing drivers through WHQL [Windows Hardware Quality Lab], and so drivers related to those test cases have failed.

What's the most interesting issue you've encountered?
Lionbridge: In one case, the AppVerifier.exe tool caught a failure on a memory test, which helped the ISV realize that a developer had left debug code running inside the app—and the ISV was ready to ship the code. If we hadn't caught the issue, under the right circumstances, the thing could throw an app error, crash or hang. It would have been a random, arbitrary situation, but it would have created a lot of head-scratching and troubleshooting hassles for the customer. Many ISVs have the same people doing both the developing and the testing—but developers are not as likely to catch their own bugs. Certification testing is done by a third-party independent lab, so we provide an extra QA pass—not just ad hoc testing. When we say it's certified, it's ready for the market.

What are the risks of deploying non-certified software?
Wipro: Apps may not perform as expected. The ISV might not have done enough stress testing, which means unpredictable behavior when running without sufficient resources. The application will almost certainly encounter security-related problems. If deployed in a global network, it may not work well in other languages. Without all the files properly signed, there's a high chance of crashing. If you deploy non-certified software, these are just issues that the customer has to accept and hope that the ISV will fix at some point in the future.

How many apps fail on the first test pass?
Lionbridge: I would say 85 to 90 percent of apps would fail unless heavily pretested by us or by them, or unless it's a very light app with minimal components, like a Web browser and database. But if you pull 10 non-certified apps off the shelf and ran them through testing, I would say all 10 would fail. It's not at all uncommon for ISVs to think they're ready and we find something that fails.

What are the most important test cases to IT pros?
Wipro: A major benefit to the customer is stress testing. ISVs use Loadgen to do the testing and give us the logs, which we will check for memory issues, CPUs, how the build recovered, how fast it recovered and so forth. Checking these scenarios definitely helps ISVs and customers know about the performance of the applications under load.

The clustering test cases are also very useful. We will check that the app is handled by the cluster server if anything fails in the main server—is it robust enough to handle failures so that the application won't lose any data? Also, the security-related test cases are very important. We verify that only approved people can log into the system. We check that the application doesn't install any malware or spyware, and that the application functions on a server with anti-virus software running continuously throughout testing.

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Certification Program Manager, Wipro Ltd.

How can a customer mitigate the risks of deploying non-certified software?
Lionbridge: If the application contains any drivers, I would personally make sure that the drivers have gone through WHQL and are properly tested, and that the app uses the Windows Installer Technology. Also, if I didn't know whether or not the app is a good citizen, I would check out the ISV's product support and try to find out what others experienced through message boards and forums. Ambitious customers could also run the "Works With" tool to get a base read on compatibility.

Considering all the partner benefits from Microsoft, I don't understand why an ISV would not certify a Windows Server app. Customers are automatically going to want the one with the seal of approval on it. Through the certification process, we have the means to have the ISVs correct their apps, which is not true for the end user who discovers an issue after the purchase. Customers should be leveraging their buying power to demand certification and thereby steer the ISV community to deliver superior quality. •

frustration \(ˌ)frəs-ˈtrā-shən\

–noun

1. the state of being frustrated with a software application's availability, stability, reliability, security and basic OS compatibility
2. chronic dissatisfaction with avoidable system failures and user support requests
3. a sense of futility in seeking technical support or satisfactory resolution
4. the way you feel about uncertified software

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