

Preparing for Compatibility Testing



How can I reduce my risk when managing a compatibility testing effort? When you are planning for deployment of a new operating system, careful planning, efficient execution, and the right tools will help to ensure that your application compatibility testing effort yields the results you need to achieve a smooth deployment.

Get Started

What's the big deal about application compatibility? Since today's enterprises use hundreds if not thousands of applications throughout their organizations, compatibility with existing applications is a key factor in the decision to deploy Windows 7.

In a managed environment, where users are not local administrators on their computers, the software and hardware profiles may be well known. In a less managed environment, or where users are local administrators on their machines, there may be applications installed that are unknown to you. An application compatibility testing plan using tools provided by Microsoft will help you understand what software and hardware exists in your organization. It can also help you determine the most likely compatibility issues each application may encounter based on how real users interact with your software on a day-to-day basis.



Create a Plan

Because organizations differ in complexity, size, resources, and technical sophistication, each organization's plan will be different, but here are some general guidelines:

Who should be involved? The core test team should include a Project Manager and technical resources experienced in software testing. Additional resources such as the application "owner" for each application being tested might move on and off the team as needed.

How long does it take? This varies widely depending on the number and complexity of applications to be tested and the number of dedicated resources to do the testing but the average is about 3-6 months.

What hardware is needed?

3 Servers are required:

- ACT Log Processing Server - One powerful dual process server w/ min 2 GB RAM & 5-10 MB disk space per computer included in data collection.
- SQL Server for ACT database – Typical database server set-up plus 1-2 MB disk space per computer included in data collection
- File Server for auxiliary test data storage – min 40 GB disk space

Test Machines

- An adequate number of client test ops and enterprise machines with Windows 7 and legacy OS loaded (Windows Vista, Windows XP/Windows 2003/Windows 2000) to perform comparative testing on Windows 7 vs. legacy OS

What results can I expect? When you have completed the testing process, you will have a wealth of information that will help you organize your deployment plan. The applications will be categorized by:

- Works, no changes required
- Works w/ automatic fixes (such as PCA, WRP)
- Works w/ code remediation
- Works w/ compatibility fixes or other mitigations
- Does not work

Microsoft Tools for Testing

ACT Compatibility Manager

ACT 5.5 is a set of tools used to collect, analyze, test and mitigate compatibility issues. To collect compatibility data, ACT provides Application Compatibility Manager to build a software and hardware inventory and run the following evaluators:



User Account Control Compatibility Evaluator (UACCE)

Looks for instances where an application may experience issues when running as a standard user. Pinpoints apps for follow-up testing.

Windows Compatibility Evaluators (WCE)

Identifies issues where an app is using GINA, a component that has been deprecated from Windows 7, or includes an interactive service.

Update Compatibility Evaluator (UCE)

Detects and reports issues that may affect the deployment of a Windows Update.

Developer and Tester Tools

Standard User Analyzer (SUA)

Gives detailed diagnostics of apps having problems running as a SU. Provides guidance for developers modifying code and mitigations for IT Pros attempting to resolve issues w/out modifying source code.

Internet Explorer Compatibility Test Tool

Monitors web apps testing to detect potential compatibility issues w/ IE8.

Setup Analysis Tool

Monitors setup programs to detect potential compatibility issues e.g. Windows Resource Protection (WRP), installing 32-bit kernel-mode device drivers, and 16-bit components.

Compatibility Administrator

Resolves many app compatibility issues using shims (fixes that change the way Windows behaves, but only for specified apps) w/out changing code.

Debugging Tools for Windows

A toolset used to debug drivers, applications, and services on systems that are running on Windows. Used if source code is not available.

Process Explorer

Lists all the processes running on the machine along with additional information that will help with debugging.

Process Monitor

Monitors real-time file system, Registry and process/thread activity.

Dependency Walker

Scans 32-bit or 64-bit Windows modules and builds a hierarchical tree diagram of all dependent modules. Lists all functions exported by each module and functions called by other modules. Also profiles the apps.

Application Verifier (AppVerifier)

Collection of tests used during the development and testing process to help developers identify potential application compatibility, stability, and security issues.

Common Compatibility Issues

User Account Control (UAC)

In Windows 7 and Windows Vista, all interactive users including members of the administrators group run as standard user. UAC is the mechanism through which users can elevate applications to full administrator privileges. Because of UAC, applications that require administrator rights or check for administrator privileges behave differently in Windows 7 and Windows Vista even when run by a user as administrator.

Windows Resource Protection (WRP)

WRP is designed to protect the system in a read-only state to increase system stability, predictability and reliability. This will affect specific files, folders, and registry keys. Updates to protected resources are restricted to the OS trusted installers, e.g. Windows Servicing. This helps to protect components and apps that ship with the OS from any impact of other apps and administrators. This can be an issue for custom installations not detected as setup by Windows Vista when they try to replace WRP files/registry and check for specific versions/values.

Internet Explorer Protected Mode (IEPM)

In Windows 7 and Windows Vista, Microsoft IE8 processes run in IEPM with greatly restricted privileges to help protect users from attack. IEPM significantly reduces the ability of an attack to write, alter, or destroy data on the user's machine, or to install malicious code. This could impact ActiveX controls and other script code which try to modify higher integrity level objects.

OS and IE Version

Many applications check the version of the OS and behave differently or fail to run when an unexpected version number is detected. This issue can be resolved by setting appropriate compatibility modes or applying version lie shims.

New Folder Locations

User folders, "My Documents" folders and folders with localization have changed moving to Windows Vista and with File Libraries in Windows 7. Applications with hard-coded paths may fail. This can be mitigated using directory junctions or by replacing hard coded paths w/ appropriate API calls to get folder locations.

Session 0 Isolation

Running services and user applications together in Session 0 poses a security risk because services run at elevated privilege and therefore are targets for malicious agents looking for a means to elevate their own privilege level. In earlier versions of the Windows OS, services and applications run in the same session as the first user who logs on to the console (Session 0). To help protect against malicious agents, in Windows Vista, Session 0 has been isolated from other sessions. This could impact services which communicate with applications using window messages.

Implementing Your Testing Process

Now that we have our plan in place, what are the steps for effective execution? Once the team is formed, a representative set of machines in your organization has been selected, and the test hardware has been built you are ready to begin the testing process. Here are some guidelines to follow.

Implement the Plan

1. Install the following tools on your test machines:
 - Microsoft Application Compatibility Toolkit 5.5* (latest version) <http://www.microsoft.com/downloads/details.aspx?FamilyId=24DA89E9-B581-47B0-B45E-492DD6DA2971&displaylang=en>
 - Debugging Tools for Windows <http://www.microsoft.com/whdc/devtools/debugging/default.msp>
 - Process Explorer
 - Process Monitor
 - Dependency Walker
 - Application Verifier
2. Create an ACT data collection package (DCP) for inventory collection to find the list of applications installed and running on a representative set of computers in the enterprise.
3. Create a second DCP to include the UAC CE & Windows CE.
4. Deploy the ACT DCP on the identified set of test computers and allow the users to test all the applications.
5. Gather the ACT report and organize the catalog of applications and the list of issues using the steps below.

Organize Your Applications

Once cataloging is done, what's next? The catalog provided by ACT 5.5 can be used to analyze and organize your apps into a manageable list so that you can plan for testing, mitigating or remediating applications with issues. This will help to ensure a smooth deployment of Windows 7 or Windows Vista. Here are the steps:

Prioritize. Determine the importance of each application. Business critical applications that must be working before you can deploy will obviously be assigned top priority. Other applications may be less important or just nice to have. These would be assigned a lower priority.

Categorize. ACT 5.5 categorizes applications according to the vendor and test complexity. You can add new categories such as "Division" or "Region" (based on how you plan to deploy). Other useful categories include the tester to whom the application is assigned, the packaging owner, or complexity of testing required. These categories can be used to guide your resource allocations. The choice is up to you.

Rationalize. With a comprehensive catalog of apps available, you can more easily review the apps running in your environment for redundancy, relevancy, and necessity. If you don't already have a policy for regular review, now would be a great time to implement one.

Standardize. Check for a number of different applications providing the same function, e.g. creating PDFs. Also check for multiple versions of the same application. You can use the catalog to standardize and reduce duplication of both functionality and version.

Use the ACT Community Data

For 3rd party vendor applications, gather and study the ACT community data for known issues and mitigations. Based on this data, if available, apply the mitigation. If not, contact the vendor for a potential fix or Windows 7 compatible version of the application.

Notes

1. A list of ISV applications that have the "Certified for Windows Vista" logo or the "Works with Windows Vista" logo can be found at <http://www.windows.com/compatibility>
2. Based on this list and the ACT data analysis, determine whether there is a need for an upgrade or alternate vendor software. This activity also provides an opportunity for consolidation or phasing out of very old legacy applications. Analyze those possibilities. For internally developed applications, guidelines listed below help to identify and resolve compatibility issues.

Start Testing

1. **Test Web Applications:**
 - Use Internet Explorer Compatibility Test Tool (IECTT) to pinpoint IE8 related compatibility issues.
 - Check whether the application works in IE7 on Windows Vista/Windows XP/Windows 2003. If so, the issue could be due to IE Protected mode.
 - Analyze whether the issue is due to an unsupported feature (like DHTML Editing control), script/ActiveX control compatibility issue or a security change. Based on the IECTT suggested mitigation, either make a code change or an IE8 settings change.
2. **Test Windows Applications**
 - Determine whether the issue is an install problem or whether the application fails to run after installation.
 - If it is a setup issue, check whether it is a PCA false start. If not it may be due to UAC or WRP. Use tools listed previously to identify the cause and either mitigate or create a new MSI. If the application fails to run, check whether it will run as administrator. If so, use SUA to find the potential issues.
 - Use Microsoft testing tools to identify the cause of each issue.
 - If source code is available, fix the source to mitigate the problem. If not, determine whether a shim can solve the issue in the interim while the application issue is being fixed.
 - On a case-by-case basis, determine whether the application is intended to run as standard user. If so, look at ways to change it to remove the need for unnecessary privileges.
3. **Update ACT with the details of each problem and its resolution.**
 - Optionally, you can synchronize this data with ACT Compatibility Exchange. When you submit data, you provide only inventory data, the pass/fail status you selected, and the issues and resolutions you have been tracking. You can select only the applications you want to synchronize with ACT Compatibility Exchange.
4. **Consider Logo Certification**
 - If the application is an application/product you sell to clients, consider logo certification. To improve quality, consider requiring internal apps to pass all these tests. Details regarding logo certification can be found at: <http://winqual.microsoft.com>

Looking for more information?

Download ACT 5.5. ACT 5.5 is available for free, and runs on Windows XP, Windows Server 2003, Windows Vista and Windows 7. Some evaluators even run on Windows 2000. It also requires either SQL Server Express, or SQL Server 2005. Download today, and give it a try!

➤ <http://www.microsoft.com/downloads/details.aspx?FamilyID=24da89e9-b581-47b0-b45e-492dd6da2971&DisplayLang=en>

Review application compatibility content on TechNet and MSDN. TechNet provides numerous resources on managing and driving an application compatibility testing effort, providing guidance, documentation, and tools. Access the Windows 7 Application Quality Cookbook and the Windows Vista Application Compatibility Cookbook on MSDN.

➤ <http://www.technet.com/appcompat>

➤ <http://code.msdn.microsoft.com/Windows7AppQuality>

Participate in the ACT newsgroups. Still have questions? The ACT newsgroups are frequented by other IT Pros, compatibility testing professionals, and the product team. Stop by and participate today!

➤ <http://social.msdn.microsoft.com/forums/en-US/windowscompatibility/threads>

Need more help?

Enlist the assistance of Application Compatibility Factory partners.

Microsoft have teamed up with world class service partners globally and in [insert country name] to assist you with application compatibility. Our partners offer deep application compatibility expertise including application compatibility assessment, testing, remediation, and deployment planning.

ACF Global Partners:

➤ Wipro Technologies, Tata Consulting Services, Satyam Computer Services, Infosys Technologies, Hewlett-Packard (HP), Sogeti and Dell

ACF Local Partners:

➤ For a list of ACF Partners in your region please contact your Microsoft Account Manager or Account Technical Sales Professional