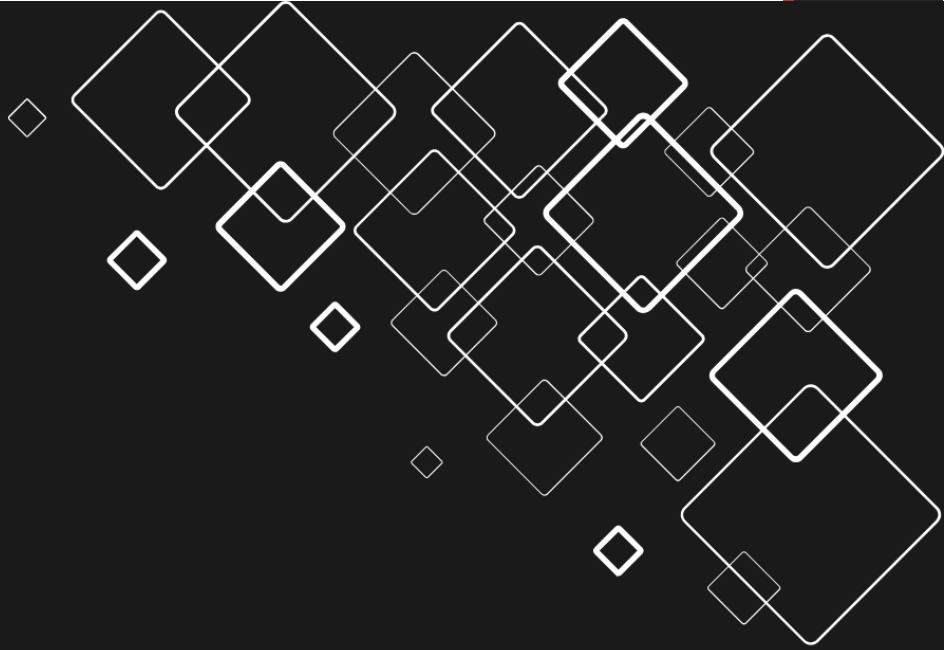


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How to Securely Run Legacy Applications on Windows 11

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Windows 10 End of Support is October 14, 2025

With Windows 10 end of support (EOS) arriving October 2025, the urgency of migrating to Windows 11 is increasing among enterprises around the world.¹ To avoid costly extended security updates (ESUs), enterprises have less than a year to modernize their application estate for Windows 11.

While Microsoft has attempted to make every new operating system update more uniform, including the transition from Windows 10 to Windows 11, some applications are not inherently able to make the move. Many enterprises are still running business-critical applications on unsupported operating systems (e.g., Windows XP and Windows 7) because of project-specific requirements – like engineering firms needing to maintain software versions that were used for a given project – or applications having requirements that prevent them from natively running on modern OS.

Maintaining legacy-specific environments can be extremely cumbersome and costly. For organizations in highly regulated industries – such as Finance, Healthcare, and Government – the security vulnerabilities and compliance violations of running software on unsupported operating systems are simply unacceptable.

This whitepaper outlines how Cloudpaging technology enables even your most complex legacy applications to seamlessly run on Windows 11.

Evolution of the Windows Operating System

As the Windows operating system evolved and modernized, more barriers to legacy applications have emerged. Windows was originally a 16-bit environment running only 16-bit software. Over time the Windows operating system became 32-bit and is now 64-bit. The 32-bit version of Windows could run both 16-bit and 32-bit applications. When we arrived on Windows 10, both it had 32-bit and 64-bit versions. Unfortunately, 16-bit applications are not inherently able to run on the platform.

Just as Windows 10 has multiple versions, some application installers include both 16-bit and 32-bit versions. Most of these can run on 64-bit operating systems. However, if application installers are or the applications themselves are 16-bit, they are no longer able to function on 64-bit systems. To add to the complexity, there are applications that appear to be 32-bit with a Win32 GUI and design but call 16-bit components.

Finally, many 32-bit legacy applications have hardcoded paths and shortcuts that are now incompatible with newer 64-bit Windows versions.

Windows 11 brings significant improvements to security hardening for Windows desktop systems, making a Trusted Platform Module (TPM) and Secure Boot requirements. Several security enhancements are built directly into the operating system. One of the primary challenges enterprises will face migrating to Windows 11 is it does not have a 32-bit edition. It's important to consider which compatibility issues may persist during the migration process, although they may be less prevalent than those encountered migrating from Windows XP to Windows 7 (or earlier migrations). As efforts are made to further harden security in the OS with future updates, application compatibility issues may become more prevalent.

How Cloudpaging Maximizes Legacy Application Compatibility

Cloudpaging is designed to package and deploy virtually any application to any modern physical or virtual Windows desktop environment without sacrificing functionality or performance. The technology abstracts applications from their underlying operating system and breaks them down into “pages” (instruction fragments).

¹ Microsoft announced Windows 10 end of support is October 14, 2025: <https://learn.microsoft.com/en-us/lifecycle/products/windows-10-home-and-pro>

Our Cloudpaging technology implements a true file system driver (FSD) at the Windows kernel level. Cloudpaging creates a writeable sandbox for applications to run in, providing granular controls over what aspects of an application to integrate to or isolate from other applications and the underlying operating system Cloudpaging containers are deployed to. The writable sandbox is especially useful in allowing legacy applications to write in legacy locations where modifications are normally not allowed on newer Windows OS versions.

Speaking figuratively, these applications pages are provisioned directly to end user desktops without going through traditional installation processes. By removing the traditional installation process, which is where most legacy applications falter on modern operating systems, legacy applications have a much better chance to run as if natively installed on new Windows OS.

NOTE

Cloudpaging does not fully emulate the platform, meaning calls made to Window XP, or earlier, may be unavailable or deprecated on later Windows version (e.g. Windows 7 or 10). However, for the most difficult applications, Cloudpaging can also page those dependencies through paging the OS or an emulator.

Legacy Application Issues Cloudpaging Solves on Windows 11

The following are a few examples and explanations of some common scenarios in which Cloudpaging successfully addresses running legacy applications on Windows 11.

Legacy Java requirements

There are also organizations who have legacy applications that still require older Java Runtime Environment (JRE) versions. The challenge is presenting legacy applications with older versions of the Java JRE they were designed for in tandem with the latest Java version. To effectively do so, you need to limit access and exposure of the older JRE version.

With Oracle recently announcing the deprecation of Java Web Start and Java applets, some organizations still relying on applications utilizing these features were forced to move toward open-source alternatives, such as Open Web Start.

Cloudpaging application containers can help with both scenarios. Leveraging the granular controls over what components of an application to fully isolate is a useful way to deliver legacy versions of Java and the open-source alternatives in a relatively secure and efficient manner that restricts access to only entitled users.

Putting old versions of JRE in containers helps reduce exposure of using these runtimes and permits you to run multiple versions side by side without the need to use the Java Deployment Rule Set. You can also containerize any applications that require deprecated components such Java Web Start with an open-source alternative to ensure continuity of your applications while working on finding a permanent long-term solution.

Applications that hardcode file paths or registry hive locations

For a trivial example, when Microsoft Office is installed on a 32-bit machine, it stores a file under “C:\Program Files” and records this path in Windows Registry. This is a hard-coded path that works well when the application remains on the machine. However, when this application is used on another machine that is 64-bit, the path becomes wrong because the correct path on the new machine should be “C:\Program Files (x86)”.

Cloudpaging overcomes this problem by encoding the path as “?programfilesx86?” in the application package. Cloudpaging then resolves this encoded path to the correct value on any other machine basing on each machine’s specific configuration. Legacy applications do far more than this (of course). Since we implement the FSD, we can completely alter the behavior of the file system for many other common legacy “misbehaviors.”

Applications requiring isolation or Windows compatibility mode

Windows Compatibility mode provides a mechanism for older applications to run with newer versions of Windows. However, it does not automatically turn on for the applications. This mode must be activated manually. With Cloudpaging, the need for an application to use this mechanism can be encoded into the application package and activated on the target machine.² If applications don't work on the latest Windows OS, the option to run them in a container with a specific Windows Compatibility mode may enable it to function.

Applications dependent on obsolete operating system components

In certain scenarios, legacy applications rely on an outdated Windows component, such as a specific system DLL. This DLL may have been updated by Microsoft in the latest OS or completely removed in Windows 11. In either case, applications with such a requirement will not work. Cloudpaging enables you to put that DLL into your application container with the dependent application and set the DLL to the isolated layer (referred to as "Layer 4" within Cloudpaging Studio – our application virtualization tool). If these application containers are deployed to an OS with a newer version of the DLL, the older version in the container will not cause a conflict nor will it be exposed to other users on the system who do not require it.

Legacy App-V packages

Microsoft announced App-V end of life will April 14th, 2026 as the end of extended support.³ Our Cloudpager platform has a built-in App-V optimization, which enables you to instantly enable your existing App-V packages to run beyond end of life simply by dragging and dropping them onto the Cloudpager administrative console. Of course, if you prefer to repackage your applications into Cloudpaging containers, reset assured any application successfully virtualized with App-V can be packaged with Cloudpaging.

Applications that will not install on Windows 11

Some applications simply throw an error if you attempt to install them on Windows 11. This may be due to vendors putting a Launch Condition in the installation media that checks the version of Windows it is being installed on. It is possible the application will work on the latest Windows OS, but the vendor restricts the installation to only supported versions of Windows. Cloudpaging Studio provides an option to capture an installation in a specific Windows Compatibility Mode, telling the installer it is being captured on a supported OS. Alternatively, Cloudpaging Studio can also be used on older Windows OS versions (e.g., Windows 7, Windows 8.1, Windows 10) to perform the capture and then the application can be successfully paged to a Windows 11 desktop.

Applications with 16-bit installers

There are some instances where a legacy application may have a 16-bit installer. These may have trouble with installation on newer versions of the Windows operating system. Cloudpaging provides application packagers and desktop managers with granular controls so they can customize a unique application sandbox environment suitable for troublesome installers, including 16-bit installers.

² Microsoft documentation on making older programs compatible with the latest versions of the Windows operating system: <https://support.microsoft.com/en-us/windows/make-older-apps-or-programs-compatible-with-windows-783d6dd7-b439-bdb0-0490-54eea0f45938>

³ Microsoft documentation on App-V end of life: <https://learn.microsoft.com/en-us/lifecycle/announcements/mdop-extended>

If a 16-bit installer installs 32-bit binaries, you can package the application on a 32-bit Windows 10 machine and later deploy it to a 64-bit machine. If an installer installs 16-bit binaries, you need to include an emulator (such as DOSBox or WineVDM) in the Cloudpaging container to run on 64-bit systems.

NOTE

Being that emulators like DOSBox and WineVDM operate as mini sub-systems for applications to run in, there may be limitations on applications interfacing with data or services on the host machine.

How Cloudpaging Mitigates Security Risk

Cloudpaging containers mitigate application compatibility issues while enhancing the security of legacy and modern applications alike.

Application isolation

As discussed above, Cloudpaging provides granular controls over what application components to integrate to or isolate from the system. You may identify a single obsolete operating system component you want to isolate from the local system while enabling the rest of the application to maintain interoperability with the local system and/or other applications.

You could also fully isolate the application, preventing other applications, users, and the local system from accessing them in any way.

Encryption in-flight and at-rest

Cloudpaging containers are encrypted with AES-256 Encryption in-flight and at-rest, each appset with its own unique encryption. Cloudpaging Player, the software responsible for virtualizing applications on end user endpoints, is also uniquely encrypted per machine. They can also be configured to prevent copying in or out of the container space, ensuring the integrity of the container and the local system, while maintaining functionality of your sensitive legacy applications.

Dynamic provisioning and instant rollbacks

Packaging your applications into Cloudpaging containers ensures they can be dynamically provisioned, updated, rolled back, and removed from end user desktops without conflict. By virtualizing applications per user, you immediately reduce security risk, as only entitled users can see applications on their respective desktop(s). If there are any issues with an application update, Cloudpager administrators can roll applications back to a known working state with the click of a button.

Conclusion

Cloudpaging is your key to securely running legacy applications across the latest Windows 11 desktop environments, including physical endpoints, Azure Virtual Desktop, and Windows 365. Whether you need to overcome legacy Java requirements or maintain multiple application versions to comply with business and regulatory requirements, Cloudpaging has you covered.

Its granular controls empower you to curate the perfect blend of application isolation and integration, eliminating interference with the operating system and other programs while maintaining full functionality. The ability to provision software containers easily and efficiently onto other machines can help to extend the lifespan of your legacy applications without sacrificing functionality or performance.



To learn how Cloudpaging can help you run seamlessly package and deploy your legacy application to Windows 11 (and beyond), visit numecent.com and [request a demo here](#) with our Solutions Architects..

About Numecent

Numecent is an award-winning cloud technology provider headquartered in Irvine, California. The company's technology portfolio, built upon 66 patents (and counting), simplifies the mobilization and management of Windows applications across modern desktop and multi-cloud environments.

Enterprises around the world – including the largest Fortune 500 companies, cloud service providers, and MSPs – leverage these technologies to package and deploy thousands of applications to millions of end-users in a friction-free manner every day.

To learn more about maximizing application compatibility across all modern and future Windows desktop environments , visit numecent.com and/or [request a demo here](#).