

Parallels Inc.

Parallels Desktop 3.0 for Mac

Microsoft Windows XP Virtualization on Mac OS X: Feature Verification of Desktop Virtualization Software



Test Summary

***Premise:** Both business and home users of Apple's Mac computer line often require applications such as Microsoft Outlook and Microsoft Access that cannot run natively on the Mac's OS X operating system. Virtualization allows this to occur by running the Windows OS as a "guest" on the Mac. Integrating the interface and resources of the guest system into the host provides a powerful tool for users.*

Parallels, Inc. commissioned The Tolly Group to evaluate a wide array of features of the Parallels Desktop 3.0 for Mac desktop virtualization software. Parallels Desktop 3.0 for Mac software aims to unify the user experience such that the virtual machines are integrated into the Mac operating system user interface providing a simple yet feature-rich user experience that enhances user productivity.

Users whose work requires access to both Windows-only and OS X-only programs, have several alternatives: They can use separate machines, they can use a single physical machine that, through a utility like Apple's Boot Camp, can be bring up either a dedicated OS X or a dedicated Windows machine, or they can employ virtualization technology. Such technology allows a single physical machine to run both the native Mac OS X operating system and a full version of Windows XP simultaneously.

This report will examine the Parallels Desktop offering with respect to features that enhance user productivity. Tests were conducted in November 2007.

Test Highlights

- ▶ Delivers integration at the application level with Smart-Select and integration at file level with Mirrored Folders
- ▶ Through the seamless virtualization, along with support for DirectX and OpenGL, users can run Windows-only applications without compromising on performance
- ▶ Includes free-of-charge utilities like Parallels Compressor, Transporter, Explorer, and Image Tool
- ▶ Offers thorough integration with Mac Dock and Exposé through its Parallels Coherence feature

Industry-Unique Features Examined by The Tolly Group for Parallels Desktop 3.0

Parallels Desktop 3.0 function	Benefit
Mirrored Shared Folders	Allows Windows and OS X common access to data resources
SmartSelect	Automatic selection of application based upon extension of data file
OpenGL and DirectX 3D Graphics	Use popular Windows-only graphics applications and play 3D games
Parallels Image Tool/ Parallels Compressor	Allows users to perform changes to their virtual machine's disk drive.

Source: The Tolly Group. November 2007

Figure 1

Executive Summary

Parallels Desktop 3.0 for Mac delivers a unified work environment for users simultaneously requiring access to Windows and Mac applications. It provides this through “industry first” features such as SmartSelect and Mirrored Shared Folders.

Neither using two separate machines nor booting a single physical machine to Windows-only or OS X-only provide viable solutions to most multi-OS users.

Virtualization — having both systems running simultaneously on one machine — is clearly the desired strategy, yet not all virtualization solutions offer the levels of OS integration that are such an important element of user productivity.

Through a combination of features, Parallels 3.0 presents a “single system” appearance that enhances productivity by allowing the user to interact virtually seamlessly with both the Mac and Windows systems through the native Mac interface.

While the nature of this project was not competitive, The Tolly Group noted that several key features such as Smart-Select and Mirrored

Shared Folders are not offered by competing Mac/Windows virtualization vendors.

KEY ELEMENTS OF AN INTEGRATED USER EXPERIENCE

Although Windows-over-Mac is indeed an environment where two separate and standalone operating systems are running, the goal is to make them appear as a single system to the user. In this latest release of Parallels Desktop, the company has developed technology that does just that. The following sections summarize these advances in the context of normal user work flow.

PROGRAM STARTUP

Users can come at their tasks one of two ways — either navigating to the desired program and clicking or navigating to the desired target file (document, database, etc.) and clicking.

Unfortunately, a Mac doesn’t know what to do with, say, a Windows “.exe” program file or a Microsoft Access database. Conversely, if users receive, say, an Apple Pages word processing document via your Outlook E-mail under Windows, Windows won’t know what to do with that file should the user try to open it.

Parallels Desktop has eliminated this problem. With its “SmartSelect” feature, Parallels Desktop associates file extensions (like .exe) with the required OS and automatically

brings up the right program in the right OS. Furthermore, users can customize how this feature is used. This is useful for cross-platform file types like .doc and .xls that could be opened in either OS X or Windows.

MOVING AMONG APPLICATIONS

With multi-tasking the norm, it is important that users be able to move easily among active applications. For OS X, this means integration with the Dock and the Exposé window management facility.

With Parallels Desktop, active Windows programs are integrated into both of these features. Windows programs appear in the Dock just as native Mac programs do. Similarly, when Exposé is invoked, the actual application windows appear individually, again, just as though they were native Mac programs.

Furthermore, mouse movements are seamlessly integrated across operating systems. Where some solutions “capture” the mouse inside an OS window and require the user to key in an “escape” sequence to release the mouse, Parallels Desktop allows the user to sweep the mouse across any windows — across OS boundaries.

ACCESS TO DATA

Early virtualization offerings placed the guest machine in its own “sandbox” and made it dif-

difficult to access, share, and move data.

Parallels has implemented multiple features that provide seamless data integration.

Most importantly, both OSes have visibility to the real and virtual disks on the Mac. In fact, files can be dragged and dropped between systems.

Clipboard sharing allows snippets of information to be shared across systems.

Mirrored Shared Folders are folders in the Mac OS X file system that are also visible to the Windows OS. These folders can be used for exchanging files between the primary OS (Mac OS X) and the virtual machine or between several virtual machines. In Mac OS X shared folders appear

as usual folders, while in the guest OS they are objects of the network neighborhood. This is a key access feature, yet one of the most under-noticed of all Parallels Desktop capabilities due to the relative ease of sharing data.

And, to access data on other machines, the Windows guest can automatically make use of the network connectivity of the host operating system to reach the Internet or even a corporate Microsoft server environment.

The features introduced in Parallels Desktop 3.0 effectively “tear down the walls” between operating systems and provide a very productive user environment

The remainder of this document details the tests that

Parallels

Parallels
Desktop 3.0
for Mac



Desktop Virtualization of
Windows on Mac OS X

Product Specifications

Vendor-supplied information not necessarily verified by The Tolly Group

Parallels Desktop 3.0 for Mac

Easy to use

- Windows Express install assistant
- Virtual machine migration tool (PC-to-VM, VM-to-VM and Boot Camp-to-VM)
- USB device connection assistant
- Pre-built virtual appliances

Windows and Mac integration

- Integrated Windows software on the Mac desktop
- File-type association (Windows-to-Mac and Mac-to-Windows)
- Complete shared folders between Windows and Mac
- Guest virtual machine mounted on the Mac desktop
- Granular security control between Windows and Mac

Management/Maintenance Tools

- Offline guest disk image explorer
- Multiple snapshot backups with management view
- Disk image compression tool
- Disk image clone tool

Mac hardware supported

- Support for Mac OS X Leopard 10.5
- Over 25+ supported x86 32-bit guest virtual machine OSes
- Boot Camp virtual machine support enabled for Windows XP and Windows Vista
- 3D Graphics Support (Up to DirectX 8.1 and OpenGL 1.5)
- USB 2.0 peripherals and devices support
- Up to 2GB RAM allocation for a virtual machine
- Intel Virtualization Technology

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Parallels Desktop Lightweight Hypervisor

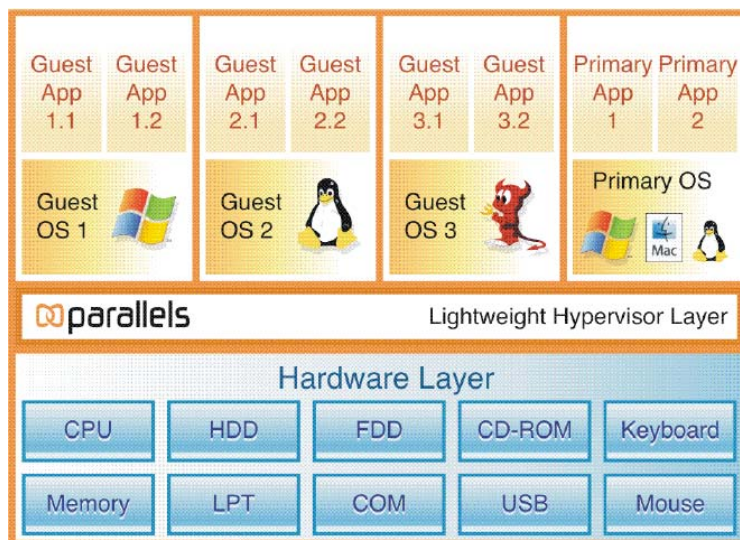


Diagram depicting the logical relationship between Parallels Hypervisor and local hardware/software elements.

Source: Parallels, Inc. November 2007

Figure 2

were carried out running Microsoft Windows XP SP on an Intel-based Apple MacBook that was running Apple's OS X (10.4 Tiger). (The software also supports Windows SP2 but was not tested with that software release.)

In addition to the areas previously addressed, users will benefit from additional compatibility and management enhancements.

INTEGRATION WITH MAC DOCK

Parallels Desktop offers comprehensive integration with the Mac Dock while running a Microsoft Windows virtual

machine. Icons from Microsoft Windows applications can be displayed and managed via the Mac Dock.

INTEGRATION WITH MAC EXPOSÉ

Engineers verified the integration of Parallels Desktop with Mac's Exposé. (See Figure 3.) Applications opened in Microsoft Windows were automatically integrated with Mac's window switching tool.

FILE EXTENSION ASSOCIATION

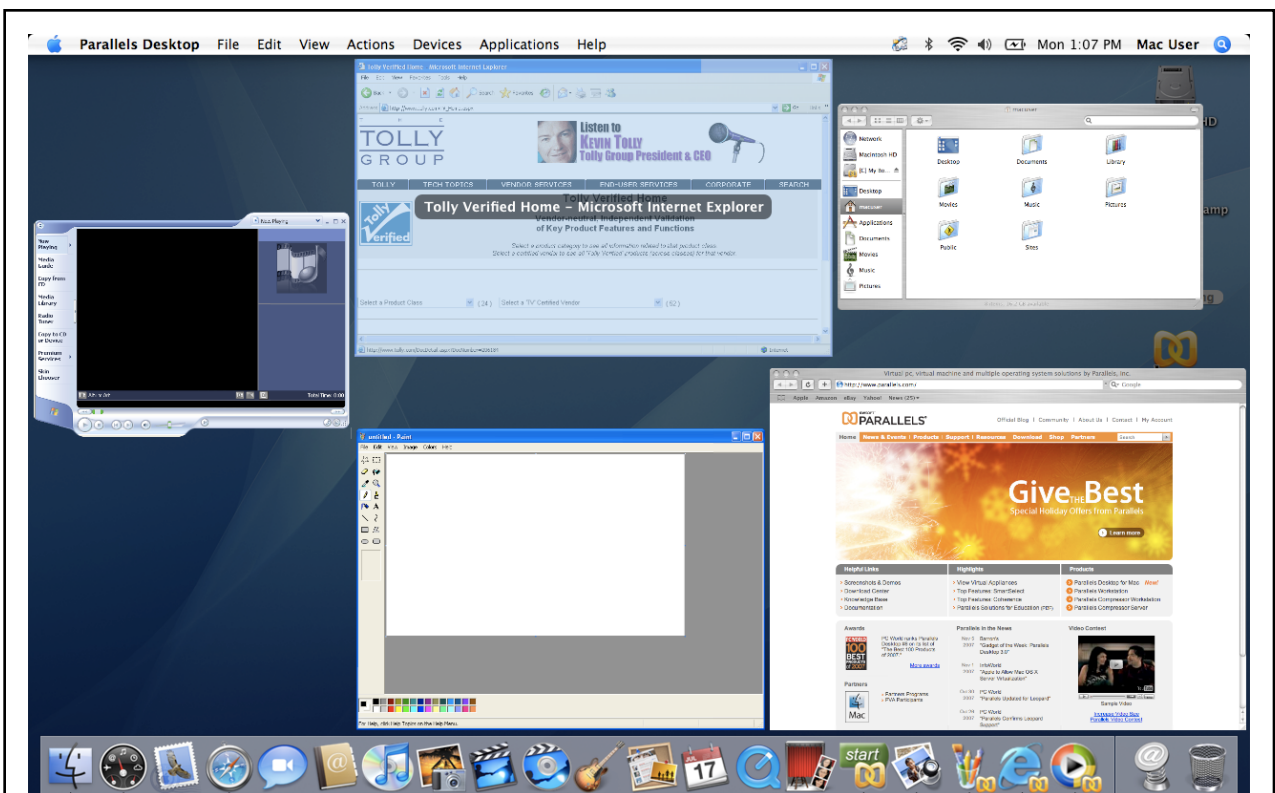
Engineers verified that Parallels Desktop demonstrates unsurpassed file extension associa-

tion. File extensions such as .exe are configured automatically to open directly with the Windows virtual machine.

Other extensions can also be configured to be associated back and forth between Mac OS and Windows. This feature is known as SmartSelect under Parallels Desktop.

VIRTUAL MACHINE RESTORE

Parallels Desktop offers the ability to take "snapshots" of the virtual machine's current state while running. This allowed the user to revert back to a previous state while restoring any changes made to the virtual



The above screen shot displays Parallels Desktop 3.0 for Mac's integration with both the Mac Dock and Exposé. Icons in the Mac Dock are the same icons used under Microsoft Windows to give the user that familiar look.

Source: The Tolly Group. November 2007

Figure 3

machine. A Snapshot Manager is also available to organize and manage the snapshots. This feature is known as Snapshots under the Parallels Desktop 3.0 for Mac software.

DIRECTX SUPPORT

Support for DirectX 7, 8, and 9 was available and tested using the “dxdiag” tool available within DirectX 9.0c.

OPENGL SUPPORT

OpenGL support was validated by installing and running the OpenGL-based game. Quake III Arena Demo. Gameplay was smooth and responsive.

FOLDER SHARING BETWEEN GUEST OS AND HOST OS

Parallels Desktop shared common folders by default. User folders are linked within the Microsoft Windows virtual machine to the host Mac OS. (e.g. My Documents to Documents, Desktop to Desktop, My Pictures to Pictures). This lessens the burden of the virtual machine user when locating where to open or save files.

FILE DRAG AND DROP BETWEEN GUEST OS AND HOST OS

This feature allows the Parallels Desktop user to access the virtual machine hard disk from Mac OS and “drag and drop” files directly inside the virtual machine’s disk drive.

USB 2.0 SUPPORT

Parallels Desktop supports USB 2.0 devices inside the virtual machine. This support was validated by connecting a USB flash drive while the virtual machine was running.

VIRTUAL MACHINE MANAGEMENT UTILITY

Parallels Explorer is a virtual machine management utility included in Parallels Desktop. This utility allows for organizing the contents of multiple virtual machines. Users can view and change data inside a virtual machine without starting it.

VIRTUAL MACHINE MIGRATION UTILITY

Parallels Transporter is a tool for migrating information from a real machine into a Parallels virtual machine. Engineers tested the functionality of this feature by migrating an existing Windows XP computer and converting it to a Parallels virtual machine.

VIRTUAL MACHINE SECURITY LEVELS

Engineers validated Parallels Desktop’s ability to choose pre-set security levels that configured the virtual machine to pre-determined security settings.

BOOT CAMP SUPPORT

Engineers validated the ability of Parallels Desktop 3.0 for Mac to run a Boot Camp partition as a virtual machine. By installing Microsoft Windows

XP on a Boot Camp partition, engineers could run that copy of Windows as a virtual machine using Parallels Desktop.

MOUSE POINTER INTEGRATION

The Tolly Group validated the ability to seamlessly move the mouse pointer between the virtual machine and the Mac desktop. This was possible without having to manually capture or release the mouse pointer from the virtual machine.

CLIPBOARD SHARING

Parallels Desktop offers the ability to share the clipboard between the virtual machine and Mac OS X. This enables users to exchange text and pictures between the guest and host OS.

VIRTUAL MACHINE HARD DISK IMAGE UTILITY

Parallels Image Tool is another utility included within Parallels Desktop. This utility allows users to perform changes to their virtual machine’s disk drive. Options include, among others, resizing, splitting, and consolidating the disk drive(s).

MICROSOFT WINDOWS INSTALLATION WIZARD

This wizard is most important when installing Microsoft Windows as a virtual machine. The wizard installs Microsoft Windows XP by asking for the Windows product key and

name. Engineers found this wizard to be much simpler than installing Windows on a standalone computer.

FULL SCREEN SUPPORT

Tolly Group engineers verified Parallels Desktop's ability to display the virtual machine in full screen format while hiding the host Mac OS completely.

VIRTUAL DISK COMPRESSION UTILITY

Parallels Compressor is a disk management utility that improves virtual machine performance by removing unnecessary files, adjusting some operating system parameters, and reducing the

size of virtual disk(s).

OPERATING SYSTEM SUPPORT

Engineers validated support for several operating systems on Parallels Desktop. Engineers installed Linux Fedora Core 6 and Microsoft Windows Vista along with the Microsoft Windows XP SP2 which was used for all of the testing.

CONFIGURATION

The Tolly Group tested Parallels Desktop (Build 5160) residing on a 13.3" Apple MacBook with Mac OS X Ver 10.4.10 (Tiger), Intel Core Duo 1.83 GHz, 2GB Memory, and 60GB HDD. Parallels Desktop requires an Intel-based Mac.

The Tolly Group is a leading global provider of third-party validation services for vendors of IT products, components and services.



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