

A performance comparison of current and previous-generation Dell OptiPlex desktop systems

Executive summary

Dell Inc. (Dell) commissioned Principled Technologies (PT) to run a set of performance tests on a mix of current- and previous-generation Intel® processor-based Dell™ OptiPlex™ desktop systems. We tested two current systems:

- Dell OptiPlex 780 with Intel Core™ 2 Duo E7500
- Dell OptiPlex 380 with Intel Core 2 Duo E7500

We compared performance of Microsoft Windows® 7 Ultimate (Windows 7), Microsoft Windows Vista® Ultimate SP2 (Windows Vista), and Windows XP Professional SP3 (Windows XP) on the current systems and of Windows XP on the following previous-generation systems:

- Dell OptiPlex GX620 with Intel Pentium® 4 Processor 630 (4-year-old system)
- Dell OptiPlex 745 with Intel Pentium Processor E2160 (3-year-old system)

Appendix A provides detailed system configuration information.

We compared the systems in three categories of tests: performance, application responsiveness, and system responsiveness. We used SYSmark 2007 Preview v1.06 to test overall system performance. We used custom hand-timed tests to measure application and system responsiveness. In most instances, we found the current Dell OptiPlex 380 desktop and the Dell OptiPlex 780 desktop running Windows 7 outperformed the previous-generation Dell OptiPlex desktops running Windows XP.

KEY FINDINGS

- The current Dell OptiPlex systems running Windows 7 provided up to 151.5% greater SYSmark Preview 2007 system performance than the previous-generation Dell OptiPlex systems running Windows XP. (See Figure 1.)
- The current Dell OptiPlex systems running Windows 7 provided up to 12.0% faster application responsiveness than the previous-generation Dell OptiPlex systems running Windows XP. (See Figure 2.)
- The current Dell OptiPlex 960 desktop running Windows 7 provided up to 58.2% faster system responsiveness than the previous-generation Dell OptiPlex systems running Windows XP. (See Figure 3.)

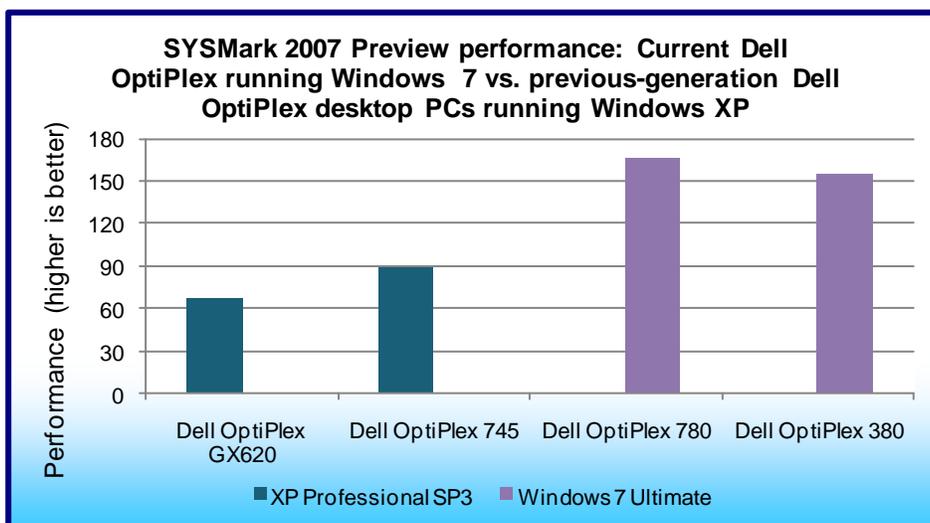


Figure 1: SYSmark 2007 Preview performance results for our test systems. Higher numbers are better.

Figure 1 shows highlights of the SYSmark 2007 Preview performance testing. The current Dell OptiPlex 780 running Windows 7 outperformed the previous-generation Dell OptiPlex GX620 by 151.5 percent, and outperformed the previous-generation Dell OptiPlex 745 by 86.5 percent. The current Dell OptiPlex 380 running Windows 7 outperformed the previous-generation Dell OptiPlex GX620 by 134.9 percent, and outperformed the previous-generation Dell OptiPlex 745 by 74.2 percent.

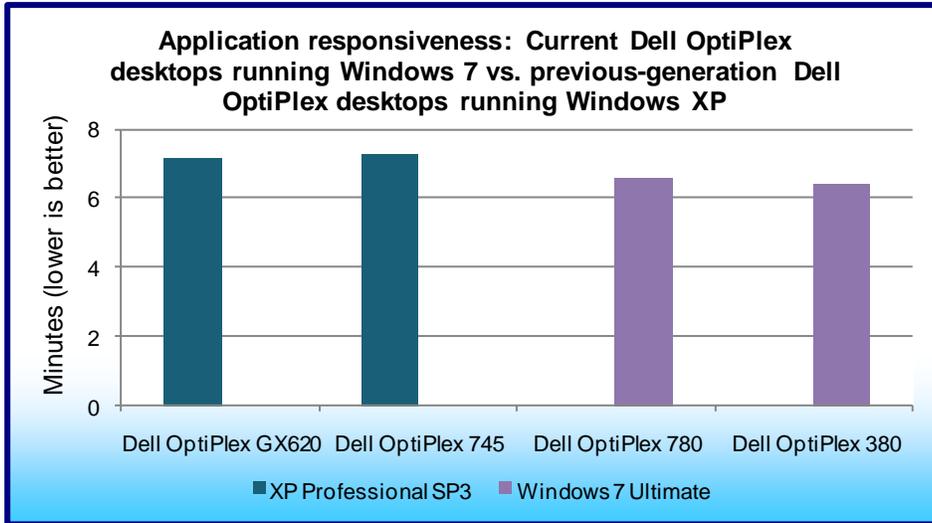


Figure 2: Application responsiveness results for our test systems – the sum of the averages for all application responsiveness tests. Lower numbers are better.

Figure 2 shows highlights of the application responsiveness testing. The current Dell OptiPlex 780 running Windows 7 responded 7.9 percent faster on our application tests than the previous-generation Dell OptiPlex 745 and 9.3 percent faster than the previous-generation Dell OptiPlex GX620. The current Dell OptiPlex 380 running Windows 7 responded 10.6 percent faster on our application tests than the previous-generation Dell OptiPlex 745 and 12.0 percent faster than the previous-generation Dell OptiPlex GX620.

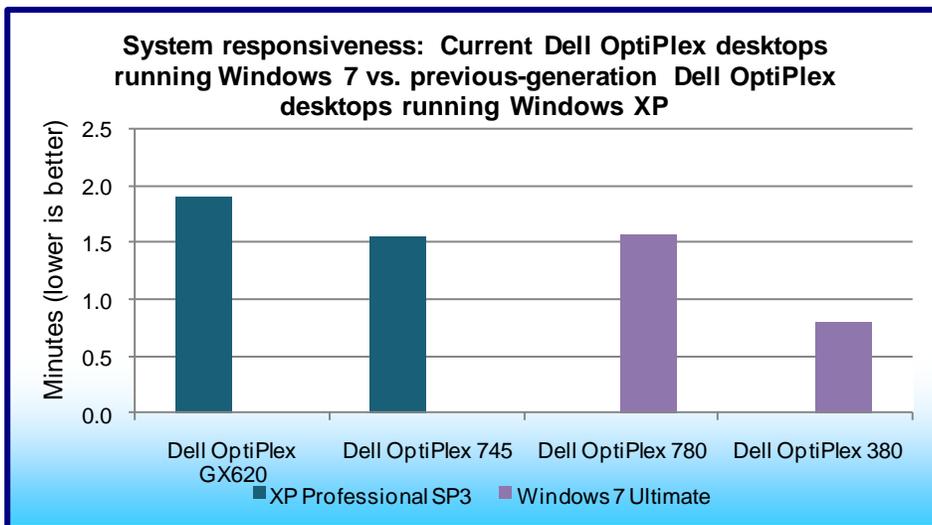


Figure 3: System responsiveness results for our test systems – the sum of the average for all system responsiveness tests. Lower numbers are better.

Figure 3 shows highlights of the system responsiveness testing. The current Dell OptiPlex 780 running Windows 7 responded 17.3 percent faster than the previous-generation Dell OptiPlex GX620, and 1.6 percent more slowly than the previous-generation Dell OptiPlex 745. The current Dell OptiPlex 380 running Windows 7 responded 58.2 percent faster than the previous-generation Dell OptiPlex GX620, and 48.7 percent faster than the previous-generation Dell OptiPlex 745.

Workload

SYSmark 2007 Preview v1.06

SYSmark 2007 Preview is a performance metric BAPCo created to measure system performance.

SYSmark 2007 Preview determines its overall rating from the mean result from four workload scenarios: e-learning, office productivity, video creation, and 3D modeling. SYSmark 2007 Preview records the time the system takes to complete each individual operation in each scenario.

SYSmark 2007 Preview consists of the following applications and corresponding tasks: Adobe® After® Effects 7 (e-learning), Adobe® Illustrator® CS2 (video creation), Adobe® Photoshop® CS2 (video creation), Autodesk® 3ds Max® 8 (3D modeling), Macromedia® Flash 8 (e-learning), Microsoft® Excel 2003 (office productivity), Microsoft® Outlook 2003 (office productivity), Microsoft® PowerPoint 2003 (office productivity), Microsoft® Word 2003 (office productivity), Microsoft® Project 2003 (office productivity), Microsoft® Windows Media™ Encoder 9 series (video creation), Sony® Vegas 7 (video creation), SketchUp 5 (3D modeling), and WinZip® 10.0 (office productivity).

To learn more, visit <http://www.bapco.com/support/sysmark2007preview/Help/Help.html>.

Test results

In this section, we average the results from Windows XP, Windows Vista, and Windows 7 on the current Dell OptiPlex systems and compare them to the Windows XP results on the previous-generation Dell OptiPlex systems.

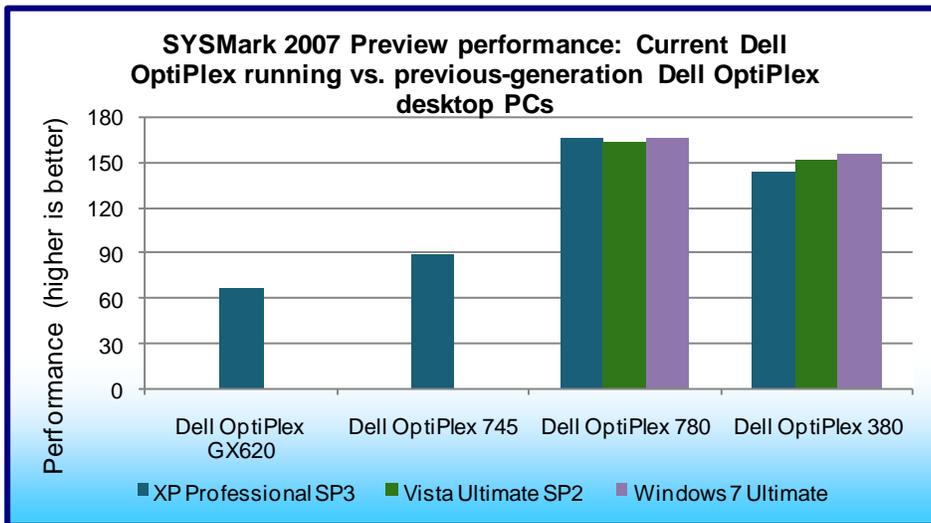


Figure 4: SYSmark 2007 Preview performance results for our test systems. Higher numbers are better.

GX620 by an average of 127.3 percent and the Dell OptiPlex 745 by an average of 68.5 percent.

Figure 4 shows the SYSmark 2007 Preview performance for the current Dell OptiPlex systems running Windows 7, Windows Vista, and Windows XP, and the previous-generation Dell OptiPlex systems running Windows XP. The current Dell OptiPlex 780 outperformed the previous-generation Dell OptiPlex GX620 by an average of 150.5 percent and the Dell OptiPlex 745 by an average of 85.8 percent. The current Dell OptiPlex 380 outperformed the previous-generation Dell OptiPlex

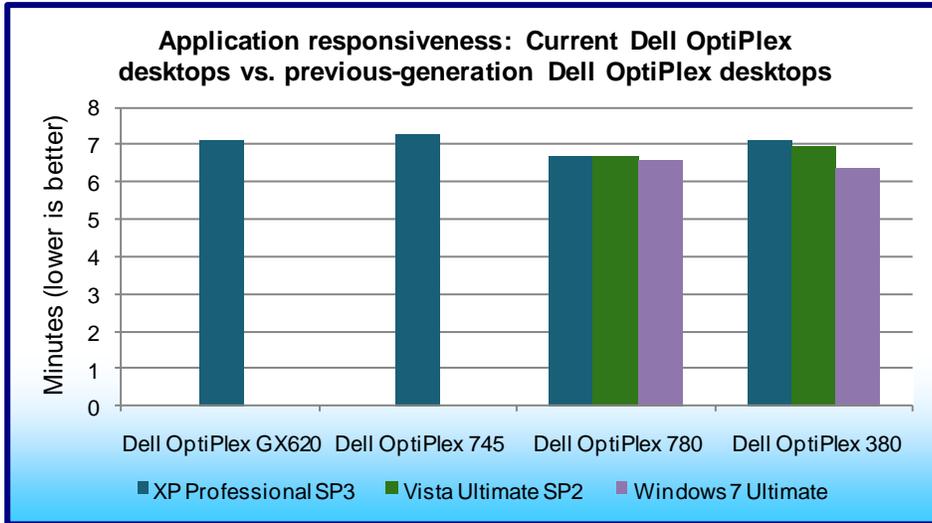


Figure 5: Application responsiveness results for our test systems – the sum of the averages for all application responsiveness tests. Lower numbers are better.

previous-generation Dell OptiPlex GX620 (19.6 seconds) and 6.0 percent faster than the Dell OptiPlex 745 (26.3 seconds).

Figure 5 shows the application responsiveness for both the current Dell OptiPlex systems running Windows 7, Windows Vista, and Windows XP, and the previous-generation Dell OptiPlex desktops running Windows XP. The current Dell OptiPlex 780 responded an average of 6.8 percent faster than the Dell OptiPlex GX620 (29.0 seconds) and 8.2 percent faster than the Dell OptiPlex 745 (35.6 seconds). The current Dell OptiPlex 380 responded an average of 4.6 percent faster on our application tests than the

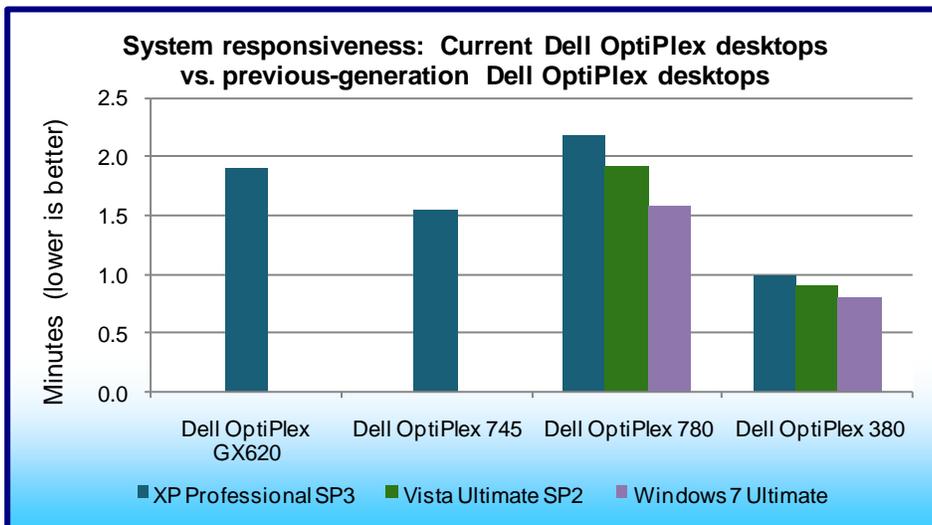


Figure 6: System responsiveness results for our test systems – the sum of the averages for all system responsiveness tests. Lower numbers are better.

OptiPlex GX620 (60.4 seconds) and 42.3 percent faster than the Dell OptiPlex 745 (39.2 seconds).

Figure 6 shows the system responsiveness for both the current Dell OptiPlex systems running Windows 7, Windows Vista, and Windows XP, and the previous-generation Dell OptiPlex desktops running Windows XP. The current Dell OptiPlex 780 responded an average of 0.7 percent faster than the Dell OptiPlex GX620 (0.8 seconds) and 22.0 percent faster than the Dell OptiPlex 745 (20.4 seconds). The current Dell OptiPlex 380 responded an average of 53.1 percent faster than the previous-generation Dell

Figures 7 and 8 show a more detailed breakdown of application and system responsiveness results for the current Dell OptiPlex desktop systems running Windows 7 and the previous-generation Dell OptiPlex GX620 desktop system running Windows XP.

As Figure 7 shows, the current Dell OptiPlex 780 running Windows 7 completed the below tasks almost 30 seconds faster than did the previous-generation Dell OptiPlex GX620. For 100 users, this translates to 50 minutes saved moving to the current Dell OptiPlex 780 running Windows 7.

Application responsiveness and system responsiveness tasks	Previous-generation Dell OptiPlex GX620 running Windows XP	Current Dell OptiPlex 780 running Windows 7	Time saved with upgrading to current Dell OptiPlex 780 desktop
Opening local Word document	5.30	2.78	2.52
Opening local Excel spreadsheet	2.25	1.63	0.62
Opening local PowerPoint deck	1.21	0.98	0.23
Opening Word document over network connection	5.79	2.84	2.95
Opening Excel spreadsheet over network connection	2.41	1.65	0.76
Opening PowerPoint deck over network connection	1.28	1.01	0.27
Copying files locally	13.66	12.53	1.13
Copying files to a USB stick	286.84	299.56	-12.72
Copying files from a USB stick to hard drive	31.43	31.31	0.12
Playing a widescreen format DVD - time to first frame	26.50	16.67	9.83
Playing a standard format DVD – time to first frame	26.19	16.31	9.88
Time to boot, launch Microsoft Outlook and connect to Exchange server	39.53	37.30	2.23
Standby	3.48	2.58	0.90
Resume from standby	8.85	3.79	5.06
Shutdown	12.00	5.94	6.06
Total	466.72	436.88	29.84

Figure 7: Application and system responsiveness, in seconds. Lower numbers are better.

As Figure 8 shows, the current Dell OptiPlex 380 running Windows 7 completed the below tasks over 46 seconds faster than did the previous-generation Dell OptiPlex GX620. For 100 users, this translates over 1 hour saved moving to the current Dell OptiPlex 380 running Windows 7.

Application responsiveness and system responsiveness tasks	Previous-generation Dell OptiPlex GX620 running Windows XP	Current Dell OptiPlex 380 running Windows 7	Time saved with upgrading to current Dell OptiPlex 380 desktop
Opening local Word document	5.30	2.74	2.56
Opening local Excel spreadsheet	2.25	1.57	0.68
Opening local PowerPoint deck	1.21	0.93	0.28
Opening Word document over network connection	5.79	2.84	2.95
Opening Excel spreadsheet over network connection	2.41	1.69	0.72
Opening PowerPoint deck over network connection	1.28	0.84	0.44
Copying files locally	13.66	3.58	10.08
Copying files to a USB stick	286.84	298.65	-11.81
Copying files from a USB stick to hard drive	31.43	30.71	0.72
Playing a widescreen format DVD - time to first frame	26.50	15.72	10.78
Playing a standard format DVD – time to first frame	26.19	14.44	11.75
Time to boot, launch Microsoft Outlook and connect to Exchange server	39.53	32.02	7.51
Standby	3.48	2.72	0.76
Resume from standby	8.85	3.79	5.06
Shutdown	12.00	8.37	3.63
Total	466.72	420.61	46.11

Figure 8: Application and system responsiveness, in seconds. Lower numbers are better.

Test methodology

In this section, we provide the methodology for three sets of tests: SYSmark 2007 Preview v.1.06, system responsiveness, and application responsiveness. For the application responsiveness and system responsiveness tests, we ran each test three times, taking the median of the three runs.

Measuring performance with BAPCo SYSmark 2007 Preview v1.06

Setting up the test

1. Reset the system to the base test image.
2. Disable the User Account Control.
 - a. Click Start→Control Panel.
 - b. At the User Accounts and Family Safety settings screen, click Add or remove user account.
 - c. At the User Account Control screen, click Continue.
 - d. Click Go to the main User Accounts page.
 - e. At the Make changes to your user account screen, click Turn User Account Control on or off.
 - f. At the User Account Control screen, click Continue.
 - g. Uncheck Use User Account Control to help protect your computer, and click OK.
 - h. At the You must restart your computer to apply these changes screen, click Restart Now.
3. Purchase and install SYSmark 2007 Preview v1.05 from <https://www.bapcostore.com/store/product.php?productid=16165&cat=251&page=1>.
4. At the Welcome to InstallShield Wizard screen, click Next.
5. At the License Agreement screen, select I accept the terms in the License Agreement, and click Next.
6. At the Choose Destination Location screen, click Next.

7. At the Ready to Install the Program screen, click Install.
8. When the installation is complete, click Finish.

Running the test

1. Launch SYSmark 2007 Preview by double-clicking the desktop icon.
2. Click Run.
3. Select Official Run, choose 3 Iterations, check the box beside run conditioning run, and enter a name for that run.
4. When the benchmark completes and the main SYSmark 2007 Preview menu appears, click Save FDR to create a report.

Record the results for each iteration.

Application responsiveness tests

Setting up the test workload

We used a specific test workload for four of five test cases (see Appendix C). Before running the test on a system image, we copied the workload to both the system itself and to a target system. While the workload is the same for four test cases, we gave the workload folder a unique name for each test case. We describe the initial setup of the test workload below. When applicable, we include steps for renaming the test workload in the setup for the specific test case.

Setting up the test workload on the test system

1. Reset the system to the base image.
2. Copy the Corpus workload folder to the Documents folder (Windows 7, Windows Vista) or the My Documents folder (Windows XP). Note: For simplicity, we will refer to this folder only as the Documents folder throughout this report.

Setting up the test workload on the target system

1. Copy the Corpus folder to the target system.
2. Rename the Corpus folder to `openfiles2`.

Opening Microsoft Office files (local HDD)

This test requires a stopwatch. We used the following test documents:

- TwoCities.docx 496 KB (507,904 bytes)
- Supply Requisition Form2.xlsx 820 KB (839,680 bytes)
- Welcome!.pptx 352 KB (360,448 bytes)

Setting up the test

1. Rename the Corpus folder to `openfiles1`.
2. Reboot the system.
3. Allow the system to idle for 3 minutes before running the test.

Running the test

1. Open the `openfiles1` folder.
2. Click once on the TwoCities.docx file to highlight the file.
3. Simultaneously press Enter to open the test document and start the timer.
4. Stop the timer when the document appears.
5. Close Word.
6. Wait 30 seconds.
7. Click the Supply Requisition Form2.xlsx file once to highlight the file.
8. Simultaneously press Enter to open the test spreadsheet and start the timer.
9. Stop the timer when the workbook appears.
10. Close Excel.
11. Wait 30 seconds.
12. Click the Welcome!.pptx file once to highlight the file.

13. Simultaneously press Enter to open the test slide deck and start the timer.
14. Stop the timer when the first slide appears.
15. Close PowerPoint.
16. Repeat steps 2 through 15 two times, and report the median.
17. Close the openfiles1 folder.

Opening Microsoft Office files (over a network using a wired connection)

This test requires a target system on the network and a stopwatch. We used the following test documents:

- TwoCities.docx 496 KB (507,904 bytes)
- Supply Requisition Form2.xlsx 820 KB (839,680 bytes)
- Welcome!.pptx 352 KB (360,448 bytes)

Note: We installed Windows 7 Ultimate (32-bit) on the target system.

Setting up the test

1. Disable the wireless network connection on the test system.
2. Verify the wired network connection works properly.
 - a. Open the openfiles2 folder on the test system.
 - b. Close the folder.
3. Reboot the system.
4. Allow the system to idle for 3 minutes before running the test.

Running the test

1. Browse to the target system on the network using the test system's wired network connection, and open the openfiles2 folder.
2. Click the TwoCities.docx file once to highlight the file.
3. Simultaneously press Enter to open the test document and start the timer.
4. Stop the timer when the document appears.
5. Close Word.
6. Wait 30 seconds.
7. Click the Supply Requisition Form2.xlsx file once to highlight the file.
8. Simultaneously press Enter to open the test spreadsheet and start the timer.
9. Stop the timer when the workbook appears.
10. Close Excel.
11. Wait 30 seconds.
12. Click the Welcome!.pptx file once to highlight the file.
13. Simultaneously press Enter to open the test slide deck and start the timer.
14. Stop the timer when the first slide appears.
15. Close PowerPoint.
16. Repeat steps 2 through 15 two times, and report the median.
17. Close the openfiles2 folder.

Installing/re-inserting a USB drive

This test requires a stopwatch, a 1GB PNY USB stick, and a 1GB Kingston Traveler USB stick.

Setting up the test

1. Copy the test.mp3 file from the Corpus folder to the PNY USB stick.
2. Copy the test.mp3 file from the Corpus folder to the Kingston USB stick.
3. Copy the 32-bit decay.exe device driver removal tool to the hard drive (e.g., C:\decay.exe).
4. Run the decay.exe tool.
 - a. Open an administrative command prompt.
 - i. In Windows 7 and Windows Vista, click the Start button, type `cmd` in Start Search, and press Ctrl+Shift+Enter.
 - ii. In Windows XP, click the Start button, click Run, type `cmd` and press Enter.
 - b. Type `cd C:\` and press Enter.

- c. Type `decay.exe -l` and press Enter to view drivers installed by the two USB sticks.
 - d. Type `decay.exe` and press Enter to run the tool and remove these device drivers.
 - e. Type `decay.exe -l` and press Enter to confirm that the tool removed the USB device drivers.
5. Reboot the system.
 6. Allow the system to idle for 3 minutes before running the test.

Running the test

1. Simultaneously insert the PNY USB stick into USB port #1 and start the timer.
2. Stop the timer when the AutoPlay menu for the USB stick appears on the desktop.
3. After the USB device driver software installs successfully, remove the USB stick using the Safely Remove Hardware tool.
4. Wait 30 seconds.
5. Simultaneously insert the PNY USB stick into USB port #2 and start the timer.
6. Stop the timer when the AutoPlay menu for the USB stick appears on the desktop.
7. Remove the USB stick using the Safely Remove Hardware tool.
8. Wait 30 seconds.
9. Simultaneously insert the Kingston USB stick into USB port #1 and start the timer.
10. Stop the timer when the AutoPlay menu for the USB stick appears on the desktop.
11. After the USB device driver software installs successfully, remove the USB stick using the Safely Remove Hardware tool.
12. Wait 30 seconds.
13. Simultaneously insert the Kingston USB stick into USB port #2 and start the timer.
14. Stop the timer when the AutoPlay menu for the USB stick appears on the desktop.
15. Remove the USB stick using the Safely Remove Hardware tool.
16. Run the `decay.exe` tool.
 - a. Open an administrative command prompt.
 - i. In Windows 7 and Windows Vista, click the Start button, type `cmd` in Start Search, and press `Ctrl+Shift+Enter`.
 - ii. In Windows XP, click the Start button, click Run, type `cmd` and press Enter.
 - b. Type `cd C:\` and press Enter.
 - c. Type `decay.exe -l` and press Enter to view drivers installed by the two USB sticks.
 - d. Type `decay.exe` and press Enter to run the tool and remove these device drivers.
 - e. Type `decay.exe -l` and press Enter to confirm that the tool removed the USB device drivers.
17. Repeat steps 1 through 16 two times, and report the median.

Copying files

This test requires a stopwatch, a 1GB Kingston Traveler USB stick, and the following workload:

- Corpus: 426 MB (446,697,472 bytes)

Setting up the test

1. Rename the `openfiles1` folder to `copyfileslocal1`.
2. Right-click the `copyfileslocal1` folder, and select Copy.
3. Right-click the Document folder, and select Paste.
4. Rename the new folder to `copyfilesusb1`.
5. Create two new output folders in the in Documents folder (e.g., `testouta1` and `testoutb1`).
6. Insert the USB stick, and create one output folder on the USB drive (e.g., `E:\testusbout1`).
7. Remove the USB stick using the Safely Remove Hardware tool.
8. Reboot the system.
9. Allow the system to idle for 3 minutes before running the test.

Running the test

1. Open the `copyfileslocal1` workload folder in the Documents folder.
2. Press `Ctrl+A` to select all files, right-click the files, and select Copy.
3. Open the `testouta1` folder.
4. Right-click the `testouta1` folder.

5. Simultaneously select Paste and start the timer.
6. Stop the timer when the copy operation is complete, as indicated by the disappearance of the copy status bar.
7. Delete the testouta1 folder from the Documents folder and empty the Recycle Bin.
8. Insert the USB stick into a USB port.
9. Open the copyfilesusb1 workload folder in the Documents folder.
10. Press Ctrl+A to select all files, right-click the files, and select Copy.
11. Open the testusbout1 folder on the USB stick.
12. Right-click the testusbout1 folder.
13. Simultaneously select Paste and start the timer.
14. Stop the timer when the copy operation is complete, as indicated by the disappearance of the copy status bar.
15. Rename the testusbout1 folder to testusbin1 and remove the USB stick using the Safely Remove Hardware tool.
16. Re-insert the USB stick into the same USB port.
17. Open the testusbin1 folder.
18. Press Ctrl+A to select all files, right-click the files, and select Copy.
19. Open the testoutb1 folder in the Documents folder.
20. Right-click the testoutb1 folder.
21. Simultaneously select Paste and start the timer.
22. Stop the timer when the copy operation is complete, as indicated by the disappearance of the copy status bar.
23. Repeat steps 1 through 22 two more times, using the following steps to set up the test for each subsequent run.
 - a. Delete the testusbin1 folder from the USB stick.
 - b. Create a new output folder with a different unique name on the USB drive (e.g., E:\testusbout2).
 - c. Remove the USB stick using the Safely Remove Hardware tool.
 - d. Delete the testoutb1 folder from the Documents folder and empty the Recycle Bin.
 - e. Create two new output folders with unique names in the Documents folder (e.g., testouta2 and testoutb2).
 - f. Rename both the copyfileslocal1 and copyfilesusb2 workloads to unique names (e.g., copyfileslocal2 and copyfilesusb2).

Playing a DVD

This test requires a stopwatch and the following two DVDs:

- Lord of the Rings: The Return of the King – Widescreen Edition
- Monty Python's Flying Circus

Setting up the test

1. Reboot the system.
2. Allow the system to idle for 3 minutes before running the test.

Running the test

1. Open Windows Media Player.
2. Simultaneously insert the Lord of the Rings DVD and start the timer.
3. Stop the timer when the first frame begins to play. Note: This may be any of the following:
 - a. the FBI anti-piracy screen
 - b. Introductory scenes prior to the DVD menu appearing
 - c. A warning about the opinions expressed not being those of the studio
 - d. A splash screen for the movie studio
 - e. Previews
 - f. The DVD menu itself
4. Close Windows Media Player, and remove the DVD.
5. Open Windows Media Player.

6. Simultaneously insert the Monty Python's Flying Circus DVD and start the timer.
7. Stop the timer when the first frame begins to play. Note: This may be any of the following:
 - a. The FBI anti-piracy screen
 - b. Introductory scenes prior to the DVD menu appearing
 - c. A warning about the opinions expressed not being those of the studio
 - d. A splash screen for the movie studio
 - e. Previews
 - f. The DVD menu itself
8. Close Windows Media Player, and remove the DVD.
9. Repeat steps 1 through 8 two more times.

System responsiveness tests

Boot experience

This test requires a stopwatch with multiple timers.

Setting up the test

1. Reset the system to the base image.

Running the test

1. Simultaneously start the timer and boot the system.
2. Stop timer 1 when the taskbar appears.
3. Launch Internet Explorer from the taskbar immediately after the taskbar appears.
4. Stop timer 2 when the home page appears.
5. Wait 3 minutes before shutting the system down.
6. Repeat steps 1 through 5 two times, and report the median.

Boot experience with Outlook 2007 SP2

This test requires a stopwatch. This test requires no setup.

Running the test

1. Boot the system.
2. Simultaneously launch Outlook and start the timer.
3. Stop the timer when the system connects to Microsoft Exchange, as indicated by the status bar in Outlook 2007.
4. Wait 3 minutes before shutting the system down.
5. Repeat steps 1 through 4 two times, and report the median.

Shutdown experience

This test requires a stopwatch. This test requires no setup.

Running the test

1. Boot the system.
2. Wait 2 minutes.
3. Simultaneously start the timer and shut down the system: Start→Turn Off Computer→Shut Down (Windows XP), Start→Shut Down (Windows Vista, Windows 7).
4. Repeat steps 1 through 3 two times, and report the median.

Cold standby experience

This test requires a stopwatch. This test requires no setup.

Running the test

1. Boot the system.
2. Wait 5 minutes.
3. Put the system in standby/sleep mode: Start→Turn Off Computer→Standby (Windows XP) or Start→Sleep (Windows Vista, Windows 7).

4. Simultaneously start the timer and select Standby/Sleep.
5. Reset the timer.
6. Simultaneously start the timer and press the power button to resume from standby/sleep mode.
7. Stop the timer when the system displays the desktop.
8. Shut down the system.
9. Repeat steps 1 through 8 two times, and report the median, but do not shut down the system after the final timed run.

Warm standby experience

This test requires a stopwatch. This test requires no setup.

Running the test

1. Wait 1 minute.
2. Put the system in standby mode: Start→Turn Off Computer→Standby (Windows XP) or Start→Sleep (Windows Vista, Windows 7).
3. Simultaneously start the timer and select Standby/Sleep.
4. Reset the timer.
5. Simultaneously start the timer and press the power button to resume from standby/sleep mode.
6. Stop the timer when the system displays the desktop.
7. Repeat steps 1 through 6 two times, and report the median.

Cold standby experience with applications open with Outlook 2007 SP2

This test requires a stopwatch. We used the following test documents:

- TwoCities.docx 496 KB (507,904 bytes)
- Supply Requisition Form2.xlsx 820 KB (839,680 bytes)
- Welcome!.pptx 352 KB (360,448 bytes)

Note: We performed this test over both wired and wireless networks.

Setting up the test

1. Reboot the system.

Running the test

1. Launch Outlook, and wait until the system is online with Microsoft Exchange, as indicated by the status bar in Outlook 2007.
2. Launch PowerPoint, and open Welcome!.pptx.
3. Launch Excel, and open Supply Requisition Form2.xlsx.
4. Launch Word, and open TwoCities.docx.
5. Wait 5 minutes.
6. With the documents open, put the system in standby/sleep mode: Start→Turn Off Computer→Standby (Windows XP) or Start→Sleep (Windows Vista, Windows 7).
7. Simultaneously start the timer and select Standby/Sleep.
8. Reset the timer.
9. Simultaneously start the timer and press the power button to resume from standby/sleep mode.
10. Stop the timer when the system is online with Microsoft Exchange, as indicated by the status bar in Outlook 2007.
11. Shut down the system.
12. Repeat steps 1 through 11 two times, and report the median, but do not shut down the system after the final timed run.

Warm standby experience with applications open with Outlook

This test requires a stopwatch. This test requires no setup. We used the following test documents:

- TwoCities.docx 496 KB (507,904 bytes)
- Supply Requisition Form2.xlsx 820 KB (839,680 bytes)
- Welcome!.pptx 352 KB (360,448 bytes)

Note: We performed this test over both wired and wireless networks.

Running the test

1. Wait 1 minute.
2. With the documents still open, put the system in standby/sleep mode: Start→Turn Off Computer→Standby (Windows XP) or Start→Sleep (Windows Vista, Windows 7).
3. Simultaneously start the timer and select Standby/Sleep.
4. Reset the timer.
5. Simultaneously start the timer and press the power button to resume from standby/sleep mode.
6. Stop the timer when the system is online with Microsoft Exchange, as indicated by the status bar in Outlook 2007.
7. Repeat steps 1 through 6 two times, and report the median.
8. Shut down the system.

Appendix A – Detailed system configuration information

Figure 9 presents the current desktop system and the details of its configuration.

Current desktop systems	OptiPlex 380	OptiPlex 780
General		
Processor and OS kernel: (physical, core, logical) / (UP, MP)	1P,2C,2L / MP	1P,2C,2L / MP
System power management policy XP	Dell Desktop Power Methodology	Dell Desktop Power Methodology
System power management policy Vista	Dell Desktop Power Methodology	Dell Desktop Power Methodology
System power management policy Windows 7	Dell Desktop Power Methodology	Dell Desktop Power Methodology
Processor power-saving option	EIST	EIST
CPU		
Vendor	Intel	Intel
Name	Core 2 Duo	Core 2 Duo
Model number	E7500	E7500
Stepping	R0	R0
Socket type and number of pins	LGA 775	LGA775
Core frequency (GHz)	2.93	2.93
Front-side bus frequency	1,066	1,066
L1 cache	32 KB + 32 KB (per core)	32 KB + 32 KB (per core)
L2 cache	3 MB	3 MB
L3 cache	NA	NA
Platform		
Vendor	Dell	Dell
Motherboard model number	0F0TGN	0200DY
Motherboard chipset	Intel G41	Intel Q45
Motherboard revision number	A3	03
System/motherboard serial number	7PX5HK1	3QCCHK1
Bios name and version	Dell A00 (10/23/2009)	Dell A01 (09/01/2009)
BIOS settings	Default	Default
Memory module(s)		
Vendor and model number	Elpida EBJ21UE8BDF0-AE-F	Samsung M378B2873EH1-CF8
Type	PC3-8500F	PC3-8500
Speed (MHz)	1,066	1,066
Speed running in the system (MHz)	1,066	1,066
Timing/Latency (tCL-tRCD-tRP-tRASmin)	7-7-7-20	7-7-7-20
Size	4,096 MB	2,048 MB
Number of memory module(s)	2 x 2,048 MB	2 x 1,024 MB
Channel (Single/Dual)	Dual	Dual
Hard disk		
Vendor and model number	Samsung HD161GJ	Western Digital WD1600HLFS-75G6U1
Size (GB)	160	160
Buffer size (MB)	8	16
RPM	7,200	10,000

Current desktop systems	OptiPlex 380	OptiPlex 780
Type	SATA 3.0 Gb/s	SATA 3.0 Gb/s
Controller	Intel 82801GB (ICH7/R)	Intel 82801JB (ICH10)
Driver XP	Inel 8.2.1.1011 (11/07/2008)	Intel 8.8.0.1009 (02/11/2009)
Driver Vista	Microsoft 6.0.6002.18005 06/21/2006	Intel 8.8.0.1009 (02/11/2009)
Driver Windows 7	Microsoft 6.1.7600.16835 (06/21/2006)	Intel 8.9.0.1023 (06/04/2009)
Operating system 1		
Name	Microsoft Windows XP Professional	Microsoft Windows XP Professional
Build number	2600	2600
Service Pack	3	3
File system	NTFS	NTFS
Kernel	ACPI Multiprocessor PC	ACPI Multiprocessor PC
Language	English	English
Microsoft DirectX version	9.0c	9.0c
Operating system 2		
Name	Microsoft Windows Vista Ultimate	Microsoft Windows Vista Ultimate
Build number	6002	6002
Service Pack	2	2
File system	NTFS	NTFS
Kernel	ACPI x86-based PC	ACPI x86-based PC
Language	English	English
Microsoft DirectX version	10	10
Operating system 3		
Name	Microsoft Windows 7 Ultimate	Microsoft Windows 7 Ultimate
Build number	7600	7600
Service Pack	NA	NA
File system	NTFS	NTFS
Kernel	ACPI x86-based PC	ACPI x86-based PC
Language	English	English
Microsoft DirectX version	11	11
Graphics		
Vendor and model number	Intel GMA X4500	Intel GMA 4500
Type	Integrated	Integrated
Chipset	Intel 4 Series Express Chipset Family	Intel 4 Series Express Chipset Family
BIOS version	1785.0	1785.0
Total available graphics memory (MB)	1,421	765
Dedicated video memory (MB)	32	32
System video memory (MB)	32	96
Shared system memory (MB)	1,357	637
Resolution	1,280 x 1,024 x 32 bit	1,280 x 1,024 x 32 bit
Driver XP	Intel 6.14.10.5160 (10/19/2009)	Intel 6.14.10.5082 (06/25/2009)
Driver Vista	Intel 7.15.10.1861 (07/31/2009)	Intel 7.15.10.1861 (07/31/2009)
Driver Windows 7	Intel 8.15.10.1872 (08/13/2009)	Intel 8.15.10.1872 (08/13/2009)

Current desktop systems	OptiPlex 380	OptiPlex 780
Sound card/subsystem		
Vendor and model number	Realtek High Definition Audio	SoundMAX Integrated Digital High Definition Audio
Driver XP	Realtek 5.10.5874 (10/23/2009)	Analog Devices 5.10.1.7260 (06/22/2009)
Driver Vista	Microsoft 6.0.6002.18005 06/21/2006	Analog Devices 6.10.1.7260 (06/22/2009)
Driver Windows 7	Microsoft 6.1.7600.16385 (07/13/2009)	Analog Devices 6.10.1.7260 (06/22/2009)
Ethernet		
Vendor and model number	Broadcom Netlink Gigabit	Intel 82567LM-3 Gigabit
Driver XP	Broadcom 12.2.0.3 (05/29/2009)	Intel 10.7.31.250 (07/30/2009)
Driver Vista	Broadcom 12.2.1.1 (06/20/2009)	Intel 11.5.4.0 (11/5/2009)
Driver Windows 7	Broadcom 12.2.1.1 (06/20/2009)	Intel 11.5.4.0 (11/5/2009)
Optical drive(s)		
Vendor and model number	LG GH50N	LG GH50N
Type	DVD-RW	DVD-RW
Interface	SATA	SATA
Dual/Single layer	Dual	Dual
USB ports		
Number	8	8
Type	USB 2.0	USB 2.0
Other	NA	eSATA
IEEE 1394 ports		
Number	NA	NA
Monitor		
LCD type	Dell E1709Wc	Dell E2210H
Screen size	17"	21.5"
Refresh rate	60 Hz	60 Hz

Figure 9. Detailed system configuration for the two current-generation Dell OptiPlex desktops.

Figure 10 presents each previous-generation desktop system and the details of its configuration.

Previous-generation desktop systems	Dell OptiPlex GX620	Dell OptiPlex 745
General		
Processor and OS kernel: (physical, core, logical) / (UP, MP)	1P,1C,2L / MP	1P,1C,2L / MP
System power management policy Windows XP	Dell Desktop Power Methodology	Dell Desktop Power Methodology
System power management policy Windows Vista	NA	NA
System power management policy Windows 7	NA	NA
Processor power-saving option	EIST	EIST
CPU		
Vendor	Intel	Intel
Name	Pentium 4	Pentium
Model number	630	E2160
Stepping	N0	L2
Socket type and number of pins	LGA 775	LGA 775
Core frequency (GHz)	3.00	1.80
Front-side bus frequency (MHz)	800	800
L1 cache	16 KB + 12 KB (per core)	32 KB + 32 KB (per core)
L2 cache (MB)	2	1
Platform		
Vendor	Dell	Dell
Motherboard model number	0HH807	0HR330
Motherboard chipset	Intel i945G	Intel Q965
Motherboard revision number	A2	C1
System/motherboard serial number	6FHZZ91	PS060808
BIOS name and version	Dell A11 (11/30/2006)	Dell 2.6.2 (08/12/2008)
BIOS settings	Default	Default
Memory module(s)		
Vendor and model number	Infineon 64T32000HU3.7A	Kingston KC6844-ELG37
Type	PC2-4200	PC2-4200
Speed (MHz)	533	533
Speed running in the system (MHz)	533	533
Timing/Latency (tCL-tRCD-tRP-tRASmin)	4-4-4-12	4-4-4-12
Size (MB)	1,024	2,048
Number of memory module(s)	4	2
Channel (single/dual)	Dual	Dual
Hard disk		
Vendor and model number	2 x Western Digital WD400BD-75JMC0	Western Digital WD800JD-75MSA3
Size (GB)	40	80
Buffer size (MB)	8	8
RPM	7,200	7,200
Type	SATA 1.5 Gb/s	SATA 3.0 Gb/s
Controller	Intel 82801GB (ICH7/R)	Intel 82801HB/HR (ICH8/R)
Driver Windows XP	Intel 7.0.0.1020 (05/23/2005)	Intel 8.0.0.1008 (04/10/2006)
Driver Windows Vista	NA	NA
Driver Windows 7	NA	NA

Previous-generation desktop systems	Dell OptiPlex GX620	Dell OptiPlex 745
Operating system		
Name	Microsoft Windows XP Professional	Microsoft Windows XP Professional
Build number	2600	2600
Service pack	3	3
File system	NTFS	NTFS
Kernel	ACPI Multiprocessor PC	ACPI Multiprocessor PC
Language	English	English
Microsoft DirectX version	9.0c	9.0c
Graphics		
Vendor and model number	Intel GMA 950	Intel GMA 3000
Type	Integrated	Integrated
Chipset	Intel 82945G Express Chipset	Intel 965 Express Chipset
BIOS version	1215	1345
Total available graphics memory (MB)	224	256
Resolution	1,280 x 1,024 x 32 bit	1,280 x 1,024 x 32 bit
Driver Windows XP	Intel 6.14.10.4543 (03/23/2006)	Intel 6.14.10.4943 (04/02/2008)
Driver Windows Vista	NA	NA
Driver Windows 7	NA	NA
Sound card/subsystem		
Vendor and model number	SoundMAX Integrated Digital Audio	SoundMAX Integrated Digital HD Audio
Driver Windows XP	Analog Devices 5.12.1.5246 (01/27/2005)	Analog Devices 5.10.1.4542 (07/05/2006)
Driver Windows Vista	NA	NA
Driver Windows 7	NA	NA
Ethernet		
Vendor and model number	Broadcom NetXtreme 57xx Gigabit	Broadcom NetXtreme 57xx Gigabit
Driver Windows XP	Broadcom 8.22.1.0 (04/20/2005)	Broadcom 10.39.0.0 (06/05/2007)
Driver Windows Vista	NA	NA
Driver Windows 7	NA	NA
Optical drive(s)		
Vendor and model number	TSSTcorp TS-H492C	TSSTcorp TS-H493B
Type	DVD-ROM / CD-RW	DVD-ROM / CD-RW
Interface	IDE	SATA
Dual/Single layer	Dual	Dual
USB ports		
Number	8	8
Type	USB 2.0	USB 2.0
Other	NA	NA
IEEE 1394 ports		
Number	NA	NA
Monitor		
LCD type	ViewSonic Optiquest Q7	ViewSonic Optiquest Q7

Previous-generation desktop systems	Dell OptiPlex GX620	Dell OptiPlex 745
Screen size	17"	17"
Refresh rate (Hz)	60	60

Figure 10. Detailed system configuration for the two previous-generation Dell OptiPlex desktops.

Appendix B – Detailed results

Figures 11 through 13 present the detailed test results for the systems.

Previous-generation desktop systems	Dell OptiPlex GX620	Dell OptiPlex 745
Operating system	XP Professional SP3	XP Professional SP3
Application responsiveness		
Test case 1a: Opening files using common office applications (local HDD)		
<i>Word document appears - median</i>	00:05.30	00:05.49
<i>Excel workbook appears - median</i>	00:02.25	00:02.25
<i>PowerPoint slide appears - median</i>	00:01.21	00:01.17
Test case 1b: Opening files using common office applications (wired)		
<i>Word document appears - median</i>	00:05.79	00:05.59
<i>Excel workbook appears - median</i>	00:02.41	00:02.34
<i>PowerPoint slide appears - median</i>	00:01.28	00:01.32
Test case 2: Installing/re-inserting a USB drive		
<i>Installing PNY USB stick - median</i>	00:09.98	00:09.90
<i>Installing Kingston USB stick - median</i>	00:11.04	00:10.48
<i>Re-inserting PNY USB stick - median</i>	00:02.18	00:01.85
<i>Re-inserting Kingston USB stick - median</i>	00:01.71	00:01.56
Test case 3: Copying files locally		
<i>Copying files to another location on the C: drive - median</i>	00:13.66	00:13.88
<i>Copying files from the hard drive to a USB stick - median</i>	04:46.84	04:46.12
<i>Copying files from a USB stick to the hard drive - median</i>	00:31.43	00:31.45
Test case 4: Playing a DVD		
<i>Lord of the Rings - median</i>	00:26.50	00:31.79
<i>Monty Python - median</i>	00:26.19	00:29.20
On/off tests		
Test case 1: Boot experience		
<i>COLD: Taskbar appears - median</i>	00:28.55	00:24.95
<i>COLD: Home page loads - median</i>	00:11.31	00:11.16
Test case 2: Boot experience with Office 2007 SP2		
<i>COLD: Time to connect to Exchange Server after booting system - median</i>	00:10.98	00:09.41
Test case 3: Cold standby experience		
<i>COLD: Time to standby - median</i>	00:03.43	00:02.73
<i>COLD: Time to resume from standby - median</i>	00:08.83	00:07.78
Test case 4: Warm standby experience		
<i>WARM: Time to standby - median</i>	00:03.53	00:01.77
<i>WARM: Time to resume from standby - median</i>	00:08.87	00:04.91
Test case 5 (wired): Cold standby experience with applications open		
<i>COLD: Time to standby - median</i>	00:04.11	00:02.88
<i>COLD: Time to connect to Exchange Server after resume from standby - median</i>	00:09.18	00:08.16
Test case 6 (wired): Warm standby experience with applications open		
<i>WARM: Time to standby - median</i>	00:03.79	00:02.30
<i>WARM: Time to connect to Exchange Server after resume from standby - median</i>	00:09.17	00:05.60

Previous-generation desktop systems	Dell OptiPlex GX620	Dell OptiPlex 745
Test case 7: Shutdown experience		
<i>Time to turn system off - median</i>	00:12.00	00:10.90
Industry-standard benchmarks		
BAPCo SYSmark 2007 Preview v1.06		
<i>SYSmark 2007 Preview v1.06 Rating</i>	66	89

Figure 11: Detailed test results for the previous-generation desktop systems.

Current desktop system: Dell OptiPlex 380			
Operating system	Windows XP Professional SP3	Windows Vista Ultimate SP2	Windows 7 Ultimate
Application responsiveness			
Test case 1a: Opening files using common office applications (local HDD)			
<i>Word document appears - median</i>	00:02.52	00:03.05	00:02.74
<i>Excel workbook appears - median</i>	00:01.48	00:01.64	00:01.57
<i>PowerPoint slide appears - median</i>	00:00.85	00:01.15	00:00.93
Test case 1b: Opening files using common office applications (wired)			
<i>Word document appears - median</i>	00:02.56	00:02.93	00:02.84
<i>Excel workbook appears - median</i>	00:01.57	00:01.81	00:01.69
<i>PowerPoint slide appears - median</i>	00:00.85	00:00.96	00:00.84
Test case 2: Installing/re-inserting a USB drive			
<i>Installing PNY USB stick - median</i>	00:10.15	00:03.10	00:02.89
<i>Installing Kingston USB stick - median</i>	00:10.10	00:03.12	00:02.85
<i>Re-inserting PNY USB stick - median</i>	00:01.96	00:01.78	00:01.71
<i>Re-inserting Kingston USB stick - median</i>	00:01.47	00:01.40	00:01.21
Test case 3: Copying files locally			
<i>Copying files to another location on the C: drive - median</i>	00:09.12	00:04.39	00:03.58
<i>Copying files from the hard drive to a USB stick - median</i>	04:58.31	05:04.19	04:58.65
<i>Copying files from a USB stick to the hard drive - median</i>	00:30.78	00:32.07	00:30.71
Test case 4: Playing a DVD			
<i>Lord of the Rings - median</i>	00:28.68	00:28.25	00:15.72
<i>Monty Python - median</i>	00:25.12	00:26.67	00:14.44
On/off tests			
Test case 1: Boot experience			
<i>COLD: Taskbar appears - median</i>	00:22.61	00:29.66	00:29.12
<i>COLD: Home page loads - median</i>	00:11.59	00:02.00	00:03.24
Test case 2: Boot experience with Office 2007 SP2			
<i>COLD: Time to connect to Exchange Server after booting system - median</i>	00:13.68	00:07.84	00:02.90
Test case 3: Cold standby experience			
<i>COLD: Time to standby - median</i>	00:03.28	00:03.03	00:03.24
<i>COLD: Time to resume from standby - median</i>	00:08.83	00:04.01	00:03.87
Test case 4: Warm standby experience			
<i>WARM: Time to standby - median</i>	00:02.81	00:03.06	00:02.19
<i>WARM: Time to resume from standby - median</i>	00:04.58	00:03.68	00:03.72
Test case 5 (wired): Cold standby experience with applications open			
<i>COLD: Time to standby - median</i>	00:03.56	00:03.24	00:03.65
<i>COLD: Time to connect to Exchange Server after resume from standby - median</i>	00:09.66	00:08.35	00:10.87
Test case 6 (wired): Warm standby experience with applications open			
<i>WARM: Time to standby - median</i>	00:03.23	00:02.42	00:02.68
<i>WARM: Time to connect to Exchange Server after resume from standby - median</i>	00:05.64	00:08.45	00:10.45
Test case 7: Shutdown experience			
<i>Time to turn system off - median</i>	00:10.62	00:09.01	00:08.37

Current desktop system: Dell OptiPlex 380			
Operating system	Windows XP Professional SP3	Windows Vista Ultimate SP2	Windows 7 Ultimate
Industry-standard benchmarks			
BAPCo SYSmark 2007 Preview v1.06			
<i>SYSmark 2007 Preview v1.06 Rating</i>	144	151	155

Figure 12: Detailed test results for the current OptiPlex 380 desktop.

Current desktop system: Dell OptiPlex 780

Operating system	Windows XP Professional SP3	Windows Vista Ultimate SP2	Windows 7 Ultimate
Application responsiveness			
Test case 1a: Opening files using common office applications (local HDD)			
<i>Word document appears - median</i>	00:02.61	00:02.95	00:02.78
<i>Excel workbook appears - median</i>	00:01.66	00:01.69	00:01.63
<i>PowerPoint slide appears - median</i>	00:01.00	00:01.18	00:00.98
Test case 1b: Opening files using common office applications (wired)			
<i>Word document appears - median</i>	00:02.62	00:03.12	00:02.84
<i>Excel workbook appears - median</i>	00:01.62	00:02.11	00:01.65
<i>PowerPoint slide appears - median</i>	00:01.01	00:01.15	00:01.01
Test case 2: Installing/re-inserting a USB drive			
<i>Installing PNY USB stick - median</i>	00:09.30	00:02.64	00:02.00
<i>Installing Kingston USB stick - median</i>	00:09.29	00:02.18	00:02.03
<i>Re-inserting PNY USB stick - median</i>	00:01.68	00:01.79	00:01.55
<i>Re-inserting Kingston USB stick - median</i>	00:01.31	00:01.35	00:01.15
Test case 3: Copying files locally			
<i>Copying files to another location on the C: drive - median</i>	00:06.08	00:11.89	00:12.53
<i>Copying files from the hard drive to a USB stick - median</i>	04:57.12	05:03.30	04:59.56
<i>Copying files from a USB stick to the hard drive - median</i>	00:31.53	00:32.30	00:31.31
Test case 4: Playing a DVD			
<i>Lord of the Rings - median</i>	00:19.34	00:17.78	00:16.67
<i>Monty Python - median</i>	00:14.67	00:16.01	00:16.31
On/off tests			
Test case 1: Boot experience			
<i>COLD: Taskbar appears - median</i>	00:28.05	00:33.06	00:31.65
<i>COLD: Home page loads - median</i>	00:38.19	00:03.38	00:03.03
Test case 2: Boot experience with Office 2007 SP2			
<i>COLD: Time to connect to Exchange Server after booting system - median</i>	00:12.24	00:12.48	00:05.65
Test case 3: Cold standby experience			
<i>COLD: Time to standby - median</i>	00:02.53	00:03.51	00:02.43
<i>COLD: Time to resume from standby - median</i>	00:12.08	00:10.60	00:03.87
Test case 4: Warm standby experience			
<i>WARM: Time to standby - median</i>	00:02.29	00:02.72	00:02.73
<i>WARM: Time to resume from standby - median</i>	00:04.67	00:10.71	00:03.71
Test case 5 (wired): Cold standby experience with applications open			
<i>COLD: Time to standby - median</i>	00:02.90	00:03.98	00:02.71
<i>COLD: Time to connect to Exchange Server after resume from standby - median</i>	00:10.51	00:11.73	00:15.31
Test case 6 (wired): Warm standby experience with applications open			
<i>WARM: Time to standby - median</i>	00:02.40	00:02.53	00:02.33
<i>WARM: Time to connect to Exchange Server after resume from standby - median</i>	00:05.71	00:11.53	00:14.71
Test case 7: Shutdown experience			
<i>Time to turn system off - median</i>	00:08.95	00:07.95	00:05.94

Current desktop system: Dell OptiPlex 780			
Operating system	Windows XP Professional I SP3	Windows Vista Ultimate SP2	Windows 7 Ultimate
Industry-standard benchmarks			
BAPCo SYSmark 2007 Preview v1.06			
<i>SYSmark 2007 Preview v1.06 Rating</i>	166	164	166

Figure 13: Detailed test results for the current OptiPlex 780 desktop.

Appendix C – Corpus contents

The 426MB (446,697,762 bytes) test workload included the following files:

11/6/2005	7:14 PM	1,161,163	19th Century Asylum.JPG
9/3/2007	6:10 PM	14,239	2008 calendar10 (2).xlsx
9/3/2007	6:10 PM	14,239	2008 calendar10.xlsx
9/3/2007	11:35 PM	617,349	3boat-Jerome10 (2).docx
9/12/2007	12:57 AM	675,901	3boat-Jerome10 (2).pdf
9/12/2007	12:57 AM	1,071,399	3boat-Jerome10 (2).xps
9/3/2007	11:35 PM	617,349	3boat-Jerome10.docx
9/12/2007	12:57 AM	675,901	3boat-Jerome10.pdf
9/12/2007	12:57 AM	1,071,399	3boat-Jerome10.xps
9/9/2007	1:32 AM	11,947	Adjustable Meeting Agenda template1 (2).xlsx
9/9/2007	1:32 AM	11,947	Adjustable Meeting Agenda template1.xlsx
9/9/2007	2:01 AM	197,621	Adventure Works (2).pptx
9/9/2007	2:01 AM	197,621	Adventure Works.pptx
9/9/2007	1:18 AM	11,953	Agenda1 (2).xlsx
9/9/2007	1:18 AM	11,953	Agenda1.xlsx
9/3/2007	6:14 PM	11,968	Agenda10 (2).xlsx
9/3/2007	6:14 PM	11,968	Agenda10.xlsx
9/3/2007	5:58 PM	774,350	alice-carroll10 (2).docx
9/12/2007	12:56 AM	518,539	alice-carroll10 (2).pdf
9/12/2007	12:56 AM	629,597	alice-carroll10 (2).xps
9/3/2007	5:58 PM	774,350	alice-carroll10.docx
9/12/2007	12:56 AM	518,539	alice-carroll10.pdf
9/12/2007	12:56 AM	629,597	alice-carroll10.xps
7/28/2003	7:56 AM	70,144	Analysis (2).xls
7/28/2003	7:56 AM	70,144	Analysis.xls
			Ancient christian stone marking Patrick's well.JPG
9/16/2005	8:39 PM	1,074,183	Art Gallery.JPG
8/26/2005	5:12 PM	1,041,140	Automation (2).rar
9/10/2007	1:16 AM	26,694	Automation.rar
12/19/2003	11:42 PM	16,896	bank24 (2).xls
12/19/2003	11:42 PM	16,896	bank24.xls
12/19/2003	11:42 PM	16,384	bank24temp (2).xls
12/19/2003	11:42 PM	16,384	bank24temp.xls
			Bidder comparison worksheet and process1 (2).xlsx
			Bidder comparison worksheet and process1.xlsx
9/9/2007	1:13 AM	19,547	Breakeven analysis10 (2).xlsx
9/3/2007	6:15 PM	24,480	Breakeven analysis10.xlsx
9/3/2007	6:15 PM	24,480	Breakeven analysis10.xlsx
9/9/2005	4:22 PM	1,236,485	Bust of Collins.JPG
12/19/2003	11:42 PM	27,136	capbudget (2).xls
12/19/2003	11:42 PM	27,136	capbudget.xls
12/19/2003	11:42 PM	26,624	capbudgettemp (2).xls
12/19/2003	11:42 PM	26,624	capbudgettemp.xls
9/16/2005	8:38 PM	1,135,462	Christ Church 1038 AD.JPG
9/9/2007	12:16 AM	118,051	ChristmasCarol (2).docx

9/12/2007	12:56 AM	287,538	ChristmasCarol (2).pdf
9/12/2007	12:55 AM	507,684	ChristmasCarol (2).xps
9/9/2007	12:16 AM	118,051	ChristmasCarol.docx
9/12/2007	12:56 AM	287,538	ChristmasCarol.pdf
9/12/2007	12:55 AM	507,684	ChristmasCarol.xps
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9/3/2007	5:48 PM	14,454,815	PPTfiles10.rar
9/9/2007	10:57 AM	42,444	Presentation1.pptx
9/3/2007	6:19 PM	136,034	Presentation10.pptx
9/9/2007	9:50 PM	317,684	presentation2.pptx
9/9/2007	9:51 PM	74,504	presentation3.pptx
9/9/2007	9:51 PM	134,559	Presentation4.pptx
9/9/2007	9:52 PM	53,903	Presentation5.pptx
12/19/2003	11:42 PM	16,384	pressdata.xls
9/9/2007	12:32 AM	277,232	PrinceandPauper.docx
9/3/2007	5:33 PM	144,246	Process diagram10.pptx
12/19/2003	11:42 PM	28,160	prodmix.xls
12/19/2003	11:42 PM	26,112	prodmixtemp.xls
9/9/2007	2:11 AM	87,243	Product Name.pptx
9/9/2007	2:21 AM	300,846	Product Name5.pptx
9/9/2007	2:00 AM	283,493	Product Name].pptx
9/3/2007	6:10 PM	18,598	Project compare10.xlsx
9/9/2007	2:07 AM	206,208	Project Overview.pptx
9/9/2007	1:53 AM	11,852	Purchase order with sales tax1.xlsx
9/9/2007	1:49 AM	16,460	Purchase order(2)1.xlsx
9/9/2007	1:50 AM	15,854	Purchase order(3)1.xlsx
9/9/2007	1:51 AM	15,734	Purchase order(4)1.xlsx
9/9/2007	1:48 AM	21,972	PURCHASE ORDER.docx
9/3/2007	6:16 PM	15,819	Purchase order10.xlsx
12/19/2003	11:42 PM	13,824	PV.xls
12/19/2003	11:42 PM	13,824	PVtemp.xls

9/9/2007	2:13 AM	75,931	Quarterly Results and.pptx
12/19/2003	11:42 PM	41,984	randdemo.xls
12/19/2003	11:43 PM	27,136	randdemotemp.xls
9/9/2007	2:18 AM	76,882	Recommending a Strategy.pptx
12/19/2003	11:42 PM	17,920	ReorderPoint_Backorder.xls
12/19/2003	11:42 PM	17,920	ReorderPoint_Lostsales.xls
9/9/2007	2:23 AM	122,701	Reporting Progress or Status.pptx
9/9/2007	2:06 AM	161,158	Return on Investment.pptx
10/1/2005	8:19 PM	1,288,715	Ring of Kerry.JPG
11/5/2005	6:39 PM	1,070,887	River Lee rising.JPG
11/6/2005	7:13 PM	1,109,309	River Rising.JPG
9/9/2007	2:27 PM	632,401	RoughingIt.docx
9/11/2007	12:03 AM	45,764	s1-s10.rar
12/19/2003	11:42 PM	13,824	s10_1.xls
12/19/2003	11:42 PM	13,824	s10_10.xls
12/19/2003	11:42 PM	13,824	s10_2.xls
12/19/2003	11:42 PM	15,872	s10_3.xls
12/19/2003	11:42 PM	13,824	s10_4.xls
12/19/2003	11:42 PM	13,824	s10_5.xls
12/19/2003	11:42 PM	14,336	s10_6.xls
12/19/2003	11:42 PM	97,280	S10_7.xls
12/19/2003	11:42 PM	97,280	s10_8.xls
12/19/2003	11:42 PM	13,824	s10_9.xls
9/11/2007	12:04 AM	10,898	s24.rar
12/19/2003	11:42 PM	13,824	s24_1.xls
12/19/2003	11:42 PM	13,824	s24_2.xls
12/19/2003	11:42 PM	13,824	s24_3.xls
12/19/2003	11:42 PM	13,824	s24_4.xls
12/19/2003	11:42 PM	13,824	s24_5.xls
12/19/2003	11:42 PM	13,824	s24_6.xls
12/19/2003	11:42 PM	13,824	s24_7.xls
9/11/2007	12:04 AM	11,542	s25.zip
12/19/2003	11:42 PM	14,848	s25_1.xls
12/19/2003	11:42 PM	15,360	s25_2.xls
12/19/2003	11:42 PM	14,848	s25_3.xls
12/19/2003	11:42 PM	14,848	s25_4.xls
12/19/2003	11:42 PM	15,360	s25_5.xls
9/11/2007	12:05 AM	12,276	s26.zip
12/19/2003	11:42 PM	16,384	s26_1.xls
12/19/2003	11:42 PM	16,896	s26_2.xls
12/19/2003	11:42 PM	19,968	s26_3.xls
12/19/2003	11:42 PM	15,360	s26_4.xls
12/19/2003	11:42 PM	16,896	s27_1.xls
12/19/2003	11:42 PM	17,920	s27_2.xls
12/19/2003	11:42 PM	16,896	s27_3.xls
12/19/2003	11:42 PM	15,360	s27_4.xls
12/19/2003	11:42 PM	29,696	s28_1.xls
12/19/2003	11:42 PM	17,408	s28_2.xls
12/19/2003	11:42 PM	23,552	s29_1.xls
12/19/2003	11:42 PM	23,552	s29_2.xls

12/19/2003	11:42 PM	16,384	s29_3.xls
12/19/2003	11:42 PM	26,112	s29_4.xls
12/19/2003	11:42 PM	15,872	s29_5.xls
12/19/2003	11:42 PM	264,192	S30_1.xls
12/19/2003	11:42 PM	259,584	s30_2.xls
12/19/2003	11:42 PM	56,832	s30_3.xls
12/19/2003	11:42 PM	13,824	s30_4.xls
12/19/2003	11:42 PM	13,824	s30_5.xls
12/19/2003	11:42 PM	22,016	S42problems1thru4.xls
12/19/2003	11:42 PM	21,504	S42problems1thru5.xls
9/11/2007	12:06 AM	149,171	s58.zip
12/19/2003	11:42 PM	404,480	s58_1.xls
12/19/2003	11:42 PM	207,360	s58_2.xls
12/19/2003	11:42 PM	17,408	s66_1.xls
12/19/2003	11:42 PM	16,896	s66_2.xls
12/19/2003	11:42 PM	13,824	s66_3.xls
9/3/2007	6:20 PM	30,418	Sales effectiveness.xlsx
9/9/2007	1:52 AM	15,474	Sales order1.xlsx
9/9/2007	2:20 AM	164,904	Sales proposal.pptx
9/9/2007	2:17 AM	54,168	Sales Training.pptx
9/9/2007	9:58 PM	54,185	Sales Training2.pptx
9/9/2007	10:02 PM	48,145	Sales Training3.pptx
1/24/2008	10:26 AM	109	Search
1/24/2008	12:21 PM	0	SearchCorpus.txt
9/9/2007	2:12 AM	68,502	Selling a Product or Service.pptx
12/19/2003	11:42 PM	18,944	ServiceLevelReorder.xls
9/9/2007	1:46 AM	12,139	Software Inventory1.xlsx
9/9/2007	9:55 PM	68,590	Staff Training.pptx
7/28/2003	7:56 AM	150,016	Staff.xls
7/28/2003	7:56 AM	142,336	Staff2.xls
9/3/2007	5:31 PM	139,054	Status charts10.pptx
11/6/2005	7:15 PM	1,744,412	Stone path.JPG
9/11/2007	12:15 AM	1,741,369	Stone path.zip
11/6/2005	7:15 PM	1,752,998	Stone staircase.JPG
9/11/2007	12:18 AM	837,626	Supply Requisition Form2.xlsx
9/11/2007	12:18 AM	838,128	Supply Requisition Form3.xlsx
9/11/2007	12:19 AM	837,886	Supply Requisition Form4.xlsx
9/11/2007	12:20 AM	837,884	Supply Requisition Form5.xlsx
1/24/2008	10:20 AM	1,463,296	Test methodology.doc
1/16/2000	5:48 PM	3,941,355	test.mp3
9/9/2007	9:56 PM	90,037	Title of Training Presentation.pptx
9/9/2007	10:01 PM	58,226	Title of Training Presentation2.pptx
9/9/2007	12:29 AM	281,104	TomSawyer.docx
9/9/2007	12:27 AM	124,045	TomSawyerAbroad.docx
9/9/2007	10:03 PM	172,469	Training Presentation.pptx
12/19/2003	11:42 PM	18,944	transport.xls
12/19/2003	11:42 PM	16,384	transporttemp.xls
9/9/2007	1:14 AM	25,007	Treasury analysis worksheet1.xlsx
7/28/2003	7:56 AM	27,136	TreeOrders.xls
9/9/2007	12:24 AM	504,476	TwoCities.docx

12/19/2003	11:42 PM	177,664	valentine.xls
12/19/2003	11:43 PM	13,824	valentinetemp.xls
9/9/2007	1:58 AM	357,867	Welcome!.pptx
9/9/2007	2:21 AM	121,946	Welcome!2.pptx
9/9/2007	10:56 AM	174,213	Widescreen Presentation.pptx
9/3/2007	6:13 PM	38,404	worker hours10.xlsx

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We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help you assess how it will fare against its competition, its performance, whether it's ready to go to market, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.



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