

## Performance comparison of a Dell Latitude netbook and previous generation Dell Latitude notebooks

### Executive summary

Dell Inc. (Dell) commissioned Principled Technologies (PT) to run a set of performance tests on a current Intel® processor-based Dell™ Latitude™ netbook and two previous generation Intel processor-based Dell Latitude notebook systems. We tested the following current Dell Latitude netbook system:

- Dell Latitude 2100 with Intel® Atom™ Processor N270

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 Dell Latitude netbook and of Windows XP on the following two previous generation Dell Latitude notebooks:

- Dell Latitude D610 notebook with Intel® Pentium® M Processor 740 (4-year-old system)
- Dell Latitude D620 notebook with Intel® Core™ Duo T2400 Processor (3-year-old system)

Appendix A provides detailed system configuration information.

We compared the systems in the areas of battery life, and system responsiveness. We used MobileMark 2007 v1.06 Productivity 2007 to test battery life performance, and used custom hand-time tests to measure system responsiveness. In most instances, we found that the Dell Latitude 2100 netbook running Windows 7 outperformed the previous generation Dell Latitude notebooks running Windows XP.

### KEY FINDINGS

- The current Dell Latitude 2100 netbook running Windows 7 provided up to 98% longer, or over 3 hours more, MobileMark 2007 battery life than that of the two previous generation Dell Latitude notebooks. (See Figure 1.)
- The current Dell Latitude 2100 netbook running Windows 7 booted 4% to 9% faster than did the two previous generation Dell Latitude notebooks. (See Figures 2 and 3.)
- The current Dell Latitude 2100 netbook running Windows 7 achieved standby from 63% to 74% faster, and resumed from standby between 6% to 10% faster, than did the two Dell previous generation notebooks (See Figures 4 and 5.)
- The current Dell Latitude 2100 netbook running Windows 7 shut down between 2% to 3% faster than did the two Dell previous generation notebooks (See Figure 6.)

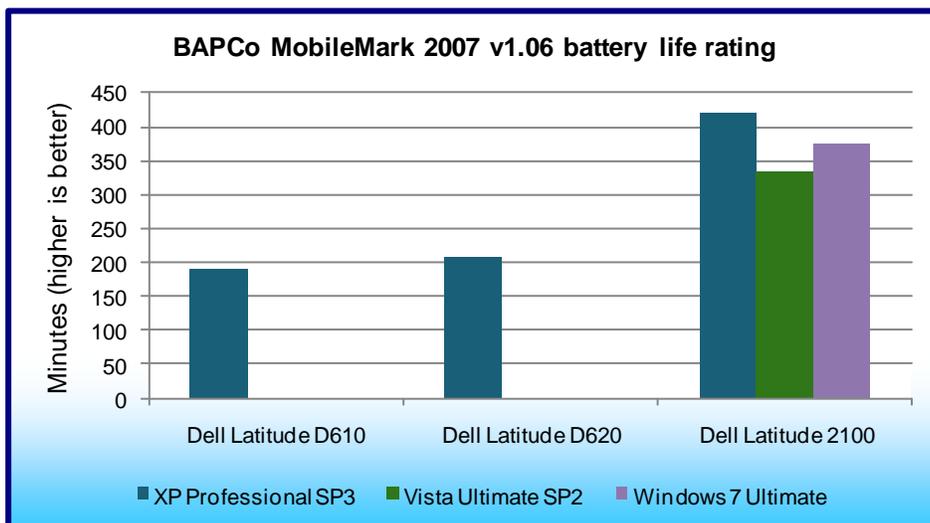


Figure 1: BAPCo MobileMark 2007 results – Battery life. Higher numbers are better.

Figure 1 shows the MobileMark 2007 v1.06 battery life results for the current Dell Latitude 2100 netbook running Windows 7, Windows Vista, and Windows XP, and the previous generation Dell Latitude notebooks running Windows XP. The Dell Latitude 2100 running Windows 7 outperformed the previous generation Dell Latitude D610 by 98 percent, or 185 minutes, and outperformed the previous generation Dell Latitude D620 by 81 percent, over 165 minutes.

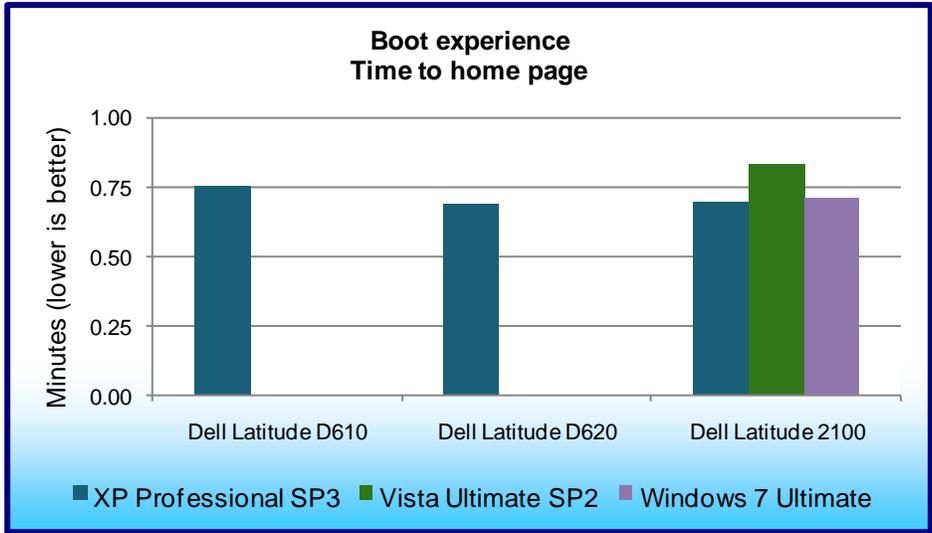


Figure 2: Boot experience results – Time to home page appearing in Internet Explorer 8 after booting notebook. Lower numbers are better.

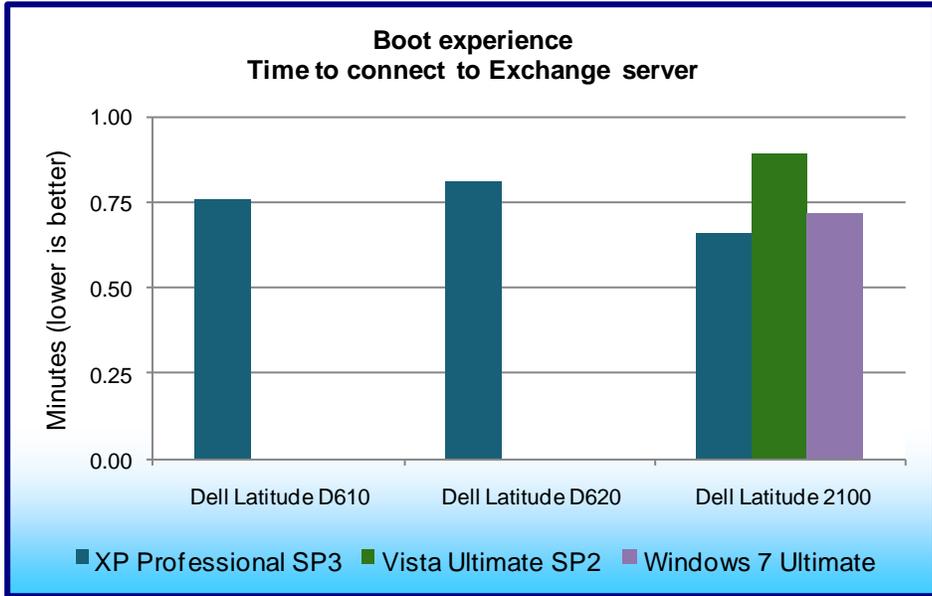


Figure 3: Boot experience results – Time to connect to Exchange server after booting. Lower numbers are better.

server between 5 percent faster than the previous generation Dell Latitude D610, and 11 percent faster than the previous generation Dell Latitude D620.

Figure 2 shows the hand-timed results for both the current Dell Latitude 2100 netbook and the previous generation Dell Latitude notebooks running Windows XP. We measured from the moment we pressed the power button to the point the home page appears in Internet Explorer 8. This takes into account not only the fact that the system has completed the boot process, but it has become usable, and has made its connection to the internet.

Although we performed this test on both wireless and wired networks, we present the wireless results here, due to the much higher likelihood that an end-user will use this netbook in a wireless environment. The Dell Latitude 2100 netbook running Windows 7 outperformed the previous generation Dell Latitude D610 by 6 percent on this test, but lost to the Dell Latitude D620 by 3 percent.

Figure 3 shows the hand-timed results for both the current Dell Latitude 2100 netbook and the previous generation Dell Latitude notebooks running Windows XP. The Dell Latitude 2100 netbook running Windows 7 booted and subsequently connected to an Exchange

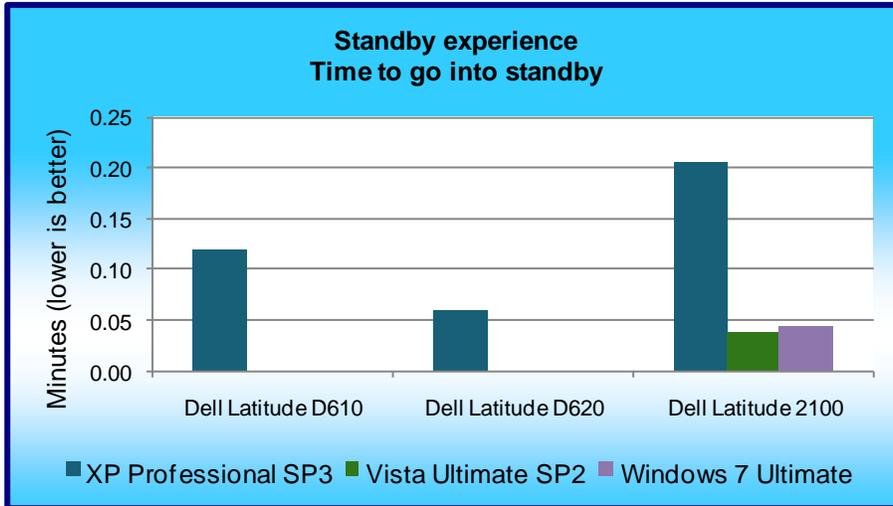


Figure 4: Standby experience – Time to go into standby. Lower numbers are better.

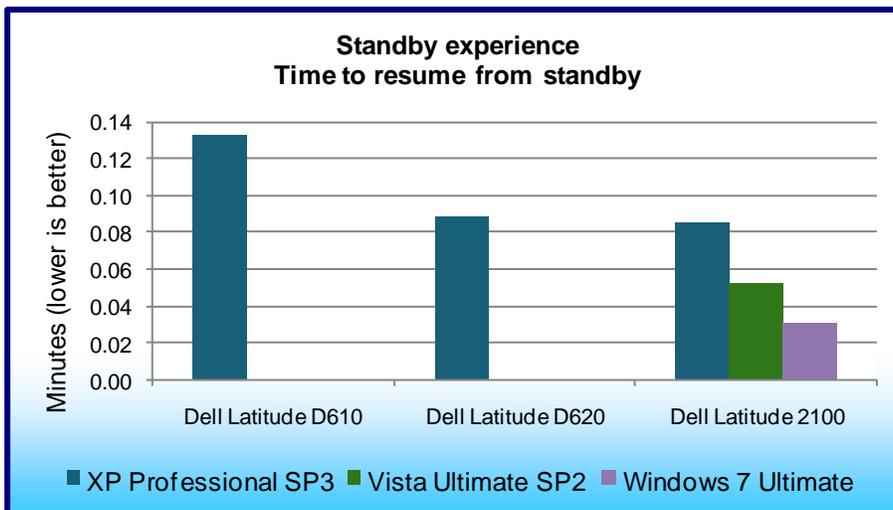


Figure 5: Standby experience – Time to resume from standby. Lower numbers are better

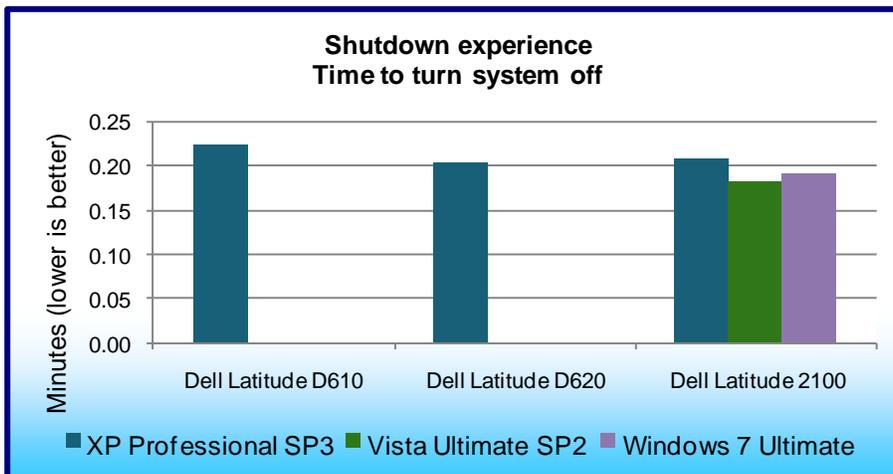


Figure 6: Shutdown experience– Time to turn system off. Lower numbers are better.

Figure 4 shows the hand-timed results for putting the systems into standby. The Dell Latitude 2100 running Windows 7 achieved standby 63 percent faster than the previous generation Dell Latitude D610, and 27 percent faster than the previous generation Dell Latitude D620.

Figure 5 shows the hand-timed results for the systems resuming from standby. The Dell Latitude 2100 running Windows 7 resumed 79 percent faster than the previous generation Dell Latitude D610, and resumed 74 percent faster than the previous generation Dell Latitude D620.

Figure 6 shows the hand-timed results for shutting down the systems. The Dell Latitude 2100 netbook running Windows 7 shut down 15 percent faster than the previous generation Dell Latitude D610, and 6 percent faster than the previous generation Dell Latitude D620.

## Workload

### MobileMark 2007 v1.06

MobileMark 2007 is an industry-standard benchmark BAPCo created to measure system battery life and performance.

MobileMark 2007 measures system battery life in minutes. MobileMark 2007 records system battery life at the start of the Productivity 2007 benchmark, and repeats the benchmark workload until the system battery life is depleted, or until the notebook system powers down due to low battery life. At the 7 percent battery life setting, MobileMark 2007 records a timestamp once per minute. At the end of the benchmark, it compares the beginning timestamp to the final (last recorded) timestamp.

MobileMark 2007 derives its system battery life rating as the number of minutes between the start and end timestamps.

MobileMark 2007 Productivity 2007 consists of the following applications and corresponding tasks: Microsoft Project 2003 (project management), Microsoft Excel 2003 (calculation sheets), Microsoft Outlook 2003 (emails, calendars, scheduler), Microsoft PowerPoint 2003 (slide presentations), Microsoft Word 2003 (formatted text documents), WinZip Computing and WinZip Pro 10.0 (compressed archives), Adobe Photoshop CS2 (manipulated and compressed images), Adobe Illustrator CS2 (manipulated images), and Adobe Flash 8 (vector graphics, animation).

We followed the run rules that MobileMark 2007 specifies here:  
<http://www.bapco.com/support/mobilemark2007/Manual/rules.html>.

## Test methodology

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

### MobileMark 2007 v.1.06

#### Preparing to measure battery life with MobileMark 2007 v.1.06

We conditioned the battery prior to testing. To do so, we performed two complete drains of the battery, starting from a battery at 100 percent charge. To expedite the draining process, we ran the MobileMark 2007 Productivity 2007 test until the battery completely discharged. We recorded the room temperature at the beginning of each official run.

#### *Antivirus software conflicts*

MobileMark 2007 is not compatible with any virus-scanning software, so we uninstalled any such software that was present on the notebook PCs before we installed the benchmark.

#### *Pre-installed software conflicts*

MobileMark 2007 installs the following applications, which its test scripts employ:

- Adobe Photoshop 6.0.1
- InterVideo WinDVD 6.0
- Macromedia Flash 5.0
- Microsoft Excel 2002
- Microsoft Outlook 2002
- Microsoft PowerPoint 2002
- Microsoft Word 2002
- Netscape Communicator 6.01
- Network Associates McAfee VirusScan 5.13
- WinZip Computing WinZip 8.0

If any of these applications are already on the system under test, they will cause problems with the benchmark due to software conflicts. To avoid any such issues, before we installed the benchmark, we uninstalled all conflicting pre-installed software applications, including different versions of any of the programs MobileMark 2007 uses.

### Installing MobileMark 2007 v.1.06

1. Reset the notebook to the base image using Symantec's Ghost product.
2. Turn off the wireless network adapter by using the external toggle switch.
3. Insert the MobileMark 2007 Install DVD in the notebook PC's DVD drive.
4. At the Welcome screen, click Next.
5. Accept the license agreement, and click Next.
6. At the Ready to Install the Program screen, click Install.

7. Run the BAPCo Auto-configuration tool, v.1.3.2, to set the power options.
  - a. Insert the Auto-configuration tool in the notebook PC's DVD drive.
  - b. Double-click BAPCo\_AutoConfig.exe.
  - c. Type M to choose MobileMark 2007.
  - d. Type 3 to choose the changes that produce the best possible scores, as follows:
    1. Set Critical battery alarm to 0%.
    2. Set Low battery alarm to 0%.
    3. Disable screen saver.
    4. Stop and disable Windows Update.
    5. Disable desktop cleanup wizard.
    6. Disable Windows Security Center warnings.
    7. Disable Windows Firewall.
    8. Disable incoming Remote Desktop connections.
    9. Disable Windows Error Reporting to Microsoft.
    10. Disable Windows Defender.

### Displaying brightness and power settings

Because the brightness of a notebook's display affects its battery life, BAPCo required that, before we tested with MobileMark 2007, we made sure the brightness of the notebook's monitor was greater than or equal to 60 nits on a completely white screen while the notebook was unplugged and running on battery power. The measurement follows the standards from the Video Electronics Standards Association ([www.vesa.org/Standards/summary/2001\\_6a.htm](http://www.vesa.org/Standards/summary/2001_6a.htm)).

We complied with this standard for all the tests we ran by setting each notebook PC's brightness as close to 60 nits as we could without going below that brightness level. We used the following procedure, which assumes we began with the notebook plugged into the power supply, to meet this requirement before we started each test:

1. To create a completely blank white screen, open Microsoft Paint by clicking Start→All Programs→Accessories→Paint.
2. Open the Attributes by pressing Ctrl+E.
3. Enter dimensions that are larger than the current screen resolution. For example, if the screen resolution is 1,280 x 800, enter 1,600 for Width and 1,200 for Height.
4. Click OK.
5. Press Ctrl+F to view the bitmap image and render the screen completely white.
6. Wait 45 minutes to allow the screen to warm.
7. Unplug the notebook from the power supply, and measure the display's brightness using a luminance meter in the center of the screen. (We use the Gossen Mavolux5032C.)
8. If the reading is below or significantly greater than 60 nits, use the notebook's keyboard screen-brightness-adjustment keys to bring the display as close to 60 nits as possible, then retest.
9. Allow the notebook to run on battery power for 10 minutes, re-measure the display, and adjust the brightness up or down as necessary.
10. Verify that the notebook saved the brightness setting by plugging in the system, unplugging it, and taking another reading. If the notebook did not save this setting, use its power-management application(s) to set the brightness appropriately, and save that setting.

### Conditioning the battery

1. Plug the AC power adapter into the notebook PC, and completely charge the battery.
2. Install MobileMark 2007 v1.05, following the steps we outlined in the Installing MobileMark 2007 section.
3. Double-click the MobileMark 2007 icon on the desktop.
4. Highlight the Productivity 2007 item in the left panel.
5. Enter a name for this test in the Project Name field at the top-right panel, and click Next Step.
6. If MobileMark lists no problems or warnings, click Next Step. If it does list any problems or warnings, close MobileMark 2007, and correct the problem(s) before proceeding.
7. Unplug the AC power adapter. The Productivity 2007 test begins immediately.
8. The test is complete when the notebook PC has fully depleted its battery and is no longer operational when running on battery power.

9. Repeat steps 3 through 8 for the second conditioning run and for all official runs.
10. Plug the AC power adapter into the notebook PC, and completely charge the battery.

### **Measuring battery life with MobileMark 2007 v.1.06**

We performed the following steps to run the MobileMark Productivity 2007 benchmark:

1. Double-click the MobileMark 2007 icon on the desktop.
2. Select the Productivity 2007 test by highlighting it in the left panel.
3. Enter a name for this test in the Project Name field in the top right panel, and click Next Step.
4. If MobileMark lists no problems or warnings, click Next. If it does list any problems or warnings, close MobileMark 2007, and correct the problem(s) before proceeding.
5. Unplug the AC power adapter. The test begins immediately.
6. The Productivity 2007 test is complete when the notebook PC has fully depleted its battery and is no longer operational when running on battery power.

We executed the Productivity 2007 test three times on each system configuration and used the average result of each set of three as the representative score for that test.

1. Configure the notebook with the standard battery and the BAPCo recommendations for running MobileMark 2007.
2. Execute the Productivity 2007 test three times in this configuration.
3. Configure the notebook with the maximum-sized battery available at the time of purchase and the BAPCo recommendations for running MobileMark 2007.
4. Execute the Productivity 2007 test three times in this configuration.

### **Getting the MobileMark 2007 results**

After each MobileMark test completed, we plugged the AC power adapter into the notebook PC and turned on the system. MobileMark 2007 started automatically after the system booted, analyzed the test scores, and opened the Test Results Viewer with the results from the last test.

To submit these results to BAPCo, we saved the test results directory. To do so, we performed the following steps:

1. Browse to the C:\Program Files\BAPCo\MobileMark 2007\results directory.
  - a. Select My Computer.
  - b. Select Local Disk (C:).
  - c. Select the Program Files directory.
  - d. Select the BAPCo directory.
  - e. Select the MobileMark2007 directory.
  - f. Select the results directory. (Note: The name of the directory for the Productivity 2007 results is the name you gave the test in Step 6 of the MobileMark Productivity 2007 process.)

## **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.

### **Standby experience with applications and Outlook 2007 SP2 open**

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)

#### *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.

### **Shutdown experience**

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

#### *Running the test*

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

## Appendix A – Detailed system configuration information

Figure 12 presents each test system and the details of its configuration.

Dell notebook systems	Dell Latitude 2100	Dell Latitude D610	Dell Latitude D620
<b>General</b>			
Processor and OS kernel: (physical, core, logical) / (UP, MP)	1P,1C,2L / MP	1P,1C,1L / UP	1P,2C,2L / MP
System power management policy Windows XP	Dell Mobile Battery Methodology	Dell Mobile Battery Methodology	Dell Mobile Battery Methodology
System power management policy Windows Vista	Dell Mobile Battery Methodology	NA	NA
System power management policy Windows 7	Dell Mobile Battery Methodology	NA	NA
Processor power-saving option	EIST	EIST	EIST
System dimensions (length x width x height)	10.5" x 7.75" x 2.25"	12.5" x 10.30" x 1.5"	13.25" x 9.5" x 1.5"
System weight	3 lbs. 4 oz.	5 lbs. 6 oz.	5 lbs. 5 oz.
<b>CPU</b>			
Vendor	Intel	Intel	Intel
Name	Atom	Pentium M	Core Duo
Model number	N270	740	T2400
Stepping	C0	C0	C0
Socket type and number of pins	Socket 437	Socket 479	Socket 479
Core frequency (GHz)	1.6	1.73	1.83
Front-side bus frequency (MHz)	533 MHz	533	667
L1 cache	24 KB + 32 KB	32 KB + 32 KB	32 KB + 32 KB (per core)
L2 cache (MB)	512 KB	2	2
<b>Platform</b>			
Vendor	Dell	Dell	Dell
Motherboard model number	0W785N	0M7181	0TD761
Motherboard chipset	Intel i945GSE	Intel i915GM	Intel i945GM
Motherboard revision number	03	03	03
System/motherboard serial number	B8L78K1	J8H54B1	BX49XB1
BIOS name and version	Dell A02 (08/11/2009)	Dell A06 (10/02/2005)	Dell A10 (05/16/2008)
BIOS settings	Default	Default	Default
<b>Memory module(s)</b>			
Vendor and model number	Elpida EBE11UE6AESA-8G-F	Hyundai HYMP512S64BP8-C4	Hyundai HYMP512S64BP8-Y5
Type	PC2-6400	PC2-4200	PC2-5300
Speed (MHz)	533	533	667

Dell notebook systems	Dell Latitude 2100	Dell Latitude D610	Dell Latitude D620
Speed running in the system (MHz)	533	533	667
Timing/Latency (tCL-tRCD-tRP-tRASmin)	4-4-4-12	4-4-4-12	5-5-5-15
Size (MB)	2,048 MB	1,024	2,048
Number of memory module(s)	1 x 1,024 MB integrated, 1 x 1,024 MB module	1	2
Channel (single/dual)	Single	Single	Dual
<b>Hard disk</b>			
Vendor and model number	Western Digital WD800BEVT-75ZCT2	Seagate ST9408114A	Toshiba MK4034GSX
Size (GB)	80 GB	40	40
Buffer size (MB)	8 MB	8	8
RPM	5,400	5,400	5,400
Type	SATA 3.0 Gb/s	ATA-100	SATA 1.5 Gb/s
Controller	Intel 82801GHM (ICH7-M/U)	Intel 82801FBM (ICH6-M)	Intel 82801GHM (ICH7-M/U)
Driver Windows XP	Intel 8.8.0.1009 (02/11/2009)	Microsoft 5.1.2600.5512 (07/01/2001)	Intel 7.0.0.1020 (05/23/2005)
Driver Windows Vista	Intel 8.8.0.1009 (02/11/2009)	NA	NA
Driver Windows 7	Intel 8.9.2.1002 (08/07/2009)	NA	NA
<b>Operating system</b>			
<b>Windows XP</b>			
Name	Microsoft Windows XP Professional	Microsoft Windows XP Professional	Microsoft Windows XP Professional
Build number	2600	2600	2600
Service pack	3	3	3
File system	NTFS	NTFS	NTFS
Kernel	ACPI Multiprocessor PC	ACPI Uniprocessor PC	ACPI Multiprocessor PC
Language	English	English	English
Microsoft DirectX version	9.0c	9.0c	9.0c
<b>Windows Vista</b>			
Name	Microsoft Windows Vista Ultimate	NA	NA
Build number	6002	NA	NA
Service pack	2	NA	NA
File system	NTFS	NA	NA
Kernel	ACPI x86-based PC	NA	NA
Language	English	NA	NA
Microsoft DirectX version	10	NA	NA
<b>Windows 7</b>			
Name	Microsoft Windows 7 Ultimate	NA	NA
Build number	7600	NA	NA
Service Pack	NA	NA	NA
File system	NTFS	NA	NA

Dell notebook systems	Dell Latitude 2100	Dell Latitude D610	Dell Latitude D620
Kernel	ACPI x86-based PC	NA	NA
Language	English	NA	NA
Microsoft DirectX version	11	NA	NA
<b>Graphics</b>			
Vendor and model number	Mobile Intel GMA 950	ATI Mobility Radeon X300	Mobile Intel GMA 950
Type	Integrated	Integrated	Integrated
Chipset	Mobile Intel 945 Express Chipset	ATI Mobility Radeon X300	Mobile Intel 945GM Express Chipset
BIOS version	1585.9	BK-ATI VER008.017M.192.062	1343
Total available graphics memory (MB)	256 MB	64	224
Dedicated video memory (MB)	0 MB	NA	NA
System video memory (MB)	64 MB	NA	NA
Shared system memory (MB)	192 MB	NA	NA
Resolution	1,024 x 768 x 32 bit	1,024 x 768 x 32 bit	1,024 x 768 x 32 bit
Driver Windows XP	Intel 6.14.10.4926 (02/15/2008)	ATI 6.14.10.6568 (07/06/2005)	Intel 6.14.10.4814 (03/30/2007)
Driver Windows Vista	Intel 7.15.10.1587 (10/22/2008)	NA	NA
Driver Windows 7	Intel 8.15.10.1867 (08/06/2009)	NA	NA
<b>Sound card/subsystem</b>			
Vendor and model number	Realtek High Definition Audio	SigmaTel C-Major Audio	SigmaTel High Definition Audio CODEC
Driver Windows XP	Realtek 5.10.0.5809 (03/12/2009)	SigmaTel 5.10.0.4255 (03/11/2005)	SigmaTel 5.10.0.5515 (05/10/2007)
Driver Windows Vista	Realtek 6.0.1.5809 (03/12/2009)	NA	NA
Driver Windows 7	Realtek 6.0.1.5886 (07/02/2009)	NA	NA
<b>Ethernet</b>			
Vendor and model number	Broadcom NetXtreme 57xx Gigabit	Broadcom NetXtreme 57xx Gigabit	Broadcom NetXtreme 57xx Gigabit
Driver Windows XP	Broadcom 11.7.2.0 (11/26/2008)	Broadcom 7.86.0.0 (08/23/2004)	Broadcom 8.48.0.0 (10/31/2005)
Driver Windows Vista	Broadcom 11.7.2.0 (10/22/2008)	NA	NA
Driver Windows 7	Broadcom 12.2.0.3 (05/28/2009)	NA	NA

Dell notebook systems	Dell Latitude 2100	Dell Latitude D610	Dell Latitude D620
<b>Wireless</b>			
Vendor and model number	Dell Wireless 1397 WLAN Mini-Card	Dell Wireless 1470 Dual Band WLAN Mini-PCI Card	Dell Wireless 1490 Dual Band WLAN Mini-Card
Driver Windows XP	Broadcom 5.10.79.14 (02/20/2009)	Broadcom 4.100.15.5 (10/12/2006)	Broadcom 5.10.79.14 (02/20/2009)
Driver Windows Vista	Broadcom 5.10.79.14 (02/20/2009)	NA	NA
Driver Windows 7	Broadcom 5.30.21.0 (07/07/2009)	NA	NA
<b>Bluetooth</b>			
Vendor and model number	NA	NA	NA
Driver Windows XP	NA	NA	NA
Driver Windows Vista	NA	NA	NA
Driver Windows 7	NA	NA	NA
<b>Modem</b>			
Vendor and model number	NA	Conexant HDA D110 MDC V.92	Conexant HDA D110 MDC V.92
Driver Windows XP	NA	Conexant 7.23.1.0 (05/03/2005)	Conexant 7.38.0.0 (12/02/2005)
Driver Windows Vista	NA	NA	NA
Driver Windows 7	NA	NA	NA
<b>Optical drive(s)</b>			
Vendor and model number	NA	TEAC DV28EV	Optiarc AD-5540A
Type	NA	DVD-ROM	DVD-RW
Interface	NA	ATA	ATA
Dual/Single layer	NA	NA	Single
<b>USB ports</b>			
Number	3	4	4
Type	USB 2.0	USB 2.0	USB 2.0
Other	Media card reader	NA	NA
<b>IEEE 1394 ports</b>			
Number	NA	NA	NA
<b>Power adapter</b>			
Type	Dell LA65NS1-00 65W	Dell DA90PS1-00 90W	Dell DA90PS1-00 90W
<b>Monitor</b>			
LCD type	WSVGA	XGA	WXGA
Screen size	10.1"	14.1"	14.1"
Refresh rate (Hz)	60	60	60
<b>Battery</b>			
Type	Dell G038N lithium-ion	Dell C1295 lithium-ion	Dell PC764 lithium-ion
Size (length x width x height)	8" x 1.75" x 1.75"	5" x 3" x .80"	7.25" x 2.6" x .9"
Rated capacity	5050 mAh / 11.1V (56Wh)	4700 mAh / 11.1V (53Wh)	5050 mAh / 11.1V (56Wh)
Weight (oz)	12	11	12

Figure 12. Detailed system configuration for the test systems.

## Appendix B – Detailed results

Figures 13 and 14 present the detailed test results for the systems.

Previous generation notebook systems	Dell Latitude D610	Dell Latitude D620
Operating system	XP Professional SP3	XP Professional SP3
<b>On/off tests (Lower is better)</b>		
<i>Boot experience: Time to taskbar - median</i>	00:29.73	00:27.65
<i>Boot experience: Time to home page load - median</i>	00:15.54	00:13.55
<i>Boot experience: Time to connect to Exchange Server after booting system - median</i>	00:15.73	00:20.88
<i>Standby experience: Time to go into standby - median</i>	00:07.13	00:03.59
<i>Standby experience: Time to resume from standby - median</i>	00:07.96	00:06.39
<i>Time to turn system off - median</i>	00:13.42	00:12.22
<b>BAPCo MobileMark 2007 1.06 Battery Life Rating (Higher is better)</b>		
<i>Battery Life - median</i>	189.00	207.00
<i>Performance Qualification - median</i>	123.50	161.00

Figure 13: Detailed test results for the previous generation notebook systems.

Current notebook systems	Dell Latitude 2100	Dell Latitude 2100	Dell Latitude 2100
Operating system	XP Professional SP3	Vista Ultimate SP2	Windows 7 Ultimate
<b>On/off tests (Lower is better)</b>			
<i>Boot experience: Time to taskbar - median</i>	00:25.13	00:46.70	00:28.89
<i>Boot experience: Time to home page load - median</i>	00:13.51	00:07.75	00:03.47
<i>Boot experience: Time to connect to Exchange Server after booting system - median</i>	00:13.41	00:09.68	00:12.53
<i>Standby experience: Time to go into standby - median</i>	00:07.25	00:03.23	00:02.67
<i>Standby experience: Time to resume from standby - median</i>	00:02.93	00:03.74	00:02.21
<i>Time to turn system off - median</i>	00:10.26	00:10.90	00:12.41
<b>BAPCo MobileMark 2007 1.06 Battery Life Rating (Higher is better)</b>			
<i>Battery Life - median</i>	379.00	374.00	350.00
<i>Performance Qualification - median</i>	248.00	238.00	228.00

Figure 14: Detailed test results for the current notebook systems.

## About Principled Technologies

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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