

LAPTOP DRIVE PERFORMANCE COMPARISON: SEAGATE SOLID STATE HYBRID DRIVE VS. HARD DISK DRIVES

A Seagate® Solid State Hybrid Drive delivered better performance



versus a traditional hard disk drive

Up to 503.3% faster
on PCMark® Vantage v1.2.0 HDD test

Up to 16.9% faster
boot time

Up to 31.8% faster
application load time

Up to 9.4% better
office productivity
on SYSmark® 2012



When selecting a laptop computer, you generally have a choice of storage options. Upgrading from a traditional spindle hard disk drive (HDD) to a Seagate Solid State Hybrid Drive (SSHD) can boost performance dramatically, speeding up everyday activities such as booting and launching applications.

To learn about the effects of the Seagate SSHD on performance, we tested three Lenovo® laptop systems in the Principled Technologies labs. We conducted a series of tests on each system configured with three different Seagate drives—a 5,400 RPM HDD, a 7,200 RPM HDD, and an SSHD. We measured boot time and application launch time and ran two industry-standard benchmark tests that quantify system performance.

For all three laptop systems, the Seagate SSHD configuration outperformed both hard drive configurations considerably, up to 503.3 percent. This increased performance shows that selecting the Seagate Solid State Hybrid Drive for your next laptop computer can be a very wise move.



THE SPEED OF AN SSD WITH THE CAPACITY OF AN HDD

No one likes to wait around while his or her computer boots, opens applications, or performs other everyday tasks. While the solid state drives that have emerged over the past few years speed up these activities considerably, they tend to hold much less data than traditional hard drives. Seagate has designed their Solid State Hybrid Drive to deliver the performance of an SSD with the capacity of an HDD.

To compare the performance of the Seagate SSHD with that of two Seagate HDDs, we tested three Lenovo laptop computers—the G400, the G480, and the Y400—in three configurations. Each of the three configurations was identical except for the storage devices:

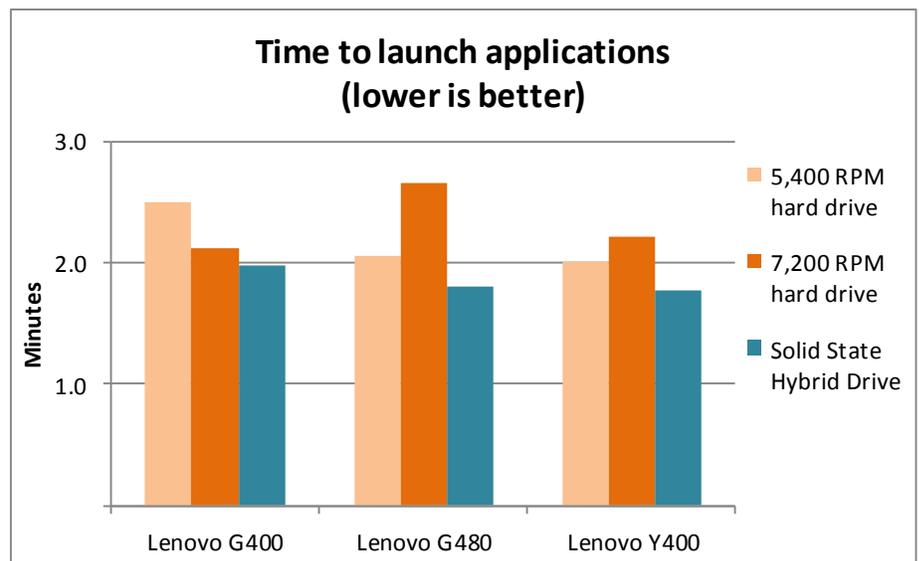
- 500GB Seagate Momentus Thin, 5,400 RPM HDD
- 500GB Seagate Momentus, 7,200 RPM HDD
- 500GB Seagate Laptop SSHD

We tested the systems exactly as we received them from Seagate. We conducted every test five times and report the results from the fifth and final run. Across the several different tests we conducted, the Seagate Laptop SSHD configuration delivered the best performance. [Appendix A](#) provides detailed system configuration information. [Appendix B](#) provides the specifics of our testing.

APPLICATION LAUNCH TIME

The less time users spend waiting for their applications to launch, the more quickly they can get down to work. Figures 1 and 2 show the median results for our application launch tests. With all three laptops, the Seagate Solid State Hybrid Drive took the shortest amount of time. The greatest improvement was on the Lenovo G480, where the SSHD decreased launch time by 31.8 percent over the 7,200 RPM HDD.

Figure 1: The laptops with the Seagate SSHDs launched applications more quickly than those with HDDs. Smaller numbers are better.



Application launch times	5,400 RPM HDD	7,200 RPM HDD	SSHD	SSHD advantage over 5,400 RPM HDD	SSHD advantage over 7,200 RPM HDD
Lenovo G400	2:29.5	2:06.7	1:58.4	20.8%	6.6%
Lenovo G480	2:03.2	2:39.1	1:48.5	11.9%	31.8%
Lenovo Y400	2:00.5	2:12.7	1:46.1	12.0%	20.0%

Figure 2: Median application launch times, in minutes:seconds, for the systems with the three storage options.

BOOT TIME

The less time users spend waiting for their laptops to boot, the more time they have to be productive. Figures 3 and 4 show the median results for our boot tests. With two of the laptops, the Seagate Solid State Hybrid Drive took the shortest amount of time to boot. (On the Lenovo G480, the SSHD configuration took slightly longer to boot than the 5,400 RPM HDD configuration.) The greatest improvement was on the Lenovo G400, where the SSHD decreased boot time by 16.9 percent over the 5,400 RPM HDD.

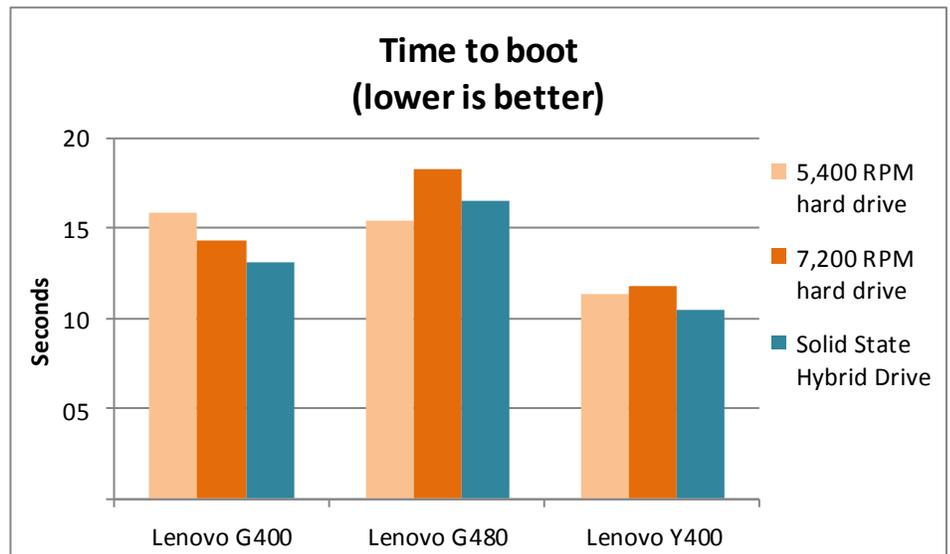


Figure 3: The laptops with the Seagate SSHDs booted more quickly than those with HDDs. Smaller numbers are better.

Boot times	5,400 RPM HDD	7,200 RPM HDD	SSHD	SSHD advantage over 5,400 RPM HDD	SSHD advantage over 7,200 RPM HDD
Lenovo G400	15.8	14.3	13.1	16.9%	8.3%
Lenovo G480	15.4	18.3	16.5	-7.2%	9.8%
Lenovo Y400	11.3	11.8	10.5	7.4%	11.4%

Figure 4: Median boot times, in seconds, for the systems with the three storage options.

GENERAL SYSTEM PERFORMANCE

We used two industry-standard benchmarks to measure the performance of the two systems. These scores indicate that the Seagate Solid State Hybrid Drive would excel at completing the tasks workers require.

Futuremark® PCMark® Vantage v1.2.0 is a PC benchmark for Windows Vista. Figure 5 shows the results for the PCMark Vantage HDD test, which measures how quickly a system’s hard drive responds. As it shows, on all three laptop systems, the Seagate SSHD delivered overwhelmingly superior performance, as much as 503.3 percent better.

Figure 5: The PCMark Vantage HDD Scores of the laptops with the Seagate SSHD were as much as 503.3 percent higher than those of the laptops with the spindle drives.

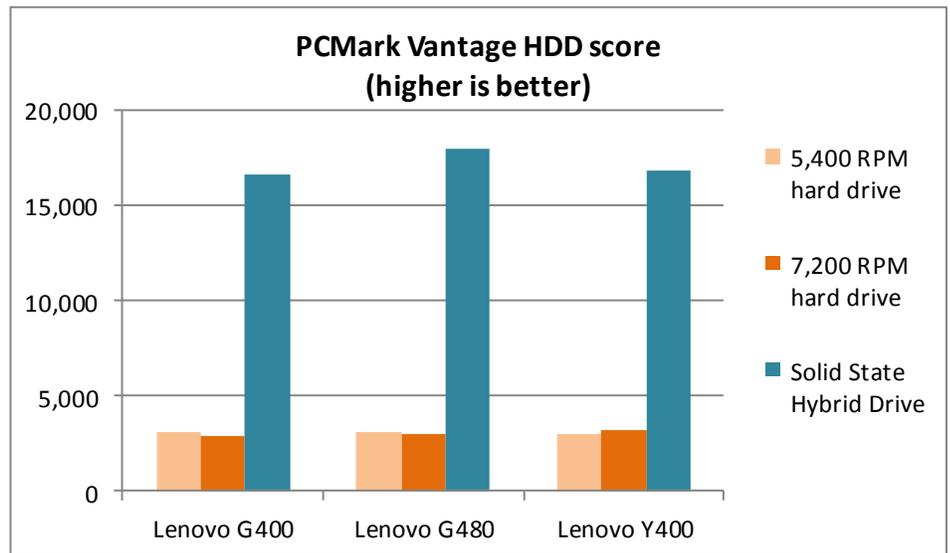


Figure 6 shows the median results of the complete set of PCMark Vantage tests. In every test on each of the three systems, the Seagate Solid State Hybrid Drive outperformed the two spindle drives.

Futuremark PCMark Vantage	5,400 RPM HDD	7,200 RPM HDD	SSHD	SSHD advantage over 5,400 RPM HDD	SSHD advantage over 7,200 RPM HDD
Lenovo G400					
Memories Score	3,204	3,089	4,936	54.1%	59.8%
Gaming Score	3,614	3,636	6,435	78.1%	77.0%
Music Score	5,122	5,253	8,252	61.1%	57.1%
HDD Score	3,069	2,932	16,660	442.8%	468.2%
Lenovo G480					
Memories Score	4,796	4,725	6,792	41.6%	43.7%
Gaming Score	5,886	6,000	9,948	69.0%	65.8%
Music Score	6,611	6,810	12,406	87.7%	82.2%
HDD Score	3,127	2,990	18,040	476.9%	503.3%

Futuremark PCMark Vantage	5,400 RPM HDD	7,200 RPM HDD	SSHD	SSHD advantage over 5,400 RPM HDD	SSHD advantage over 7,200 RPM HDD
Lenovo Y400					
Memories Score	3,105	3,186	4,083	31.5%	28.2%
Gaming Score	2,742	2,915	4,711	71.8%	61.6%
Music Score	6,841	7,782	14,426	110.9%	85.4%
HDD Score	2,978	3,193	16,840	465.5%	427.4%

Figure 6: Median score for the Futuremark PCMark Vantage benchmark. Higher numbers are better.

BAPCo SYSmark® 2012 measures system performance for a number of common tasks including office productivity and media creation. Figure 7 shows the SYSmark 2012 Office Productivity score, which measures productivity usage during word processing, spreadsheet data manipulation, email creation/management, and Web browsing. As it shows, on all three laptop systems, the Seagate SSHD delivered superior performance, as much as 9.4 percent better.

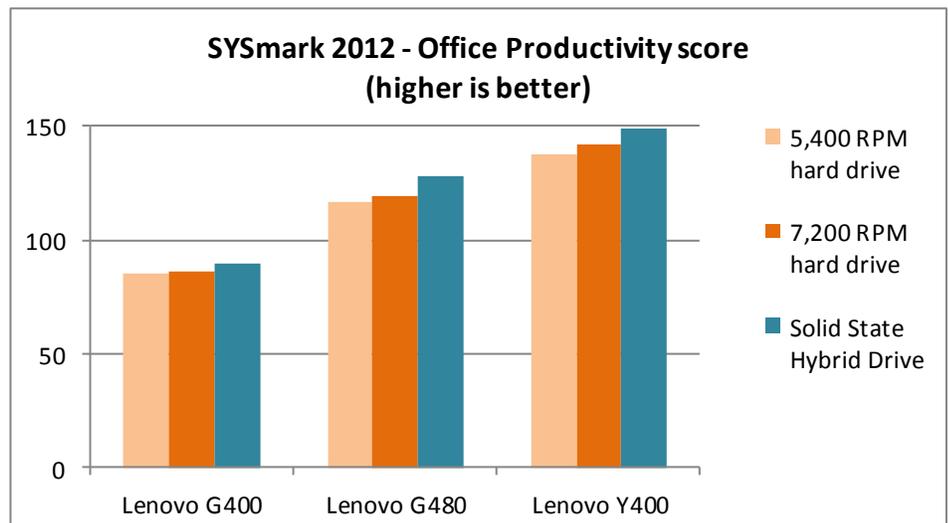


Figure 7: The SYSmark 2012 Office Productivity scores of the laptops with the Seagate SSHD were consistently higher than those of the laptops with the spindle drives.

Figure 8 shows the results of the complete set of SYSmark 2012 tests. In every test on each of the three systems, the Seagate Solid State Hybrid Drive outperformed the two spindle drives.

BAPCo SYSmark 2012	5,400 RPM HDD	7,200 RPM HDD	SSHD	SSHD advantage over 5,400 RPM HDD	SSHD advantage over 7,200 RPM HDD
Lenovo G400					
Overall Performance Rating	84	85	87	3.6%	2.4%
Office Productivity	85	86	90	5.9%	4.7%
Media Creation	91	91	92	1.1%	1.1%
Web Development	73	77	79	8.2%	2.6%
Data/Financial Analysis	92	92	93	1.1%	1.1%
3D Modeling	75	75	76	1.3%	1.3%

BAPCo SYSmark 2012	5,400 RPM HDD	7,200 RPM HDD	SSHD	SSHD advantage over 5,400 RPM HDD	SSHD advantage over 7,200 RPM HDD
Lenovo G480					
Overall Performance Rating	124	124	130	4.8%	4.8%
Office Productivity	117	119	128	9.4%	7.6%
Media Creation	122	122	124	1.6%	1.6%
Web Development	113	113	120	6.2%	6.2%
Data/Financial Analysis	144	143	151	4.9%	5.6%
3D Modeling	118	119	120	1.7%	0.8%
Lenovo Y400					
Overall Performance Rating	170	176	178	4.7%	1.1%
Office Productivity	138	142	149	8.0%	4.9%
Media Creation	169	171	173	2.4%	1.2%
Web Development	165	182	180	9.1%	-1.1%
Data/Financial Analysis	251	250	260	3.6%	4.0%
3D Modeling	177	201	185	4.7%	1.1%

Figure 8: Median scores for the BAPCo SYSmark 2012 benchmark. Higher numbers are better.

WHAT WE TESTED

Futuremark PCMark Vantage v1.2.0

Futuremark PCMark Vantage v1.2.0 is a PC benchmark for Windows Vista offering one-click complete performance testing. It includes eight PC tests covering photos, video, gaming, music, communication, and productivity. You can complete system testing or test at the component level with a range of CPU and HDD tests.

For more information on this benchmark, see

www.futuremark.com/benchmarks/pcmark-vantage/.

BAPCo SYSmark 2012

BAPCo SYSmark 2012 is an application-based benchmark that tests performance in the following office workload scenarios: office productivity, media creation, Web development, data/financial analysis, 3D modeling, and system management. SYSmark 2012 records the time that the system takes to complete each individual operation in each scenario. For more information on this benchmark, see

www.bapco.com/products/sysmark2012/.

IN CONCLUSION

Across the three laptop systems we tested, the Seagate SSHD configuration outperformed both hard drive configurations. It booted and launched applications as much as 31.8 percent more quickly and delivered general performance increases of up to 503.3 percent.

By speeding up the tasks that users perform day in and day out, the Seagate Solid State Hybrid Drive can boost productivity and let you spend more of your day working and less of it waiting.

APPENDIX A – SYSTEM CONFIGURATION INFORMATION

Figure 9 provides detailed configuration information for the test systems. We tested the systems exactly as we received them from Seagate. The Lenovo G400 and the Lenovo Y400 lacked drivers for the discrete graphics cards. Because of this, those cards were disabled for our testing and all testing was performed on the integrated graphics. As a result, some specifications for the discrete cards were unavailable.

System	Lenovo G400	Lenovo G480	Lenovo Y400
General			
Number of processor packages	1	1	1
Number of cores per processor	2	2	4
Number of hardware threads per core	1	2	2
Total number of threads	2	4	8
System power management policy	Balanced	Balanced	Balanced
Processor power-saving option	EIST	EIST	EIST
System dimensions (depth x width x height)	9-1/4" x 13-3/4" x 1-1/2"	9" x 13 3/8" x 1-1/2"	9-3/4" x 13-3/4" x 1-3/8"
System weight (pounds)	4.84	4.70	5.48
CPU			
Vendor	Intel®	Intel	Intel
Name	Pentium®	Core™ i5	Core i7
Model number	B980	3320M	3630QM
Stepping	D2	E1/L1	E1/L1
Socket type and number of pins	Socket 988B rPGA	Socket 988B rPGA	Socket 988B rPGA
Core frequency (GHz)	2.40	2.60 (Max Turbo Frequency 3.30)	2.40 (Max Turbo Frequency 3.40)
Bus frequency	DMI bus 5 GT/s	DMI bus 5 GT/s	DMI bus 5 GT/s
L1 cache	32 KB + 32 KB per core	32 KB + 32 KB per core	32 KB + 32 KB per core
L2 cache	512 KB (256 KB per core)	512 KB (256 KB per core)	1 MB (256 KB per core)
L3 cache	2 MB (shared)	3 MB (shared)	6 MB (shared)
Platform			
Vendor	Lenovo	Lenovo	Lenovo
Motherboard chipset	Intel QM77	Intel QM77	Intel QM77
BIOS name and version	Lenovo 78CN13WW(v1.01), (03/12/2013)	Lenovo 5ECN95WW (V9.00) (12/29/2012)	Lenovo 6BCN42WW (V2.02) (02/08/2013)
Memory module(s)			
Vendor and model number	Ramaxel Technology® RMT3170EB68F9W-1600	Hynix HMT351S6EFR8C	Hynix HMT41GS6MFR8C
Type	PC3-12800	PC3-12800S	PC3-12800S
Speed (MHz)	1,600	1,600	1,600

System	Lenovo G400	Lenovo G480	Lenovo Y400
Speed running in the system (MHz)	1,300	1,600	1,600
Timing/Latency (tCL-tRCD-tRP-tRASmin)	9-9-9-24	11-11-11-28	11-11-11-28
Size (MB)	4,096	4,096	8,192
Number of memory module(s)	2	1	1
Chip organization (single-sided/double-sided)	Double-sided	Double-sided	Double-sided
Channel (single/dual)	Dual	Single	Single
Storage drive			
First storage drive			
Vendor and model number	Seagate Laptop Thin SSHD ST500LM000	Seagate Laptop Thin SSHD ST500LM000	Seagate Laptop Thin SSHD ST500LM000
Number of disks in system	1	1	1
Size (GB)	500	500	500
Buffer size (MB)	64	64	64
RPM	7,200	7,200	7,200
Type	SSHD 6.0 Gb/s	SSHD 6.0 Gb/s	SATA 6.0 Gb/s
Controller	Microsoft® Storage Spaces Controller	Intel 7 Series Chipset Family SATA AHCI Controller	Intel 7 Series/C216 Chipset Family SATA AHCI Controller
Driver	Microsoft 6.2.9200.16548 (06-21-2006)	Intel 11.5.4.1001 (08/16/2012)	Intel 9.3.0.1011 (08/16/2012)
Second storage drive			
Vendor and model number	Seagate Momentus ST9500423AS	Seagate Momentus ST9500423AS	Seagate Momentus ST9500423AS
Number of disks in system	1	1	1
Size (GB)	500	500	500
Buffer size (MB)	16	16	16
RPM	7,200	7,200	7,200
Type	SATA 3.0 Gb/s	SATA 3.0 Gb/s	SATA 3.0 Gb/s
Controller	Microsoft Storage Spaces Controller	Intel 7 Series Chipset Family SATA AHCI Controller	Intel 7 Series/C216 Chipset Family SATA AHCI Controller
Driver	Microsoft 6.2.9200.16548 (06-21-2006)	Intel 11.5.4.1001 (08/16/2012)	Intel 9.3.0.1011 (08/16/2012)
Third storage drive			
Vendor and model number	Seagate Momentus Thin ST500LT012	Seagate Momentus Thin ST500LT012	Seagate Momentus Thin ST500LT012
Number of disks in system	1	1	1
Size (GB)	500	500	500
Buffer size (MB)	16	16	16
RPM	5,400	5,400	5,400
Type	SATA 3.0 Gb/s	SATA 3.0 Gb/s	SATA 3.0 Gb/s

System	Lenovo G400	Lenovo G480	Lenovo Y400
Controller	Microsoft Storage Spaces Controller	Intel 7 Series Chipset Family SATA AHCI Controller	Intel 7 Series/C216 Chipset Family SATA AHCI Controller
Driver	Microsoft 6.2.9200.16548 (06-21-2006)	Intel 11.5.4.1001 (08/16/2012)	Intel 9.3.0.1011 (08/16/2012)
Operating system			
Name	Microsoft Windows® 8 Professional	Microsoft Windows 8 Professional	Microsoft Windows 8 Professional
Build number	6.2.9200	6.2.9200	6.2.9200
Service Pack	N/A	N/A	N/A
File system	NTFS	NTFS	NTFS
Kernel	X64-based PC	X64-based PC	X64-based PC
Language	English	English	English
Microsoft DirectX version	11	11	11
Graphics cards			
First graphics card			
Vendor and model number	Intel HD Graphics 4000	Intel HD Graphics 4000	Microsoft Basic Display Adapter
Type	Integrated	Integrated	Integrated
Chipset	Intel HD Graphics 4000	Intel HD Graphics 4000	N/A
BIOS version	2137.0	N/A	N/A
Total available graphics memory (MB)	1,664	1,664	256
Dedicated video memory (MB)	32	32	0
System video memory (MB)	0	0	0
Shared system memory (MB)	1,632	1,632	256
Resolution	1,366 x 768	1,366 x 768	1,366 x 768
Driver	Intel 9.17.10.2932 (12/12/2012)	Intel 9.17.10.2932 (12/12/2012)	Microsoft 6.2.9200.16384 (06/21/2006)
Second graphics card			
Vendor and model number	AMD Radeon™ HD 8570M	NVIDIA® GeForce™ GT 635M	NVIDIA GeForce GT 750M
Type	Discrete	Discrete	Discrete
Chipset	8570M	635M	750M
BIOS version	N/A	70.08.A8.00.90	N/A
Total available graphics memory (MB)	N/A	3772	N/A
Dedicated video memory (MB)	N/A	2048	N/A
System video memory (MB)	N/A	0	N/A
Shared system memory (MB)	N/A	1724	N/A
Resolution	N/A	1,366 x 768	N/A

System	Lenovo G400	Lenovo G480	Lenovo Y400
Driver	N/A	NVIDIA 9.18.13.745 (11/06/2012)	N/A
Sound card/subsystem			
Vendor and model number	High Definition Audio Device	High Definition Audio Device	Realtek™ High Definition Audio
Driver	Microsoft 6.2.9200.16497 (01/08/2013)	Microsoft 6.2.9200.16497 (01/08/2013)	Realtek 6.0.1.6714 (08/27/2012)
Ethernet			
Vendor and model number	Qualcomm® Atheros® AR8162 Fast Ethernet Controller	Qualcomm Atheros AR8162 Fast Ethernet Controller	Qualcomm Atheros AR8162 Fast Ethernet Controller
Driver	Microsoft 2.0.0.4 (02/15/2011)	Microsoft 2.0.0.4 (02/15/2011)	Microsoft 2.0.0.4 (02/15/2011)
Wireless			
Vendor and model number	Broadcom® 802.11n Network Adapter	Broadcom 802.11n Network Adapter	Qualcomm Atheros AR9485WB-EG Wireless Network Adapter
Driver	Microsoft 5.100.245.20 (03/13/2012)	Microsoft 5.100.245.20 (03/13/2012)	Qualcomm 10.0.0.209 (09/19/2012)
Optical drive(s)			
Vendor and model number	TSST Corp. SN-208DB	PLDS DS8A8SH	N/A
Type	DVD-RW	DVD-RW	N/A
USB ports			
Number	3	3	3
Type	2 x USB 3.0 1 x USB 2.0	2 x USB 3.0 1 x USB 2.0	1 x USB 3.0 2 x USB 2.0
Other	HDMI, VGA, 2-in-1 card reader (SD, MMC)	HDMI, VGA, 2-in-1 card reader (SD, MMC)	HDMI, VGA, 6 in 1 SDXC card reader
IEEE 1394 ports			
Number	0	0	0
Monitor			
LCD type	HD LED-backlit	HD LED-backlit	HD LED Glossy
Screen size	14.0"	14.0"	14.0"
Refresh rate (Hz)	60	60	64
Battery			
Type	Lenovo L11S6Y01 Lithium-Ion	Lenovo L11S6Y01 Lithium-Ion	Lenovo L11S6R01 Lithium-Ion
Size (depth x width x height)	2" x 8" x 3/4"	2" x 8" x 3/4"	2-1/4" x 10-3/4" x 3/4"
Rated capacity	10.8V / 4,400mAh / 48 Wh	10.8V / 4,400mAh / 48 Wh	10.8V / 6,700mAh / 72Wh
Weight (pounds)	0.6	0.6	0.7

Figure 9: System configuration information for the test systems.

APPENDIX B - HOW WE TESTED

Measuring system performance with Seagate App Launch

1. Reboot the system.
2. Bring up an administrative command prompt:
 - a. Type CMD
 - b. Right-click the Command Prompt app to open App options.
 - c. Click Run as administrator.
3. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
4. Do not interact with the system until the command completes.
5. After the command completes, wait 5 minutes before running the test.
6. Double-click the App Launch Icon.
7. When the test completes, take a screenshot of the results and record the time as App Launch Score.

Measuring time to boot

1. Simultaneously start the timer and boot the system.
2. When the word Start appears in the Windows Store App, stop the timer.
3. Record the result as the Boot time.
4. Bring up an administrative command prompt:
 - a. Select Windows Start orb.
 - b. Type `cmd` and right-click `cmd.exe`.
 - c. Select Run as administrator.
5. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
6. Do not interact with the system until the command completes.
7. After the command completes, wait 5 minutes before shutting the system down.
8. Shut the system down.
9. Repeat steps 1 through 8 four more times, and report the fifth run.

Measuring system performance using Futuremark PCMark Vantage v1.2.0

Setting up the test

1. Reset the system with the appropriate test image.
2. Download the PCMark_Vantage_v102_1901-[Guru3D.com].exe Windows package from www.futuremark.com/support/downloads.
3. Double-click the PCMark_Vantage_v102_1901-[Guru3D.com].exe file to install PCMark Vantage with the default options.
4. Click the PCMark Vantage desktop icon to launch PCMark Vantage. Enter the registration code, click Register, and click OK.
5. Exit PCMark Vantage.
6. Download Futuremark_SystemInfo_v419_installer.msi from www.futuremark.com/support/downloads.
7. Double-click the Futuremark_SystemInfo_v419_installer.msi file to install Futuremark System Info with default options.

Running the test

1. Reboot the system.
2. Double-click the PCMark Vantage desktop icon to launch the benchmark.
3. Select all test suites.
4. Click Run Benchmark.
5. When the benchmark run completes, take a screenshot of the results, and record them as follows:

- PCMark Score
- Memories Score
- TV and Movies Score
- Gaming Score
- Music Score
- Communications Score
- Productivity Score
- HDD Score

6. Repeat steps 1 through 5 four more times, and report the fifth run.

Measuring system performance with SYSmark 2012

Avoiding antivirus software conflicts

SYSmark 2012 is not compatible with any virus-scanning software, so we uninstalled any such software that was present on the laptop PCs before we installed the benchmark.

Avoiding pre-installed software conflicts

SYSmark 2012 installs the following applications, which its test scripts employ:

- ABBYY FineReader Pro 10.0
- Adobe® Acrobat® Pro 9
- Adobe After Effects® CS5
- Adobe Dreamweaver® CS5
- Adobe Photoshop® CS5 Extended
- Adobe Premiere® Pro CS5
- Adobe Flash® Player 10.1
- Autodesk® 3DS Max® 2011
- Autodesk AutoCAD® 2011
- Google SketchUp™ Pro 8
- Microsoft Internet Explorer®
- Microsoft Office 2010
- Mozilla® Firefox® Installer
- Mozilla Firefox 3.6.8
- Winzip® Pro 14.5

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 and before we installed the benchmark, we uninstalled all conflicting pre-installed software applications, including different versions of any of the programs SYSmark 2012 uses.

Setting up the test

Using the SYSmark built-in Configuration Tool

This tool supports three levels of configuration:

- Only makes changes that are REQUIRED in order for the benchmark to run.
- Additionally, makes changes that are RECOMMENDED for repeatable results.
- Additionally, makes OPTIONAL changes that help ensure best results.

The Configuration tool makes the following configuration changes at each of the three levels:

Level 1 - Required

- Disables User Account Control (UAC)
- Disables Windows Update
- Disables System Sleep and Hibernate
- Disables Low Battery Actions
- Disables Network Proxies

Level 2 - Recommended

- Creates BAPCo power scheme
- Sets Power Plan Type to High Performance
- Disables Windows Firewall
- Disables Windows Sidebar/Gadgets
- Disables Windows Pop-ups
- Disables Incoming Remote Desktop Connections
- Disables Windows Error Reporting
- Disables Screen Saver and Monitor Timeout
- Sets CPU Adaptive Mode
- Disables Desktop Slideshow
- Disables Disk Defrag

Level 3 - Optional

- Sets Hard Disk Timeout
- Disables Windows Defender
- Disables System Restore
- Ignores Laptop Lid Close
- Sets Maximum Display Brightness
- Disables Adaptive Brightness

Because we are testing how well each system does out of the box, we chose only the Required options in the Configuration tool.

1. Insert the SYSmark 2012 Install DVD into the laptop PC's DVD drive.
2. When the Autoplay menu appears, click Run SYSmark2012_setup.exe.
3. At the Welcome screen, click Next.
4. Enter the serial number, and click Next.
5. Accept the license agreement, and click Next.
6. At the Choose Components screen, select Full, and click Next.
7. At the Choose Install Location screen, accept the default location of C:\Program Files (x86)\BAPCo\SYSmark2012, and click Next.
8. At the Choose Start Menu Folder screen, click Install.
9. When prompted, insert Disc 2.
10. At the InstallShield Wizard Complete screen, click Finish.
11. Download and install SYSmark 2012 Patch 2 www.bapco.com/support/.
12. Launch SYSmark 2012.
13. Click Configuration, and choose only the Required options.
14. Click Apply, and restart the computer when prompted.

Running the test

1. Double-click the desktop icon to Launch SYSmark 2012.
2. Enter a Project name, and choose three iterations.

3. Click Run Benchmark.

Getting the SYSmark 2012 results

When SYSmark 2012 has completed, the Test Results Viewer appears. To submit these results to BAPCo, we saved the test results by performing the following steps:

1. Click Save.
2. Enter a name, and select FDR to save the results as an FDR file.
3. Click Save again, and select PDF to save the results as a PDF file.
4. Browse to the Documents directory where the result FDR and PDF files were saved.

ABOUT PRINCIPLED TECHNOLOGIES



Principled Technologies, Inc.
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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 our clients assess how it will fare against its competition, its performance, its market readiness, 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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