

Mobile Client Capability Brief for Cyberlink* PowerDVD* 8



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About this Document

This document is a guide measuring performance and battery life of the Intel® Centrino® 2 platform using application software. The primary audience for this document includes individuals, publications, OEMs and technical analysts whose goal is to test or evaluate the performance and battery life benefits and features of the Core 2 Duo Processor. If there are questions that are not answered here on software application performance evaluation of the Core 2 Duo Processor, please contact your Intel representative.

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Chapter 1

Performance and Battery Life using Cyberlink PowerDVD

1.0 Application Description

Cyberlink* PowerDVD* is an industry leading application used to playback high definition and standard definition video content on laptop and desktop PCs. PowerDVD* supports video formats such as AVHD, MPEG-4 AVC (H.264) and Blu-ray discs. It allows users to remix their own movies, track their own movie watching experiences, and get information and ratings about movies online.

1.1 Workload Description

The tested workload involves a user who is traveling and wants to watch High Definition Blu-ray content on battery power.

Starting with a fully charged battery, the user begins to watch a movie on Blu-ray disc. The user will be able to enjoy high quality HD content without being tethered to a power adapter or plugged into an electrical socket. The recommended content for this usage is the movie 300 on Blu-ray disc encoded in VC1 format.

Chapter 2

Measurement Methodology

The following is a description of the measurement methodology that should be used to evaluate performance and battery life of the mobile platform while running this scenario.

2.0 System Setup

This section outlines the system setup recommended for all mobile benchmarks under Microsoft Windows* Vista Ultimate Edition:

- Always start with a clean, formatted hard disk.
- Set your system to boot from CD/DVD drive in the bios.
- Begin installation Windows* Vista Ultimate Edition* from the operating system CD.
- Format the file system to NTFS during installation if the drive if you have not already done so.
- After installation of the OS is complete restart your system.
- Immediately after installing the Windows Vista operating system, install the latest drivers (INF files) to allow the operating system to recognize the chipset and all the components on the motherboard. The drivers can be downloaded from the chipset software link at <http://downloadfinder.intel.com>
- Install the latest Intel Matrix Storage Manager. The install file can be downloaded from the chipset software link at <http://downloadfinder.intel.com>. (Windows Vista installs the basic driver for Intel Matrix Storage, and you should update the driver once the OS boots up.) The Intel® Matrix Storage Driver can provide better system performance because features like Native Command. Some system benchmarks with an I/O component, like BAPCo* SYSmark*, may show increased performance with the Intel Matrix Storage Driver installed and the system set to raid-ready.
- Install the Intel integrated sound driver from <http://support.intel.com> or from your motherboard CD.
- Install the latest LAN driver from <http://support.intel.com>.
- Download and Install the latest Windows Vista graphics driver for your graphics card from the manufacturer website.
- The table below describes how to perform an initial setup of Windows Vista.

Microsoft Windows* Vista Setup	Setting	Description of how to set up Windows Vista
Windows Aero	Enable	<p>Ensure Windows Aero is enabled - Right click on desktop -> Personalize -> Window color and appearance -> click on "Open classic appearance properties for more color options - Ensure "Windows Aero" is checked.</p> <p>Note: In order for Aero to work on Intel Graphics Media Accelerator X3000 and 3000, Vista drivers should be installed prior to setup Aero feature in Vista.</p>
Search Indexing	Enable	<p>Leave Search Indexing Enabled - You can check if Search Indexing is enabled by Open Control Panel -> System and Maintenance -> Indexing Options. The Indexing location will include: Offline Files, Start Menu, and Users.</p>
Internet Offline Files	Enable	<p>Leave Internet Offline files Enabled - You can check if Offline files is enabled, Open Control Panel -> Network and Internet -> Offline Files. On the general tab, the "Disable Offline Files" button should appear.</p>
Disable Screen saver	Disable	<p>Right click on desktop -> Personalize -> Screen Saver. Set the screen saver to "None"</p>
Disable Power Management	High Performance	<p>Right click on desktop -> Personalize -> Screen Saver -> Change Power settings -> Select "Balanced" and click "Change plan settings" below this option. A new view will appear called "Edit Plan Settings." Change "Turn off display" to "Never." Click Save Change. (Note: Exceptions include MobileMark* and other standardized benchmarks that measure battery life; these should be run with their own power management settings.)</p>
Vista Desktop Display resolution, monitor refresh	Custom	<p>Right click on desktop -> Personalize -> Display Settings. In the "Display Settings" dialog choose the system's native screen resolution and set Colors= Highest (32bit). Click the "Advanced Settings" button. Select the "Monitor" tab and change the "Screen refresh rate" to 75 Hz.</p>
Remove always on top	Disable	<p>Right click on Windows task bar at the bottom -> Properties -> Taskbar -> uncheck "Keep the taskbar on top of other windows"</p>
Remove hide inactive icons	Disable	<p>Right click on Windows task bar at the bottom -> Properties -> Select the "Notification area" tab and uncheck "Hide inactive icons"</p>

Disable Windows Defender	Disable	Open Control Panel -> Security -> Windows Defender. Click on "Tools" in the toolbar at the top. Click on the Options link in the next view. Uncheck all boxes.
Disable Windows "Welcome screen"	Disable	Open Control Panel -> System and Maintenance -> Welcome Center, Uncheck "Run at Startup" at the bottom of the Windows Welcome screen
Disable System Protection (previously "System Restore")	Disable	Open Control Panel -> System and Maintenance -> System. Under the tasks link on the left side select System Protection. Uncheck "Local Disk" found in the "Automatic restore points" section.
Disable Security Center Alerts	Disable	Open Control Panel -> Security Center. On the left side at the bottom click on the link, "Change the way Security Center alerts me." In the dialog select "Don't notify me and don't display the icon (not recommended)"
Adjust Folder Options for hidden files	Custom	Open Control Panel -> Appearance and Personalization -> Folder Options. On the view tab select "Show hidden files and folder" uncheck "Hide extensions for known file types" and uncheck "Hide protected operating system files (Recommended)"
Disable backup on Recycle bin	Disable	Right click on the recycle bin and choose properties. On the general tab select "Do not move files to the Recycle Bin. Remove files immediately when deleted"
Disable Windows Sidebar	Disable	Remove "Windows Sidebar" by right click on the Windows sidebar, click properties, Uncheck "Start Sidebar when windows Starts"
Disable Disk Defragmentation	Disable	Click on "My Computer", right click on the C: drive. Click "Properties", "Tools", "Defragment Now". Uncheck "Run on Schedule"
Disable User Account Control	Disable	Open Control Panel -> User Accounts and Family Safety -> User Accounts -> Turn User Account Control on or off -> Continue -> Uncheck Use User Account Control (UAC) to help protect your computer -> OK -> Restart Computer

2.1 Evaluation of Mobile Platform Battery Life

This section outlines the recommended methodology for evaluating mobile platform battery life.

Clean up Windows prefetch

1. Delete the contents of the c:\windows\prefetch directory between testing of **individual**

benchmarks.

Allow your system to settle into an idle state:

1. Reboot your computer.
2. Open the Task Manager by right clicking on the Taskbar and clicking the option for Task Manager. Click on the Performance tab in the Task Manager.
3. Click on the Resource Monitor button in the Task Manager. This will bring up the Resource Monitor Window below.
4. Click on the panel that says Disk. This will allow you to view the various active requests to the disk drive.
5. Watch the Resource Monitor. The number of requests to the disk will gradually decline. Wait until there are no more requests to the disk as shown below.
6. After there are no more requests to disk, close the Resource Monitor.

Process Idle Tasks

1. Call the ProcessIdleTasks API from advapi32.dll using the command line or create and execute a batch file with the following command: *rundll32.exe advapi32.dll,ProcessIdleTasks*

Benchmark Run:

1. After you have run the ProcessIdleTasks API, run the workload 5 times in a row without reboots in between each run.
2. Take the median of the 5 runs.

2.2 Additional Blu-Ray Playback Battery Life Evaluation Methodology

This section outlines additional settings required to properly evaluate the battery life of a mobile platform while performing Blu-Ray movie playback.

Power Profile

1. Right click on desktop -> Personalize -> Screen Saver -> Change Power settings -> Select "Balanced" and click "Change plan settings" below this option. A new view will appear called "Edit Plan Settings." Set the options "Turn off the display" and "Put the computer to sleep" options to "Never." Click Save Change.
2. Right click on desktop -> Personalize -> Screen Saver -> Change Power Settings -> Change plan settings" and click on "Change advanced power settings".
3. In the advanced settings window ensure the Balanced profile is selected and set the following options:

- Hard disk -> Turn off hard disk after -> On battery (Minutes): 3 minutes
 - Hard disk -> Turn off hard disk after -> Plugged in: 3 minutes
 - Sleep -> Sleep after -> On battery (Minutes): Never
 - Sleep -> Sleep after -> Plugged in: Never
 - Sleep -> Allow hybrid sleep -> On battery: Off
 - Sleep -> Allow hybrid sleep -> Plugged in: Off
 - Sleep -> Hibernate after -> On battery: Never
 - Sleep -> Hibernate after -> Plugged in: Never
 - Display -> Turn off display after -> On battery: Never
 - Display -> Turn off display after -> Plugged in: Never
 - Display -> Display brightness -> On battery: <if this setting is available, set to whatever setting needed for 60+ nit brightness, notes below>
 - Display -> Display brightness -> Plugged in: <if this setting is available, set to whatever setting needed for 60+ nit brightness, notes below>
 - Battery -> Critical battery action -> On battery: Shut down
 - Battery -> Critical battery action -> Plugged in: Shut down
 - Battery -> Low battery level -> On battery: 0%
 - Battery -> Low battery level -> Plugged in: 0%
 - Battery -> Critical battery level -> On battery: 0%
 - Battery -> Critical battery level -> Plugged in: 0%
 - Battery -> Low battery notification -> On battery: Off
 - Battery -> Low battery notification -> Plugged in: Off
 - Battery -> Low battery action -> On battery: Do nothing
 - Battery -> Low battery action -> Plugged In: Do nothing
4. The screen brightness should be set to the lowest possible brightness setting that is still above 60 nits.
- Measure screen brightness with a nitmeter such as a Gossen Mavolux nit meter.

- When measuring screen brightness, open a notepad.exe window and maximize it so that most of the screen is displaying white. Wait for 5-10 minutes to allow the screen to warm up and then take brightness measurements at the exact center of the screen with your nitmeter.
- In most cases screen brightness can be set in the Vista advanced power settings window as indicated in step 3. (note most laptop panels only have 5-10 different brightness settings so changing the Display brightness setting by only 1% usually makes no difference) In some cases, screen brightness must be set in the BIOS in order to ensure the same levels of screen brightness after reboots.

Chapter 3

Procedure for Evaluating Performance

The following is a procedure for evaluating performance using Cyberlink PowerDVD 8. Run this test on a system running **Windows* Vista**. Be sure to follow the recommendations made in section 2.2 of this document in order to accurately measure battery life.

Setup Instructions:

1. Download and install Cyberlink PowerDVD 8. PowerDVD 8 can be obtained from <http://www.cyberlink.com>.
2. Launch PowerDVD from the desktop icon and perform the online activation process required to launch PowerDVD for the first time. (optionally you may also perform product registration as well)
3. In the main PowerDVD window, right click to bring up the PowerDVD Express menu and select "Configuration...".
4. In the Configuration window, select the Video pane and ensure that "Enable hardware acceleration" is selected (if available).
5. In the Configuration window, select Mobile Power Settings. Under Battery, set "Stop Playback When Power Falls Below" to 0%.
 - a. *Please note:* In some cases, the system may force the power profile to a lower power profile at a certain battery power percentage. If this is the case, the playback quality may suffer in such a state. If playback quality is then unacceptable, this setting should be adjusted to stop playback before the power profile changes.
6. Click on OK to save your changes.
7. Insert the Blu-ray disc into the BD-drive. If PowerDVD begins to play the movie, press the stop button.
8. Close PowerDVD.
9. Reboot your system.

Run Instructions

Evaluating Playback Quality

1. Upon rebooting your system, launch PowerDVD from the desktop icon.
2. Disconnect your system from the AC adapter in order to ensure the system is functioning on battery power.
3. Press the play button to begin movie playback.

- Evaluate the video quality of the movie playback by watching the first 100 seconds of chapter 17 of the movie. Use the metric below to evaluate the video quality for the 100 second segment watched. This is the **video playback quality score**.

Subjective Video Playback Metric (Visual Movie Quality)

While the workload (Movie) is being played back, the subject (tester) scores the playback based on a 5 point metric listed below.

Score	Description
5	Perfect Picture Quality, no observed artifacts
4	Occasional artifacts but very viewable
3	Noticeable artifacts, viewable but annoying
2	Bad artifacts, Not viewable
1	Slideshow or no playback

Higher scores for the subjective metric imply better movie playback quality.

- If the video playback score is **below 3**, do not continue with this benchmark. The system is **unable to playback the selected content with acceptable video quality**.
- After you have finished evaluating playback quality, close PowerDVD.
- Shut down the system.
- Plug the system back into the AC adapter to charge the battery up to maximum capacity.

Measuring Playback Time

- Boot your system and verify that the battery is fully charged to 100%.
- After the system is fully charged, launch PowerDVD from the desktop icon.
- Press the play button to begin movie playback.
- Simultaneously unplug the AC adapter from the system and start your stopwatch.
- As movie playback progresses, if PowerDVD reaches the end of the movie, immediately restart the movie playback at the beginning of the movie.
- As the battery level reaches 0%, the movie playback will stop or the system may simply shutdown. When this happens stop your stopwatch. This is the **Blu-ray playback time** for this scenario.
- If the system did not shut down, shut down the system.
- Plug the system back into the AC adapter to charge the battery up to maximum capacity. Wait for as long as is required by the system to fully charge the battery.
- Repeat steps 9-16 four more times. Take the median Blu-ray playback time as your **median Blu-ray playback time**.