High Definition Video Playback Assessment Methodology Guide

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About this Document

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Chapter 1
High Definition Video Playback Assessment

1.0   Methodology Description

This guide is intended to specify a High Definition (HD) Video Playback Performance Assessment methodology for graphics chipset platforms.

1.1   Test Workload Description

Playback of HD content from Blu-ray optical drives on Personal Computers is becoming more prevalent. In order to measure the capability of a given platform to playback HD content we propose a two part Performance Evaluation Metric, Visual Movie Quality (subjective) and the Movie playback CPU Utilization (objective). We choose specific movie titles and chapters (please see the list below) that cover a variety of bitrates and codec formats (MPEG2, VC1 and AVC) from recently available popular content (Any other content could also be used for this). The first 100 seconds of these chapters are played and the playback quality is measured using the metric specified in the next section.

Title	Format	Chapter
Night at the Museum	MPEG2	10
Resident Evil: Extinction	H.264	2
Flight Plan	VC1	6

1.2   Performance Evaluation Metric

The performance of video playback quality is assessed using a two part metric.

Subjective 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.

Objective Metric (Movie Playback CPU utilization)
While the workload (Movie) is being played back, the average CPU utilization is recorded for the entire workload.

Chapter 2
Procedure for Evaluating Performance

The following is the procedure for evaluating video playback performance on graphics chipset platforms running Microsoft Vista Ultimate operating system.

Software Setup Instructions:

Perfmon Setup
Setup Perfmon to collect the CPU utilization data as follows.
1. Start->Perfmon
2. On the left panel, go to "Data Collector Sets"
3. Right Click on "User Defined"
4. Left Click on "New" and then "Data Collector Set"
5. In the "Name" specify a test relevant name, e.g. "Blu-Ray test"
6. Choose "Create manually (Advanced)" and Left Click "Next"
7. Choose "Performance Counter" and left click "Next"
8. Left Click the "Add" button
9. Choose "Processor" and left click the "Add" button on the bottom, then left click "OK"
10. Back on the original window, change the "Sample Interval" to "1" seconds and Left Click "Next"
11. Left Click "Next" on the "Where would you like the data to be saved?" window.
12. On the "Create the data collector set" window select "Open properties for this data collector set", then Left Click "Finish"
13. On "properties" window, select the "Stop Condition" tab
14. Under the "Limits" section, select "Duration" and specify "100" seconds, then Left Click "OK"

Either one of Blu-ray playback programs, Cyberlink PowerDVD or Corel WinDVD that can playback Blu-ray movies, can be used to playback the movie. Please setup the required player as follows.

Cyberlink PowerDVD setup
15. Install Cyberlink PowerDVD choosing all the default options.
16. Once PowerDVD is installed, open the application, Right Click and choose "Configuration". Select the "Video" tab and check "Enable hardware acceleration". Then Left Click "OK".

Corel WinDVD setup
17. Install Corel WinDVD choosing all the default options.
18. Once WinDVD is installed, open the application, Right Click and choose "Setup". Select the "Video" tab and check "Use Hardware Decode Acceleration".
19. Under the "Region" tab, choose your region country for the "BD Title".
20. Left Click "OK".

Assessing Blu-ray playback with a background task can be achieved by running any program in the background while the Blu-ray playback is happening on the foreground. We use Norton Internet Security 2008 to scan directories for Viruses in the background.

Data Gathering

Once all the software (PowerDVD/WinDVD, Norton Internet Security 2008 (if required), and Perfmon) is setup, insert the Blu-Ray DVD in the optical drive, start your chosen BD player, and choose the chapter for the DVD from the list below. Please make sure that your video resolution is set to at least "1920x1080" to experience high definition movie experience.

21. The next two steps should be executed as concurrently as possible.
22. Start Perfmon and Right Click "Blu-Ray test" and choose "Start".
23. Immediately start playing the specified chapter from the DVD.
24. While the playback is progressing, notice the playback quality and assign a score to the playback using the subjective metric. At the end of 100 seconds of playback, Perfmon will automatically stop collecting the data. At this point, stop the DVD playback.
25. Go to Perfmon window to note the CPU utilization.
26. Select "Performance Monitor" under "Monitoring Tools" on the left pane.
27. On the right pane, Left Click the second button on the top tool bar, it will say "View Log Data" once you place your mouse on the button.
28. On the "Performance Monitor Properties" window, select "Log Files" and Left Click the "Add" button.
29. On the "Select Log File" window, browse to "Blu-Ray test" and the numerically last data set (e.g. "00004"). Inside this directory will be a file named "DataCollector01.blg". Select this file and Left Click "Open".
30. Back on the "Performance Monitor Properties", Left Click "OK".
31. The chart shows the CPU utilization, below the chart; note the Average CPU utilization number.