NVIDIA PerfKit 6: The World’s Most Advanced GPU Performance Suite

**PerfHUD 6**
- *New!* GeForce 8800GT, 9600GT, 9800GX2 support
- *New!* Use stock NVIDIA drivers with PerfHUD (on Windows Vista)
- *New!* Multi-GPU Support
- *New!* More real-time signals, including SLI signals
- *New!* API Call List
- *New!* Draw Call Dependency Analysis
- *New!* Advanced Texture Visualization
- *New!* Texture Overrides
- Real-time performance analysis and debugging
- Automated bottleneck determination

**PerfSDK**
- *New!* GeForce 8800GT, 9600GT, 9800GX2 support
- API for accessing GPU and driver counters
- Supports DirectX 9 & 10, as well as OpenGL
- NVIDIA Plug-in for Microsoft PIX for Windows
- GLExpert
PerfHUD 6

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Tons of other improvements!

- **Multiple, named Performance Dashboard Layouts**
  - Save separate layouts for each of your monitoring scenarios.

- **Sampler State Editing**
  - Edit and override any property of a sampler in your application

- **New Real-time Experiments**
  - Minimize Geometry (Replaces all geometry with a single primitive)

- **Improved Compatibility and Stability**
  - Rewritten interception layer requires less cooperation from the application.
  - Now compatible with applications that include frame-limiting logic.
  - Now compatible with applications which send non-deterministic graphics workloads.
  - Many bug fixes and performance improvements.

- **Improvements to Frame Profiler**
  - New CPU/GPU Timings Graph lets you directly see and compare utilization in the CPU, the driver, and the GPU.

- **User Interface Improvements**
  - Navigation hotkeys for every major tool

- **Compatibility, stability, and reliability improvements**
  - Extensive testing on a wide range of applications
  - Minor bug fixes
How to Think of PerfHUD’s Main Modes

- **Performance Dashboard**
  Real-time Holistic Analysis

- **Frame Debugger**
  Rendering Debugging

- **Advanced Screens**
  Shader and Render State Inspection and Modification

- **Frame Profiler**
  Automated Bottleneck Detection
  Per-Draw Call Performance Graphs
New! Advanced Texture Overrides

- Override any texture in your application with a variety of useful texture overrides.

- **2x2 Texture**: Reduces texture bandwidth usage by using the smallest texture possible.

- **Black, 25% Gray, 50% Gray, 75% Gray, White, Horizontal gradient, Vertical Gradient**: Each of these can be useful as debug input to your shaders.

- **Color Mipmap Texture**: Visualize your mip levels quickly and easily.

- Use with shader edit and continue to quickly diagnose and correct bugs.
**New! API Call List and Perf Event View**

**New! API Call List**

A full list of all D3D API calls, colorized by call type

One click jumps you to the corresponding draw call.

**New! Perf Event List**

Navigate your scene using D3D Perf Events to annotate sections of the frame.

Use Perf Events to selectively disable state overrides for portions of the scene.

Set a debug break (_int 3) to occur on a Perf Event to help debug your CPU code.
Shader Edit and Continue

- **Edit & Continue for:**
  - DirectX 9 HLSL and .fx
  - DirectX 10 HLSL and .fx
  - Vertex, geometry, and pixel shaders

- **Code editing**
  - Standard keyboard and mouse interaction
  - Search bar

- **Easily toggle between original and modified shaders**
  - Discard Current Edits
  - Restore Original Shader
  - Controlled via hotkey
The Frame Profiler

- Same powerful automated analysis as in PerfHUD 5

- New! CPU/GPU timing graph

Detailed CPU/GPU Timings
How is PerfHUD Different from Other Performance Tools?

- **It works in real-time on your application.** Other tools require out of context, offline analysis. PerfHUD allows you to debug and tune your application in the most natural place: within your application!

- **One key press provides a list of draw calls (grouped by bottleneck and sorted by duration) to work on.** Running experiments and collecting data from individual pipeline units is difficult and easy to misjudge. PerfHUD automatically tells you exactly where your bottlenecks are so you can fix them quickly.

- **Real-time frame scrubbing.** Modern engines have thousands of draw calls per frame. PerfHUD lets you decompose the scene, stepping through each draw call to find any problems.

- **Edit-and-continue.** Modifying shader code and render states can be time consuming. PerfHUD allows you to make changes while your application is running – allowing you to quickly try our ideas and get immediate feedback.
Trying Out PerfHUD 6

- Read Chapter 1 of the User’s Guide
  - This will guide you through the key new features quickly

- Please share your feedback:
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  developer.nvidia.com/forums