



HP Z1 Workstation

The First All-in-One with Professional Workstation Graphics

Overview

The first HP all-in-one Workstation, the HP Z1, is well equipped with a range of workstation quality professional graphics options. Intel®'s offerings include Intel Core™ i3 with HD 2000 graphics and the Xeon® E3-1245 P3000 graphics. Intel's P3000 is suited better for professional applications as well as provides an entry 3D solution with ISV certifications. For entry 3D to graphics power users, the HP Z1 Workstation offers the NVIDIA Quadro 500M, Quadro 1000M, Quadro 3000M and Quadro 4000M. The NVIDIA Quadro offerings on the HP Z1 Workstation use the same professional HP-qualified graphics driver as the rest of the HP Z Workstation series and are comparable in performance to their desktop PCIe equivalent.

Graphic/Segment Mapping

| | intel | NVIDIA | Financial Services | M&E—Video | Entry CAD | Animation M&E | Value CAD | Healthcare | Oil and Gas |
|------------|----------------|-----------------------------|--------------------|-----------|-----------|---------------|-----------|------------|-------------|
| Ultra High | | | | | | | | | |
| High | | Quadro 4000M | | | | | | | |
| Mid-Range | | Quadro 3000M | | | | | | | |
| Entry | | Quadro 1000M Quadro 500M | | | | | | | |
| Sub-Entry | Intel HD P3000 | | | | | | | | |
| Pro 2D | Intel HD P3000 | | | | | | | | |
| Office 2D | Intel HD P2000 | | | | | | | | |

When to choose Integrated?

Intel®'s 2nd generation HD graphics is available on the Intel Core™ i3 and the Intel Xeon® E3-1245 SKU. There are specific benefits when choosing integrated graphics, such as low-cost, Quick Sync capabilities and some ISV certification. Intel Quick Sync, which is offered on all graphics CPU SKUs, uses dedicated media processing units to accelerate encoding H.264 and MPEG2 for faster conversion time. Applications written to utilize Quick Sync can take advantage of that capability when choosing Intel's integrated graphics offering. (Note: When the Quadro graphics adapter is present in the HP Z1 Workstation, all Intel graphics capabilities are not available to use—including Quick

HP recommends Windows® 7.

Sync). Intel HD P3000 graphics, offered in the Xeon® E3-1245, is certified for key professional applications: Adobe Photoshop CS5, Adobe Premier Elements, Bentley Microstation, Solid Edge, AutoCAD 10/11/12, Revit 11/12, Inventor 11/12 and Solidworks. The Intel HD 2000 graphics, available on Core™ i3, is not certified for any 3D professional application and should be used in general office applications only.

When to choose Quadro?

From entry 3D to high-end 3D graphics, the NVIDIA Quadro graphics lineup provides an offering for each need. Choose Quadro when you want graphics performance and features comparable to the capabilities of NVIDIA discrete cards on your other HP Z Workstations. Quadro graphics come with a long list of ISV certifications, exceeding those certified for integrated graphics. The complete list of ISV certifications is listed on hp.com/workstations. The Quadro 3000M and the Quadro 4000M are certified for GPU acceleration with the Mercury Playback Engine for Adobe Premiere Pro CS 5.x. With HP Performance Advisor a user can ensure they are running a qualified solution for their application(s). All of the HP Z1 NVIDIA graphics offerings use the same HP workstation qualified NVIDIA driver used across the HP Z Workstation product line. A unified graphics driver enables customers to use the best tested driver available and simplify the management of their entire HP workstation install base. The HP Z1's Quadro graphics adapter is seated in a HP Workstation designed heatsink that optimizes thermal behavior and provides whisper-quiet acoustics.



| HP Z1 GRAPHICS SOLUTIONS | Z DISCRETE CARDS |
|--|---|
| Q4000M 2 GB GDDR5—336 CUDA cores | Quadro 4000 2 GB GDDR5—256 CUDA cores |
| Q3000M 2 GB GDDR5—240 CUDA cores | Quadro 2000 1 GB GDDR5—192 CUDA cores |
| Q1000M 2 GB DDR3—96 CUDA cores | Quadro 600 1 GB DDR3—96 CUDA cores |
| Q500M 1 GB DDR3—96 CUDA cores | Quadro 400 512 MB DDR3—48 CUDA cores |

Intel Integrated Graphics and NVIDIA Quadro Performance

The performance data in this section is separated into three categories based on the market segments:

- Professional OpenGL—ViewPerf 11, SolidWorks 2011, Adobe Premiere Pro CS 5.5
- Professional DirectX—Autodesk 3ds Max, Autodesk AutoCAD 2010
- Gaming DirectX—3DMark Vantage

Here is a full summary of specifications discussed in this article:

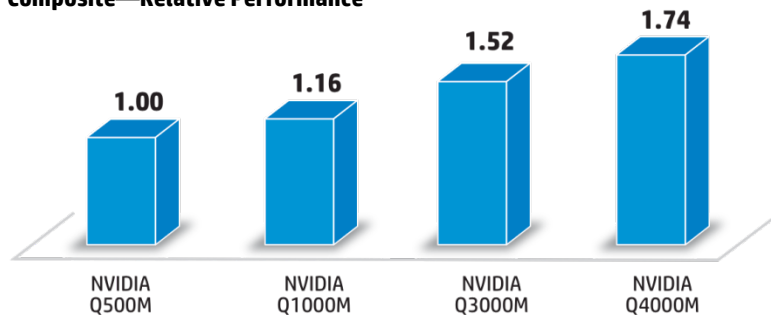
| | DirectX | OpenGL | Dedicated Memory | CUDA Cores | Application Certifications |
|---------------------|---------|--------|------------------|------------|---|
| HD 2000/3000 | 10.0 | 3.0 | N/A | N/A | Autodesk AutoCAD, Inventor, Revit, Adobe Premiere Elements, Adobe Photoshop, SolidWorks |
| HD P3000 | | | | | |
| NVIDIA 500M | 11.0 | 4.1 | 1 GB DDR3 | 96 | Visit HP links to see the full list of certified applications and drivers at: • www.hp.com/go/mcad • www.hp.com/go/dme • www.hp.com/go/oilandgas • www.hp.com/go/aec |
| NVIDIA 1000M | | | 2 GB DDR3 | 96 | |
| NVIDIA 3000M | | | 2 GB GDDR5 | 240 | |
| NVIDIA 4000M | | | 2 GB GDDR5 | 336 | |

ViewPerf 11

SPEC ViewPerf 11 is a synthetic benchmark designed to provide a reliable prediction of graphics subsystem performance using OpenGL data sets from multiple professional applications.

A higher relative score correlates to more frames per second, which in turn means less time spent rendering an object and smoother workflow. Intel® HD P3000 was not supported by the benchmark at the time of this article.

Composite—Relative Performance

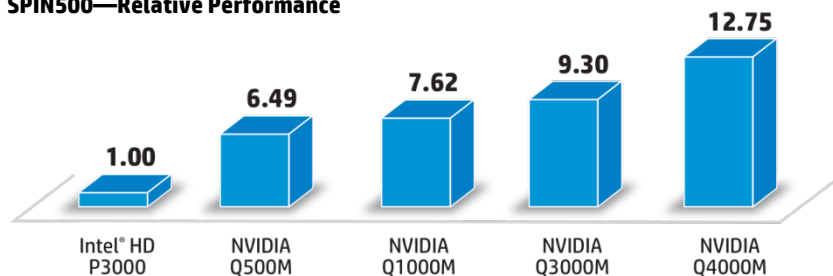


■ Genuine Windows® 7 Professional 64-bit, Intel® Xeon® processor E-1245

SolidWorks 2011

Next up is SolidWorks 2011. It is one of the most advanced mid-range CAD applications on the market and its RealView technology enables real time image rendering when modeling. All available graphics options are capable to run the minimum, but advanced visual features, including RealView, will benefit greatly from a more powerful card.

SPIN500—Relative Performance

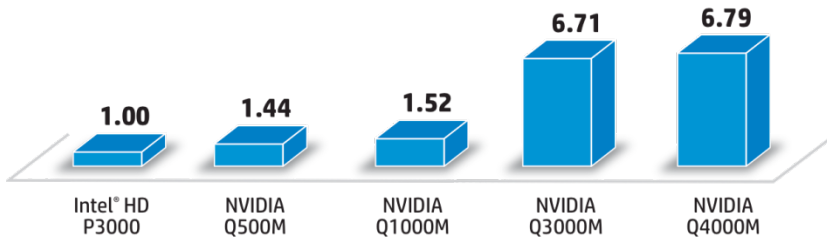


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Adobe Premiere Pro, CS 5.5

Adobe Premiere Pro is a powerful professional grade video editing application. Beginning with CS 5, and improving the feature with CS 5.5, Adobe enabled GPU acceleration in its Creative Suite. The Adobe Mercury Playback Engine speeds up editing and rendering tasks by leveraging Nvidia CUDA parallel architecture. The feature offers outstanding performance and is fully supported by HP, NVIDIA, and Adobe on the HP Z1 with the NVIDIA Quadro 3000M and Quadro 4000M. The recently released Adobe CS6 continues the use of Mercury Playback Engine. Other components of the Creative Suite, such as After Effects, Speedgrade, and Photoshop, also benefit from this technology. Here is a link to NVIDIA's website for more information: <http://www.nvidia.com/object/premiere-pro-cs6.html>.

Adobe Premiere Pro CS5.5—Relative Performance



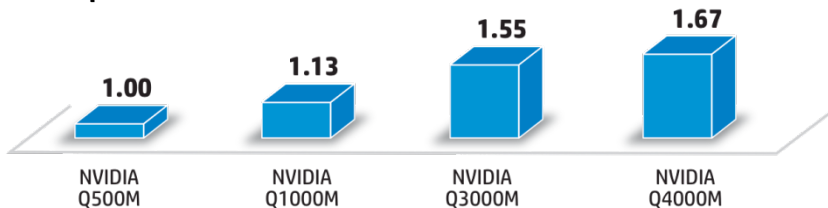
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Autodesk 3ds Max 2011 SPECapc

Autodesk 3ds Max 2012 is one of several professional applications that utilize DirectX. Its function is similar to that of Autodesk Maya. The test had been run with the help of SPECapc benchmark using DX9 viewport. The graph is based on GPU Composite data.

NVIDIA provides further tuning for professional applications with their special plug-in drivers. Most notable examples are performance accelerator drivers and PhysX plug-in, a powerful physics engine that enables real time simulation with the help of a GPU. Visit NVIDIA's website for more information at <http://www.nvidia.com/object/gpu-accelerated-applications.html>.

GPU Composite—Relative Performance

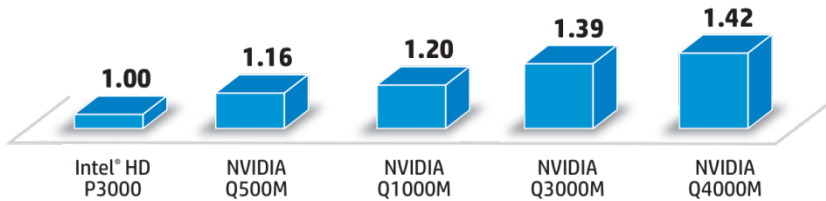


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HP recommends Windows® 7.

Autodesk AutoCAD 2010

The second entry in the professional DirectX field is Autodesk AutoCAD 2010, a 2D and 3D drafting application. Catalyst 5.3 was used to compile the data. Intel®'s HD P3000 can handle pure polygons without textures and effects reasonably well, even some 3D. The performance increases with each following card and Q4000M being able to handle most tasks in real-time 3D mode.

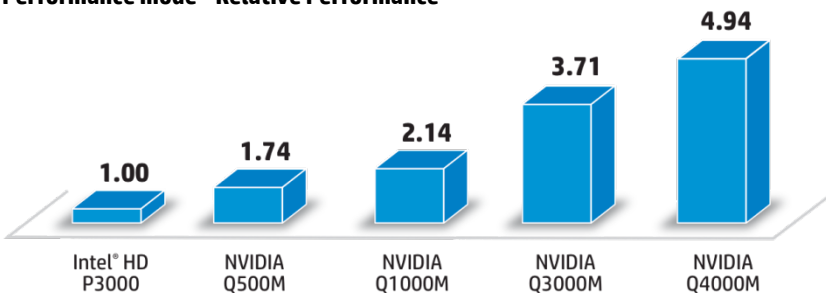


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3DMark Vantage

The 3DMark Vantage benchmark shown below is a good indicator of DX gaming performance. An enthusiast gamer will be thrilled with the ability of 3000M and 4000M. With the help of NVIDIA's Full-Scene Antialiasing (up to 64x), GPU Tessellation with Shader Model 5, and HDR technologies the games will look more realistic and provide immersive experience.

Performance mode - Relative Performance



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Additional resources

hp.com/go/whitepapers

hp.com/support/Z1_manuals

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4AA3-9377ENW, August 2012

