

Mac Pro 2008: Performance and Productivity for Creative Pros

Productivity and workflow efficiency of the 2008 Mac Pro with the Adobe Creative Suite 3 and QuarkXPress 7

Pushing the Limits of Hardware

The Mac Pro, which was first introduced in 2006, has evolved over the years to take in account the requirements of the creative community around the world, **driving hardware trends such as multiprocessor architectures, graphics performance and expansion.** Combined with Leopard, the latest release of Mac OS X, the new Mac Pro continues to redefine the creative work environment.

Over the years, creative workflows have evolved considerably, moving from mainly print-centric production environments to multiple media and increasingly diverse output channels. While five or ten years ago, the separation between different disciplines were relatively clear-cut, the same is not true any more today.

In many cases, the same creative professionals who work on display advertisements, for instance, will also have to tackle interactive content, digital video, web development, 3D rendering and audio production.

As a result, the hardware requirements for the creative workstation have grown dramatically in terms of media diversity as well as concerning quantity and size of the files that need to be managed and processed.

About this Report

This report analyzes the results of a benchmark project conducted by Pfeiffer Consulting for Apple, **comparing performance and workflow productivity of the 8-core 2.8GHz and 3.2GHz Mac Pro introduced in early 2008 with earlier Macintosh models** including the dual 2.0GHz Power Mac G5, the Power Mac G5 Quad, as well as the previous generation Mac Pro. To find out more about the benchmarks and hardware configurations, please refer to the *Methodology* sidebar on page 3.

The project included system benchmarks as well as performance and productivity measures conducted with Adobe Creative Suite 3 as well as QuarkXPress 7.3.1. Productivity benchmarks cover **workflow productivity and inter-application integration measures.**

In addition, this report takes a closer look at the hardware differences between the latest Mac Pro and previous versions of the Mac Pro family. (See page 6.)

If you are interested in a detailed discussion of hardware configurations and benchmark methodology, as well as complete results of all benchmarks, please download the complete **Mac Pro 2008 Benchmark Report** at www.pfeifferreport.com.

Major Findings

- The 2008 Mac Pro provides **an optimized hardware platform** with increased hardware performance and greater memory bandwidth than earlier models.
- Based on the benchmarks conducted for this project, **the 2008 Mac Pro offers a clear increase in performance and productivity over the previous generation Mac Pro** and older Macintosh computers.
- The 2008 Mac Pro **brings extended multiprocessing architectures to the mainstream** by providing eight processing cores in almost all configurations.

About Pfeiffer Consulting

- Pfeiffer Consulting is an **independent technology research institute and consulting operation** focused on the needs of publishing, digital content production, and new media professionals.
- Download the complete **Mac Pro 2008 Benchmark Report** at www.pfeifferreport.com.

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Mac Pro: Key Performance Data

Major Points

- Based on the benchmarks conducted for this project, **the Mac Pro released in early 2008 represents a highly optimized computing platform that increases performance and productivity** over previous Macintosh models.
- **The 2008 Mac Pro offers a clear increase in performance over the previous generation Mac Pro, the Power Mac G5** and older Macintosh computers in basic system benchmarks, as well as in application-based performance measures.
- Efficiency of key applications such as Photoshop CS3 **is significantly better on the latest Mac Pro** than on older models.

Performance vs. Productivity

Performance and productivity are completely different notions and rely on different aspects of a computing platform. Processor frequency, memory speed and bandwidth, disk performance, graphics architecture, and, of course, the operating system all play together to deliver a satisfying and efficient user experience. **Only if all hardware and software components work together in an optimal way can we expect maximum efficiency and productivity.**

In other words, number-crunching prowess is not the only factor that counts. A computer can be very powerful at complex computations such as 3D rendering, yet deliver a poor overall productivity profile. **It is for this reason that the benchmarks conducted for this project are comprised of a wide variety of tests and efficiency measures** ranging from aspects such as application launch and file copy to pure performance measures of cutting-edge applications such as Photoshop CS3, as well as workflow productivity measures of common tasks.

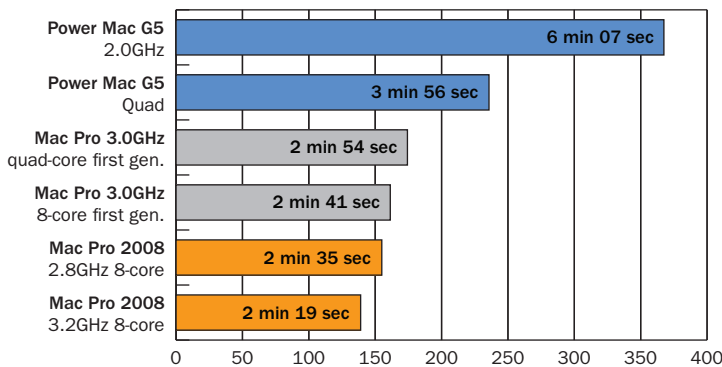
How Does the Latest Mac Pro Stack Up?

The benchmarks conducted for this report compare the 8-core 2.8GHz and 3.2GHz Mac Pro released in early 2008 with the previous generation Mac Pro, as well as older Power Mac models. The test results **clearly show the increase in performance** that the new hardware platform procures.

Mac Pro 2008: Key Performance and Productivity Data

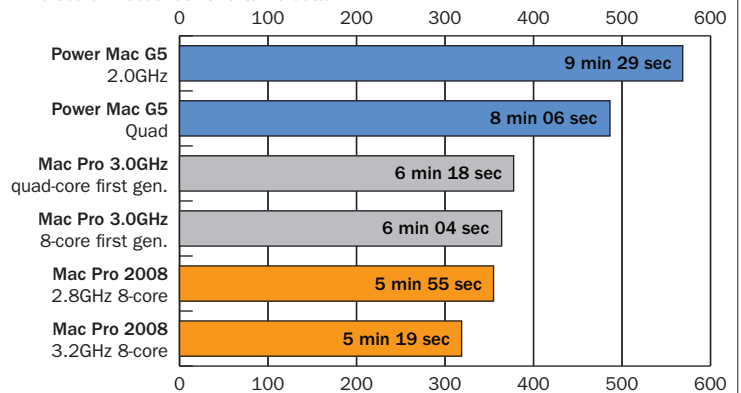
Photoshop CS3 Performance (Total Time)

Time scale in seconds. Shorter is better.



All Workflow Benchmarks (Total Time)

Time scale in seconds. Shorter is better.



Performance increases in frequently performed, time-consuming operations are very important in deadline-driven work environments. The chart on the left shows the cumulative time of all Photoshop performance benchmarks in this benchmark project, including common operations such as unsharp masking,

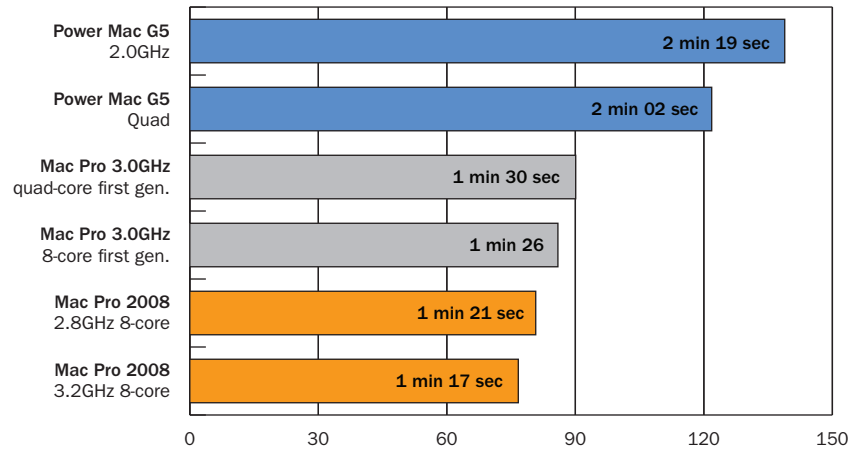
resampling and image rotation performed with files of varying sizes. The chart on the right shows the cumulated time of all workflow benchmarks. Both sets of data underline the performance and productivity increase of the latest generation Mac Pro over older Macintosh models.

Methodology

- This benchmark project was conducted by Pfeiffer Consulting for Apple. It analyzes the performance and productivity of the **8-core 2.8GHz and 3.2GHz Mac Pro released in early 2008**, as compared with the **quad-core and 8-core 3.0GHz Mac Pro** released in 2006 and 2007, the **2.5GHz Power Mac G5 Quad**, released in the Fall of 2005, the first-generation **dual 2.0GHz Power Mac G5** introduced in 2003 and the **dual 1.25GHz Power Mac G4** introduced in 2002.
- **Productivity benchmarks** were conducted using a set of workflow and application integration measures executed with Adobe Creative Suite 3 and QuarkXPress 7.3.1.
- **Benchmarks were conducted on standard hardware configurations.** All computers were equipped with 4GB of RAM. The Power Mac G4 was equipped with 2GB of RAM, the maximum amount of RAM supported by this model.
- All systems were equipped with the **standard hard drives shipped with the computer.** All hard drives were reformatted using a single partition before testing.
- All benchmarks were run on a **standard, unmodified installation of Mac OS X 10.5.1 Leopard.**
- This benchmark analysis report **presents key data from the benchmark project and focuses on the comparison of the Mac Pro with two generations of Power Mac G5.** To view the complete results, including the data concerning the dual 1.25GHz Power Mac G4 introduced in 2002, as well as descriptions of the benchmark methodology, and detailed system configurations, **please download the complete benchmark report from <http://www.pfeifferreport.com>.**
- For more information, please contact **research@pfeifferreport.com**.

Basic System Tests (Total Time)

Time scale in seconds. Shorter is better.



Basic system benchmarks measure the time necessary for frequent system tasks such as application launch and re-launch. The 2008 Mac Pro is clearly more efficient in these tests: the 3.2GHz model is almost twice as fast as the 2.0GHz Power Mac G5.

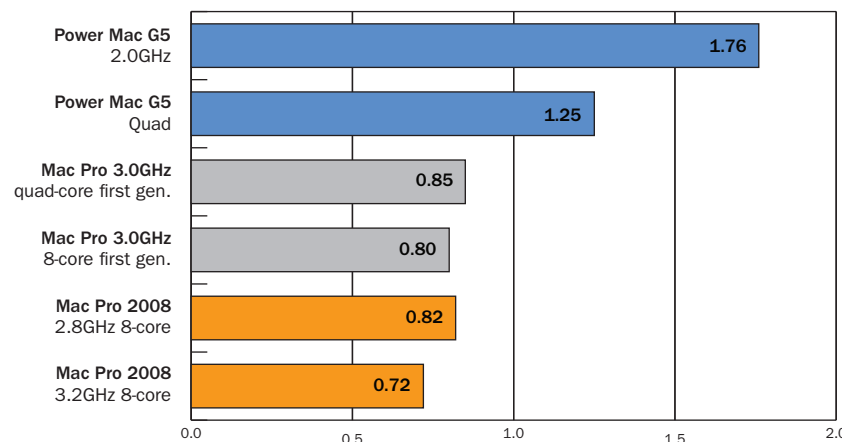
It is interesting to note that despite a relatively modest increase in processor speed **the 2008 Mac Pro is clearly faster than the previous generation Mac Pro.** Compared with older models such as the Power Mac G5 Quad, it is almost twice as fast in many tests.

A good example for this is the Photoshop Filter Index benchmark. Different Photoshop filters draw upon varying hardware aspects; for example, some use mainly floating point calculations, others rely on integer performance, yet others mainly on memory bandwidth. This makes the Photoshop Filter Index a good indicator of the overall performance of a computer. **The 3.2GHz Mac Pro performed significantly better than older models, scoring 0.72 seconds per filter, compared with 0.80 seconds for 3.0 GHz 8-core Mac Pro released in 2007.**

In other words, the Mac Pro hardware platform **keeps evolving at a significant pace, and shows coherent performance and productivity increases over previous models.** Combined with the Adobe Creative Suite 3 and QuarkXPress 7.3.1, the 8-core 2.8GHz and 3.2GHz Mac Pro offer a measurably faster and more productive hardware platform than older Macintosh models, and **contribute to redefining the creative workflow in terms of efficiency and performance.**

Photoshop Filter Index (Average)

Time scale in seconds. Shorter is better.



The Photoshop Filter Index benchmark measures the time necessary to compute 103 Photoshop filters in succession on a 10MB image file. The times displayed in this chart show the average time per filter.

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Workflow Productivity For Creative Professionals

Major Points

- **Creative workflows have become extremely complex over the years:** The size of the files that are commonly used has grown considerably, and the number of documents in the typical project has soared. This has created a number of new processing and management challenges for users.
- In all workflow benchmarks conducted for this project, **the 2008 Mac Pro offers clear productivity advantages** over older Macintosh models.
- The 3.2GHz Mac Pro offers **clearly increased performance and productivity** over the 2.8GHz model, and is **up to 3 times faster than the 2.0GHz Power Mac G5**.

An Increasingly Complex Work Environment

Over the years, creative workflows have become increasingly complex. Designers now have to routinely handle a variety of different media types, as assignments span a growing number of potential output channels for content and media.

Even seemingly straightforward market segments such as digital imaging have reached a level of maturity that requires a set of sophisticated and diversified tools. **As different media types are increasingly interconnected, the sophistication and the complexity of the workflow-reality creative professionals face in their average project has evolved dramatically.**

As a result, efficiency has to some extent displaced features as the main driver for tool adoption. As everyday deadline pressure increases, **productivity has become a predominant concern for creative professionals around the globe.**

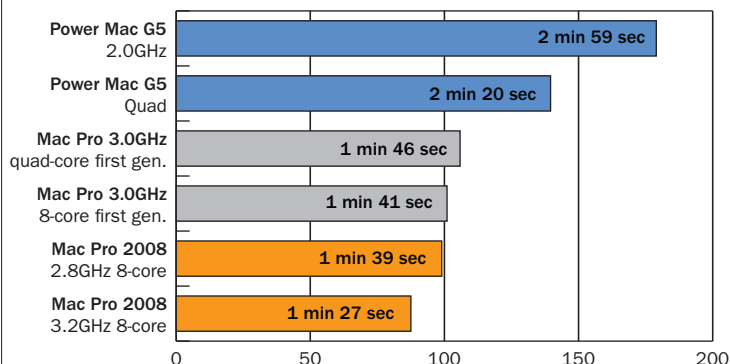
The Challenges

The size of the files we create and use has grown enormously over the years, image files can easily weigh several hundred megabytes, a complete project can take several gigabyte of data. **And size is not the only issue,** we also have a seemingly ever-increasing number of documents we need to manage, store, open, sort and access. And all of this needs to be done as fast as possible.

Design Workflow: InDesign CS3 and QuarkXPress 7.3.1

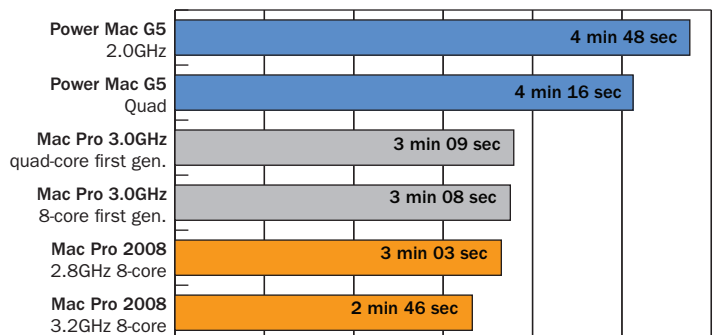
InDesign CS3 Workflow Benchmarks: Total Time

Time scale in seconds. Shorter is better.



QuarkXPress 7.3.1 Workflow Benchmarks: Total Time

Time scale in seconds. Shorter is better.



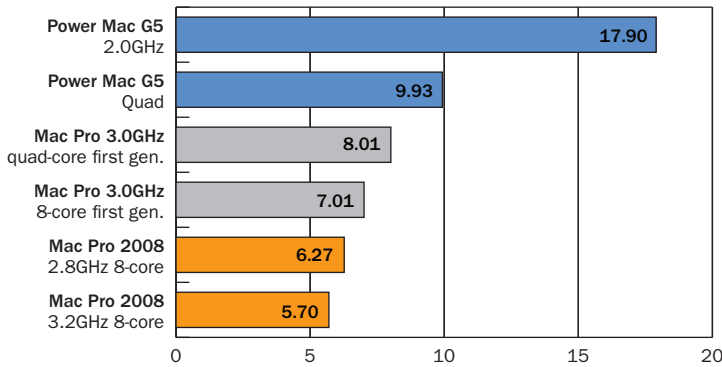
Design workflow benchmarks measured a variety of common workflow steps and procedures, such as the time to execute a Photoshop round-trip between a page layout program and the imaging application. Results for these tests show the speed of the applications as well as the fluidity

of the inter-application integration. Both Mac Pro models introduced in 2008 were clearly more efficient in these tests than older Macintosh computers. Tests were conducted with InDesign CS3, QuarkXPress 7.3.1, Photoshop CS3 and Illustrator CS3.

Photoshop Expert Options

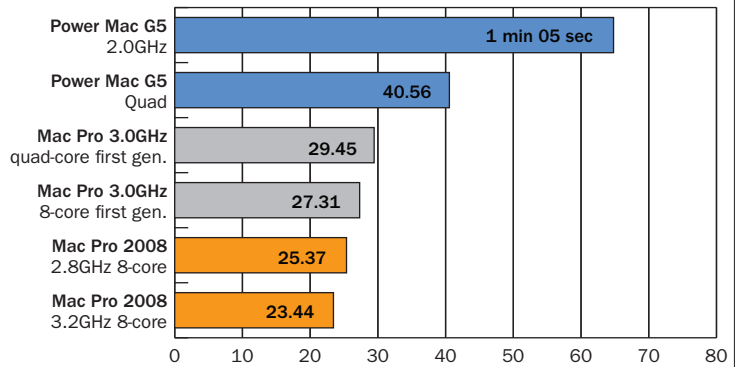
Rotate Canvas (300MB Multi-Layered File)

Time scale in seconds. Shorter is better.



RAW Conversion (10 x 13MP File)

Time scale in seconds. Shorter is better.



Photoshop is one of the most widely used software packages for creative professionals, and offers a considerable breadth of features targeting a wide variety of users. Some of these specialized options have become the backbone of specific creative workflows, and their efficiency can have a strong impact on

the overall productivity. Several such actions or tasks (such as manipulating complex, multi-layered image files, or the conversion of increasingly widely used Raw files from digital cameras) were covered in this benchmark project. The charts show individual results for two of these tests.

About the Workflow Benchmarks

The workflow efficiency measures conducted for this benchmark project included a variety of common steps and workflow sequences frequently encountered in creative workflows.

Workflow integration benchmarks covered **the time necessary to perform a round-trip between a page layout application (InDesign or QuarkXPress) and graphics applications such as Photoshop CS3 and Illustrator CS3**, measuring the time necessary to switch between programs, open a file, apply a simple modification, save the changes, and switch back to update the design document.

The Basic Imaging Workflow benchmark focuses on efficiency within Photoshop CS3, and measures the time necessary to open a file, resample it to a specific size, apply RGB to CMYK color conversion, perform an Unsharp Mask filter, and save the file under another name.

Workflow efficiency measures include the time necessary for the operator to perform menu selection and other user interface operations required to complete the tasks. This means that **workflow benchmarks cover not only program efficiency, but also measure overall fluidity of the computing environment.**

The Importance of Integration

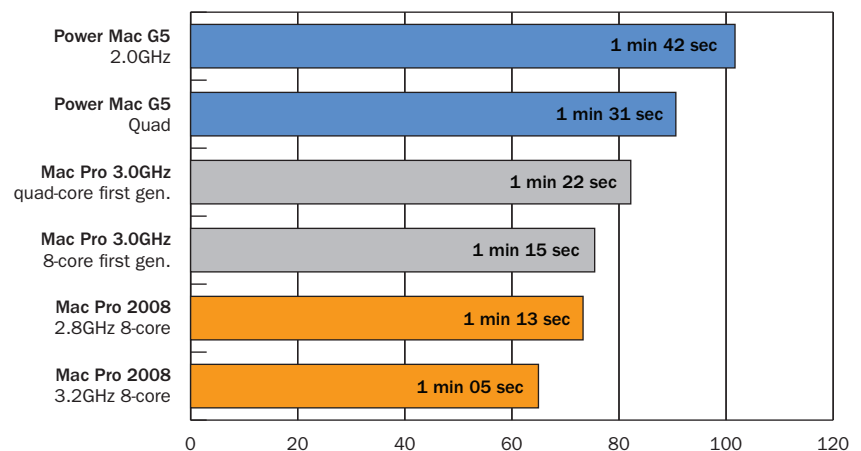
Integration is one of the most important aspects of workflow productivity on any computer: Most creative professionals use a variety of different tools together, rather than individually, moving back and forth between several applications. **In this process, the fluidity and speed of integration is at least as important as the processing speed of one particular program.**

So how does the Mac Pro compare with older Macintosh models in productivity measures where the complexity of the individual task is not the predominant factor? **The workflow benchmarks conducted for this project show that the 2008 Mac Pro is clearly more productive than previous Mac Pro models.** For example, the 3.2GHz Mac Pro managed to complete the Basic Imaging Workflow Benchmark in just over 1 min. 5 seconds. By comparison, the 3.0GHz Mac Pro introduced in 2007 took 17% longer for the same test; the Power Mac G5 Quad, the fastest PowerPC-based Macintosh ever produced, required almost 40% longer to complete the same benchmark. (See chart below.)

Basic Imaging Workflow

Basic Imaging Workflow Benchmark (Total Time)

Time scale in seconds. Shorter is better.



This benchmark measures the time necessary to complete a set of basic image processing operations common in design and publishing workflows.

Evolutions of the Hardware Platform

Major Points

- Performance and productivity of a hardware platform rely increasingly on **the perfect integration of a variety of different hardware aspects**.
- The Mac Pro introduced in early 2008 offers **significantly improved memory throughput** over older models.
- By moving the majority of configurations to 8-core processors, **the 2008 Mac Pro brings extended multiprocessing architectures to the mainstream**. In addition, Mac OS X Leopard provides increased support for multi-processing.

Looking Beyond Processor Speed

The results of this benchmark project underline a long-term trend in the personal computer industry: **Performance and productivity of a hardware platform rely of course on the clock-speed of the central processors, but increasingly also on other hardware aspects** such as memory bandwidth, system bus speed, L2 cache, mass storage architecture, and graphics subsystem among many others. Sophisticated operating system support for advanced hardware features such as multiple processor cores is also essential to optimize productivity.

The Mac Pro introduced in early 2008 is a case in point. At 3.2GHz, the processor speed of the new high-end configuration is only slightly increased over the previous top-of-the-line model, the 3.0 GHz 8-core Mac Pro released a year earlier, **yet performance and productivity are clearly and consistently superior on the newer model**, as the benchmark results from this report show.

In other words, improvements across the entire system architecture are delivering greater performance and capabilities to the end user. The new Mac Pro benefits from increased L2 cache (a total of 12MB, or 6MB of shared L2 cache per pair of cores), as well as the fastest Xeon architecture available, which includes 1600MHz independent frontside buses and 800MHz FB-DIMM memory, that allow significantly greater memory throughput. Plus, the 2008 Mac Pro extends the capabilities of the platform in terms of expansion capabilities as well as concerning key hardware features with advanced graphics options from both ATI and NVIDIA, up to 4TB of internal storage, and high-performance storage options with 15,000rpm SAS drives and the Mac Pro RAID card. Together, these hardware improvements **contribute to make the new model an important evolution of the hardware platform over previous models**, and ensure that the Mac Pro can tackle the challenges of the modern creative workflow.

Mac Pro 2008 Hardware Highlights

Processing	Two 2.8GHz, 3.0GHz or 3.2GHz Quad-Core Intel Xeon 5400 Series ("Harpertown") processors or one 2.8GHz Quad-Core Intel Xeon 5400 Series processor
	L2 Cache: 12MB per quad-core processor (6MB shared per pair of cores)
	128-bit SSE4 vector engine
	64-bit data paths and registers
	1600MHz, 64-bit dual independent frontside buses
Memory	800MHz DDR2 ECC FB-DIMM memory
	256-bit-wide memory architecture
	8 FB-DIMM slots, for up to 32GB of fully buffered memory
Graphics and displays	Double-wide 16-lane PCI Express 2.0 slot (Supports two 30-inch Apple Cinema HD displays)
Storage	Four 3.5-inch hard drive bays on independent 3Gb/s Serial ATA channels
	Up to 4TB of internal storage
	Optional 15,000 RPM SAS (serial attached SCSI) drives and Mac Pro RAID card