Render faster. Create more.

Dell Precision™ T7600 workstation with NVIDIA® Quadro® graphics outperformed Apple® Mac Pro® by up to 96.5% on video production tasks

Those who use video editing software increasingly rely on powerful workstations to do their work. The time these systems take to complete compute-intensive tasks such as video renderings varies considerably. Selecting one that completes tasks quickly can save workers an enormous amount of time.

In our labs, PT tested a Dell Precision™ T7600 workstation with NVIDIA® Quadro® graphics and an Apple® Mac Pro® system with ATI Radeon™ graphics to determine the relative speed at which they could perform a variety of video-rendering tasks. While the systems were priced comparably, the Dell system accomplished the tasks in a fraction of the time it took the Apple system, with time savings of up to 96.5 percent.

This dramatic difference would be very noticeable to a video professional performing these kinds of tasks on a daily basis. Less time waiting for your system to finish a job means greater productivity and a greater return on your investment.

QUICKER RENDERING SAVES TIME AND BOOSTS PRODUCTIVITY

On both the Dell Precision T7600 and Apple Mac Pro systems, we completed a set of video-rendering tasks using Adobe® Premiere® Pro CS5.5. As Figure 1 shows, the Dell Precision T7600 needed only a fraction of the time the Mac Pro needed to complete the rendering tasks.

Figure 1: The Dell Precision T7600 was over 12 times faster than the Apple Mac Pro needed at completing the rendering tasks. Lower numbers are better.

Time to complete a set of video-rendering tasks

System	Minutes
Dell Precision T7600	2.6
Mac Pro Desktop	32.4
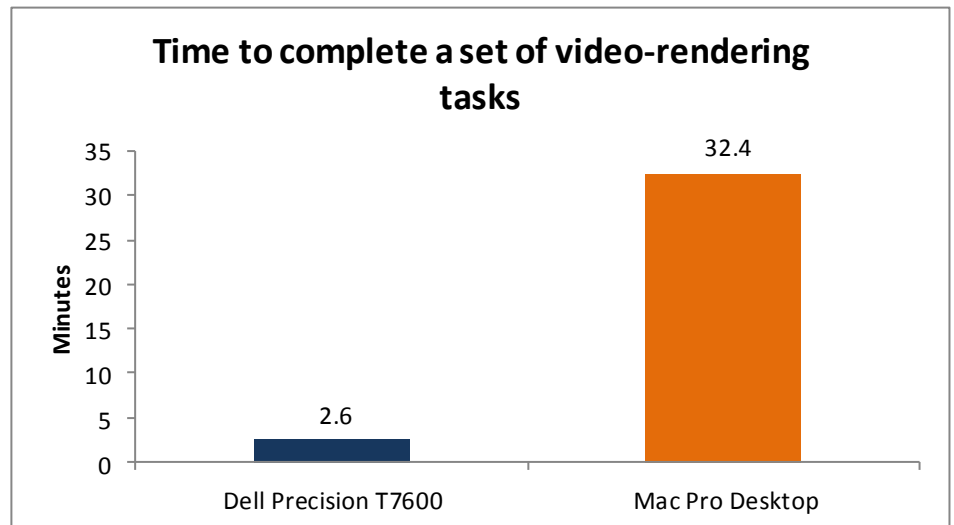
As Figure 2 shows, the systems were configured and priced comparably. The Dell Precision T7600 price included a three-year warranty, while the Apple Mac Pro price includes the cost of a three-year AppleCare plan for $249. Appendix A provides more detailed configuration information for the two systems.

	Dell Precision T7600	**Apple Mac Pro**
Processor	Dual Intel® Xeon® Processor E5-2687W (3.10GHz, 20MB Cache, 8 cores, 16 threads, 8.00 GT/s)	Dual Intel® Xeon® Processor X5670 (2.93GHz, 12MB Cache, 6 cores, 12 threads, 6.40 GT/s)
RAM	32GB 4 x 8GB, 1600 MHz, DDR3 RDIMM,ECC	64GB 8 x 8GB 1333 MHz, DDR3 RDIMM, ECC
HDD	2 x 256GB SSDs RAID 0 2 x 500GB 7200 RPM SATA RAID 0	2 x 512GB SSDs RAID 0 2 x 512GB SSDs RAID 0
Graphics	2.5GB NVIDIA Quadro 5000	1GB ATI Radeon HD 5870
DVD-ROM	6X Blu-ray Disc Burner	18X SuperDrive
Price (excluding tax and shipping)	$12,317	$12,448
Years of warranty included in base price	3	Includes cost of AppleCare Protection Plan for 3 years for an additional $249.

Figure 2: Configuration, pricing, and warranty information for the systems we tested. Prices, which exclude tax and shipping, came from www.dell.com and www.apple.com on August 14, 2012.

The Dell Precision T7600 workstation's performance advantage, along with the more attractive warranty, makes it an excellent, cost-effective choice for anyone whose workday includes video-rendering tasks.

Also, while the Dell Precision T7600 system closely approximates the specifications and pricing of the Apple Mac Pro, Dell also provides workstations that scale much higher in terms of processor speed, RAM capacity, and graphics cards. These would likely deliver even greater performance advantages than the system we tested. Since the start of this test, Apple has released a version of the Mac Pro with a slightly faster processor. While there are several notable differences in the hardware components between the two systems, they are not enough to explain the significant performance gap between them.

The following section provides more detailed test results and Appendix B provides the specifics of our testing.

OUR FINDINGS IN DETAIL

As Figures 3 and 4 show, the Dell Precision T7600 workstation performed Adobe Premiere Pro video-rendering tasks in a fraction of the time that the Apple Mac Pro did, reducing rendering time by as much as 96.5 percent, 28.8 times faster. To render an entire work area for an AVCHD four-layer video, the Dell Precision T7600 took only 13 seconds to do what it took the Apple Mac Pro more than 6 minutes to accomplish.
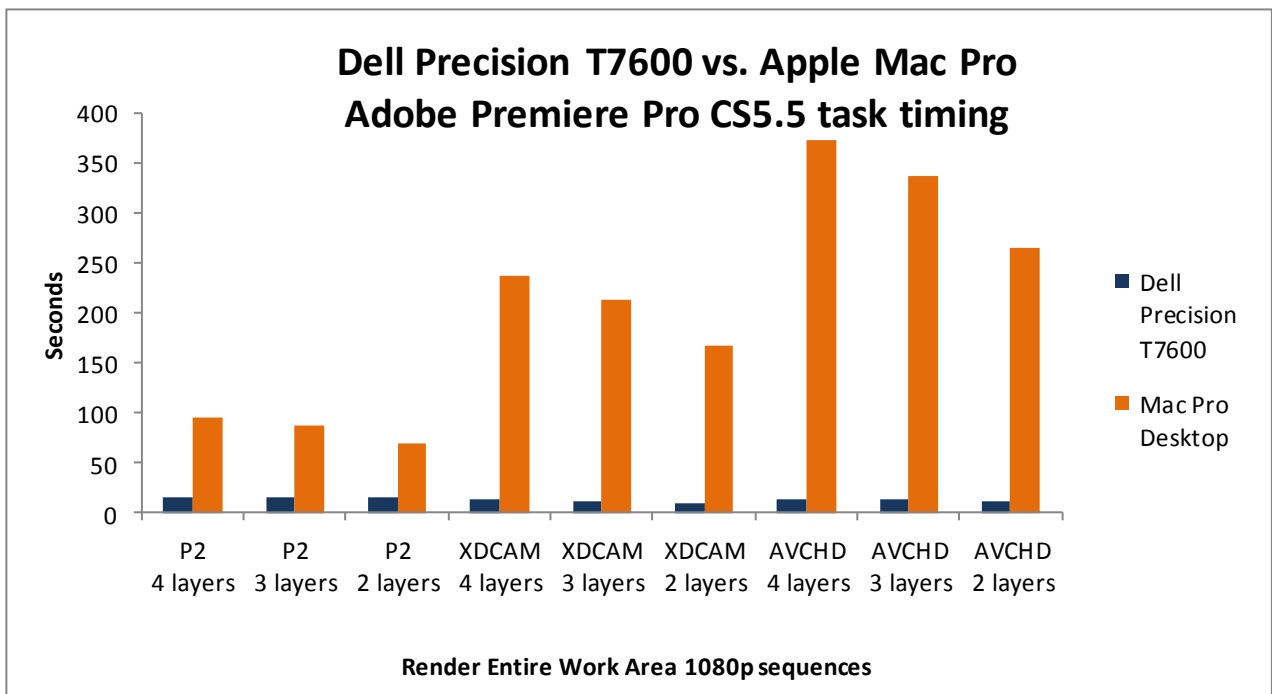

Figure 3: The time the two systems took to render the entire work area. Lower numbers are better.

Video-rendering performance comparison: Dell Precision T7600 workstation vs. Apple Mac Pro

A Principled Technologies test report **3**

Dell Precision T7600 vs. Apple Mac Pro
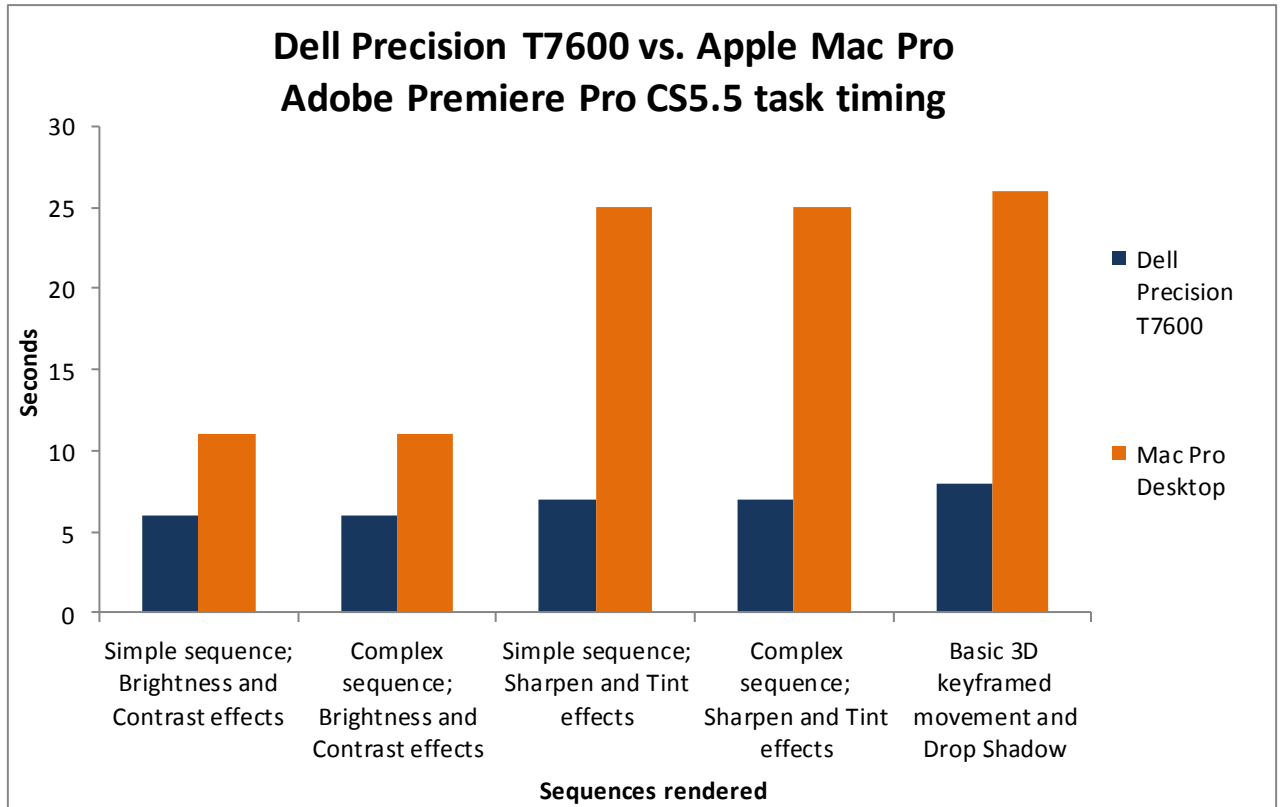## Adobe Premiere Pro CS5.5 task timing

Figure 4: The time the two systems took to render the workload. Lower numbers are better.

Figure 5 provides the time it took, in seconds, for the systems to complete each task, along with how many times faster the Dell Precision T7600 completed the task delivered compared to the Apple Mac Pro.

Premiere Pro CS5.5	Dell Precision T7600	Apple Mac Pro	How many times faster was the Dell Precision T7600?
Render Entire Work Area 1080p			
P2 sequence - 4 video layers	16	96	6.0
P2 sequence – 3 video layers	16	87	5.4
P2 sequence - 2 video layers	15	69	4.6
XDCAM sequence - 4 video layers	13	237	18.2
XDCAM sequence - 3 video layers	12	214	17.8
XDCAM sequence - 2 video layers	10	168	16.8
AVCHD sequence - 4 video layers	13	374	28.8
AVCHD sequence - 3 video layers	13	337	25.9
AVCHD sequence - 2 video layers	12	266	22.2
Perform other common tasks			
Render simple sequence with Brightness and Contrast effects	6	11	1.8
Render complex sequence with Brightness and Contrast effects	6	11	1.8

Video-rendering performance comparison: Dell Precision T7600 workstation vs. Apple Mac Pro

A Principled Technologies test report **4**

Premiere Pro CS5.5	Dell Precision T7600	Apple Mac Pro	How many times faster was the Dell Precision T7600?
Render simple sequence with Sharpen and Tint effects	7	25	3.6
Render complex sequence with Sharpen and Tint effects	7	25	3.6
Render sequence with Basic 3D keyframed movement and Drop Shadow	8	26	3.3
Total time in seconds	154	1,946	12.6
Total time in minutes	2.6	32.4	

Figure 5: Summary of times, in seconds, the systems needed to complete the test tasks. Lower numbers are better (except for percentage win).

CONCLUSION

When you work with graphics and video day in and day out, choosing the right system is paramount. A system that not only produces top-of-the-line images but also does so quickly and efficiently can shave hours off your day, leaving you more productive and less frustrated with waiting for your system to do its job.

In our tests, the Dell Precision T7600 workstation was able to handle many typical graphics rendering tasks more efficiently than the comparably priced Apple Mac Pro. By being able to complete common tasks up to 28.8 times faster, the Dell Precision T7600 lets you spend more time being creative and less time waiting.

Video-rendering performance comparison: Dell Precision T7600 workstation vs. Apple Mac Pro

A Principled Technologies test report 5

APPENDIX A – SYSTEM CONFIGURATION INFORMATION

Figures 6 provides detailed configuration information for the test systems.

System	Dell Precision T7600	Apple Mac Pro
General		
Number of processor packages	2	2
Number of cores per processor	8	6
Number of hardware threads per core	2	2
System power management policy	Dell	Apple default
Processor power-saving option	Enhanced Intel SpeedStep Technology	Enhanced Intel SpeedStep Technology
CPU		
Vendor	Intel	Intel
Name	Xeon E5 2687W	Xeon X5670
Model number	2687W	X5670
Socket type and number of pins	LGA 2011	FCLGA1366
Core frequency (GHz)	3.10	2.93
L1 cache	32 KB + 32 KB (per core)	32 KB + 32 KB (per core)
L2 cache	256 KB (per core)	256 KB (per core)
L3 cache	20 MB (shared)	12 MB (shared
Platform		
Vendor	Dell	Apple
Motherboard model number	0VHRW1	Intel 6 series chipset
Motherboard chipset	Sandy Bridge-E	Intel 6 series chipset
BIOS name and version	Dell Inc. A01 (06-06-2012)	Apple Inc. MP51.007F.B03
Memory module(s)		
Vendor and model number	Samsung M393B1K70DH0-CK0	Hynix HMT31GR7BFR4C-H9
Type	PC3-12800	PC3 10600
Speed (MHz)	1,600	1,333
Speed running in the system (MHz)	1,600	1,333
Timing/Latency (tCL-tRCD-tRP-tRASmin)	11-11-11-28	9-9-9-24
Size (MB)	8,192	8,192
Number of memory module(s)	4	8
Total amount of system RAM (GB)	32	64
Chip organization (single-sided/double-sided)	Double-sided	Double-sided
Channel (single/dual)	Quad	Dual
Hard disk 1		
Vendor and model number	Samsung PM83	Toshiba THNSNC512GBSJ
Size (GB)	256	512
Type	SSD 6.0 Gb/s	SSD 3.0 Gb/s
Controller	Intel C600/X79 series chipset	Intel 6 series chipset
Driver	Intel 9.2.3.1013 (03/16/2011)	N/A

System	Dell Precision T7600	Apple Mac Pro
Hard disk 2		
Vendor and model number	Samsung PM83	Toshiba THNSNC512GBSJ
Size (GB)	256	512
Type	SSD 6.0 Gb/s	SSD 3.0 Gb/s
Controller	Intel C600/X79 series chipset	Intel 6 series chipset
Driver	Intel 9.2.3.1013 (03/16/2011)	N/A
Hard disk 3		
Vendor and model number	Western Digital Scorpio Black WD5000BPKT-75PK4T0	Toshiba THNSNC512GBSJ
Size (GB)	500	512
Buffer size (MB)	16	N/A
RPM	7,200	N/A
Type	SATA 3.0 Gb/s	SSD 3.0 Gb/s
Controller	Intel C600/X79 series chipset	Intel 6 series chipset
Driver	Intel 9.2.3.1013 (03/16/2011)	N/A
Hard disk 4		
Vendor and model number	Western Digital Scorpio Black WD5000BPKT-75PK4T0	Toshiba THNSNC512GBSJ
Size (GB)	500	512
Buffer size (MB)	16	N/A
RPM	7,200	N/A
Type	SATA 3.0 Gb/s	SSD 3.0 Gb/s
Controller	Intel C600/X79 series chipset	Intel 6 series chipset
Driver	Intel 9.2.3.1013 (03/16/2011)	N/A
Operating system		
Name	Windows 7 Professional	Mac OS X Lion
Build number	7601	10.7.4
Service Pack	SP1	N/A
File system	NTFS	Journaled HFS+
Kernel	ACPI x64-based PC	Darwin 11.4.0
Language	English	English
Microsoft DirectX® version	11	N/A
Graphics		
Vendor and model number	NVIDIA Quadro 5000	ATI Radeon HD 5870
Type	Discrete	Discrete
Chipset	Quadro 5000	Radeon HD 5870
BIOS version	70.0.67.0.3	N/A
Total available graphics memory (MB)	6,363	1,024
Dedicated video memory (MB)	2,560	N/A
System video memory (MB)	0	N/A
Shared system memory (MB)	3,803	N/A
Resolution	1280 x 1024 x 32 bit	1280 x 1024 x 32 bit
Driver	NVIDIA 8.17.12.7619 (10/06/2011)	N/A

Video-rendering performance comparison: Dell Precision T7600 workstation vs. Apple Mac Pro

A Principled Technologies test report 7

System	Dell Precision T7600	Apple Mac Pro
Sound card/subsystem		
Vendor and model number	NVIDIA High Definition Audio	Intel High Definition Audio
Driver	1.2.24.0 (07/07/2011)	N/A
Ethernet 1		
Vendor and model number	Intel 82574L Gigabit	Intel 10/100/1000BASE-T Ethernet
Driver	Microsoft 11.0.5.22 (04/06/2009)	N/A
Ethernet 2		
Vendor and model number	Intel 82579LM Gigabit	N/A
Driver	Intel 11.15.12.0 (11/30/2011)	N/A
Wireless		
Vendor and model number	N/A	AirPort
Driver	N/A	N/A
Optical drive(s)		
Vendor and model number	Matshita UJ260	Intel HL-DT-ST GH61N
Type	BD-RE	DVD-RW
USB ports		
Number	13	5
Type	8 x USB 2.0, 2 x USB 3.0, 3 x USB 2.0 Internal	2.0
Other	Media card reader, 2 x HDMI	N/A
IEEE 1394 ports		
Number	2	4
Monitor		
LCD type	SXGA	SXGA
Screen size	17"	17"
Refresh rate (Hz)	60	60

Figure 6: System configuration information for the Dell Precision T7600 and Apple Mac Pro.

Video-rendering performance comparison: Dell Precision T7600 workstation vs. Apple Mac Pro

A Principled Technologies test report **8**

APPENDIX B - HOW WE TESTED

We conducted the following Adobe Premiere Pro CS5.5 tests:

- Render P2 Sequence
- Render XDCAM Sequence
- Render AVCHD Sequence
- Render simple sequence with Brightness and Contrast effects
- Render complex sequence with Brightness and Contrast effects
- Render simple sequence with Sharpen and Tint effects
- Render complex sequence with Sharpen and Tint effects
- Render sequence with Basic 3D keyframed movement and Drop Shadow

All tests are hand-timed and require a stopwatch.

Rendering Entire Work Area

1. Double-click the desired sequence project file.
2. When the Scratch Disk dialog opens, click Yes.
3. Navigate to Footage→P2 and select the requested file.
4. Click Open.
5. When the project opens, prepare the stopwatch.
6. Click Sequence, and simultaneously select Render Entire Work Area from the drop-down menu and start the stopwatch.
7. Stop the stopwatch when the Rendering Progress window disappears.
8. Close Adobe Premiere and repeat steps 1 through 8 two more times.
9. Repeat the test for three-and two-stream configurations by deselecting the fourth stream for a three-stream run and deselecting the fourth and third streams for a two-stream run.
10. Repeat the test for XDCAM and AVCHD sequences.

Performing other common tasks in Premiere CS5.5

1. Double-click the CS5_Benchmarks project file.
2. When the Scratch Disk dialog opens, click Yes.
3. Navigate to Footage→XDCAM, and select the requested file.
4. Click Open.
5. When the project opens, click the desired sequence to highlight it.
6. Prepare the stopwatch.
7. Click Sequence, and simultaneously select Render Entire Work Area from the drop-down menu and start the stopwatch.
8. Stop the stopwatch when the Rendering Progress window disappears.
9. Repeat steps 1 through 8 two more times.
10. Repeat the test for each CS5 Benchmark sequence.

ABOUT PRINCIPLED TECHNOLOGIES

Principled Technologies, Inc.
1007 Slater Road, Suite 300
Durham, NC, 27703
www.principledtechnologies.com

We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.

Video-rendering performance comparison: Dell Precision T7600 workstation vs. Apple Mac Pro

A Principled Technologies test report 10