CASE STUDY
Intel® Xeon® processor 5600 series
Enterprise Server
Performance for Data-Intensive Computing

Shrek's Law Meets Moore's Law

DreamWorks Animation brings imagination to life with Intel® Xeon® processor 5600 series

With the stakes higher for each new computer-generated (CG) animated 3D feature film, DreamWorks Animation has an ever-increasing need for computing performance. Using Intel® Xeon® processor 5600 series-based platforms, the studio is achieving more than a 60 percent performance increase over previous-generation systems. DreamWorks Animation is using that boost in performance to help deliver two stereoscopic 3D animated films in 2011: Kung Fu Panda 2* and Puss in Boots*.

"Taking advantage of technological innovation is the key to enabling our overall business ambitions. By working closely with technological leaders such as Intel, DreamWorks Animation is able to stay on the cutting edge. Our collaboration with Intel and its new technologies is allowing our artists to be more creative."

– Ed Leonard
CTO
DreamWorks Animation

CHALLENGE

- **High-performance, stereoscopic, 3D CG animation.** DreamWorks Animation artistic teams are ambitious and continually need more compute power, including performance, throughput, and capacity, to produce increasingly visually rich characters, environments, and effects in high-quality, stereoscopic 3D.

SOLUTIONS

- **Intel Xeon processors.** DreamWorks Animation optimizes its data centers and maximizes rendering throughput with render farms of the newest HP ProLiant* G7, G6, and G5 server blades powered by Intel Xeon processors. Animators and filmmakers use Intel Xeon processor-based workstations to work more interactively. Servers and workstations run Red Hat Enterprise Linux* V5, and servers are configured with 48 GB of RAM.
- **Collaboration.** DreamWorks Animation uses Intel® visual computing software tools and works with Intel software experts to optimize its applications for Intel technologies.

IMPACT

- **Twice the throughput per processor.** The Intel Xeon processor 5600 series more than doubles the rendering throughput per processor of previous generations while improving density and energy efficiency.
- **Unleashed creativity.** Animators and filmmakers shorten the cycle time between ideas and images. They're better able to bring their creativity to life and elicit the "wow" factor from audiences at the theater and on home entertainment systems.
- **Improved efficiency.** Despite the rising complexity and sophistication of its films, DreamWorks Animation continually improves efficiency and maximizes its production dollars.

Kung Fu Panda 2

In 1965, Intel pioneer Gordon Moore predicted the steady increases in processing performance that we continue to see today. That performance has been a boon to DreamWorks Animation, which has applied the increasing compute power to tell more visually rich stories. This is most apparent from sequel to sequel. In fact, DreamWorks Animation, in deference to Moore's Law, coined "Shrek's Law": Every sequel will need double the render power of the film before it.

The original Shrek movie required five million rendering hours; Shrek 2* required 10 million; and Shrek the Third required 20 million. In 2010, the final Shrek feature film, Shrek Forever After*, consumed over 45 million rendering hours. Continuing that trend, DreamWorks Animation's latest feature, Kung Fu Panda 2, used more than 55 million rendering hours—more than double the original Kung Fu Panda in 2008.

Peak computational loads for Kung Fu Panda 2 were up to 50 percent higher than any previous DreamWorks Animation film

DreamWorks Animation produces all its CG animated feature films in stereoscopic 3D. Each shot in the film is conceived in 3D from the beginning of the filmmaking process, allowing the use of depth to further the storytelling and immerse audiences into the characters' environment.

Add in rising audience expectations and higher-definition devices, and it's no wonder each new film places increasingly heavier demands on server, desktop, and storage infrastructure throughout its development.

"We use technology to enable the creative ambition of our artists and filmmakers," says Ed Leonard, DreamWorks Animation chief technology officer.

Intel Xeon Processors in the Data Center and on the Desktop

To meets its rigorous infrastructure requirements, DreamWorks Animation provisions its data centers with servers and storage systems powered by the latest Intel Xeon technologies. The company was quick to adopt the Intel Xeon processor 5500 series and its energy-efficient performance, as well as the Intel Xeon processor 5600 series, which uses Intel's industry-leading 32nm process technology to provide additional improvements in performance, memory bandwidth, and energy consumption.

Along with server processors, DreamWorks Animation uses the latest Intel Xeon processors in the desktop workstations its artists use to create their visions and bring them to virtual life. The company uses Intel® compilers and tools to performance-tune its rendering and simulation applications, and Intel Xeon processor-based storage solutions to keep pace with swelling data volumes.

"With Kung Fu Panda 2 we hit computational load peaks nearly 50 percent higher than any previous production, and our upcoming films will be higher still," says Leonard. "Intel's contributions to performance and throughput are critical for us in both the software and hardware arenas."

Teamwork Drives Advances

In addition to relying on Intel technologies, DreamWorks Animation has forged a strategic alliance with Intel to achieve DreamWorks Animation's goals and accelerate the evolution of high-quality 3D entertainment. Intel engineers work closely with the studio to support its 3D leadership and advance the company toward its vision of highly interactive toolsets.

The collaboration, along with the end-to-end Intel technologies, pays off for DreamWorks Animation as it continues its drive to lead the digital entertainment industry and delight audiences with riveting, high-quality entertainment experiences. "The work we're doing on Intel's scalable multi-core platforms allows us to deliver the highest-end computer graphics software to our artists," says Lincoln Wallen, head of research and development at DreamWorks Animation. "Our partnership with Intel provides a unique and incredibly valuable collaboration between their technology experts and ours."

SPOTLIGHT ON DREAMWORKS ANIMATION SKG

DreamWorks Animation creates high-quality entertainment, including CG animated feature films, television specials and series, live entertainment properties and online virtual worlds, meant for audiences around the world. The company has world-class creative talent, a strong and experienced management team, and advanced filmmaking technology and techniques. DreamWorks Animation has been named one of the 100 Best Companies to Work For by Fortune magazine for two consecutive years. In 2010, DreamWorks Animation ranked No. 6 on the list. All of DreamWorks Animation's feature films are now being produced in 3D. The company has theatrically released a total of 22 animated feature films, including the franchise properties Shrek, Madagascar, Kung Fu Panda, and How to Train Your Dragon.

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