



**The Fountain** - © 2006, Warner Bros, Regency Enterprise - VFX by Mokko Studio

## **AMD OPTERON™ PROCESSORS HELP MOKKO STUDIO COLLABORATE TO BRING VFX ARTISTRY TO LIFE**

“With 3-D VFX and CGI animation at 2K film resolution, you really need speed. At Mokko Studio, we’re always tracking production time and optimizing processing hours. *Based on our performance rating calculations, the AMD Opteron™ processor is unquestionably the best processor for us.*”

—Danny Bergeron, president and co-founder of Mokko Studio

### **Challenge:**

- At 2K film resolution, visual effects (VFX) and computer-generated imagery (CGI) animation require enormous processing power and speed
- An explosion in the number of VFX scenes in films today increases those requirements exponentially
- Studios need VFX houses to collaborate under tight deadlines to create the growing numbers of shots—and still maintain seamlessly consistent work

**Solution:**

- A network of dual boot workstations (with Microsoft® Windows® XP Pro and Linux® operating systems) powered by AMD Opteron™ processors with Direct Connect Architecture
- Rack mounted SAN servers and rendering farm with Dual-Core AMD Opteron processors
- Autodesk® Backburner network rendering system
- Autodesk Toxik collaborative compositing software and Autodesk Maya digital image creation, 3D animation, and visual effects software

**Impact:**

- Increased performance and speed keeps talented and highly paid VFX artists working at peak efficiency
- Faster creation and rendering time makes it possible to meet tight deadlines, permit easy retakes, and still maintain a profitable margin
- Powerful collaborative software applications allow artists to work together on VFX scenes in real time

In 1980, CGI first hit the big screen with the release of “Star Trek”. But the real breakthrough came nine years later, when flawless integration of CGI with live action shots in “Jurassic Park” revolutionized the industry. Today, film directors routinely extend their creative vision to include scenes that would previously have been too costly—or downright impossible—to create.

Given that a single CGI shot can have 50 layers or more, and that it will go through as many as 10 approval cycles—each with subtle changes affecting one, some, or all layers—it all adds up to a lot of data and computer processing, even more rendering time, and a massive coordination effort.

But these days, the talk is all about an explosion in volume of CGI shots per film. “A few years ago, a handful of feature films utilized somewhere between 50 and 200 CGI shots each,” says Danny Bergeron, president and co-founder of Montreal-based Mokko Studio. “Now, the major studios look for 1,000+ shots per film.” To develop so many scenes in just six to eight months, the VFX producer signs on multiple VFX

studios, increasing the complexity of the project exponentially. To provide a seamless look, close collaboration among VFX houses is essential.

### **Speed to meet the increasing demands of VFX creation**

For the film "The Fountain" (Warner, November 2006), VFX producers parceled out scenes to 11 separate visual effects houses, until a pipeline was lined up to produce all the required shots. Mokko Studio, one of the visual effects houses contributing to the film, uses more than 110 AMD Opteron™ processors to give a core staff of 30 digital VFX artists the tools, power, and speed needed to meet the increasing demands of VFX creation.

"It only makes sense to keep talented and highly-paid artists working at peak efficiency," Bergeron comments. "With 3-D VFX and CGI animation at 2K film resolution, you really need speed. At Mokko Studio, we're always tracking production time and optimizing processing hours. *Based on our performance rating calculations, the AMD Opteron processor is unquestionably the best processor for us.*"

Purchasing individual parts from several vendors, Bergeron and his team build out their own workstations, tailoring them to their special needs. Each artist is supplied with two powerful AMD Opteron™ processor-based, dual boot workstations running Microsoft Windows XP Pro and Linux operating environments. Two monitors, one for quality control and another for application menus and interfaces, along with a graphic tablet, give artists the resources they need. Each workstation has its own SATA RAID module to play back film clips at 2K resolution. An external server, running Autodesk software and an Oracle database, monitors the pipeline and workflow of each project.

### **Rack-mounted rendering servers support tight deadlines while maintaining a profitable margin**

A powerful AMD Opteron™ processor-based server render farm, located in a nearby machine room, helps reduce turnaround time. "We have to deliver projects on a tight schedule and to deliver on time, we need fast processors," says Bergeron. "To remain viable, we also need a reasonable profit margin. If we have 'redos', with

AMD64 technology, we can get them done quickly. And if we can do even more work in the same period of time, we are that much more profitable.”

The server farm configuration is equipped with heat and power sensors that monitor the optimal working environment. Supporting software calculates the number of processors running, the amount of heat dissipation, and the appropriate air conditioning requirements. If any limit is breached, an alert is sent to all studio managers to ensure immediate response. However, it’s rarely a problem because AMD Opteron processors are designed for energy efficiency and help keep power and heat constant.

During off hours, when Mokko VFX artists are not creating animation, modeling, matte painting, and VFX, their workstations are also used for rendering. “Our machines are rendering all night and all weekend,” Bergeron reports. The Autodesk Backburner network rendering system administers and improves performance on both the rack-mounted server farm and the network of artist workstations when set to rendering mode.

### **Collaboration is now the standard**

Multi-threaded, 64-bit software applications also contribute to rapid creation and rendering. But these capabilities have only increased the demands made on the VFX industry. Tighter deadlines and an upsurge in the number of VFX scenes make increased collaboration among VFX artists, and among VFX houses, a must. Mokko Studio relies on Autodesk Maya digital image creation, 3D animation, and visual effects software and Autodesk Toxik collaborative compositing software to create an efficient operating environment. “Toxik can manage a pipeline of 60+ artists in real-time. Due to the collaborative nature of the Toxik work environment, several compositors can work on a shot at the same time. The whole sequence is updated instantly on each machine as the artists work together,” says Bergeron. “This provides enormous time savings, helping us to improve the shot and meet schedules and deadlines.”

Toxik tracks version control, which is essential when hundreds of changes to layers are involved. Bergeron notes, “With Toxik, we can manage dailies for client approval, with each scene numbered and formatted with the version level and data.

Remember, the reviewer in L.A. is probably working with 10 other studios, so dailies have to be coordinated in a straightforward manner. It's a huge tracking job and Toxik automation is indispensable."

**About AMD**

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**About Mokko Studio**

Established in 2003, Mokko Studio offers a wide range of services, including VFX design storyboards, on-set supervision, animation, compositing, matte painting, and miniatures. For more information visit <http://www.mokkostudio.com/>.

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