Success Story

SGI® Solutions Deliver the Power Behind Weta Digital's *The Two Towers*

"The 300 artists working on the second film were moving ITB of data in and out of DMF every day. Being able to migrate the data seamlessly between online and near-line and then back again has been absolutely critical. We couldn't do that without SGI DMF."

—Scott Houston, Chief Technical Officer, Weta Digital

While the Ring may have the power to move heaven and hell and corrupt even the purest hobbit's heart, Weta Digital summoned up a different kind of power—the visual supercomputing and asset management power of SGI—to deliver the much-anticipated second film in The Lord of the Rings trilogy, *The Two Towers*. This film adaptation of the epic fantasy-adventure classic written by J.R.R. Tolkien has even more special effects, CGI-created creatures, and horrific battle scenes with hundreds of thousands of animated characters than *The Fellowship of the Ring*, its blockbuster predecessor.

"We rely heavily on DMF. DMF is running on one Origin 2000 system and we recently upgraded it to 12 400 MHz processors. The key objective is to free up as much disk space for the artists as possible. We use SGI DMF to offline the data from the online disk storage to tape storage.

—Scott Houston, Chief Technical Officer, Weta Digital

Weta Digital continues to rely on the same full complement of SGI® IRIX® OS-based Silicon Graphics® Octane® visual workstations, Silicon Graphics® Onyx2® visualization systems, SGI® Origin® family servers, and SGI Linux™ OS-based visual workstations and servers as on the first film. For *The Two Towers,* Weta Digital, the digital effects arm of Weta Ltd., the Wellington, New Zealand, production company that shot all three films back-to-back, upgraded its SGI® Origin® 2000 server to handle twice the data load of the first film. Released by New Line Cinema in December 2001, *The Fellowship of the Ring* has grossed over $860 million worldwide, earned 13 Academy Award® nominations, and won four Oscar® statuettes. New Line released *The Two Towers* in the United States on December 18, 2002. The critics were unanimous in their praise, and the film earned over $316 million in its first 38 days. New Line has slated the third film, *The Return of the King*, for a December 2003 release.

SGI® Data Migration Facility (DMF)

Key to producing the entire *The Lord of the Rings* film trilogy, directed by Peter Jackson, is the premier SGI solution for hierarchical storage management, the SGI Data Migration Facility (DMF). SGI DMF allows high-performance, reliable, and efficient data management with virtually unlimited storage capability while also dramatically lowering total cost of ownership by moving data seamlessly between high-performance storage arrays and lower-cost-per-megabyte tape libraries. On *The Fellowship of the Ring*, Weta Digital first used SGI DMF to manage 100TB of data from approximately 10 million files, which range from small to extremely large. A file can consist of an element, a texture, one version of a shot, or a completely rendered image sequence. Adding the data from *The Two Towers* doubles Weta's information storage to 20 million files. Approximately 230TB, representing the first two films' worth of data, is now managed by SGI DMF.

"We rely heavily on DMF," said Scott Houston, chief technical officer, Weta Digital. "DMF is running on one Origin 2000 system and we recently upgraded it to 12 400 MHz processors. The key objective is to free up as much disk space for the artists as possible. We use SGI DMF to offline the data from the online disk storage to tape storage. The StorageTek L700E robotic library now has six LTO [linear tape open] drives and four DLT drives. In June, we migrated from DLT to LTO, which gave us greater capacity on the tape cartridges and faster tape cartridges. That gave us more capacity on near-line; we went from about 25TB available to about 75TB potentially available. We're able to move data from very valuable online disk storage to near-line disk storage and still be able to retrieve it relatively quickly and seamlessly, from the artists' point of view."

One of the many challenges Weta Digital faced at the start of *The Two Towers* was that it needed to bring 100,000 files from the first film back from offline storage to online storage in order to make those elements, textures, and shots available for the artists. Again, the totally automated DMF made that relatively painless for the artists, according to Houston.

"We need to have access to all the files, including files that are two, three, four, or almost five years old, and we need to be able to have access to these as well. We keep everything, and keeping and managing that is going to be a challenge. There are also opportunities for repurposing some of those assets, and that will be essential for Weta in the future."

—Scott Houston, Chief Technical Officer, Weta Digital

"The 300 artists working on the second film were moving ITB of data in and out of DMF every day. Being able to migrate the data seamlessly between online and near-line and then back again has been absolutely critical. We couldn't do that without SGI DMF," said Houston. "We need to have access to all the files, including files that are two, three, four, or almost five years old, and we need to be able to have access to these as well. We keep everything, and keeping and managing that is going to be a challenge. There are also opportunities for repurposing some of those assets, and that will be essential for Weta in the future."

Weta Ltd. has already begun repurposing its assets stored by SGI: *The Two Towers* video game was released a month before the film and Weta is currently working with Electronic Arts on an action game based on *The Return of the King*.

Massively Awesome FX

From the beginning of preproduction, Weta Digital has also used the IRIX OS-based Silicon Graphics Octane visual workstations to write extensions to Alias|Wavefront™ Maya®, the facility's core 3D application, and to create proprietary technology. This technology includes MASSIVE, a custom-built crowd animation or "artificial ecology" system developed on IRIX and now ported to the Linux® OS that draws from a huge database of motion-capture data.

In *The Two Towers*, the spectacular, breathtaking battle at Helm's Deep demonstrates the awesome potential of MASSIVE, which allows hordes of digital creatures to do battle as though they had minds of their own. Instead of having to program each digital combatant's actions, MASSIVE allows, for instance, orcs to recognize elves as foes and attack, or elves to identify fellow elves, and act accordingly.

The Explosion of Data Management in Film

Weta Digital's workflow for *The Two Towers* exemplifies the explosion of data necessary in the creative side of the film industry. Increasingly, management of complex data in the digital content creation and cinema mastering aspects of the business expand the need for more powerful tools to manage that data. The choice of SGI DMF on the highly scalable SGI Origin server family allowed Weta Digital to meet the challenges of the trilogy's movie release schedule and deliver what is sure to be another Academy Award-nominated blockbuster film with groundbreaking visual effects also created, in part, on Silicon Graphics® equipment.

sgi®

Corporate Office
1600 Amphitheatre Pkwy.
Mountain View, CA 94043
(650) 960-1980
www.sgi.com

North America 1(800) 800-7441
Latin America (52) 5267-1387
Europe (44) 118.925.75.00
Japan (81) 3.5488.1811
Asia Pacific (65) 6771.0290

3454 (02/14/2003)

J14224