

# NEWS

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## On Holland Computing Center Cluster, Windows and Linux Applications Run Concurrently with Rocks+Moab

*Hybrid solution makes cluster OS choice a thing of the past*

PROVO, Utah – July 29, 2008 – Miniature computers are everywhere—on silicon chips in our cell phones, watches, kitchen appliances, and even our automobiles. Going through a normal day without benefiting in some way from one or more of these tiny computers is practically impossible.

But the real workhorses of the computer world don't reside on those tiny, hidden microchips. They're "supercomputers"—systems that may include thousands of computer processors working together to answer life's biggest questions. These supercomputers answer questions that lead to new life-saving medicines, more efficient oil and gas production, and safer automobiles and workplace environments.

Such a supercomputer, known as Firefly, has its home at the Holland Computing Center, one of the largest supercomputing facilities in the United States. Firefly is a 1,154-node cluster of Dell SC1435 servers and is capable of a sustainable computational rate of 21.5 teraflops (trillion calculations per second).

While speed is a key objective in supercomputing, for the Holland Computing Center speed is secondary to the goal of Firefly. Firefly is used to focus on "what-if" computations: asking—and answering—questions that have never even been conceived of before.

In developing the system, Jim Skirvin, president of the Holland Computing Center, selected Rocks+Moab, a joint solution from Cluster Resources, Inc. and Clustercorp that combines a complete, tightly integrated HPC software stack on a single DVD (Rocks+) with enterprise-class resource- and workload-management tools (Moab Cluster Suite®).

"When it comes to selecting vendors, we look for partners we know we can work with over the long term, partners who will help us achieve our center's goals," said Skirvin. "Based on that principle, selecting the Clustercorp / Cluster Resources team was a no-brainer. They offered a smart and holistic toolset that would get the job done, and right from the get-go their approach was 'What can we do to make this partnership work better?'"

To cater to the needs of users running Windows applications, the center made an early design decision to run both Linux and Windows (CCS) operating systems. In an industry dominated by Linux-based clusters and users, this choice created a set of difficult decisions that required the cluster administrator to set up the cluster to run either Windows or Linux based on user needs and then allocate the cluster's resources appropriately. As part of this time-consuming process, Firefly was divided into two or three non-contiguous clusters at any given time.

The implementation of the Rocks+Moab solution at the Holland Computing Center made platform choice a thing of the past—Firefly now operates as the first-of-its-kind 1,000+ node hybrid compute resource where both Windows and Linux applications can run concurrently on the same cluster. In the hybrid paradigm the cluster is now a single unified compute resource, with Moab able to dynamically change the OS of any

compute node based on workflow. This process is made nearly invisible to the user through a simple setup built into Rocks+ and unified job submission in Moab.

“A unique capability of Rocks+Moab, and one that was very intriguing to us, is its ability to have a static implementation of two operating systems that we could dynamically switch between,” noted Skirvin. “We had a work-around solution that was painful at best and very time consuming. By switching to Rocks+Moab we were able to utilize either operating system, which created a huge time savings for our admin.”

The Holland Computing Center is housed at the University of Nebraska at Omaha. The purpose of the center, and more specifically Firefly, is to provide a leading-edge computational resource to academic, government and commercial researchers, as well as to scientists and students at the University of Nebraska and in the Midwest region. By offering the Windows/Linux hybrid solution, the center is able to make the computational resources of Firefly available to a more diverse set of users. Additionally, the center prepares students for high-tech professions and attracts high-tech experts and jobs to the region. The development of the center was made possible by generous contributions from Richard Holland, Walter Scott Jr., and other local philanthropists, all of whom who share the desire to make Omaha and, by extension the world, a better place.

“We don’t want researchers to just focus on the ‘I want this project to go 10 percent faster’ aspect of Firefly’s abilities,” said Mark Furtney, vice president of research and development at the Holland Computing Center. “We want researchers to think, ‘I am going to take a project 100 times bigger than that and do something that’s never been done before.’ That’s how we see the core of supercomputing.”

Anyone interested in additional information on hybrid clusters or who wants to test the Moab hybrid Windows/Linux cluster solution on their own hardware should contact Cluster Resources at [info@clusterresources.com](mailto:info@clusterresources.com) or +1 (801) 717-3700 in the U.S. or +44 (1223) 437134 in EMEA.

### **About Cluster Resources**

Cluster Resources, Inc. is a leading provider of workload and resource management software and services for cluster, grid and utility-based computing environments. With over a decade of industry experience, Cluster Resources delivers software products and services that enable organizations to understand, control, and fully optimize their compute resources and related processes.

For more information please visit the company’s website at [www.clusterresources.com](http://www.clusterresources.com), or call +44 (1223) 437134 (for Europe, Middle East and Africa), +1 (801) 717-3700 (for the Americas and Asia Pacific), or email [info@clusterresources.com](mailto:info@clusterresources.com).

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### **About Clustercorp**

Clustercorp, a privately held corporation based in San Jose, California, was founded by core members of the Rocks community who saw a clear need for commercial software, services, and support for the Rocks cluster distribution. Clustercorp’s primary product line is a commercial version of Rocks called Rocks+, which includes Rocks +Support, Rocks+Rolls, and Rocks+Moab. More information can be found at [www.clustercorp.com](http://www.clustercorp.com) or by calling +1 (408) 694-3564, ext. 2.

*This product includes software developed by the Rocks Cluster Group at the San Diego Supercomputer Center at the University of California, San Diego and its contributors. Rocks® is a registered trademark of the Regents of the University of California.*

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