

Platform™

StatoilHydro Chooses Platform LSF and EnginFrame to Implement an Enterprise-Wide Computing Grid that Meets the Processing Requirements for Sophisticated Reservoir Simulations

StatoilHydro

Overview

StatoilHydro needed to give its reservoir engineers access to more computing power so that simulation applications involving vast amounts of data and complex calculations could execute faster and perform more iterations.

Challenge

Local computing clusters at each StatoilHydro location needed to be oversized, and only gave engineers access to a limited amount of processing power in peak periods, restricting their ability to generate the highly accurate results needed to support cost-effective drilling operations.

Solution

Platform LSF
Platform LSF MultiCluster
NICE EnginFrame

Results

All users, regardless of location, now have access to a single, division-wide computing grid and to the group's full complement of computers.

An intuitive, Web-based portal simplifies global job submission and provides better visibility into job execution.

It is no longer necessary to have computer resources located at all sites, resulting in less fragmentation and better utilization.

The amount of simulation work that engineers are able to perform is significantly increased.

"The results of this grid project exceeded my expectations. With a project of this seeming complexity I anticipated lots of technical grief, but it simply didn't happen – everything went smoothly. We have seen increased load, and more simulation runs than ever before with the new system."

John Hybertsen, Technical Projects Manager, StatoilHydro

Reservoir engineers in the Sub-Surface Division of StatoilHydro ASA, a Norway-based oil and gas company and one of the world's largest crude oil traders, use sophisticated 3-D simulation applications to search for potential oil-bearing structures in the Earth's crust. These applications involve vast amounts of data, large numbers of complex calculations and, to produce accurate results, require that thousands of iterations be run. It takes plenty of computing horsepower to meet the needs of these modeling applications.

The rising cost of drilling and the high cost of an error in choosing a drilling location put StatoilHydro engineers under increasing pressure to produce ever-more accurate results with their modeling efforts. However, local computing clusters at each of StatoilHydro's four Norway locations were not meeting engineers' needs for increased ease of use in job submission and for additional processing power to run more iterations of their models.

Using Platform's LSF workload management software with its MultiCluster capability to interconnect the four clusters, in concert with EnginFrame, a web portal for job submission, Platform helped StatoilHydro implement a single, enterprise-wide computing grid, giving engineers access to all computing resources in the division. The grid not only allows computing resources to be managed centrally, but also allows engineers to have access to significant compute power anywhere in the world. Now, StatoilHydro has a robust and scalable computing platform that meets their current processing requirements and makes it easy to add more resources to support continued growth.

Business Challenge

A key ingredient in StatoilHydro's continued success is the ongoing work done by reservoir engineers, who use computers and sophisticated 3-D modeling software to simulate the flow of fluids in oil and gas reservoirs. Their primary tools in this pursuit are the ECLIPSE™ Simulators from Schlumberger, which provide numerical simulation techniques for all kinds of reservoirs and all degrees of extraction complexity. ECLIPSE™ can be very compute-intensive, involving huge amounts of data, large numbers of highly complex calculations and often, hundreds of simulations for every field analysis. With ever increasing demands for more oil and gas output from existing fields, StatoilHydro engineers are performing more simulations than ever before.

Initially, each of StatoilHydro's four Norway locations independently operated its own local computing infrastructure consisting of engineering workstations and server clusters that ranged in size from 64 to 400 CPUs. This approach was causing a number of problems. For example, each location was investing in its own computing equipment, and the clusters on each site needed to be oversized to accommodate peak periods of activity. In addition, homegrown interfaces based on old scripting technology were used for job submission and to integrate the ECLIPSE™ application with the Platform LSF software used to control the

computing clusters. These scripts were old, difficult to maintain and didn't provide adequate visibility into the job execution activity going on within the clusters.

The disparity in the relative number of CPUs available to each location also caused problems in terms of differences in engineering process consistency, performance and reservoir simulation accuracy.

To better meet current needs, and position the company for continued growth, StatoilHydro's IT department turned to Platform's grid technology to create a consistent, high-performance computing environment, which in turn would help foster a consistent methodology for job submission amongst StatoilHydro reservoir engineers worldwide.

Solution

In just 20 days, Platform implemented a single, division-wide computing grid, and demonstrated that this solution met all the Sub-Surface division's specifications for a new computing model that could handle their current and future needs.

First, the Platform LSF software managing each of the four local clusters was upgraded to the latest level to simplify ongoing software management. Then, Platform LSF MultiCluster software was used to tie the four local server clusters into a single computing grid, giving each engineer user, irrespective of their location, access to the division's entire complement of computing resources, which is fast approaching 1,000 CPUs.

Platform worked with Schlumberger's software development team to produce a seamless integration between ECLIPSE™, Platform LSF and EnginFrame. This allows ECLIPSE™ users to perform significantly more iterations for multi-realization simulations on cost-effective server clusters, which in turn yields far-more-accurate results – when you're drilling for oil, even a small error in location could cost many millions of dollars. Platform LSF allows StatoilHydro to dynamically grow the size of its grid by 'harvesting' unused CPU cycles as needed from any of the 185 user workstations across the division that might not be running at full capacity. This accounts for nearly 25 percent of StatoilHydro's overall computing capacity, and is totally transparent to the workstation users.

Next, a Web portal was implemented based on EnginFrame from NICE, giving users a modern, intuitive interface that greatly simplified the submission of jobs to the grid, provided better visibility into the job execution process, and saved time for StatoilHydro IT staff by eliminating the need to maintain their legacy job-submission system. EnginFrame's ability to support the submission and monitoring of jobs by any skill level of user from anywhere in the world is a key component of StatoilHydro's grid solution.

"We're pleased that Platform included EnginFrame in their solution," says John Hybertsen, Technical Project Manager at StatoilHydro. "We see the Web portal as an important part of our infrastructure vision and the NICE people did a great job of customizing it for our needs."

As a result of giving users access to greater computing power, StatoilHydro is seeing a significant increase in the amount of simulation work taking place throughout the grid – without having to add more computer hardware. Harstad, for example, a StatoilHydro location that would have needed to buy lots of new equipment to support its increasing use of the ECLIPSE™ application, can now run simulations any time, eliminating the need for additional equipment; and when StatoilHydro opens another location, as they had recently done in Houston, Platform LSF with MultiCluster makes it a simple matter to implement additional clusters and add them to the grid.

"I have received lots of comments from our users that they really like the new system, especially because of the increased computing capacity that's readily available to them," says Hybertsen.



About StatoilHydro

StatoilHydro, a Norwegian oil and gas company, has just over 25,000 employees operating in 34 countries, with exploration and production activities underway in 15. StatoilHydro is the leading operator on the Norwegian continental shelf and is also experiencing strong growth in its international production, which accounts for 15.7% of all output in 2006. StatoilHydro is one of the world's largest sellers of crude oil and a substantial supplier of natural gas to the European market. In addition, StatoilHydro has substantial industrial activity and operates 1,803 service stations in Scandinavia, Poland, the Baltic states and Russia. For the third year in a row, StatoilHydro was ranked by the Dow Jones Sustainability World Index as the world's best oil and gas company in terms of sustainability.

About Platform Computing

Platform Computing is the global leader for grid computing solutions and a technology pioneer of the supercomputing world. The company's solutions for enterprise and high performance computing helps the world's largest organizations integrate and accelerate business processes, to increase competitive advantage and enjoy a higher return on investment from IT. With over 2000 customers, the company has achieved a clear leadership position in the market through a focus on technology innovation and execution. Founded in 1992, Platform Computing has strategic relationships with Dell, HP, IBM, Intel, Microsoft, Novell and Red Hat, along with the industry's broadest support for third-party applications. For more please visit www.platform.com.



World Headquarters

Platform Computing Inc.
3760 14th Avenue
Markham, Ontario
L3R 3T7 Canada
Tel: 905 948 8448
Fax: 905 948 9975
Toll-free tel: 877 528 3676
info@platform.com

United States

Boston: 781 685 4966
Detroit: 248 359 7820
Reston: 703 251 4850
Newport Beach: 949 798 6125
New York: 646 290 5070
San Jose: 408 392 4900

Asia-Pacific

Beijing: +86 10 82276000
Tokyo: +81 3 5326 3105

Europe

Munich: +49 (0) 2102 610390
Düsseldorf: +49 (0) 2102 610390
Basingstoke: +44 (0) 1256 883756
London: +44 20 7956 2098
Paris: +33 (0) 1 41 10 09 20

Copyright © 2007 Platform Computing Corporation. ®™ Trademarks of Platform Computing Corporation.
All other logo and product names are the trademarks of their respective owners, errors and omissions excepted.
Printed in Canada. Platform and Platform Computing refer to Platform Computing Inc. and each of its subsidiaries.