

HP, TIBCO solutions light the way for real-time trading in the "Land of the Midnight Sun"

Norwegian Stock Exchange



"HP delivers all the components for an adaptive enterprise – hardware, software, and services – which enable us to respond quickly to dynamic market conditions."

– System Architect John Martin Furseth, Oslo Børs ASA

While Norway may be best known for its many natural wonders and Viking history, it also boasts one of the oldest and most forward-thinking stock exchanges in the world. Founded in 1819, the Oslo Børs stock exchange is now privately owned with more than 180 listed companies. Throughout its distinguished history, Oslo Børs has been at the forefront in developing and implementing advanced technologies. The Norwegian exchange was among the first to employ telegrams, and later radio, to facilitate trading. Oslo Børs also pioneered the development of computerized trading systems, introducing its first in 1988.

In 2002, the stock exchange moved its trading operations from its in-house system, known as Automated Securities Trading System (ASTS), to the joint SAXESS trading system used by the NOREX Alliance (www.norex.com) and maintained by OM Technology in Stockholm. The ASTS ran on HP 9000 servers under the HP-UX operating



system, providing 99.98 percent uptime in its first year of operation. The Alliance, which also includes the Copenhagen, Stockholm, and Reykjavik stock exchanges, works toward a joint Nordic marketplace with a common trading platform and harmonized regulations. The Oslo Børs IT organization must supply NOREX with reliable, real-time market intelligence, listing information, index calculations, and data-warehousing functions. Reliability at every level is paramount, as is providing a means for rapid and flexible publish/subscribe communication between the SAXESS trading system and Oslo Børs supporting applications.

Enabling trading interaction – anytime

To meet these challenges, Oslo Børs invested in an enterprise application integration (EAI) architecture based on the message-oriented TIBCO Active Enterprise, part of the TIBCO Rendezvous suite. Explains Oslo Børs System Architect John Martin Furseth: "Although we are not hosting the central trading application, we needed to exchange high volumes of information with it easily at fast speeds and with great reliability. We already had a highly reliable HP server and software infrastructure in place with ASTS, but found that the rapid changes required to accommodate the needs of the joint alliance required a new messaging architecture. After considering enterprise application integration (EAI) products from a number of vendors, we chose the TIBCO Rendezvous suite because of its proven track record in the financial world

Challenge

- Provide reliable, real-time market intelligence, listing information, index calculations, and data warehousing to NOREX.
- Supply a means for rapid and flexible publish/subscribe communication between the SAXESS trading system and Oslo Børs supporting applications.

Solution

Hardware

- 25 HP-UX servers, including K, D, and L-Class HP 9000 servers and one A-Class HP e3000 server
- 75 HP ProLiant servers, models DL360, DL380, DL580 and DL740
- HP StorageWorks Disk Array XP256

Software

- HP OpenView software, including Service Desk, Operations, Network Node Manager, GlancePlus, Performance Manager, Software Distributor, and Reporter
- HP OpenView Smart Plug-Ins for Informix and Microsoft SQL Server databases
- HP ProLiant Essentials Foundation Pack, including Insight Manager 7 SP2 proactive server-management tool, SmartStart server deployment tool, Insight Manager 7 Version Control for centralized software updates, Remote Deployment Utility
- HP-UX operating system
- Microsoft Windows 2000 Advanced Server operating system
- TIBCO Rendezvous messaging system
- Linux operating system
- Legato NetWorker backup software
- Tivoli Maestro scheduling tool
- Business Objects reporting application

HP Services

- Software and systems support
- Consulting
- Implementation of HP OpenView applications and the TIBCO Rendezvous suite

Results

- A stable, adaptable HP infrastructure provides real-time information to NOREX Alliance stock exchange members and customers.
- The HP solution provides a means for rapid and flexible publish/subscribe communication between the SAXESS trading system and Oslo Børs supporting applications.
- Highly available HP servers and HP-UX operating system support mission-critical TIBCO messaging middleware, helping to avoid costly downtime that can amount to \$6.45 million an hour in delayed or potentially lost trading opportunities.
- HP OpenView management software ensures consistently high levels of service, which is critical in maintaining and enhancing investor and exchange partner confidence.
- Oslo Børs IT professionals can now focus on value-added projects to advance the company's key goals.

using the highly scalable publish-subscribe paradigm and with available local support."

Oslo Børs deployed the EAI solution across a mix of HP servers, running HP-UX, Microsoft Windows, and Linux operating systems. Oslo Børs also uses HP OpenView solutions for completely integrated operations management and service-level assurance. The resulting infrastructure provides a truly adaptive enterprise in support of the NOREX trading alliance.

"The stability and predictability of our entire HP infrastructure gives us the credibility that is so critical in the financial markets."

– System Architect John Martin Furseth, Oslo Børs ASA

Gaining a clear management view

HP Services helped integrate the TIBCO Rendezvous messaging system and implement HP OpenView management solutions, including Service Desk, Operations, GlancePlus, and Network Node Manager. The combination of reliable HP servers, management software, and good processes provide the adaptive, yet secure infrastructure that is so essential in the financial market.

"HP Services played a strong role in helping us implement HP OpenView management solutions across our enterprise," Furseth notes. "I can't emphasize enough how much they streamlined the process and made it easy for us. When we switched over to the ASTS trading system and later to the SAXESS system the NOREX Alliance uses, OpenView software enabled us to proactively monitor and tune our support applications to provide the trading information and analysis required."

It is imperative for Oslo Børs mission-critical trading support applications to remain highly available, particularly during trading hours; a single hour of downtime can result in more than \$6.45 million in delayed – or potentially lost – trading opportunity. "HP OpenView and our HP infrastructure provide an amazingly stable, scalable environment that has been critical to our success," Furseth says. "HP OpenView Service Desk, in particular, allows us to proactively

manage service levels, which is so important in a joint trading environment where partners and customers depend on real-time data around the clock. Service is everything, and the HP OpenView suite is the key to maintaining continuous, high-quality service.

"Before we converted to an HP infrastructure, we had a very inefficient information system with numerous stovepipe applications that could not communicate effectively," Furseth continues. "Now, we have standardized on HP and TIBCO and this combination is proving to be very efficient and reliable. Process integration and infrastructure remodeling is much easier now, and is essential in order for us to provide services to the NOREX Alliance members – as well as interaction with our members, customers, and partners locally."



Giving great performance

Oslo Børs uses more than 75 HP ProLiant servers in its trading and support infrastructure, many clustered under Microsoft Windows. The ProLiant systems run the Microsoft Windows 2000 Server and Linux operating systems, as well as Web applications and Microsoft Exchange Server. OpenView software also provides a central point of management for all of the firm's operating systems.

In addition, 25 HP 9000 and HP e3000 servers still play important roles in the infrastructure. "Even our oldest HP-UX-based servers continue to give us great performance,"

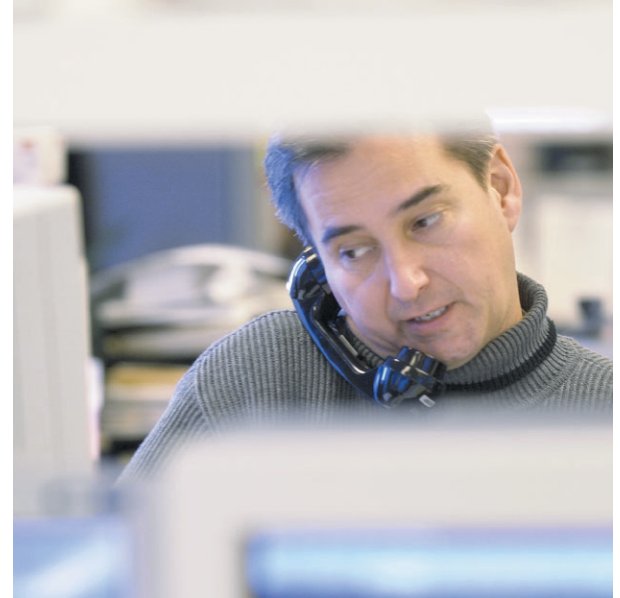
notes Oslo Børs Systems Administrator Lars Irgens. "While we are slowly moving to more Microsoft Windows-based HP ProLiant servers, we find new uses for our HP-UX servers all the time. We converted to the SAXESS joint trading system in the spring of 2002, yet we have kept our original ASTS trading system in operation in order to supply key index calculations and other data to the SAXESS system."

Today, the NOREX Alliance successfully provides access to 80 percent of the Nordic equity market and 90 percent of the Nordic bond markets through a single, joint system. Thanks to HP, Oslo Børs provides the critical real-time data required by NOREX partners and customers.

The solution enabled other enhancements. "We expanded our use of TIBCO middleware to our HP ProLiant systems, particularly in the areas of data warehousing and our Web portal," Irgens explains. "The stability and predictability of our entire HP infrastructure gives us the credibility that is so critical in the financial markets. It's our business, and we wouldn't trust our operations to anything else. HP delivers all the components for an adaptive enterprise – hardware, software, and services – which enable us to respond quickly to dynamic market conditions."

Company profile

Established in 1819, Oslo Børs ASA (www.oslobors.no) became a privately owned stock exchange in 2001 and currently has more than 180 listed companies, including Royal Caribbean Cruises, Norsk Hydro, Telenor, and Statoil. The company pioneered the development of computerized trading systems, introducing its first in 1988.



For more information on how working with HP can benefit you, contact your local HP representative, or visit us at www.hp.com.

© Copyright 2003 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. Microsoft and Windows are trademarks of Microsoft Corporation. UNIX is a registered trademark of The Open Group.

5982-1517ENE, 09/2003

