



NYSE Euronext Chooses Red Hat Solutions for Flexibility and Reliable, Fast-Paced Performance

FAST FACTS

Industry	Financial Trading
Geography	Global
Challenge	To integrate varied trading platforms to produce a high-speed, low-cost platform that offers the reliability and flexibility necessary to produce the rapid performance results demanded by the expanding financial trading industry
Migration Path	HP UX, IBM AIX, and SUN Solaris to Red Hat Enterprise Linux
Software	Red Hat Enterprise Linux, Red Hat Network
Hardware	200 HP ProLiant DL585 four-processor servers, 400 ProLiant BL 685c blades, AMD dual-core Opteron processors
Benefits	Implemented a reliable, secure, and cost-effective solution that provided flexibility, freedom from vendor lock-in, and the ability to handle heavy workloads while producing fast-paced performance results



BACKGROUND

NYSE Euronext (NYSE) operates the world's leading and most liquid exchange group, and seeks to provide the highest levels of market quality, customer choice, and innovation. Its family of exchanges, located in six countries in the U.S. and Europe, include the New York Stock Exchange, the world's largest cash equities market; Euronext, the Eurozone's largest cash equities market; Liffe, Europe's leading derivatives exchange by value of trading; and NYSE Arca Options, one of the fastest-growing U.S. options trading platforms.

NYSE Euronext offers a diverse array of financial products and services for issuers, investors and financial institutions in cash equities, options and derivatives, ETFs, bonds, market data, and commercial technology solutions. NYSE Euronext's nearly 4,000 listed companies represent a combined \$27.3/€17.3 trillion in total global market capitalization as of March 31, 2008, more than four times that of any other exchange group.

NYSE Euronext's equity exchanges transact an average daily trading value of approximately \$141 billion/€103 billion as of Dec. 31, 2007, which represents more than one-third of the world's cash equities trading. NYSE Euronext is part of the S&P 500 index and the only exchange operator in the S&P 100 index.

CHALLENGE

NYSE's goal to cement its position as the world's preeminent marketplace by diversifying its product base and developing a global platform for trading, led to the merger with Archipelago in 2006 and Euronext in 2007.

With the acquisition of Archipelago and Euronext complete, NYSE Euronext faced the ongoing challenge of integrating its varied trading platforms to produce a simplified and optimized technology architecture. During this integration, NYSE Euronext sought to enhance the effectiveness of its technology through the incorporation of features needed to remain competitive in the current market. It needed a

high-speed, low-cost platform that offered the reliability and flexibility necessary to produce the fast-paced performance results demanded by the industry.

"We're working on integrating all the pieces of our business together and making the result better than any of the systems that comprised it in the first place. From a system architecture standpoint, we need to be very flexible. We must have the latest and greatest technology without painting ourselves into a corner and without finding out that we are out-running the capabilities of our solutions. Technology is in every corner of what we do, and the software that sits on our technology is key to being us remaining a viable competitor today," said Steve Rubinow, Chief Information Officer at NYSE Euronext.

SOLUTION

When assessing the right technology solution to help enable the optimized processing of the hundreds of thousands of messages per second and the billions of messages per day that are processed by the NYSE Euronext electronic trading platform, three considerations were made. The cost of starting, the cost of support, and the cost of potentially leaving the technology solution in the future were all considered.

"Too many people forget that the cost of leaving a technology can be substantial. We didn't want to get locked into any certain technologies, and desired the flexibility to jump to a different hardware platform if necessary," said Rubinow. "Linux gives us that flexibility. We felt that Linux was right for our environment, so we decided to pursue it full speed ahead."

NYSE Euronext investigated two competing Linux flavors, including Red Hat Enterprise Linux, and compared the solutions based purely on the offered technology and related support. When support was considered, it was quickly clear that the leading choice was Red Hat. So, NYSE Euronext decided to implement Red Hat Enterprise Linux to run its mission-critical electronic trading platform.

"We needed a good partner and found one in Red Hat. We were looking for a partner that was offering reliable software and one that would help and advice on its use while providing the value of trusted support services. Red Hat satisfied our objectives," said Rubinow.

Today, much of NYSE Euronext's high-speed trading environments rely on Red Hat Enterprise Linux. "The pace of electronic trading has picked up dramatically, and across the enterprise, the main part of our 6.5-hour trading day includes the processing of billions of messages," said Rubinow.

"Red Hat is almost like water, it's pervasive within our architecture. Red Hat is extremely strategic and without it, most of our computers wouldn't be running."

**– Steve Rubinow,
Chief Information Officer
at NYSE Euronext**



To maintain its several hundred servers running Red Hat Enterprise Linux, NYSE Euronext employs Red Hat Network. With Red Hat Network Update and Management solutions, NYSE Euronext has been able to effectively manage its complex, mission-critical systems.

NYSE Euronext also relies on Red Hat Enterprise Linux and its included Security-Enhanced Linux (SELinux) functionality to preserve the security of its platform. With trillions of dollars flowing through the exchange each month, security is a large and very important organizational focus. "We are very security conscious because we have to be. The operating system is a key part of every server that we operate and each server must be secure at all times. We maintain the security of our systems by relying on the SELinux features within Red Hat Enterprise Linux," said Rubinow.

BENEFITS

Of the very elite competition in the marketplace, NYSE Euronext must compete with other top players in size and in features, but also in the demand to be the fastest and the most reliable at the lowest cost. Red Hat Enterprise Linux delivers on these requirements, in addition to providing flexibility, high levels of security, and a unique customer feedback loop.

"With the combination of speed, cost, reliability, and functionality pushed to the limit, we have to out perform the competition in each category, and our competition is getting better all the time. Linux as an operating system has been the fastest growing with respect to these requirements, and we're not limited by what's in front of us. The quality of the Linux platform is greatly important to us and Red Hat Enterprise Linux has exceeded our expectations," said Rubinow.

In addition, NYSE Euronext benefits from the unmatched value Red Hat places on customer feedback. Important to the open source model is the constant feedback loop between users and customers and the engineers and developers behind the software. Through Red Hat's Global Support Services, there is constant feedback and development between Red Hat and its customers. "When we have mundane questions, they're answered quickly. When we have larger technical questions, we put our best minds and Red Hat's best minds together and have these smart people work in collaboration to solve the problem," said Rubinow.

With continued growth, new development, and ongoing conversion activities, NYSE Euronext will add several hundred more subscriptions of Red Hat Enterprise Linux in the coming 18 months. In addition, Red Hat solutions are slated to play a pivotal role in NYSE Euronext's next-generation trading platform, the Universal Trading Platform. Currently, the first phase of the project is planned for completion by the end of 2008.

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