Merlin Securities increases SAN performance 5-fold and server performance 2-fold without any increase in power consumption

- Intelligent Data Management
- Green Efficiency
- Networking

"When investors need deep, sophisticated analytics, they use SHARP. We're able to process highly complex queries in a matter of seconds with Dell hardware."

Robert Garrett, Senior Partner and Chief Technology Officer, Merlin Securities

Customer Profile

Company:	Merlin Securities
Industry:	Financial Services Technology
Country:	United States
Employees:	105
Web:	www.merlinsecurities.com

Business Need

Merlin Securities, a prime brokerage technology and services firm, gives hedge fund investors sophisticated analytics into fund performance through a proprietary software package. Merlin is growing rapidly because of the competitive advantage that this software provides. The firm recently upgraded its hardware infrastructure to ensure that performance of the software remains leading-edge.

Solution

After extensive testing of server and storage hardware from 10 vendors, the firm selected Dell™ EqualLogic™ storage arrays, along with Dell PowerEdge™ blade servers with Intel® Xeon® processors 5600 series and high-density 10 GbE switches from Arista Networks. Rollout in the first data center is almost finished. According to Bob Garrett, senior partner and chief technology officer for Merlin, "the results are already astonishing."

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Benefits

- 5-fold increase in overall SAN performance
- No increase in SAN power consumption
- Reduced power consumption saves costs with power efficient Dell blade chassis
- 2.5-fold faster native SAN speed (10-Gigabit vs. 4-Gigabit)
- 60% lower capital expenditure to get to 10-Gigabit storage
- 2-fold increase in CPU performance
- 2-fold increase in RAM throughput
- No increase in server power consumption
- Complex analytics for clients completed in seconds vs. hours
- Unparalleled insights into storage system via Dell EqualLogic SAN HeadQuarters

In investment decision-making, alpha is king. Alpha is a risk-adjusted measure of return on investment, and before the financial market meltdown of the late 2000s, hedge funds were dedicated to its optimization. Fund managers were laser-focused on investment returns, sometimes neglecting to notice the cost of the business systems they used to generate those returns.

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Mike Mettke, Partner, Senior Database Administrator and Manager of the Infrastructure Group, Merlin Securities

Today, post-crisis, overseers of investment vehicles are dedicating themselves to business management as well as fund management. Many midsize hedge funds are reducing their fixed costs by outsourcing tasks they previously managed in-house, such as risk and performance analytics. This shift has meant rapid growth for Merlin Securities, a New York-based prime brokerage technology and services firm whose custom-built SHARP software provides shadow reporting, analytics, and risk and performance measurement for hedge funds.

"SHARP gives us our competitive advantage," explains Bob Garrett, senior partner and chief technology officer. "It can blend benchmarks and compare a hedge fund's performance against the benchmarks. It can generate metrics on assets held across multiple custodians, tracked by trader, country, strategy, account or geography. The ability to produce real-time reports across multiple custodians and multiple accounts is a major differentiator for us."

Since the financial market crisis, these capabilities have resonated with hedge fund managers. "Our recent growth has been exceptional," says Ron Suber, senior partner and global head of sales and marketing for Merlin. "Last year, Merlin's number of hedge fund clients grew by 40 percent, and in the first two months of this year, it grew by another 10 percent."

Garrett sees Merlin's growth as a function of the firm's focus on bringing leading edge technology to the investment community. "If an institutional investor with money in 10 hedge funds wants to see its exposure to gold, or to Greece, during three specific days back in December, the managers of the funds that use SHARP can quickly produce this information," he says. "Today's investors are able to pull and analyze market data quickly, and they rightfully expect to have the same capabilities with their portfolios."

Upgrading hardware to stay sharp

Performance of the SHARP software, and of the Oracle Real Application Clusters (RAC) databases that underlie it, is business-critical for Merlin. That's

Technology at Work

Services

Dell™ Support Services
- Dell ProSupport™ with Mission Critical and Enterprise-Wide Contract

Hardware

Arista Networks 7148SX low latency switches

Dell EqualLogic™ PS6010S solid-state disk storage arrays

Dell EqualLogic PS6510E SATA disk storage arrays

Dell PowerEdge™ M1000e modular blade enclosures

Dell PowerEdge M710 and M610 blade servers with Intel® Xeon® processors 5600 series

Software

Arista EOS™ (Extensible Modular Operating System)

Dell EqualLogic SAN HeadQuarters (SAN HQ)

Oracle® Enterprise Linux 5.5

Oracle Real Application Clusters 11*g* Release 1

VMware® vSphere™ 4.1

Windows Server® 2008, 2003

why the firm recently began upgrading the technology infrastructure of its two data centers. "Managing the SHARP back end is challenging," says Mike Mettke, partner, senior database administrator and manager of the firm's infrastructure group. "Our growth has been so dramatic that the usual long-term projections for IT platform upgrades don't apply."

Mettke and his team were tasked with upgrading the firm's servers and storage hardware to optimize performance, availability and energy efficiency. They also needed a solution flexible enough to grow with the company. "Not only are we continuing to add new clients rapidly, but we're expanding in terms of our product base and geographic reach," Suber says. "We're planning new offices in Canada, Latin America and Asia, so our New York data center needs to provide high availability 24×7."

Merlin analyzed hardware from 10 vendors. For servers, Mettke and his team quickly selected Dell blades. "We've used Dell hardware since our founding in 2004, so we are very familiar with the Dell PowerEdge server platform," Mettke says. "We know that Dell hardware is stable and provides great performance. Plus, when we researched energy efficiency, we found that none of the other major suppliers could match Dell blades and the power supplies in Dell blade enclosures. The Dell blade chassis is highly power efficient and helps Merlin save costs by lowering power consumption."

Breakthrough performance with 10-Gigabit SSD storage

The storage search required more extensive research. Merlin was using a 4-Gigabit Fibre Channel SAN, but Mettke wanted to increase bandwidth by moving to 10-Gigabit Ethernet iSCSI SANs. "We were looking for a storage platform with full SAN capabilities out of the box—monitoring analytics, replication, SAN copying and snapshotting—that was also a native 10-Gigabit product," he says. "There are a lot of platforms out there based on legacy standards that add a 10-Gigabit interface on the front end, but that doesn't give you the same performance."

Mettke and his team thoroughly tested several different SANs, including Dell EqualLogic iSCSI solid-state disk (SSD) and SATA disk arrays. The EqualLogic hardware came out on top taking all requirements into account. Merlin's tests also indicated that EqualLogic SANs excel in energy efficiency. "Very few storage manufacturers have a native SSD option with their storage platform," Mettke says. "We were interested in SSD for two reasons: performance and power consumption. We were able to reduce power consumption, and hence data center costs by replacing a large number of conventional disks with a small number of SSD drives."

Moreover, Mettke likes the flexibility of the Dell EqualLogic platform. "The fact that EqualLogic is modular is a major advantage in terms of being able to scale after installation," he says. "Not only can you scale the number of disks, but you can simultaneously scale throughput, performance, network and host attachment capabilities. That is a strategic advantage."

Finally, he was impressed with the EqualLogic arrays' integrated monitoring and analysis tools and support for VMware vStorage APIs for Array Integration (VAAI). "EqualLogic SAN HeadQuarters provides insight into the entire storage system, including historical trending and analysis," Mettke says. "The tool is, frankly, unparalleled. Not only that, but Dell bundles it into the cost of the EqualLogic SANs. With other vendors, management tools add to the total cost of ownership of the product."

Making critical connections

The servers and storage were connected using a pair of Arista Networks 7148SX low latency switches. A Dell strategic partner, Arista offers the industry's highest density 10 Gigabit Ethernet switching solutions and the first with an extensible modular network operating system, Arista EOS (Extensible Modular Operating System).Since low latency performance coupled with low power utilization and cooling was vital to the solution, Mettke saw the switches as a vital part of the infrastructure—the critical connection between the servers and the iSCSI storage.

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>
> *Ron Suber, Senior Partner and Global Head of Sales and Marketing, Merlin Securities*

The interconnections from the switches were made to the Dell M1000e blade enclosure using pass-through I/O modules on the rear of the blade enclosure. The Dell EqualLogic storage controllers were also connected to the Arista switches for low latency and high bandwidth performance coupled with reduced power and cooling requirements. A proof of concept demonstrated stellar results over the incumbent competitor and avoided over provisioning and potential spanning tree issues.

Exceeding "five nines" availability

In both data centers, Merlin decided to implement Dell PowerEdge M1000e modular blade enclosures housing Dell PowerEdge M710 and M610 blade servers with Intel Xeon processors 5600 series. For storage, it selected Dell EqualLogic PS6010S arrays to handle Oracle RAC, running on Oracle Enterprise Linux, and it deployed Dell EqualLogic PS6510E SATA disk arrays to run the rest of its applications on Windows Server in a VMware vSphere virtual environment. The Linux operating system is a natural fit with EqualLogic storage, since both are industry-standard, offer a modular design and provide the flexibility of a scale-out architecture.

The upgrade of Merlin's first data center is almost complete, and the company is about to begin upgrading the second data center. "The modular architecture of EqualLogic enabled us to subdivide our infrastructure into two independent stacks per data center," Mettke says. "Each stack is completely self-contained; it encompasses storage, controller and networking connectivity. Then, by combining these independent stacks into a larger ecosystem, we can guarantee uptime even if we sustain substantial damage. The target service level agreement (SLA) on the storage hardware is five nines. For Merlin, five minutes a year of downtime isn't an issue, but recovery is. We can't afford the days or hours it would take to recover from five minutes of downtime, so five nines is not good enough. By constructing multiple independent islands of functionality within the data center, we dramatically increased our SLA. Since installation in September 2010, we've had no downtime with the Dell blade servers or EqualLogic SAN."

5-fold faster storage, no increase in energy use

The Dell servers and storage arrays are also exceeding Merlin's performance goals. "The performance is mind-blowing," Mettke says. "We improved the native SAN speed by a factor of 2.5 by jumping from a 4-Gigabit to a 10-Gigabit SAN. And we avoided two forklift upgrades on storage. Had we stayed on our previous storage path, we would have moved to 8-Gigabit, then Fibre Channel over Ethernet, then 10-Gigabit. By leapfrogging straight to 10-Gigabit with iSCSI, we reduced our total capital expenditure by eliminating two major SAN forklift upgrades."

The cost savings estimate increases even more when it takes into account the SANs' energy usage. "Our energy usage hasn't dropped, but it hasn't increased either," Mettke says. "Meanwhile, migrating to a native 10-Gigabit platform that fully supports SSD has dramatically improved our storage performance. For the same level of power consumption, we've improved our storage IOPS five-fold. And that's a very conservative estimate."

The Dell blade servers are providing similar results. "On the server side we've been able to keep our power consumption level, while doubling CPU performance and RAM throughput," Mettke says. "The RAM speed is critical for the database operations supporting SHARP analytics. By upgrading to the Dell blade server architecture, we're using servers with the highest RAM speed currently available on the market. In our experience, the Intel 5600 series CPUs have increased performance over the previous generation without increasing power consumption."

For rapid response and resolution of critical issues, Merlin chose Dell ProSupport with Mission Critical and Enterprise-Wide contract for the blade servers and SAN. "Our support experience has been great thus far," says Mettke.

Helping clients build enterprise alpha

As a next step in its ongoing infrastructure improvements, Merlin is considering a "hybrid cloud," through which it would combine services of an external cloud provider with an internal cloud built on Dell hardware. "The decision points between a physical infrastructure, an internal cloud and the external cloud are essentially driven by cost and time to market," Mettke says. "It would give the company a lot more flexibility on a strategic level."

For now, the new Dell-based infrastructure enables Merlin to help hedge funds optimize not only their investment alpha, but also their organizational bottom line—their enterprise alpha. "When investors in Merlin's hedge fund clients need deep, sophisticated analytics across securities, across time frames, across accounts and across custodians, they use SHARP," Garrett says. "We're able to process highly complex queries in a matter of seconds with Dell hardware."

"Our competitors are struggling to keep up because they're using legacy architectures," concludes Ron Suber. "Dell gives us a technological edge."

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