Case Study: Large Mortgage Originator

"Large Mortgage Originator" Expands Profitable Trading with Digipede Network

Elegantly Simple Grid Computing Delivers High Performance on Microsoft .NET

Financial firms rely on cutting-edge mathematical modeling for their investment and trading strategies. Regardless of the size of the firm or the models they employ, financial analysts all cry out for one thing: more number-crunching power. And it's not just for a couple of applications; analysts typically face computational bottlenecks in risk management, fixed income pricing, trading analytics, and other critical areas. Eliminating such bottlenecks can generate immediate benefits: reduced risk, faster entry into new markets, and the chance to out-trade competitors.

The Company

"Large Mortgage Originator," one of the biggest in the United States, is a leader in fixed-income asset trading. With one of the largest Treasury desks in the world, Large Mortgage Originator is a major player in the market for collateralized debt obligations.

The Challenge

Last year, Large Mortgage Originator started a new commercial desk. In order to advise his team on ideal trades, one of the desk's quantitative analysts (or "quants") ran loan-pricing calculations on a large number of assets across a wide range of interest rate scenarios—all in Excel, with some .NET and COM behind his spreadsheets. The analyst, however, faced a recurring problem: his pricing calculations consistently ran longer than overnight, with an average runtime of 17 hours. He would kick off the job on his workstation as he left for the evening, and when he came back the next morning, the machine was often still finishing the process.

The analyst found this situation to be increasingly frustrating, as it was literally keeping him from doing his work. To complicate the matter, Large Mortgage Originator, like many financial firms, had competing IT priorities and was not ready to take on a year long, interdepartmental technical evaluation. Any prospective fix would have to be efficient, cost-effective, and based on the firm's industry-standard Microsoft platform.

The Solution

Large Mortgage Originator's commercial market quant had heard of Digipede's Windows-based grid computing solution, and decided to evaluate its ability to reduce the run-time on his analysis. He downloaded and installed an evaluation copy of the Digipede Network on five dual-CPU machines available in his department. The Digipede Network is an affordable distributed computing solution built entirely on Microsoft .NET that delivers dramatically increased performance for processes that require significant computing horsepower.

With no previous grid computing experience—and not all that much software development experience, either—Large Mortgage Originator's analyst only needed a few days to adapt his calculations to run on the Digipede Network. In fact, his effort required only about 30 lines of Digipede-specific code. His initial experiment showed that a typical 17-hour job would now run in about two hours, a near-linear speedup from one CPU to 10 CPUs.

Run-Times of Pricing Calculation Job

Job runs 9X faster by running on the Digipede Network
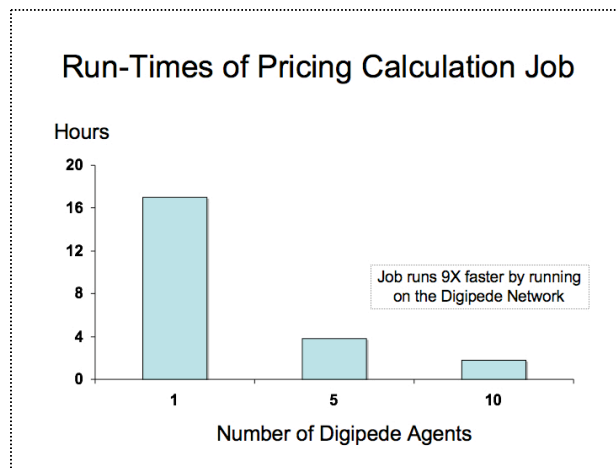
To put his successful test into production, the analyst bought a license for the Digipede Network Professional Edition for less than $10,000. He was then able to run his analysis several times a day, thereby pricing assets with more current information and greater accuracy. Better analysis led him to identify more profitable trading opportunities; in fact, the profits from a single trade exceeded the software's cost, so his time to payback was measured in *days*.

The Results: Bet the Farm on Grid Computing

When word of the analyst's initial success began to spread, Large Mortgage Originator's IT Director became quite enthusiastic about firm-wide possibilities. He hadn't been aware that a truly high-performance grid computing solution was available on .NET, but was pleased to learn of the Digipede Network's deep integration at multiple points in Microsoft's stack. Given the firm's commitment to a Microsoft environment, in particular its use of Visual Studio for application development and SQL Server to back all data-driven applications, Digipede was an ideal solution.

The IT Director recognized that Digipede's scalable grid computing technology would benefit many other stakeholders within the firm—from small teams to large departments. He said, "I knew of at least 6-8 other groups that were building their own application-specific compute farms. Each of these groups had IT and developer resources creating distributed computing infrastructure, when they *should* have been working on financial analysis functionality. Using Digipede for this infrastructure gave us a supported commercial grid platform, and let us focus on our core competencies."

In addition, the IT Director appreciated that the programming model enabled by the Digipede Network was the antithesis of the complex "grid-enablement" methods required by other solutions. "We weren't going to retrain our development team on difficult parallel programming techniques or some proprietary scripting language—in a fast-paced financial business like ours, we need to deploy new ideas *now*." The Digipede Network fit this IT environment and corporate culture perfectly.

After just a few months, Large Mortgage Originator had deployed a production grid of the Digipede Network across more than 400 CPUs. It adapted multiple fixed-income pricing and trading analytics applications to the grid, and is now planning for further expansion throughout the organization in the coming year. With superior pricing analysis of the most current information available, the firm's profitable trading opportunities have now expanded far beyond that first initial test on five machines.