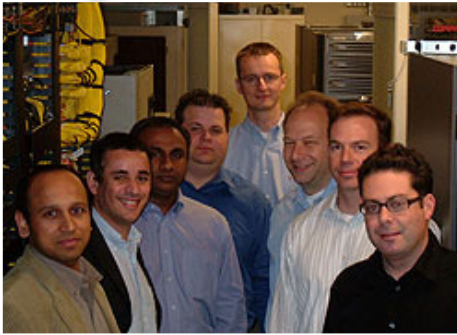



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Living LARGE, L to R: Jacob Chirayath, Benjamin Imelhaine, Wilson Varghese, Matt Hart, Morten Hoyer, Karim Khiar, Billy Rutledge and Leo Solomon

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Living LARGE

BGIs challenge conventional wisdom

Mickey ButtsiniSan Francisco

BGI's fixed income researchers employ massive computer horsepower to bring cutting-edge financial products to market. But when they needed to perform intensive [Monte Carlo simulations](#) for a new credit derivatives product called synthetic collateralized debt obligations (CDOs), they found that their existing computing environment didn't have the flexibility they required.

"The world of innovation in financial products is moving extremely fast," says [Karim Khiar](#), a research officer who heads up CDO analytics. "To keep up with this level of innovation and the complex modeling that these new financial products demand, I needed a computing environment that was not too expensive, that could evolve extremely quickly, and that met all my technical criteria."

In a lightning-fast partnership with Global Infrastructure, a 13-member team built **LARGE** (Linux Analytical Research GRID Environment), a network of 24 AMD Opteron 64-bit servers running the Red Hat Linux operating system. **The project is the first to use Linux within BGI**, and the first to develop an end-to-end platform to run memory-intensive 64-bit software applications, allowing for nearly 100 computers to be used to solve one problem and greatly reducing the amount of time required to complete a calculation.

BGI looks to Linux

Linux is the open source operating system whose building-block code was written by Finnish visionary [Linus Torvalds](#). Unlike such proprietary operating systems as Windows, the underlying Linux code can be freely used, improved, and redistributed. Because Linux has harnessed the world's open-source programming community to develop the operating system for free, it has been able to create a computing environment that offers a much better price-to-performance ratio and much more stability than the traditional server environment.

The financial services industry is slowly adopting Linux in the US, mainly for use in specialized projects like this. **BGI is leading the innovation curve in its adoption of Linux as a core platform.** "There are many companies out there using Linux, but they are not really using it as a core part of daily business yet," says [Jacob Chirayath](#), global platform manager (UNIX). Concerns over legal liability issues (such as code copyright indemnification from vendors) have held back adoption of the platform, as have the new training required for technical support and difficulties transitioning large organizations away from their current environments.

In addition, the unique grid design of LARGE distributes processing over a



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Challenging conventional wisdom?

"Challenging conventional wisdom," a new *bip* series, brings you stories of your colleagues breaking new BGI ground, thinking differently--and innovating--to help clients and make important leaps for BGI.

Is your team challenging conventional wisdom? [Let us know--the first five entries win BGI-monogrammed bags--and perhaps, a well-deserved story in bip.](#)

Living LARGE: the team

Launching LARGE was a joint IT/research effort, with key contributors including:

- **Business sponsors:** Brian Zalaznick, Karim Khiar, John Van Moyland, Eric Christiansen
- **Research and Analytics:** Karim Khiar, Benjamin Imelhaine, Morten Hoyer, Billy Rutledge
- **Technical team:** Scott Nichols, Wilson Varghese, Tim Madams, Dean Petrich, Dan Wake
- **Project management:** Leo Solomon
- **Infrastructure management:** Dan Hagelin, Keith Carsten, Jacob Chirayath
- **Infrastructure support:** Pat Nelson, Paul Fiester

network of computer servers to achieve radical improvements in speed, stability, and scalability. For instance, computing power can be added to the grid without disrupting staff who are using the system.

A need for speed

Because BGI researchers needed to develop a distributed platform using the latest 64-bit computing applications (such as MATLAB, ILOG CPLEX, and BGI Ops), the team chose to adopt Linux running on the AMD processor, after conducting a thorough cost-to-performance analysis. Karim has found the new grid has produced a 500 percent increase in the speed of these highly computing-intensive 64-bit applications over the previous Solaris and Windows PC environments, enabling jobs that once took seven hours on a single machine to be performed in 20 minutes over a network of 24 machines. Karim adds that it's also extremely stable compared to the previous collection of Windows PCs that he used.

In the end, the project was a textbook example of IT mobilizing rapidly to meet cutting-edge business needs. "We knew it was a critical project for the business," says [Leo Solomon](#), project manager. "It was a Herculean effort one weekend to get Karim ready for a client demo, and it turned into a great collaboration between Fixed Income and Global Infrastructure."

"The Global Infrastructure Team put the grid together in an extremely fast time frame," agrees Karim. "The project team worked over the weekend, and the following week I was up and running with my Monte Carlo simulations. It was fantastic."

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