



Customer Testimonial

Grid Computing

Solution Panorama

SG Corporate & Investment Banking

- Activity: Commodities Trading Room
- Staff: 250 people, including 120 traders and 35 IT personnel

Objectives

- Perform hundreds of thousands of real time calculations using data stored in existing applications.
- Benefit from a decision making application to take advantage of the results of these calculations, and allow traders located throughout the world to access this application and run simulations on financial products.

Solution

Implementation of a Grid Computing architecture dedicated to calculations, currently composed of 10 dual-Xeon servers running at 2.8 GHz and including 2 GB of RAM. The grid will later include 100 servers. Calculation results are stored in a database combined with an OLAP driver and hosted on a cluster composed of two Xeon quad processors running at 2 GHz, with 4 GB of RAM and 2 MB internal cache.

Products Used

- Development environment: Microsoft® .NET
- Message manager: Microsoft® Messages Queue Server
- "Symphony" from Platform Computing
- Programming language: Microsoft® Visual Basic .NET
- Database: Microsoft® SQL Server 2000
- OLAP Analysis Services engine
- Operating system: Microsoft® Windows 2000 Advanced Server for the server grid and Microsoft® Windows 2003 for the Microsoft® SQL Server / OLAP Analysis Services cluster.

SG Corporate & Investment Banking: a unique architecture for hundreds of thousands of calculations in real time!

To be competitive, a Trading Room must continuously analyze the efficacy of its financial products, calculate risks, perform simulations, etc. All of these complex operations involve many parameters that must be taken into account. To provide its traders with a reliable, robust and economically advantageous architecture, the Commodities Trading Room at "SG Corporate & Investment Banking" (SG CIB) have opted for a server grid running Windows and a decision-making solution based on SQL Server and the OLAP Analysis Services engine from Microsoft.

In 2000, the SG CIB Commodities Trading Room undertook a far-reaching project: unifying its IT system to increase reactivity and be able to quickly respond to the needs of its 120 traders. Thanks to this new architecture, the 30-person IT team can tackle problems that are complex and difficult to solve in terms of time, data volumes, etc. For example: continuously creating new financial products, updating applications to comply with rapid changes in banking regulations, offering custom tailored products that combine multiple parameters, etc.

■ Handling a large volume of real time calculations

The project also included a decision-making component that involved implementing tools used to calculate risk for financial products. The objective: provide traders located throughout the world with the tools they need to perform real time simulations on financial products. Started in 2003, this project component makes use of an original Grid Computing architecture, with planning provided by Symphony from Platform Computing. This technology is used to distribute computations over many servers (currently 10, and soon to be 100), all equipped with Windows 2000 Advanced Server Enterprise Edition. The project also involves implementing Microsoft Analysis Services,



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About Platform Computing

- With 80% market share, the Canadian software developer Platform Computing was created in 1992 and is the world leader in GRID Computing. With turnover of \$60 million, more than 1,600 corporations throughout the world use our solutions in sectors as diverse and sensitive as research, aeronautics, the army, education, science and financial markets. A solution that is specific for financial markets:

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- Risk calculation in real or deferred time, real time pricing, fixed income, equities, derivatives, loans, foreign exchange, asset management, simulations, modeling, Monte Carlo simulations, etc. Platform Computing offers the following functionalities:

www.platform.com/products/Symphony

- Harness and “virtualize” underused machine power. Significantly increase performance and management of risk calculation strategic applications. Control and reduce costs associated with maintaining multiple machine clusters. High availability 24 hours a day, contractually guaranteed.

- A few of our references:

www.platform.com/customers/



an OLAP engine that, when combined with the Microsoft SQL Server 2000 database, allows traders to perform multidimensional analyses.

■ Distribute calculations to optimize performance

Several criteria led the Commodities Trading Room IT team at SG CIB to choose this innovative architecture. Nicolas Narozniak, the Commodities Department Project Manager, explains that **“the type of calculations we need to perform is very complex and consumes a great deal of machine resources. On average, each computation really includes several hundred thousand operations involving several gigabytes of data. We needed a robust architecture to perform these calculations in real time, since the trader needs this information at time T. A mainframe type solution wouldn’t work, since if the machine went down, the traders wouldn’t have access to their tools.”** He adds, **“with the Grid, if a machine goes down, the calculations are redirected to other machines and the malfunction has little or no impact on the overall performance of the application. In addition, the Grid provides unique flexibility: We only need to add a server to our grid in order to scale up.”** Cost was also an important factor in the decision, with the Grid architecture requiring a smaller investment and offering greater flexibility for upgrading.

■ Automated calculation distribution

Started at the beginning of 2003, the implementation of this architecture is based on technologies and developments that are advanced but easy to use. In fact, all trader requests are directed to a server cluster, which breaks the work down into basic tasks before sending these to another server cluster responsible for sending them to the server grid. The server grid is known as a “broker”, and distributes the processing according to the availability of each server, repeating failed tasks according to predefined rules. Each server in the grid extracts the data it needs to perform its task from a database supplied by existing applications or an annex server cluster. To avoid overloading the central database, these annex servers can act as a distributed cache that stores data from the database in the form of objects.

The result of calculations performed by the server grid is then stored in the SQL Server 2000 database with OLAP engine. At the same time, a message is sent to the trader’s client application, which can then start crossing data to perform its analyses. The entire architecture is based on Windows 2000, except for the two cluster servers that host SQL Server 2000 and the OLAP engine. These run Windows 2003 to benefit from the latest optimizations for work load distribution and administration.

“In operation for the past four months, the project was developed with Visual Basic .NET and uses Web Services. This conclusive initial phase will soon be followed by the addition of new calculations and reinforcing the grid with additional servers. _Now, it only takes us one hour to perform calculations that we couldn’t even do before due to a lack of resources and time,” explains Nicolas Narozniak. **“Some calculations were taking more than 12 hours to process and had to be performed twice a day: it just wasn’t possible! And the advantage with our solution is that we only need to add servers to the grid to speed up computing time!”** ■