

# Vanguard Global Optimizer™

Solves Complex Decision Problems by Combining  
Intelligent Search Strategies with the Power of Grid Computing



Use Vanguard across your organization to guide important decisions such as:

- What product mix and pricing levels will maximize our profit?
- How much cash do we need to ensure we can cover all planned activities?
- In which projects should we invest to maximize the portfolio effect and cancel risk?
- How do we shift project schedules to stay within our annual operating budget?
- What production schedule maximizes manufacturing throughput subject to raw material availability?
- What is the minimum amount of inventory we can hold and still achieve high service levels?
- What supply chain strategy satisfies uncertain customer demand while minimizing logistics costs?

Vanguard Global Optimizer is a decision support system that guides your most important business decisions, improving your business and, ultimately, your bottom line.

## **Solve Your Million Dollar Problems**

The many moving parts of real-world business problems make them difficult to comprehend and arduous to solve. Vanguard models these moving parts and accounts for their interactions. It then creates and evaluates millions of potential strategies and identifies the ones that best achieve your goals. It's like having a team of a thousand analysts simultaneously evaluating thousands of strategies. Vanguard provides the same results in just a few seconds and at a fraction of the cost.

## **Guide Any Decision in Any Department**

Vanguard is versatile by design. It can optimize all decision types, from Operational to Strategic, and it can benefit any department, from Finance to Operations to Marketing. This flexibility makes Vanguard a valuable decision support system for anyone who makes important business decisions, from analysts to C-level executives.

## **Easily Describe Your Decision Problem**

As long as you can quantify your problem, Vanguard can optimize your decisions. First, you describe your goal to Vanguard; that is, what you want to improve. For example, you might want to minimize costs, reduce inventory, or maximize customer service levels. Then, you describe your business constraints, such as a \$5 million budget or a scheduling restriction of no more than 12 people on a shift. Finally, tell Vanguard what decisions you can make and how they impact your objective and constraints. Click Run and see your results.

## **Account for Risk and Uncertainty**

Because very little in the business world is known with certainty, Vanguard lets you use *fuzzy values* to reflect your assumptions about risk and uncertainty. For each of the millions of strategies it might evaluate, Vanguard uses your fuzzy values to simulate thousands of "what if" scenarios in assessing how well the strategy will perform. Vanguard reviews the results and identifies your most robust strategies: those that will perform best in an uncertain future.

## Enterprise-Class Abilities

Vanguard has the analytic power to handle the most demanding types of problems, the capacity to handle enterprise-scale models, and the flexibility required to allow many individuals to collaborate in the modeling process.

Vanguard's features include:

- Flexible formulations that allow any problem structure, regardless of linearity, discontinuity, and stochasticity assumptions.
- Support for traditional problem formulations, including linear (LP), integer (IP), and more.
- Grid computing to handle complex optimizations with or without Monte Carlo simulation.
- Support for collaborative, distributed modeling.
- Networked for geographically dispersed user groups.
- Customizable Web-based interfaces.
- Complete user authentication, access controls, version controls, and quality controls.
- Support for system integration protocols, including ODBC, Web Services, read/write for CSV, XML, and other file types, Excel links, and many more.

## Remove the Need to Simplify

Many business problems defy traditional optimization techniques because they contain complicated, yet real-world, structures or uncertainty. Optimization modelers are forced to simplify business problems to use available techniques, essentially forcing square pegs into round holes. While the solutions they find might be mathematically optimal, they do not solve the original, real-world problems.

Vanguard has no restrictions on linearity, discontinuity, stochasticity, and other model characteristics that limit the applicability of virtually all other optimization tools. With Vanguard, you can model the *real* business problems you face.

## Intelligent Search and Robust Solutions

Vanguard is a true black box optimizer based on a proprietary search algorithm. The tendency to get caught in local optima is a common problem for most optimizers. However, Vanguard is very robust and highly resistant to this problem due in part to its unique combination of population-based techniques, heuristics, and statistical analysis. This combination of approaches enables Vanguard to optimize simulations as well, a feat that is impossible for most commercial optimization solvers.

## Harness the Power of Grid Computing

Vanguard's incredible speed compliments its intelligent search strategy. Uniquely designed to use grid computing, Vanguard achieves over 1,000,000 samples per second.

## Scale Inexpensively

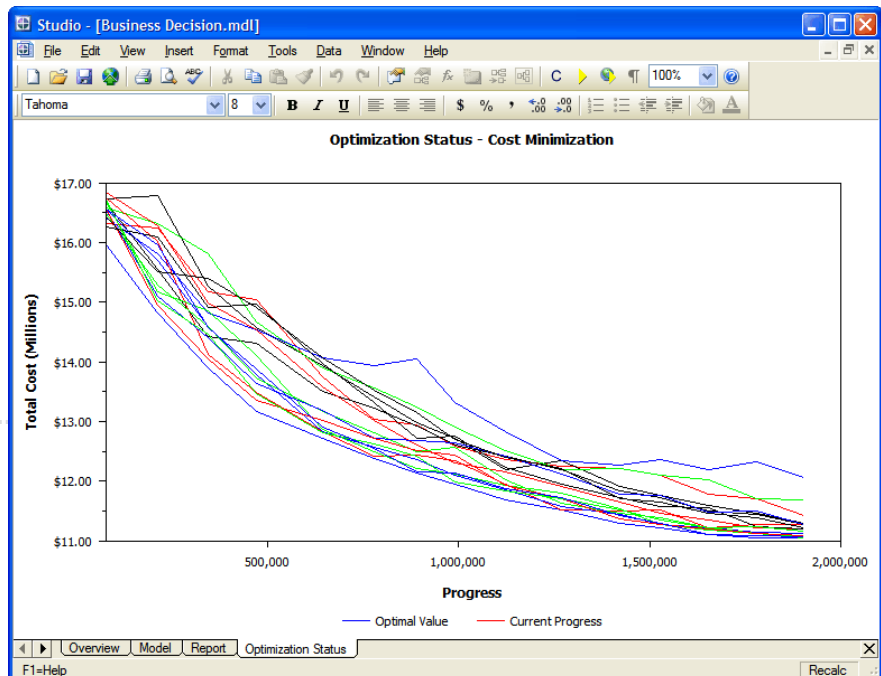
Vanguard gives you the option of running your optimizations on your desktop computer, on an enterprise grid, or in the Vanguard Optimization Cloud™. An enterprise grid is a cluster of dedicated or individual computers across your network that all assist in performing the optimization. Vanguard Optimization Cloud is a high-performance computer grid hosted by Vanguard Software.

By using an enterprise grid or the Vanguard Optimization Cloud, there is virtually no limit to your optimization power.

## Desktop, Web, or Embedded Modes

Build and optimize your models in Vanguard's desktop environment. Deliver any optimization model as an interactive Web application. Let colleagues and stakeholders manage model assumptions or run "what if" scenarios. Create your own custom Web interfaces or use Vanguard's default designs. You also can embed your optimization models as callable engines in existing business planning and Web-based systems.

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Vanguard combines the intelligence of an innovative search algorithm with the speed of grid computing to offer incredible optimization power.