GAMS

Optimization

www.gams.com

Support

Sales

Solvers

Documentation

Model Library

gamsworld.org

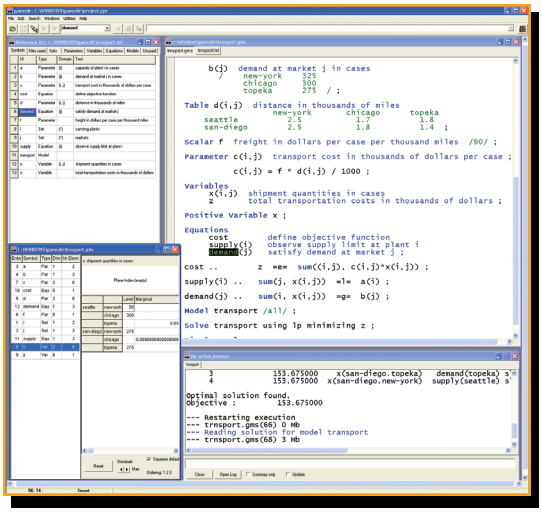
High-Level Modeling

The General Algebraic Modeling System (GAMS) is a **high-level modeling system** for mathematical programming problems. GAMS is tailored for complex, large-scale modeling applications, and allows you to build large maintainable models that can be adapted quickly to new situations. Models are **fully portable** from one computer platform to another.

Wide Range of Model Types

GAMS allows the formulation of models in **many different problem classes**, including

- Linear (LP) and Mixed Integer Linear (MIP)
- Quadratic Programming (QCP) and Mixed Integer QCP (MIQCP)
- Nonlinear (NLP) and Mixed Integer NLP (MINLP)
- Constrained Nonlinear Systems (CNS)
- Mixed Complementary (MCP)
- Programs with Equilibrium Constraints (MPEC)
- Conic Programming Problems
- Stochastic Linear Problems



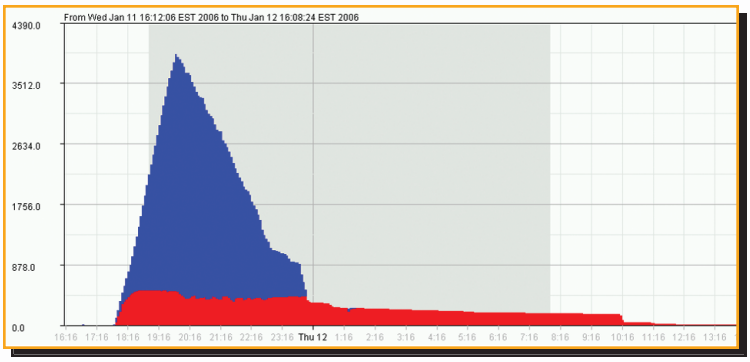
GAMS Integrated Developer Environment for editing, debugging and solving models and viewing data.

State-of-the-Art Solvers

GAMS incorporates all major commercial and academic **state-of-the-art solution technologies** for a broad range of problem types, including global nonlinear optimization solvers.

Cyberinfrastructure: GAMS, Condor and the Grid

Researchers at the University of Wisconsin in Madison, partially supported by NSF Cyberinfrastructure-OR funding, have used the GAMS Grid Computing language extensions in conjunction with the Condor Resource Manager to process long running mixed integer programming models.



UW-Madison Condor Pool User Statistics showing running jobs (red) and idle jobs (blue).

In the case depicted in the figure, over 4000 MIP subproblems were solved on a collection of over 1000 workstations managed by the Condor system.

At times over 500 workstations were running multiple instances of the CPLEX and XPRESS solvers delivering more than 5000 CPU hours in a little over 20 hours wall clock time. Communication of cutoff values and incumbent solutions between models running asynchronously over the grid was handled automatically using recently added solver features.

Condor
High Throughput Computing

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