

GAMS



Rapid Application Prototyping With GAMS

Lutz Westermann

lwestermann@gams.com

GAMS Software GmbH

www.gams.de

GAMS Development Corp.

www.gams.com



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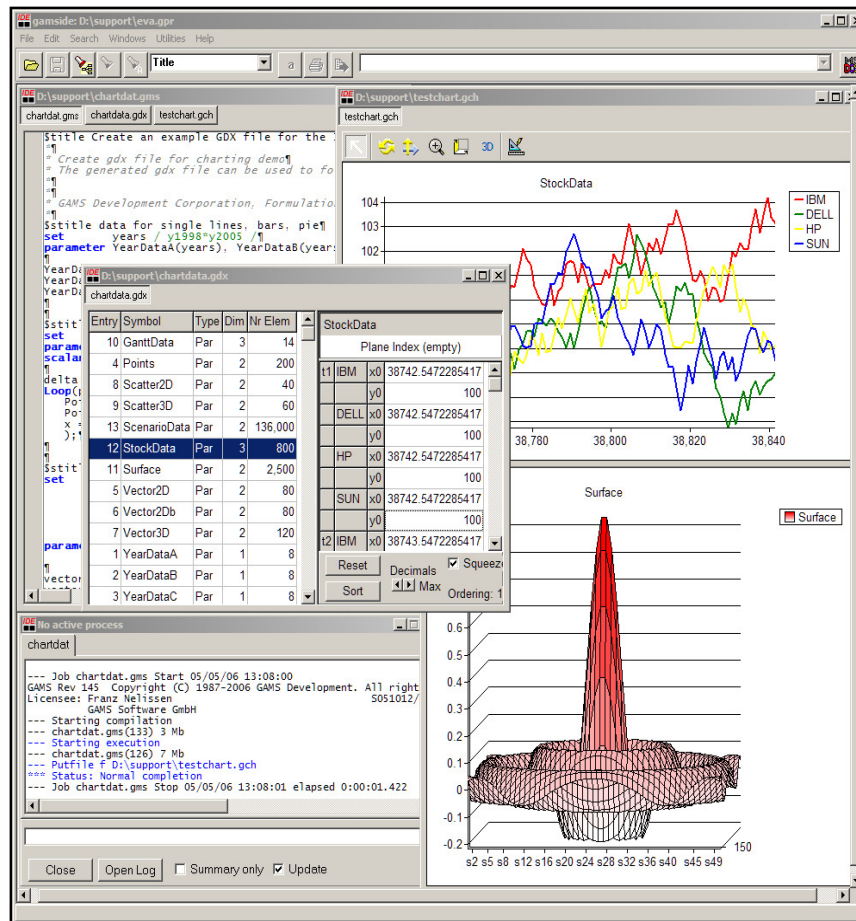


Bonn, July 7, 2009

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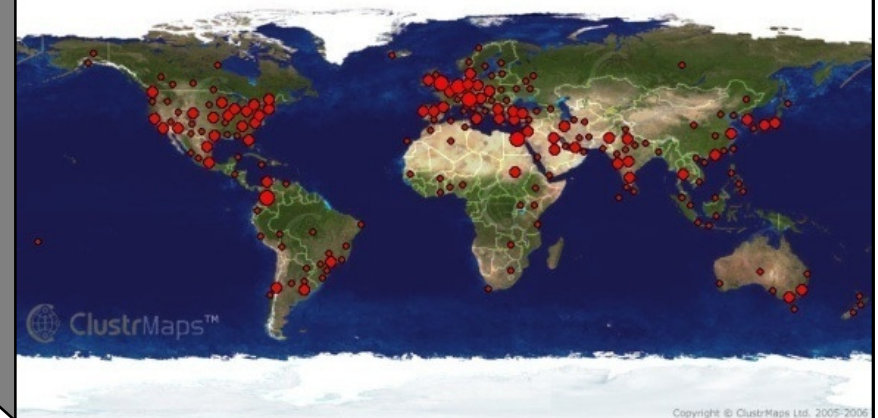


GAMS at a Glance



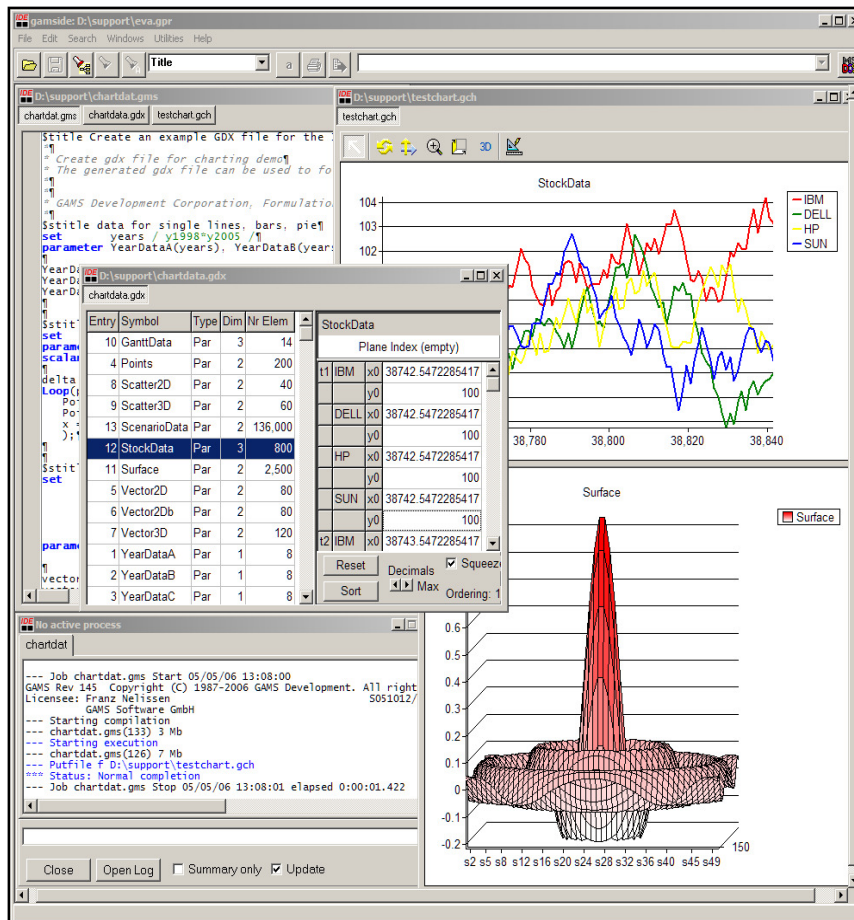
General Algebraic Modeling System

- Roots: World Bank, 1976
- Went commercial in 1987
- GAMS Development Corp.
- GAMS Software GmbH
- Broad academic & commercial user community and network





GAMS at a Glance

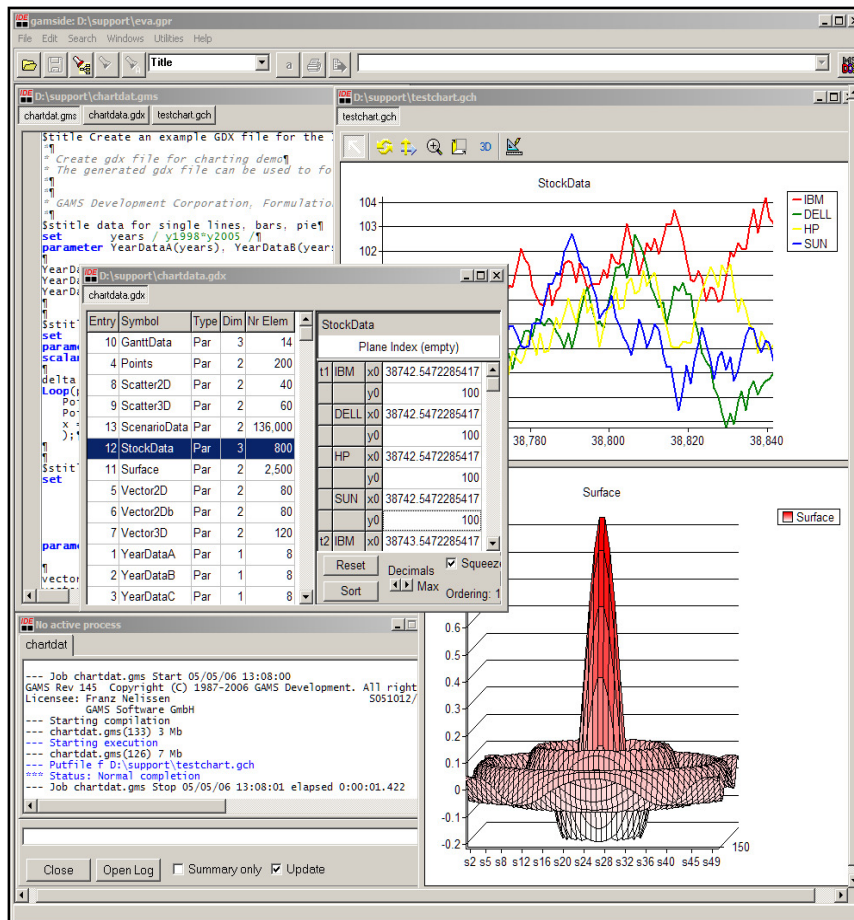


Algebraic Modeling System

- Facilitates to formulate mathematical optimization problems similar to algebraic notation
 - ➔ Simplified model building
- Provides links to appropriate state-of-the-art external algorithms
 - ➔ Efficient solution process



GAMS at a Glance



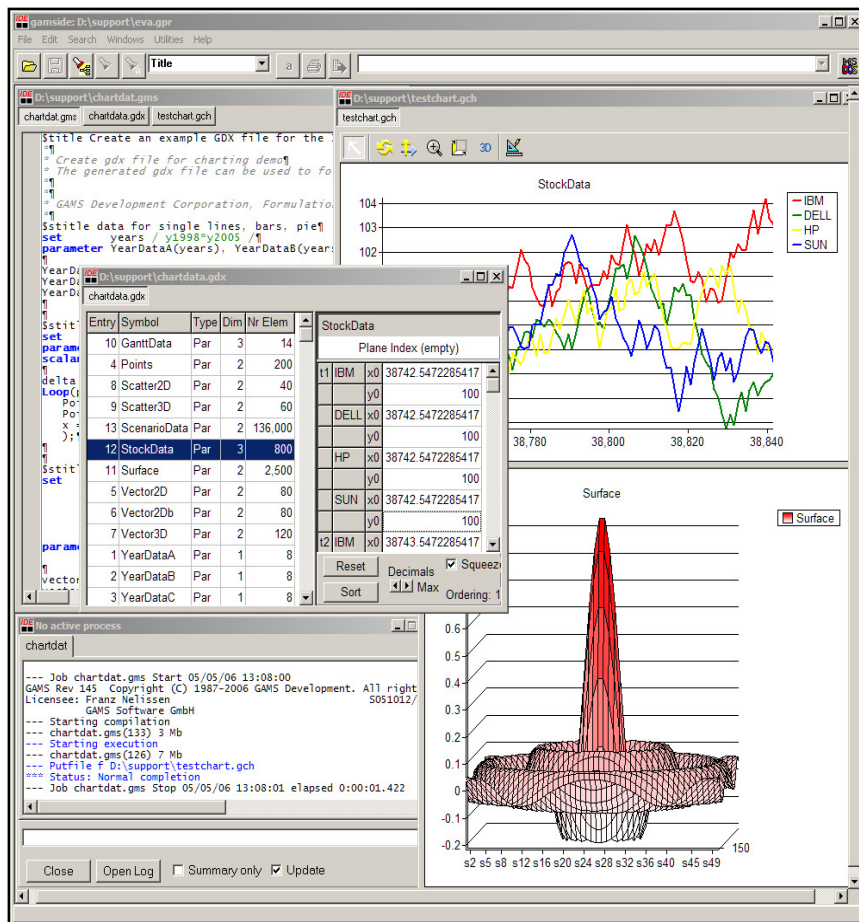
General Algebraic Modeling System

- Algebraic Modeling Language
- 25+ Integrated Solvers
- 10+ Supported MP classes
- 10+ Supported Platforms
- Connectivity- & Productivity Tools
 - IDE
 - Model Libraries
 - GDX, Interfaces & Tools
 - Grid Computing
 - Benchmarking
 - Compression & Encryption
 - Deployment System
 - ...

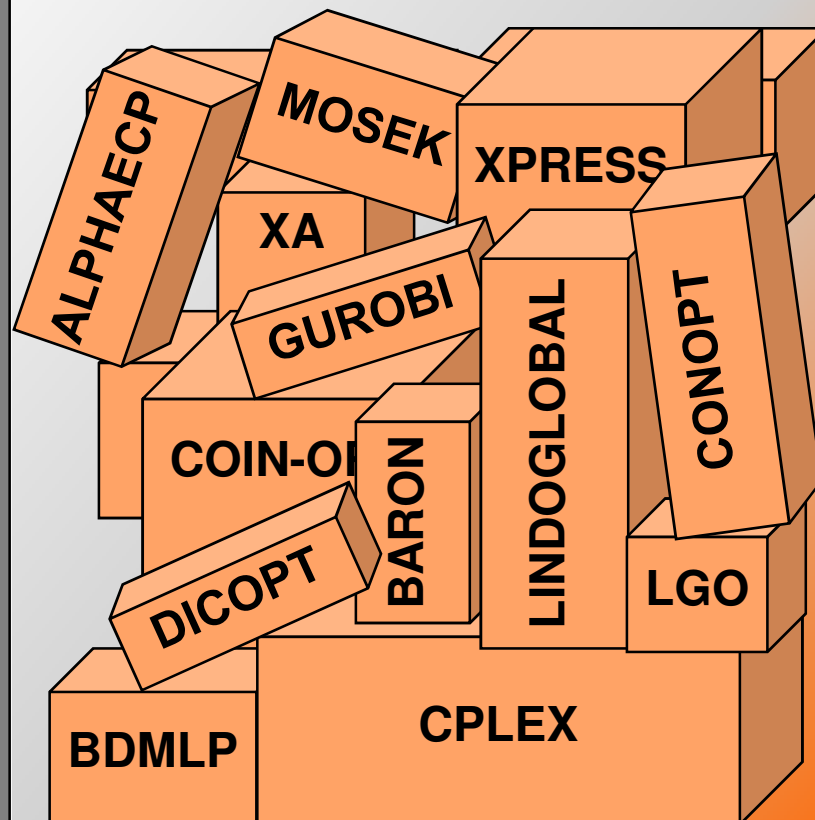
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GAMS at a Glance



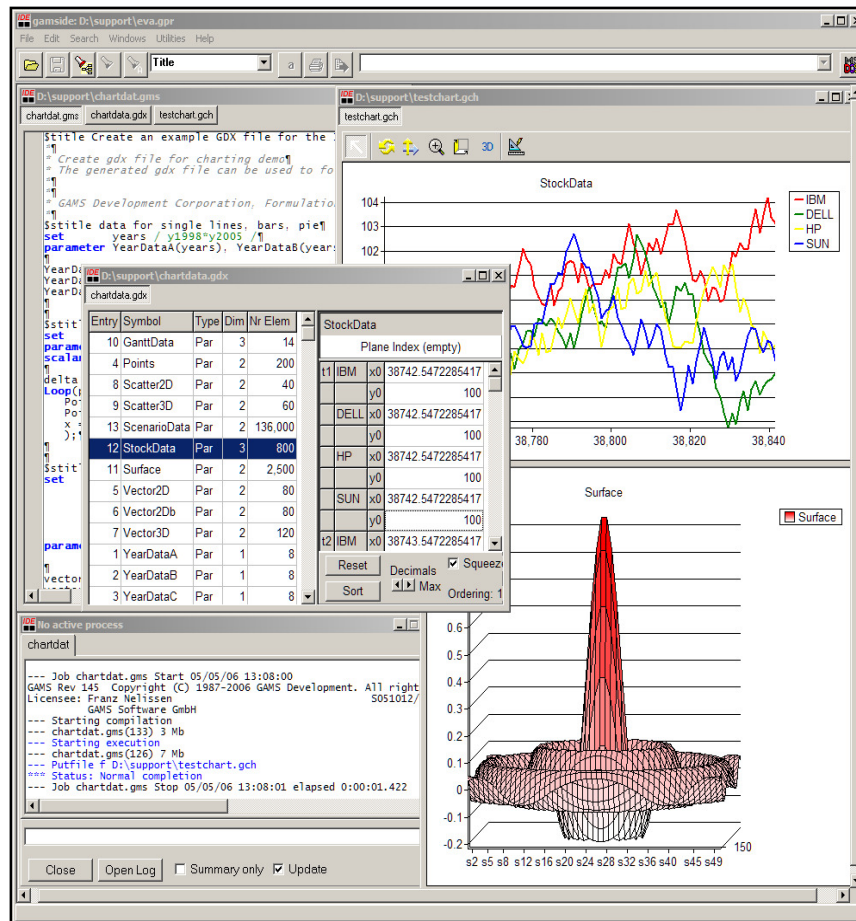
25+ Integrated Solvers



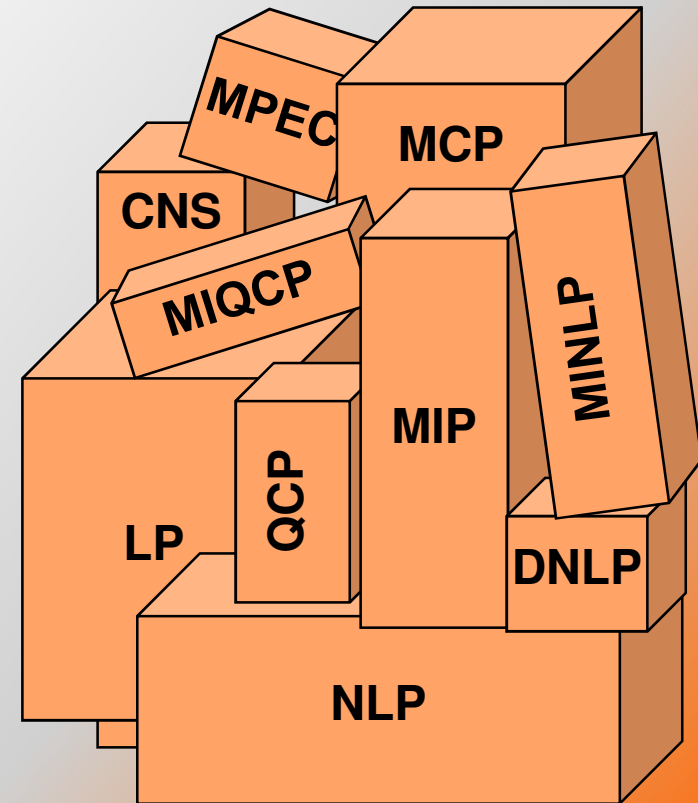
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GAMS at a Glance

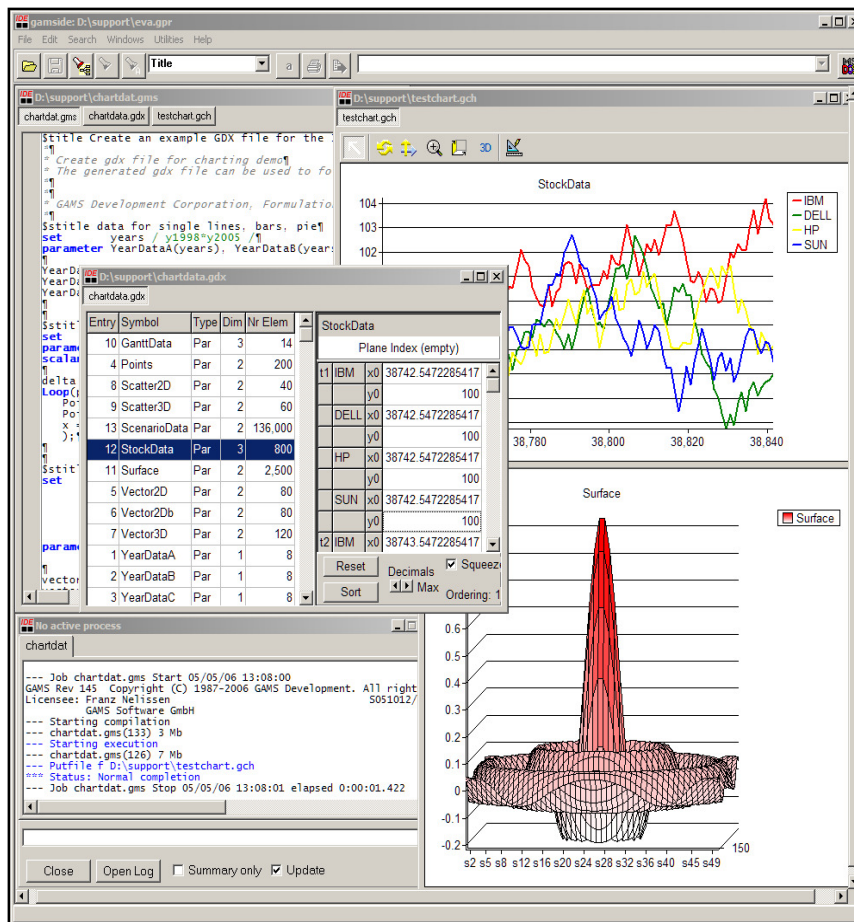


10+ Supported MP classes

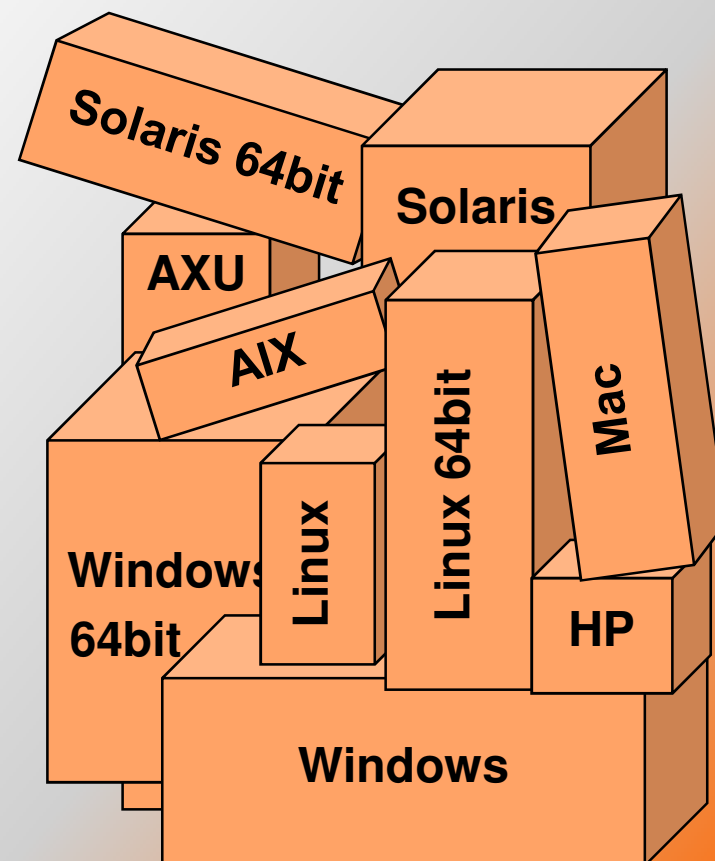




GAMS at a Glance



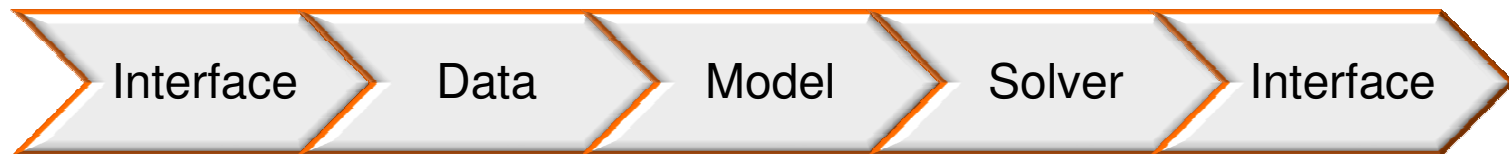
10+ Supported Platforms





GAMS' Fundamental concepts

- **Platform independence**
- **Open architecture and interfaces to other systems**
- **Balanced mix of declarative and procedural elements**
 - Declaration of Sets, Parameters, Variables, Equations, Models, ...
 - Procedural Elements like loops, if-then-else, ...
- **Layers of separation**





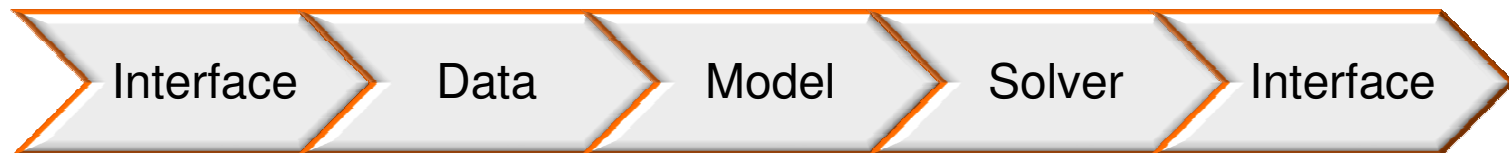
GAMS' Fundamental concepts

Deployed models have often 15+ years lifecycle

- Changing environment (Hardware, OS, Interface)
- Improving solver technology

→ Different layers with separation of

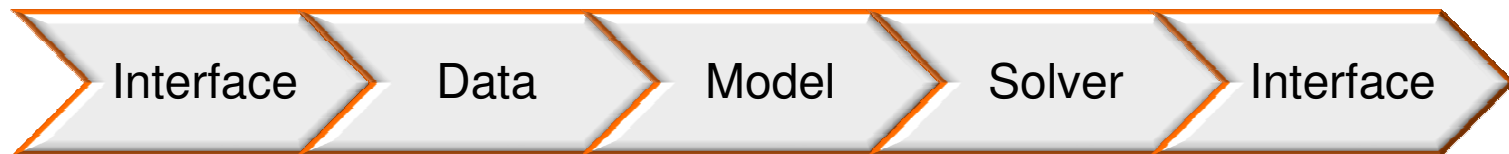
- model and data
- model and solution methods
- model and operating system
- model and interface





GAMS' Fundamental concepts

- Models benefit from
 - Advancing hardware
 - Enhanced / new solver technology
 - Improved / upcoming interfaces to other systems
- Backward compatibility
- Protection of user investments





What's new? (GAMS 22.1 Beta)

New Platform

- Intel Mac 64 Bit

New Solver

- CoinCouenne

New solver binaries

- CoinCbc 2.3
- CoinGlpk 4.37
- CoinIpopt 3.6
- Gurobi 1.1
- Knitro 6.0
- Mosek 5.0 rev 127



Basic Sudoku

Address  <http://www.dailysudoku.com/sudoku/index.shtml>

Daily SuDoku



Home

Today's SuDoku

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SuDoku for Kids

Draw/Play

Discussion

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Welcome to the Daily SuDoku!

Today's SuDoku is shown on the right. Click the grid to download a printable version of the puzzle. Visit [the archive](#) for previous daily puzzles and solutions. Play online, print a Sudoku, solve and get hints using the new improved **Draw/Play** function.

But how do I do it?

The object is to insert the numbers in the boxes to satisfy only one condition: each row, column and 3x3 box must contain the digits 1 through 9 exactly once. What could be simpler?

The rules of the new **Monster Sudokus** are exactly the same, but more numbers and letters are needed.

Classic

Monster

Kids

Squiggly

						6		1
			7	3	1			4
5					9			
6			2				1	
		8				4		
	1				5			8
			9					3
7			8	6	3			
9		2						

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Daily SuDoku: Thu 2-Nov-2006

very hard



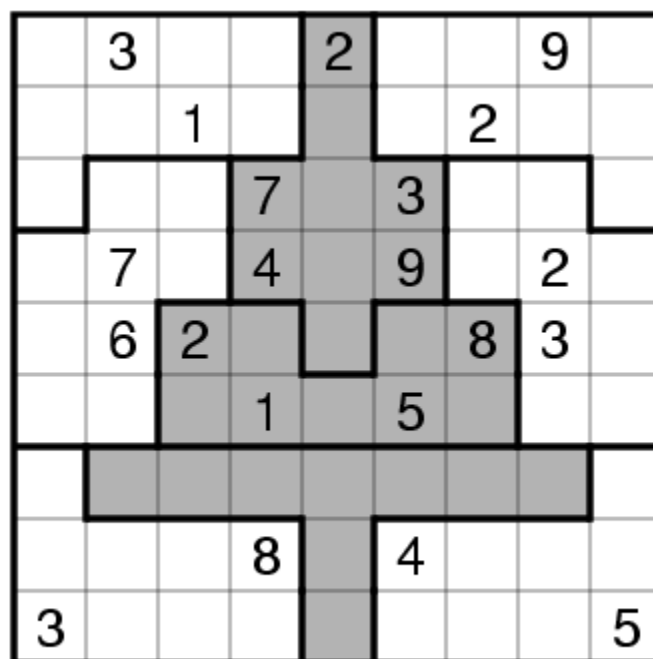
Christmas Tree Sudoku

Address <http://www.dailysudoku.com/sudoku/archive.shtml?year=2005&month=12&day=23&type=seasonal>

Daily SuDoku


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Daily Seasonal Sudoku: Fri 23-Dec-2005 [[instructions](#)]



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Christmas tree Sudoku: Fri 23-Dec-2005 very hard



The classic five merged grid Samurai Sudoku. We have one free puzzle each week and three additional weekly puzzles for registered users. See below for previous puzzles.

Free Samurai #33 (Easy)

To obtain an access key:

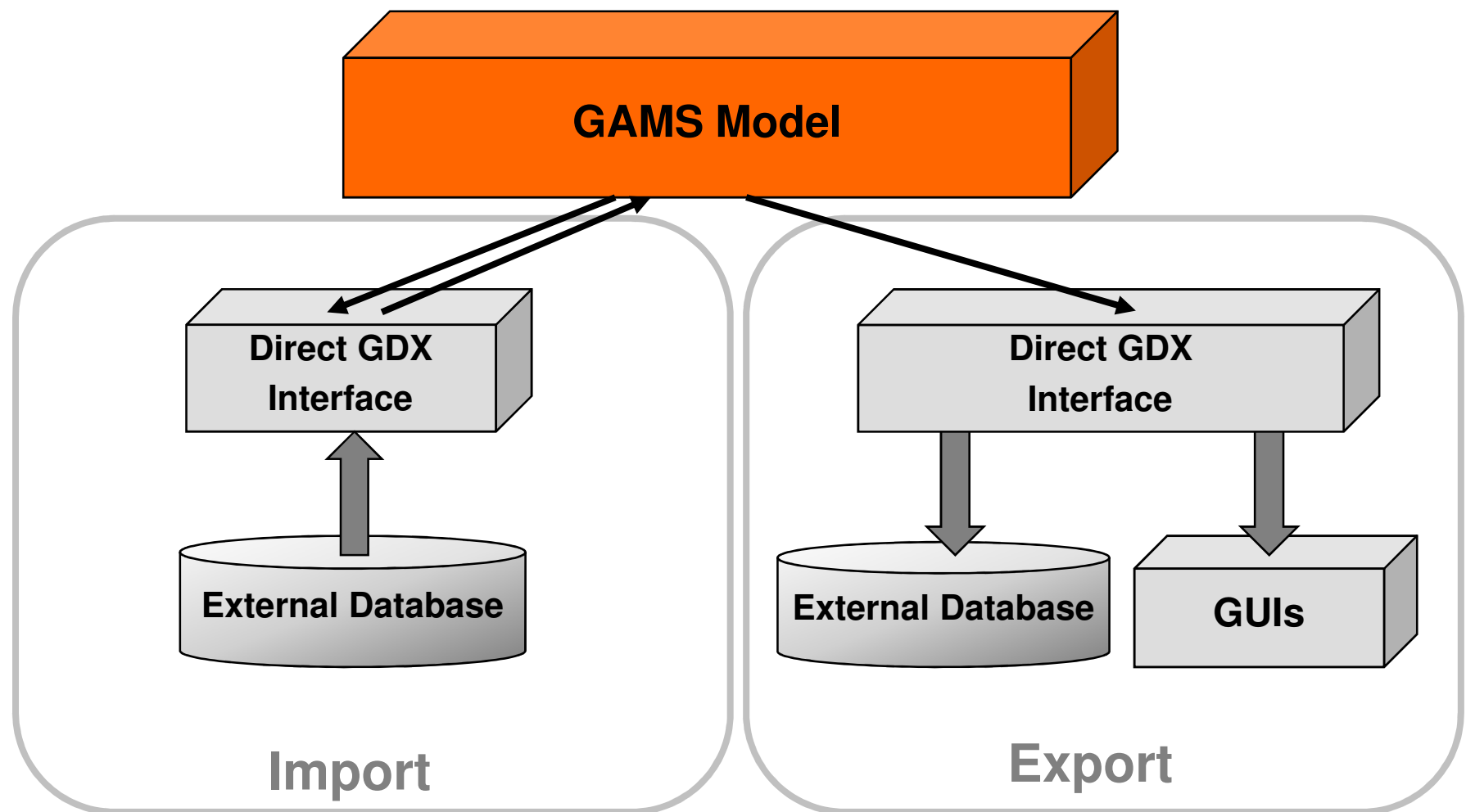
Buy Now

Get the [solution to this puzzle](#) from our solver.
Registered users can view, save or print this Samurai in [Acrobat PDF format](#).

[illegible]

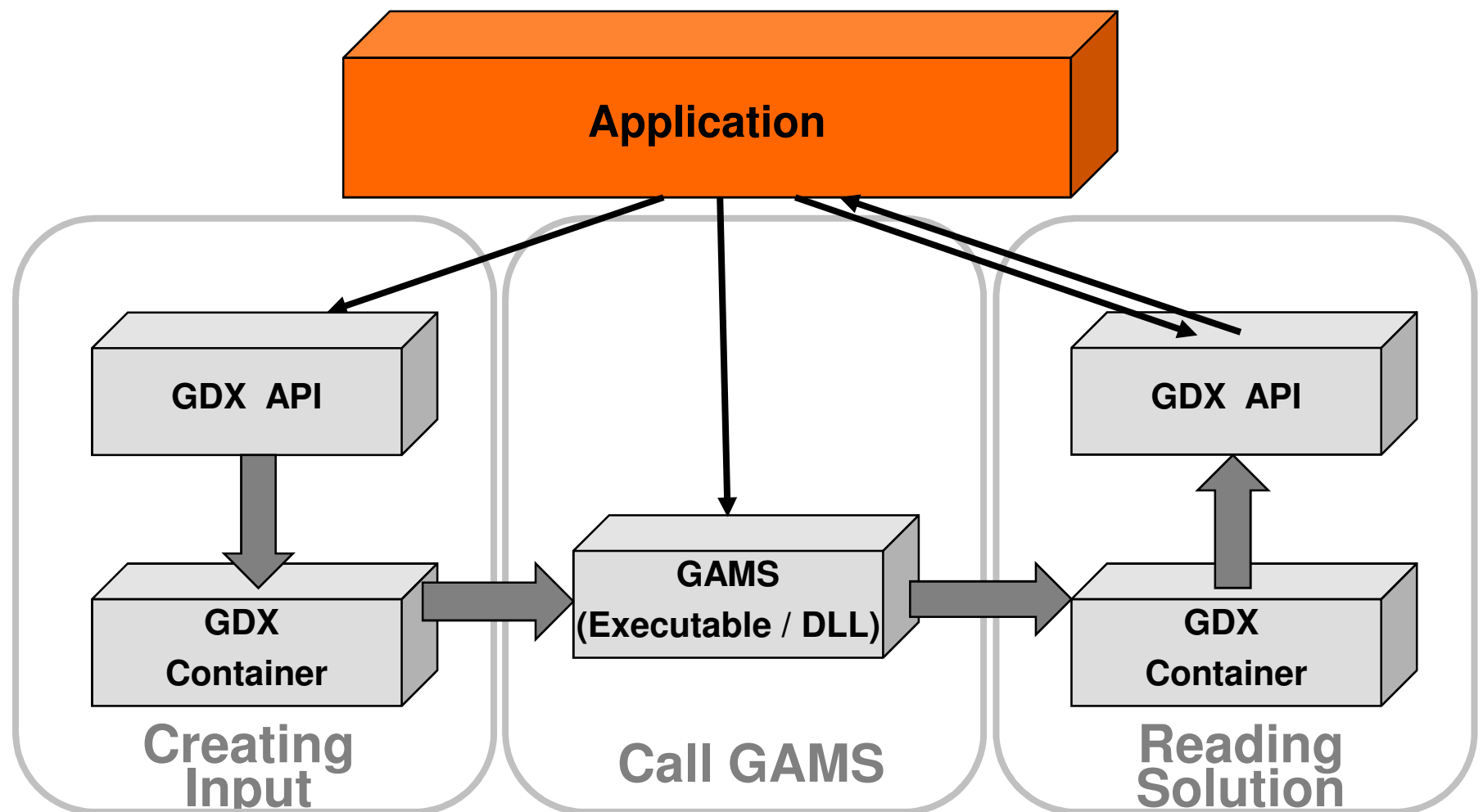


GAMS in Control





Application in Control





Calling GAMS from an Application

Creating Input for GAMS Model

Callout to a GAMS Process/Executable

Reading Output from GAMS Model

- Works from basically every environment
 - Web application (server side)
 - Application Builder
 - Oracle, Eclipse, .NET, ...
 - Regular Programming language C++, Java, VB, ...
 - MS Office Application / VBA
- Integrates with existing user IT infrastructure

GAMS



Interfacing with MS Office / VBA

Microsoft Excel interface showing a spreadsheet with a crossword puzzle grid. The grid is located in the range A1 to Z10. The puzzle is a crossword puzzle with numbers 1 through 32. The grid is displayed in the range A1 to Z10. The puzzle is a crossword puzzle with numbers 1 through 32. The grid is displayed in the range A1 to Z10.

Samurai 1 Samurai 2
Samurai 3 Samurai 4
Solve

GAMS Directory:
c:\program files\GAMS23.1\
Working Directory:
c:\tmp\



Contacting GAMS

Europe

**GAMS Software GmbH
Eupener Str. 135-137
50933 Cologne
Germany**

Phone: +49 221 949 9170

Fax: +49 221 949 9171

<http://www.gams.de>

info@gams.de

support@gams-software.com

USA

**GAMS Development Corp.
1217 Potomac Street, NW
Washington, DC 20007
USA**

Phone: +1 202 342 0180

Fax: +1 202 342 0181

<http://www.gams.com>

sales@gams.com

support@gams.com