



Object Oriented GAMS API using the example of .NET

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GAMS



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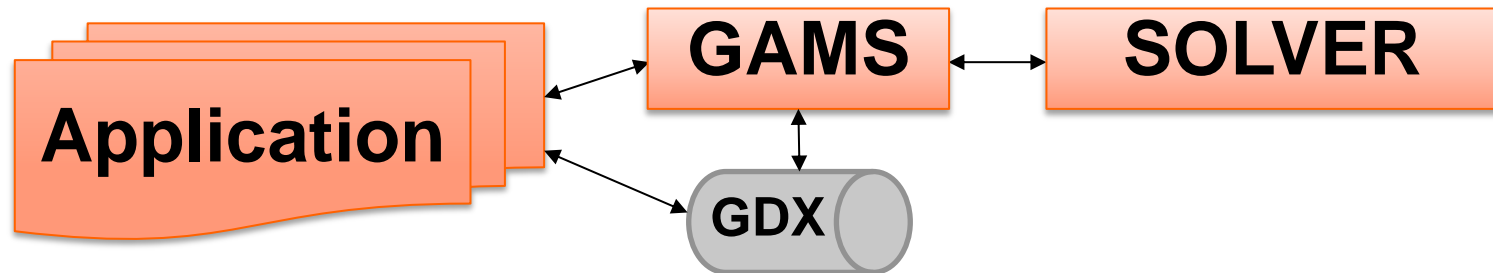


Outline

- Introduction
- Development of a small GUI Application in C#



Calling GAMS from your Application



Creating Input for GAMS Model

→ Data handling using GDX API

Callout to GAMS

→ GAMS option settings using Option API

→ Starting GAMS using GAMS API

Reading Solution from GAMS Model

→ Data handling using GDX API



Low level APIs → Object Oriented API

- Low level APIs
 - GDX, OPT, GAMSX, GMO, ...
 - High performance and flexibility
 - Automatically generated imperative APIs for several languages (C, Delphi, Java, Python, C#, ...)
- Object Oriented GAMS API
 - Additional layer on top of the low level APIs
 - Object Oriented
 - Written by hand to meet the specific requirements of different Object Oriented languages



Features of the object oriented API

- No modeling capability. Model is still written in GAMS
 - Prepare input data and retrieve results in a convenient way → *GAMSDatabase*
 - Control GAMS execution → *GAMSJob*
 - Seamless integration of GAMS into other programming environments
- .NET, Java and Python APIs part of the current distribution at www.gams.com



Transport Application

- Scenario solves of the transportation problem (mutable scalar)
- Features:
 - Preparation of input data
 - Loading data from Access file
 - Solving multiple scenarios of a model
 - Displaying results
- Four implementation steps:
 1. Graphical User Interface
 2. Preparation of GAMS model
 3. Implementation of scenario solving using GAMSJob
 4. GAMSModelInstance for performance improvements



A Transportation Model





Summary

- Object Oriented API provides an additional abstraction layer of the low level GAMS APIs
- Powerful and convenient link to other programming languages
- .NET, Java and Python APIs are part of the current GAMS release available at www.gams.com. Many examples available:
 - Sequence of Transport examples
 - Cutstock, Warehouse, Benders Decomposition
- .NET/Mono and C++ under development



GAMS Talks at the OR 2013

- **Thursday 9:00 – 10:30:**
Open-source Quality Assurance and Performance Analysis Tools (Michael Bussieck)
- **Thursday 11:00 – 12:30:**
Recent Enhancements in GAMS (Lutz Westermann)
- **Thursday 11:00 – 12:30:**
Object Oriented GAMS API: Java, Python and .NET (Clemens Westphal)



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