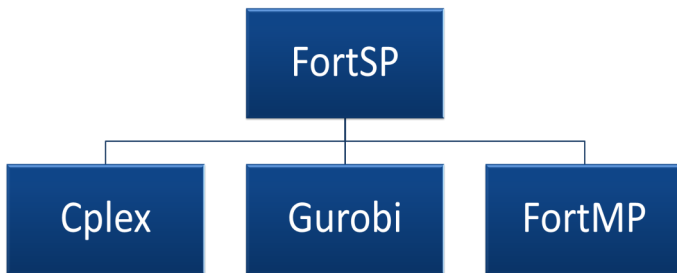


FortSP

FortSP is a solver specifically developed for stochastic programming (SP) problems. It is used by *AMPLDev SP Edition* to solve problems formulated in SAMPL and may be used on its own to solve problems presented in SMPS format. FortSP is available as a standalone program and as a library with C/C++ interface. It has a powerful plug-in system to connect to solvers used by the solution algorithms implemented in FortSP. Currently supported solvers are FortMP, Gurobi and Cplex. These solvers are used to optimize the sub-problems which emerge from the decomposition methods and/or the deterministic equivalent model instance.



Stochastic models and measures

Starting from a single model instance, FortSP can automatically formulate and solve the *Here and Now*, *Wait and See* and *Expected Value* problem classes.

The values of the following stochastic measures can be derived from the solutions of the problem classes above:

- EVPI (Expected Value of Perfect Information)
- VSS (Value of Stochastic Solution)

What is SAMPL?

SAMPL extends the leading algebraic modelling language AMPL by incorporating syntax that helps expressing the random nature of the problems. SAMPL introduces powerful constructs for formulating complex stochastic programming and (integrated) chance constrained programming models.

What is AMPLDev?

AMPLDev is an integrated modelling and solving environment for deterministic and stochastic optimisation. In essence, it is a graphical interface for AMPL and SAMPL. AMPLDev, in its stochastic edition, is designed to build, solve and analyse stochastic models in a quick and scalable way. AMPLDev is used in developing large-scale optimisation models in many application domains including supply chain, logistics, production planning, scheduling, portfolio optimization and risk management.

Key Features

FortSP is designed to solve both two-stage and multi-stage recourse stochastic programming problems.

The following decomposition algorithms are available in FortSP for solving the class of problems referred to as *Here and Now* problems:

- Benders' decomposition – L-shaped method
- Variant of level decomposition and alternative regularization methods
- Nested Benders' decomposition

FortSP can also automatically formulate and solve deterministic equivalents of two-stage problems with chance constraints and integrated chance constraints. For integrated chance constraints, an efficient cutting-plane algorithm is provided.

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