

ILOG CP Optimizer

First automatic constraint programming optimizer



Extend the reach of optimization

Important optimization problems, such as the sequencing of activities, rectangle packing, timetabling problems and subproblems for column generation, can be too irregular for mathematical programming (MP). Whether these problems contain constraints that are non-linear in nature or numerous disjunctions that result in a highly fractional relaxation with poor lower bounds, they are poorly suited for MP. ILOG CP Optimizer provides a wide range of modeling constructs, and takes advantage of the efficiency of constraint propagation to find feasible, and then optimal, solutions to common business problems such as resource allocation, production sequencing, timetabling and staff scheduling.

CP technology in the style of ILOG CPLEX

Classic constraint programming (CP) engines require you to provide both the model and the search strategy to solve it. ILOG CP Optimizer has been designed to support a simpler “model and run” development process that is similar to the one used by ILOG CPLEX. A robust solution search engine can now find a feasible solution automatically and then improve it until a better one cannot be found. For the first time, CP technology can be used to solve complex problems without having to program search instructions, providing the same ease of use that ILOG CPLEX provides in solving MP models.

Speed, reliability and robustness

ILOG CP Optimizer can solve real-world problems with astonishing speed. Its solution search engine adapts to the specific characteristics of the scenario’s data and model to provide excellent response times in deployed applications.

- Arithmetic constraints
- Logical constraints
- Array-based constraints
- Tunable optimization engine
- Fast “feasible solution” generator
- Model and run development process



Modeling expressivity

ILOG CP Optimizer provides a comprehensive set of modeling constructs: arithmetic constraints and expressions (sum, product, max, min, abs, modulo, division, different, equality...), logical constraints (and, or, imply...), array-based indexing with decision variables, and specialized constraints for a concise and efficient statement of frequently used patterns (all different, lexical ordering, inverse...). This expressivity allows compact and efficient model representations to be built for your most complex problems, and lets you add new side constraints without having to change the underlying data structures of your model.

Tunable search

While ILOG CP Optimizer automatically adjusts its search strategy to the provided model and data, it also supports the option to tune the search strategy by declaring search phases or selecting parameters that put special emphasis on individual search algorithms or constraint propagation techniques.

Use with ILOG CPLEX

ILOG CP Optimizer's solution search technology is not only for optimizing stand-alone CP models. The constructive search technique that builds and improves solutions enables ILOG CP Optimizer to be used as a "feasible solution" generator as well. For example, a complex rostering problem can be attacked using a combination of ILOG CPLEX and ILOG CP Optimizer. In this case, the problem is converted into a set partitioning problem by having ILOG CPLEX select an optimal schedule from a set of valid options generated by ILOG CP Optimizer. Examples of these applications include rostering, bin packing, and crew and sporting event scheduling.

Works with the ILOG OPL-CPLEX Development System

ILOG CP Optimizer is part of ILOG OPL-CPLEX Development System. CP models built in the OPL IDE can be tested, debugged and tuned alongside ILOG CPLEX models. And ILOG CP Optimizer models built in the OPL IDE can be rapidly turned into interactive decision-support applications using ILOG Optimization Decision Manager (ODM). Firm-specific staff scheduling applications can be built more easily than ever before.

Interfaces in C++, Java and C#

In addition to model development with ILOG OPL-CPLEX Development System and application generation with ILOG ODM, ILOG CP Optimizer also provides advanced programming interfaces (APIs) for C++, Java and C#. Developers can create a model, run the engine and write custom propagator functions and search controls using any of these languages. With the C++ API, experienced CP developers and researchers can additionally write their own search strategies to continue using CP technology in the classic way. This API also facilitates the migration of existing ILOG CP-based models (models built using ILOG Solver) to ILOG CP Optimizer.

ABOUT ILOG'S OPTIMIZATION PRODUCTS

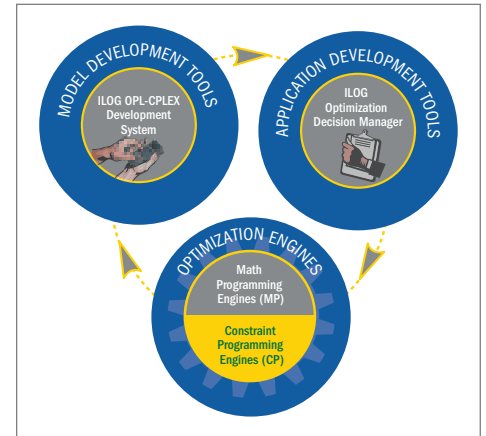
More than 1,000 commercial customers, including 49 members of the Global 100, use ILOG optimization tools, engines and applications to solve the world's most challenging planning and scheduling problems. ILOG optimization products are also used by a majority of the leading supply chain management software applications, as well as in research programs at over 1,000 universities around the world, making the products the "gold standard" for performance and solution quality in the operations research community. For more information and a complete list of customer references, please visit <http://optimization.ilog.com>.

ABOUT ILOG

ILOG delivers software and services that empower customers to make better decisions faster and manage change and complexity. Over 2,500 corporations and more than 465 leading software vendors rely on ILOG's market-leading business rule management system (BRMS), supply chain planning and scheduling applications and optimization and visualization software components, to achieve dramatic returns on investment, create market-defining products and services, and sharpen their competitive edge. ILOG was founded in 1987 and employs more than 800 people worldwide. For more information, please visit www.ilog.com.

ILOG Worldwide Information Center – Tel: 1-800-FOR-ILOG (US only) or 1-775-881-2800 (International) • URL: <http://www.ilog.com>
Australia – ILOG Pty. Ltd. – Sydney – Tel: +61 (0)2 8249 4355 – E-mail: info-aus@ilog.com
China – ILOG (S) Pte. Ltd. – Beijing Representative Office – Tel: +86 10 8518 1080 – E-mail: info@ilog.com.sg
France – ILOG S.A. – Gentilly – Tel: +33 (0)1 49 08 35 00 – E-mail: info@ilog.fr
Germany – ILOG Deutschland GmbH – Bad Homburg v.d.H. – Tel: +49 6172 40 60 0 – E-mail: info@ilog.de
Japan – ILOG Co., Ltd. – Tokyo – Tel: +81 3 5211 5770 – E-mail: info@ilog.co.jp
Singapore – ILOG (S) Pte. Ltd. – Singapore – Tel: +65 67 73 06 26 – E-mail: info@ilog.com.sg
Spain – ILOG S.A. – Madrid – Tel: +34 91 710 2480 – E-mail: info@ilog.es
UK – ILOG Ltd. – Bracknell – Tel: +44 (0) 1344 66 16 00 – E-mail: info@ilog.co.uk
USA – ILOG, Inc. – Sunnyvale, CA – Tel: +1 408-991-7000 – E-mail: info@ilog.com
 Representatives and distributors in other countries

ILOG, CPLEX and the ILOG logotype are registered trademarks, and all ILOG product names are trademarks of ILOG. All other brand, product and company names are trademarks or registered trademarks of their respective holders. The information presented in this brochure is summary in nature, subject to change, non-contractual, and intended only for general information.



ILOG CP Optimizer is an integral part of ILOG's Optimization Decision Management System

Learn more

For more information on ILOG CP Optimizer, visit <http://cpoptimizer.ilog.com>.



Changing the rules of business™