

SNCF

TRAIN STATION RESOURCE ALLOCATION

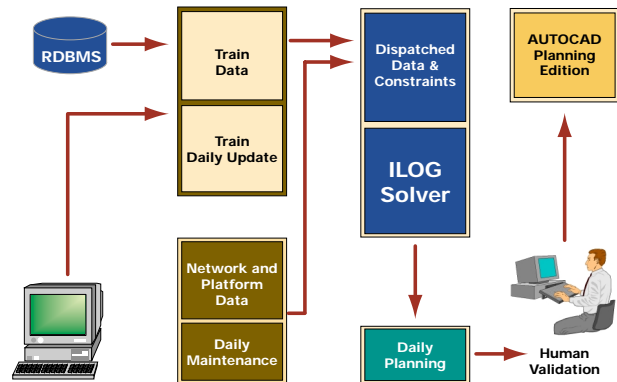
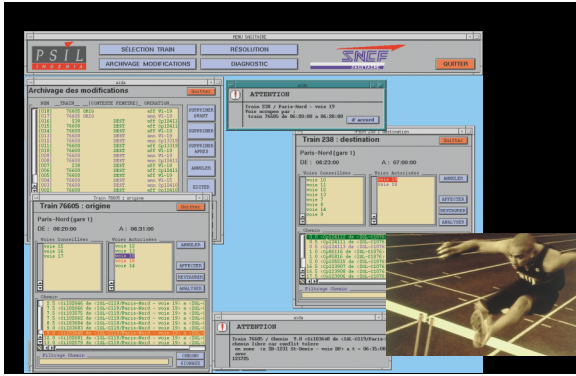
TRAIN ROUTING AND PLATFORM ALLOCATION are complex activities at Paris-Nord Station, an extremely busy railroad hub in Paris. Every day, French National Railway Company (SNCF) planners at the station handle over 1,700 trains sharing 300 kilometers of track, a combination that can generate as many as 400,000 itineraries. Thousands of constraints must be met to route traffic properly, a time-consuming task that used to take a team of 15 planners to do manually.

Faced with an ever-growing traffic load resulting mainly from handling high-speed TGV trains and Eurostar shuttles between London and Paris, SNCF decided to help its planners by introducing a constraint-based scheduling system. Called Sagitaire, the new system developed with ILOG Solver cuts weeks from the time it takes to schedule trains, and enables SNCF to produce timetables that route traffic safely, smoothly and efficiently.

“Our planners are finally free from routine tasks. They can concentrate on the area where their expertise is needed most difficult planning situations.”

Pascal Moyon
SNCF
Project Manager





Architecture of the Sagitaire system

SNCF

With 182,000 employees and more than 58.9 billion passenger/kilometers per year, the SNCF is one of the largest railway companies in the world. The French company offers services ranging from the TGV high-speed lines and Eurostar trains to freight and parcel services.

ABOUT ILOG

ILOG is a leading provider of advanced C++ and Java® software components for graphics and resource optimization. ILOG products deliver high-performance data visualization for 2D and 3D user interfaces; integer, linear and constraint solvers for resource optimization, scheduling, logistics and planning applications; dynamic rule systems for intelligent agents and real-time data flow control, and components for integrating modules with real-time and relational data sources. Founded in 1987, ILOG now employs more than 490 people in seven countries. Visit www.ilog.com for additional information.

FLEXIBILITY TO MEET CHANGES

The train scheduling at Paris-Nord Station is typical of over-constrained problems in which all the constraints cannot be satisfied. But given all the train, network and platform information, Sagitaire can automatically generate schedules that meet the greatest number of constraints possible.

Schedules are updated regularly, and the planners adjust them six times annually to accommodate seasonal factors such as holidays, vacations and daylight-saving time. Relatively minor events, like the presence of a VIP at a station or a local strike, are taken into account on a day-by-day basis.

Sagitaire displays information graphically in a format long familiar to the planners, making the system much easier to use. The planners can easily refine a schedule with point and click actions, applying their preferences and expertise. Validated schedules are also used to control switching devices and automatically update schedule panels in the station. Furthermore, the system can be easily adapted for use at other railroad stations.

PROJECT

Sagitaire was developed by the software house Ingenia and an SNCF team consisting of one planner and two engineers. It is run on a Sun SPARCstation, the schedules are drawn with AutoCAD, and train information and updated schedules are stored in an Ingres database.

BENEFITS

ILOG Solver has reduced the design and planning time for new schedules from days to less than an hour. Also, Sagitaire's user-friendly environment manages all the routine work and allows the SNCF planners to concentrate on other difficult tasks.

ILOG Direct - Incline Village, NV - Tel: +1 775 322 7600 or +1 800 367-4564 • URL: <http://www.ilog.com>

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: +65 773 06 26 - E-mail: info@ilog.com.sg • **Spain** - ILOG SA - 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. - Mountain View, CA - Tel: +1 650 567-8000 - E-mail: info@ilog.com • Representatives and distributors in other countries

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