



Operations

Traffic Re-scheduler

Using real-time train performance changes to predict and mitigate train service disruption.

Integration of information is the key for further growth of railway transport volume. Decision makers will be able to make better decisions once they have the right information at hand about their own processes and about the processes of their partners in business. InteGRail is the project that developed an enabling technology to allow universal access to existing information systems, be it databases, monitoring systems or existing user applications. For this purpose InteGRail defined a standard approach for architecture and communication. Using this standard approach a number of example applications were developed. One of these applications is a Traffic Re-scheduler that takes account of the performance impact of on-train equipment failure, to predict and resolve disruption to railway traffic



What is a Traffic Re-scheduler?

A Traffic Re-scheduler is a tool used by railway traffic managers to manage the train service when disruption occurs due to train or instructive failures, or external events. These tools allow the traffic manager to view the planned and actual train timings, and allow re-scheduling of selected trains to reduce the overall disruption to the train service. Railways already use systems of this type, usually with a “train graph” type of graphical user interface. There has also been extensive research into algorithms for automated methods of conflict prediction and resolution, e.g. the EU project TRIS.

The InteGRail information system architecture allows significant enhancement to this functionality through a capability to access a much wider range of data sources. This will enable problems to be predicted earlier and more accurately, and allow more sophisticated criteria to be used in choosing the optimum solution.

Who can benefit?

Infrastructure Managers and Railway Undertakings will benefit from a reduction in train delays, through better management of the response to unplanned events.

How is the benefit realised?

Existing Traffic Re-schedulers only make use of planned and actual (in the past) train movements. This means that they can only react when trains are already delayed.

Additional information sources made available through InteGRail can allow a Traffic Re-scheduler to predict in advance when future train movements are going to deviate from the timetable. Some examples of the use of additional.

information sources are:

- Locomotive diagnostic information reporting a speed reduction for the remainder of the journey
- Passenger coach diagnostic information reporting door failure that will result in an extended dwell time at the

next station

- Environmental monitoring information reporting low adhesion that will mean trains are unable to accelerate at the normal rate on a certain section of route

Present status, availability and future possibilities

A prototype Traffic Re-scheduler has been implemented for InteGRail Demonstration Scenario 3 "Fault on a High-speed Train". This has been realised by linking an existing timetable planning tool to a data repository that contains planned, actual and predicted train times, together with performance changes reported from on-train diagnostic systems.

The Demonstration takes place in Autumn 2008 using a Euro*City train of Trenitalia running on the RFI network in Italy.

Other results of InteGRail

Architecture definition of integrated information systems: IGRIS

Semantic data structure of the railway domain, the InteGRail ontology

Example user applications: ODSS for on-line operational decision support, IAC for on-line infrastructure availability, IDT for on-line vehicle maintenance information

Description of interdependence of performance of railway processes: the railway KPI tree, and a tool to assess and visualise performance

InteGRail - Facts and Figures

InteGRail started on 1/1/2005 and ends on 31/12/2008

Total project budget:
20 million Euros

EC funding : 11 million Euros

Total effort over 125 person-years

39 partners from 11 countries

Partners of InteGRail:

UNIFE • Alstom Transport • AnsaldoBreda • Bombardier Transportation • Siemens Mobility • UIC • Trenitalia • D'Appolonia • TSB-FAV • DeltaRail • ATSF • CAF • Nortel Networks • Laboratori Guglielmo Marconi • FAR Systems • MER MEC • Italcertifer • ATOC • České dráhy • MAV • UNICONTROLS • Strukton Railinfra • Deuta-Werke • Heriot-Watt University • IMEC • OFFIS • Televic • Seebyte • Kontron • University of Chile • INRETS • Wireless Future • University of Birmingham • ADiF • RFF • ARGE Corridor X • Network Rail • ProRail • SNCF

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