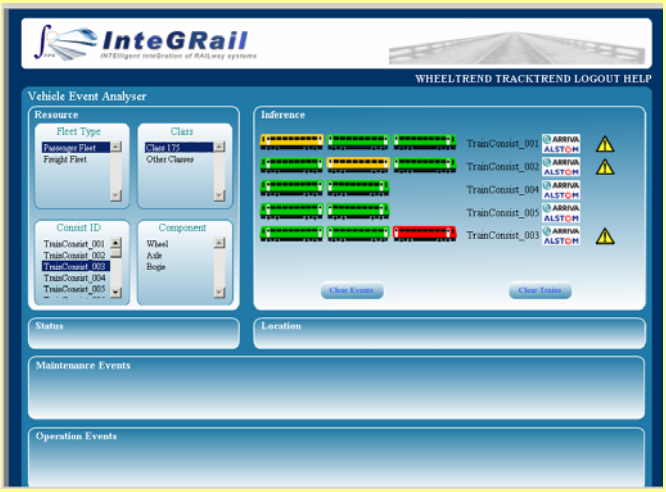

Maintenance

Event Analyser

Decision support through Ontology inference

Integration of information is 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 the Event Analyser. This is a prototype application aimed at utilising distributed reasoning to gather asset condition data from numerous sources.

What is the Event Analyser?

The Event Analyser is a semantically enabled application using Integrail's intelligent monitoring (IMON) distributed reasoning[t] service which enables the registration of queries from applications to remote reasoning nodes. Queries are sent across a network of distributed repositories and data is exchanged using the Railway Domain Ontology[t2] (RDO) created within the project. Specifically, the Event Analyser registers queries with numerous condition monitoring information sources and integrates the results. Systems such as Hot Axle Box detectors (HABD) and Wheel Impact Load Measurement systems (WILM) and vehicle borne track measurement systems are integrated to give an overall view of the health of rolling stock or infrastructure. The machine interpretable nature of the ontology allows the event analyser to infer the appropriate response from the recieved data and produce a suitable response.

The Event Analyser also receives input from other applications. The Wheel Trend Analyser[t3] and Track Trend Analyser[t4] take the same source event data and use it to perform trending functions. When a trend is observed that implies some action is required, the event analyser is notified allowing it to use current information to infer a result for the user.

Who can benefit?

The event analyser application is intended to work as an enhancement to existing remote condition monitoring tools. Vehicle Operators/Maintainers and Infrastructure Operators/Maintainers can use the tool to assess the status of assets and use the information to support decision making. Condition monitoring system vendors can also benefit as the the Event Analyser is extensible. The use of the Railway Domain Ontology (RDO) means that a system vendor can make new products more appealing by producing data that subscribes to the format of the ontology. This means that the data can be directly integrated and used by the tool.

[t] See Distributed Reasoning fact sheet
[t2] See Railway Domain Ontology fact sheet
[t3] See Wheel Trend Analyser fact sheet
[t4] See Track Trend Analyser fact sheet

How is the benefit realised?
The benefit can be realised by the commitment of the system vendors and data consumers to implement a semantic web-based application. The user/owner of the source systems get improved visibility of the data in the context of its measurement. The usefulness of recorded data is maximised by integrating it with other data sources to provide a broader, integrated view of asset status. The benefit is quantifiable through the assessment of improvement to maintenance and operations. Another benefit is that this type of application, based on an extensible architecture, can be appended with new monitoring systems. Providing that these applications subscribe to the data structure of the appended Railway Domain Ontology, data from these systems can be readily integrated. This approach creates the potential for great benefit to the major players who already have numerous multiple monitoring systems in place.

Present status, availability and future possibilities
This application is currently in a prototype, demonstration phase. At the end of the project, it will be in a status where a true integration using operational systems can be realised. Once some issues of security and access rights are addressed, the application is available to any party who has the requirement and wish to integrate multiple asset monitoring systems.

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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