



TRAFFIC MANAGEMENT FOR EUROPE'S DENSEST RAIL NETWORK

RCS – controlling and monitoring with Swiss precision.

RCS IS THE ANSWER TO MANY OF TODAY'S NEEDS ARISING FROM THE DENSE TRAFFIC ON SBB'S NETWORK.

With 8,829 passenger trains and 1,842 freight trains per day, SBB possesses, per route kilometre, the most heavily used rail network in Europe. At peak times, up to 1,000 trains can travel on the SBB track network at the same time. SBB has the task of bringing all of these trains to their destination safely, punctually and in an economical manner.

With the Rail Control System (RCS), SBB has introduced the mobility solution of the future. The system provides a real-time overview of the operating situation to the more than 250 dispatchers and rail traffic controllers who work simultaneously to monitor and manage rail traffic across the entire SBB network. RCS permits precise

forecasting of the development of rail traffic over the next 120 minutes for every combination of train and station or train and signal according to the existing timetable. Using these predictions, RCS then generates even more precise forecasts for the development of rail traffic over the next 90 minutes.

Every year, SBB produces 176,9 million train-path kilometres. To put it more simply, this equates to 4,250 journeys around the Earth. More than 1 million passengers and 210,000 tonnes of goods are transported every day – 24 hours a day, seven days a week and 365 days a year.

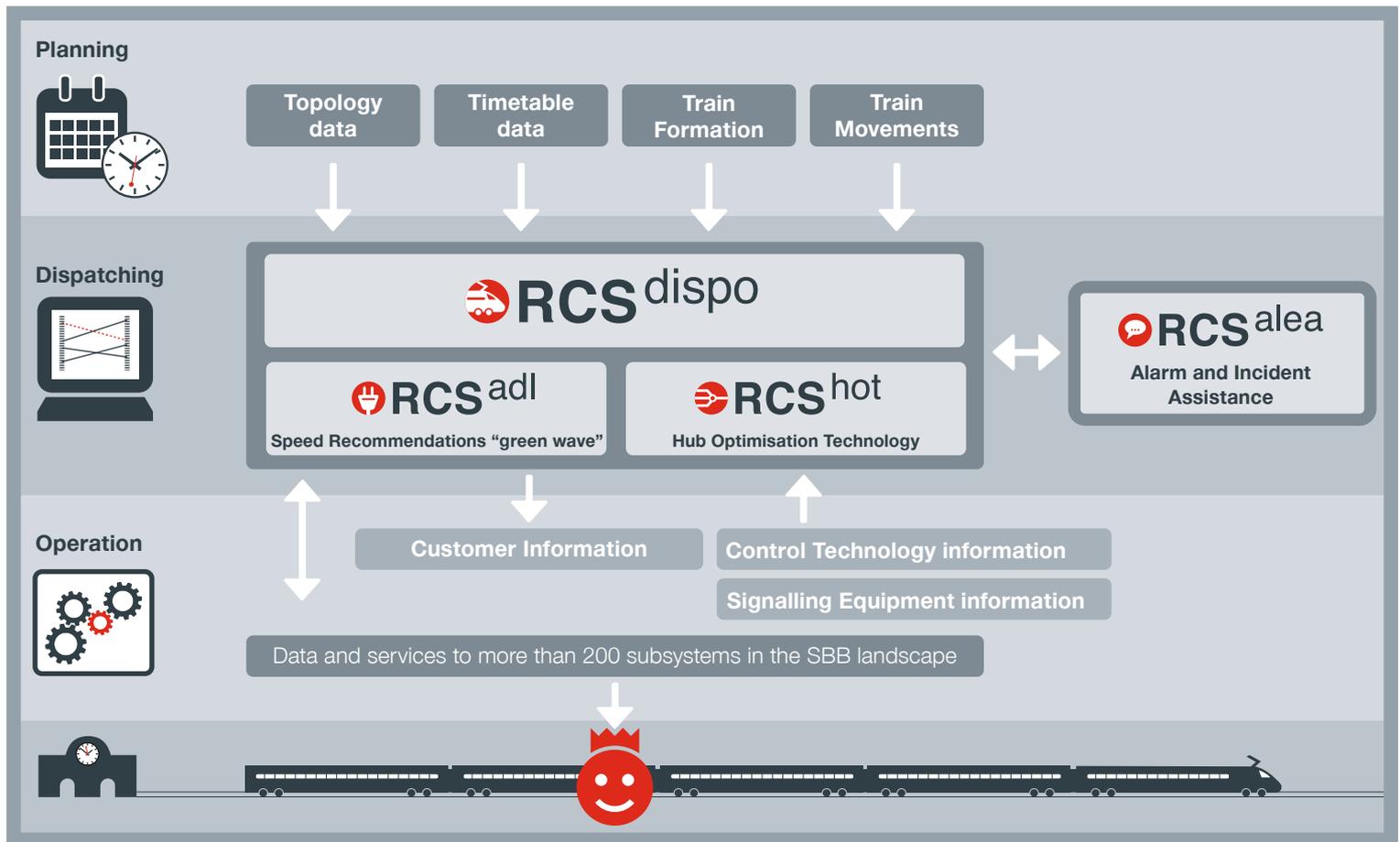
Core functionality

RCS receives and handles several hundred messages per second from different peripheral systems (e.g. train position sensors) and processes this information, calculates train journey forecasts and delivers the resulting changes to dispatchers and customer information systems.

The centralised, standardised depiction of all elements of the railway in the same model provides a network-wide overview of the availability. Systematic connection management forms the basis for optimised customer information. RCS provides different views of planned, current and future network usage and occurring conflicts in real time, re-

Benefits of RCS

- Higher forecasting accuracy allows higher network load.
- Higher level of operation stability; passengers and freight traffic customers benefit from early information regarding the current and future operating situation.
- Greater energy efficiency and lower energy costs.
- Faster and more effective incident management. RCS provides the information needed to rectify deviations from the plan rapidly.
- Simplified communication by interfacing existing telephony and GSM-R systems.



presented in graphical user interfaces, such as: time-distance diagram, track allocation and occupation, connections per station, alarm monitor, potential conflicts.

The forecasting model provides dispatchers with all critical information, such as reliable connection forecasts, needed to resolve conflicts and to return quickly to the original operational plan. This allows for automated route control, following resolution of conflicts by dispatching actions.

Since RCS was introduced in 2009, the punctuality of passenger trains has increased by 2%. This places SBB at the top of the international punctuality statistics.

RCS is the answer to many of the present and future demands that arise from dense rail traffic. Thanks to its modularity and scalability, the RCS family offers a great deal of flexibility. RCS can be connected to existing peripheral systems.

Ambitious targets met

RCS makes it possible to expand available capacity on the rail network within its limits and increase the density of trains running in succession. Thanks to precise, network-wide forecasts of conflicts and proposed solutions, more trains can travel on the existing rail network. In ad-

dition, RCS makes it possible to avoid or reduce cost-intensive investments in upgrading railway infrastructure.

The system family

RCS is a versatile and highly efficient group of applications:

- RCS-Dispo shows the actual and target status across the entire network and is the tool used by dispatchers and rail traffic controllers in the train control centres.
- RCS-ADL ("green wave") provides engine drivers with driving recommendations so that they can drive in a smooth, energy-efficient and resource-saving manner.
- RCS-HOT optimises train management at problematic points.
- RCS-ALEA provides a communications channel for incidents that occur on the network.

Robust system with high availability

RCS fulfils the high requirements for availability (99.8% including Windows support) and scalability. The system architecture is designed to be scaled up by simply adding hardware, at a fraction of the cost of additional database servers.

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