

Positive Train Control - Complex Events Management Solution

With increasing dependence on technology, rail signaling systems have become exceedingly complex. Positive Train Control (PTC) is a set of predictive collision avoidance technologies that can stop a train before an accident occurs. Implementing FRA's PTC mandate requires complex predictive enforcement and advanced integration methodologies.

The **Complex Events Processing solution** addresses the compliance requirement and offers much more. The PTC goal of train separation or collision avoidance, civil speed restrictions enforcement, temporary speed restrictions, rail worker wayside safety are all enforced using the concept of complex events. Diverse events are captured and correlated in real-time, thereby proactively responding to environmental changes. The solution is a cost-effective way to improve real-time response to live PTC events, thereby enhancing decision making efficiency and making PTC implementations more robust and reliable.

This solution also provides for live monitoring and reporting of the events and entity states, enable strategic decision making, beyond just train control.

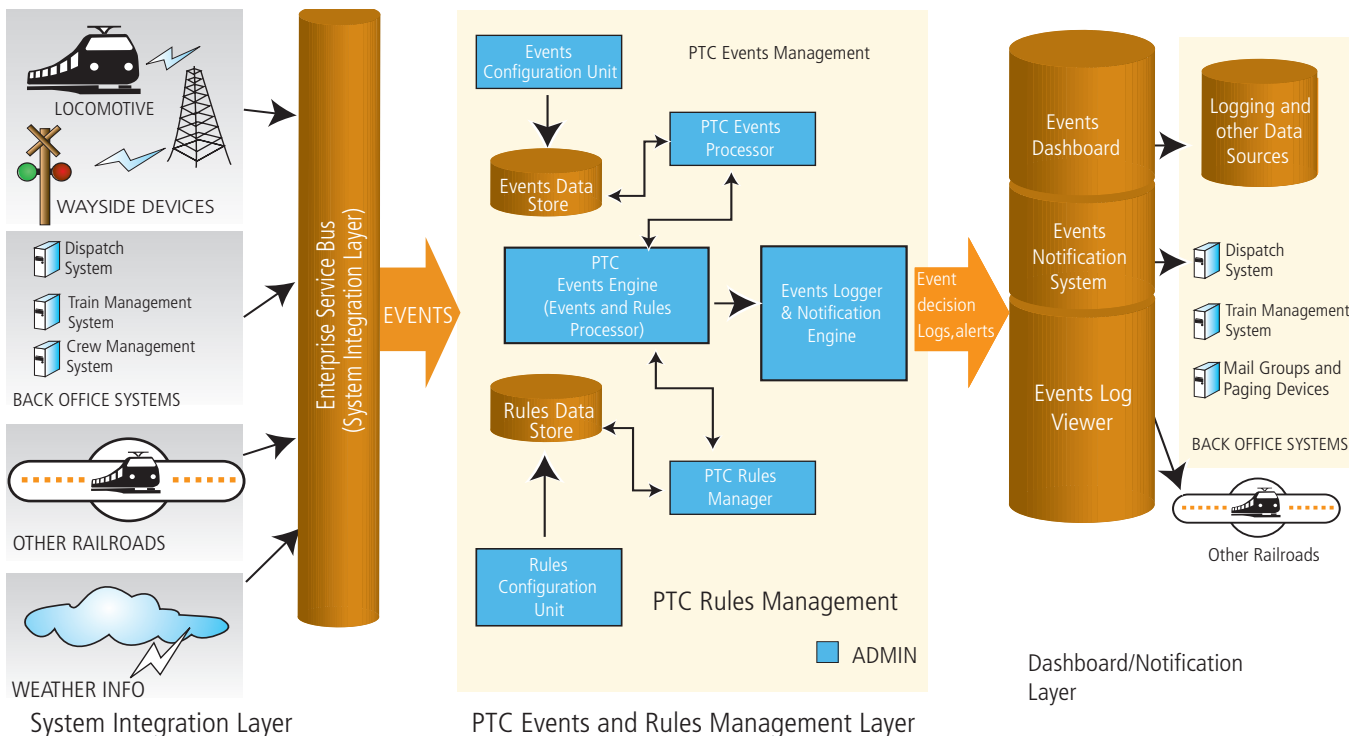
Solution Overview

With the **Complex Events Processing (CEP) solution**, all PTC components including Wayside devices, Onboard segments, Train Management Systems, Crew Management Systems, Dispatch systems become event enabled and event producers.

These events are sent to an event data store. The PTC CEP engine identifies certain event patterns based on pre-determined rules and responds to such events immediately. The event engine also checks with on-demand services like weather forecast systems and Hazmat databases on-the-fly.

The rules are persisted in a rules store, where it can be conveniently maintained by a rule manager. These rules trigger notifications to target systems to act on it. These systems could be onboard, wayside, PTC Backoffice or Dispatch systems.

An event dashboard provides visual monitoring and reporting features, allowing integration to PTC and Dispatch helpdesks. It also provides for a detailed drill-down for any adhoc event triggering situations as well as capability of complex reporting for compliance and auditing needs.



PTC - Complex Event Management – Functional Architecture

Solution Key Benefits

The PTC Complex Events solution delivers the following benefits:

Data level Integration

- Creation of standard event and service data models.
- Facilitates interoperability with other railroads
- Integration with Master Data sources to define Common Information Model

Event Processing

- Event Agents for aggregation of events based on standards.
- Persists events in event store
- Rules oriented Complex Event Processing implementation
- Performance of predetermined action (Train control) based on execution of the rule

Agile Platform

- Correlates multiple, diverse events in real-time – improving situational awareness.
- Develop an agile platform that adapts proactively to environmental changes

High Performance and Scalable

- Proven for high performance and scalability in production environments.

Event Enabling Legacy systems for Real time Events

- Captures database events directly from DBs using adapters.
- Build custom native components to tap exiting application hooks and publish events
- Modify applications to invoke vendor provided APIs and enable events

Service Enable Legacy system for Request Reply

- Builds query-response layer on top of existing database services.
- Enables B2B or secure query-response to external services
- Implements service mediation in the ESB or service layer with native calls to legacy apps.

Infosys-TIBCO Alliance Overview

- Infosys is a [global consulting partner](#) with TIBCO.
- Driven by a [decade-long](#) engineering and support partnership with TIBCO, Infosys understands TIBCO's product roadmap.
- Infosys is [the only System Integrator \(SI\) partner hosting the TIBCO Concept Centre](#), an innovation lab, on Infosys' premises. This was done to showcase new products and releases.
- Infosys and TIBCO [have jointly developed industry-specific solutions](#) based on client demands across multiple verticals to demonstrate Infosys' delivery capabilities coupled with TIBCO's leading products.

Allied services

Business Consulting

Provides you with strategic differentiation and operational superiority, assessments, proprietary industry analyses & projects structured around beating the competition.

Independent Validation

Gives your applications the third degree treatment and tests their robustness and ability to survive your business growth. A "must have" service if you are serious about long term leverage of your application assets.

Enterprise Application Integration

Make the whole of your IT applications much greater than the sum of its parts. Infosys leverages Global Delivery Model (GDM) to deliver immediate and dramatic productivity growth like no one else can.

Modular Global Sourcing

A strategically mature alternative to total outsourcing and ad-hoc offshoring. Align your sourcing strategy to your business strategy, modularize your applications and processes and leverage the power of Global Delivery Model.

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