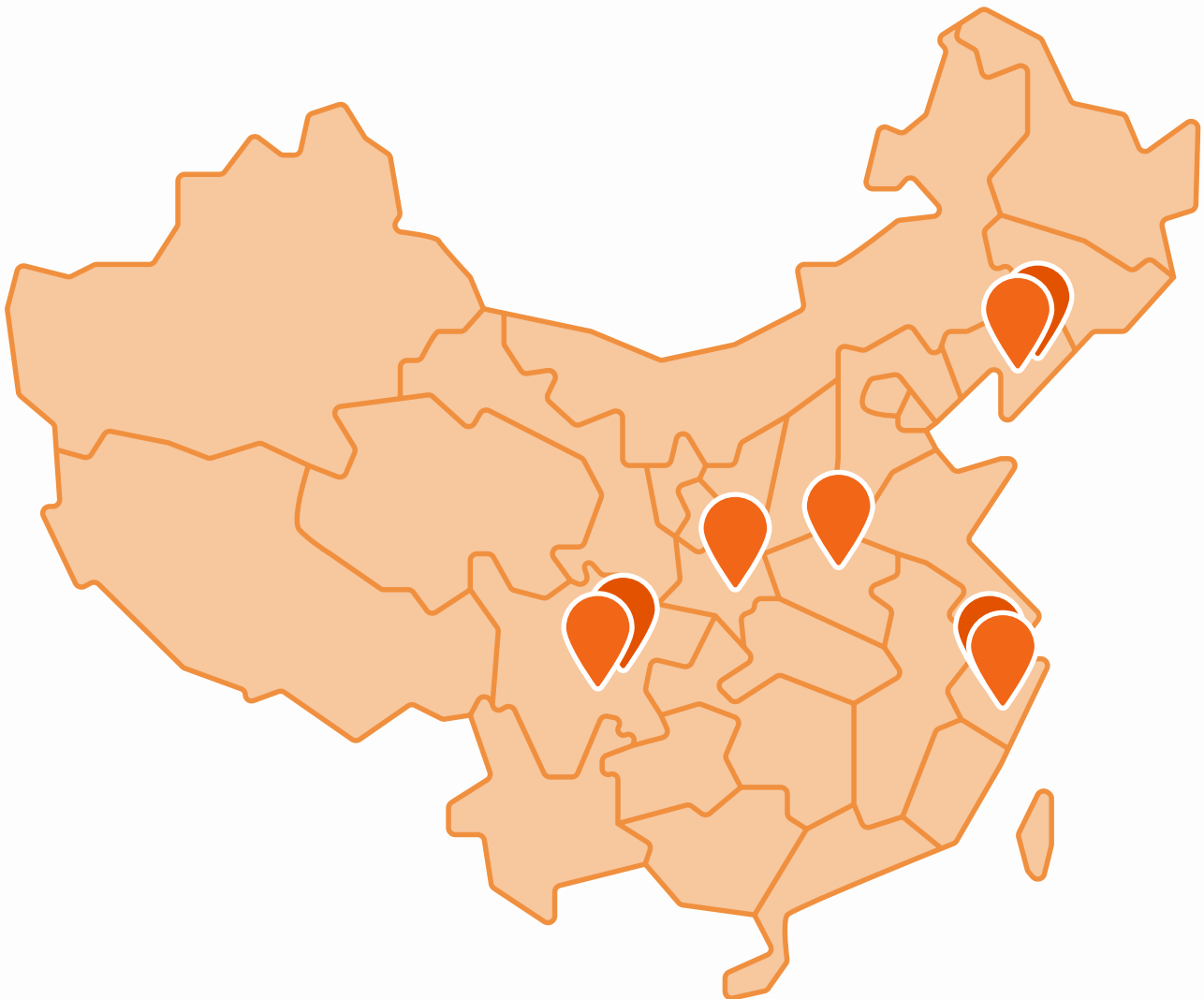


TRAIN SUPERVISION SYSTEM FOR CHINESE METROS

Datasheet

Project objective

Development support for commuter rail software systems deployed in Asia including dispatching features utilizing Communication Based Train Control for driverless train operation. Resolution of reported System Problem Requests and implementation of System Change Requests for existing railroad Automatic Train Supervision Control Software on active metro systems.



Result

With our development support, our client has implemented CBTC across 300 miles of railway in China. Connectivity, display, and functional issues connected with trains, rail lines, and stations were eliminated once they were reported, as well as new functions were implemented. Overall the whole supporting period, 400+ defects were eliminated on 8 lines of the Chinese metro. Enhancements touched the Centralized Traffic Control, Train Scheduler, Vehicle Regulation, Speed restrictions, Train Graph, and Centralized Maintenance System.

Scope of work

Bugs fixes to the Train Supervision System included:

- ❖ Elimination of losses of connection with trains and rail stations, as well as long train loading
- ❖ Synchronization of tracking IDs with trains schedules, elimination of false train identifications
- ❖ Adjusting arrival times and destination points
- ❖ Elimination of loss of files in case of power-off; addition of user information to backup servers
- ❖ Host server issues resolution
- ❖ Configuration of user roles and joint access
- ❖ Introduction of additional confirmation for critical requests
- ❖ Elimination of spontaneous restarts of the Simulator tool
- ❖ Elimination of random train stops at stations where it was not required
- ❖ Addition of display of extra elements, such as transfer tracks
- ❖ Resolution of interface issues of wrong coloring, dialog windows, location of the elements, and so on.

CBTC integration-related activities included:

- ❖ Development of the Interstation interlocking functionality
- ❖ Added communications for interlocking wayside controllers
- ❖ Resolved memory leaks and improved CPU usage of the interlocking controller
- ❖ Provided compatibility with CBTC hardware through HAL design and remote debugging

New functions implementation included:

- ❖ Train Scheduler tool deployment, including Vehicle Regulation and Speed restrictions functionality
- ❖ Communication between dispatchers and maintainers regarding wayside equipment failures
- ❖ Automatic train schedule updates and their transfer to the Public Announcement system
- ❖ Automatic creation, editing, and closing of temporary speed restrictions
- ❖ Tie-ins with an alarm system including emergency switch, fire alarm, and failover
- ❖ Formatting of messages and their automatic transfer to 3rd party systems
- ❖ Drawing train graphs and exporting the graphs to a file or to print

About the project

Activities

- ❖ Software Change Requests Implementation
- ❖ New Features Implementation
- ❖ HAL Design & Remote debugging
- ❖ GUI Updates and Modifications
- ❖ Unit testing
- ❖ Regression testing
- ❖ Functional Testing
- ❖ Software Configuration
- ❖ Documentation Creation and Updates

Technologies

- ❖ Eclipse
- ❖ X-Designer
- ❖ Gprof
- ❖ Valgrind
- ❖ Wireshark
- ❖ TCP/IP
- ❖ C/C++
- ❖ Gcc
- ❖ Imake
- ❖ Shell scripting
- ❖ Motif
- ❖ XML
- ❖ UML
- ❖ VMWare
- ❖ Red Hat Enterprise Linux
- ❖ Rational ClearQuest

Project size

- ❖ 1 Technical Coordinator
- ❖ 1 Project Manager
- ❖ 5 Software Engineers
- ❖ 1 QA Engineer
- ❖ 1 Graphic Designer

Duration



63 months
from October 2011 –
December 2016

Platform

Linux
Embedded