



**\*TIM Service Team**

W. Buczak, F. Havart, R. Martini, O. Ratcliffe, T. Riesco, S. Roy, J. Letra Simoes, A. Suwalska, J. Stowisek, F. Valentini

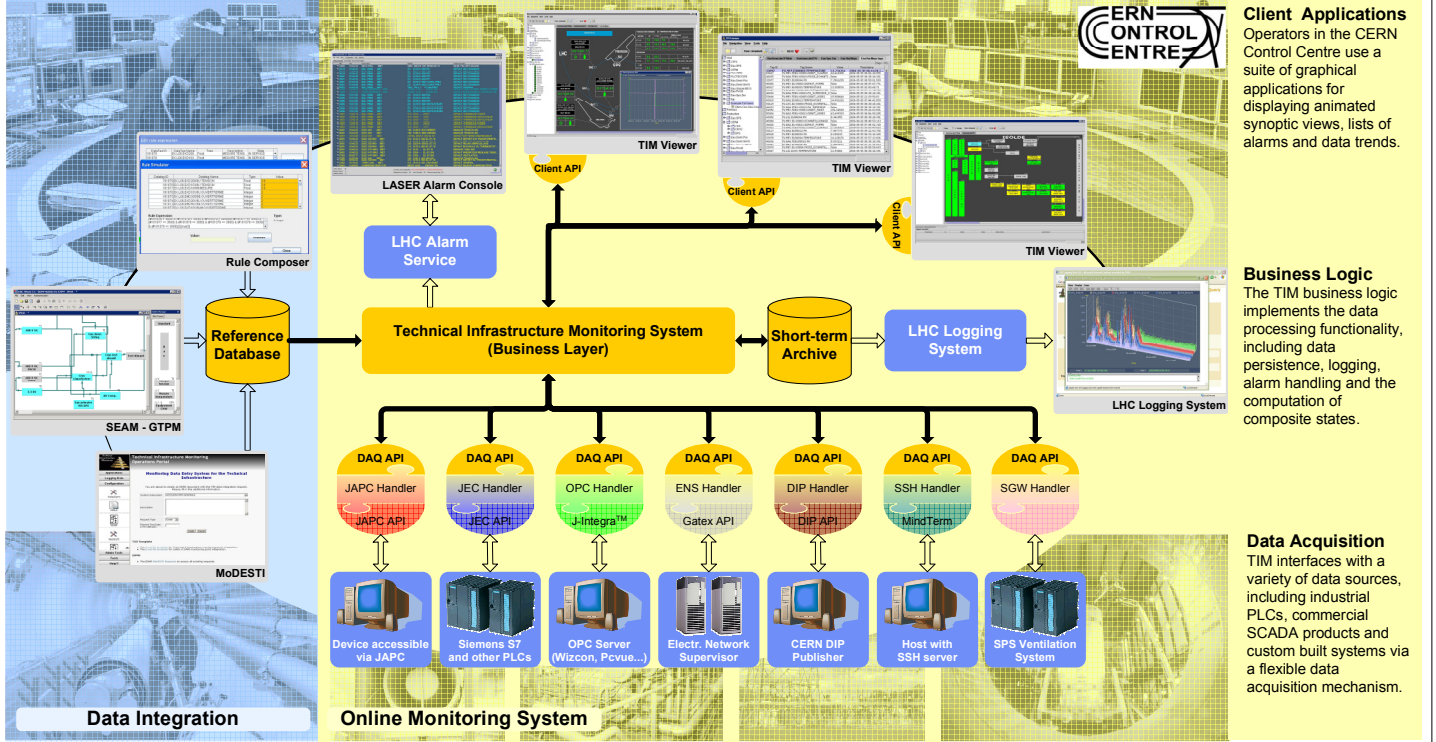
# Technical Infrastructure Monitoring at CERN

The Technical Infrastructure Monitoring system (TIM) is used to monitor and control CERN's technical services from the CERN Control Centre (CCC). The system's primary function is to provide operators with reliable real-time information about the state of the laboratory's extensive and widely distributed technical infrastructure.

A flexible data acquisition mechanism allows TIM to interface with a wide range of technically diverse installations, using industry standard protocols wherever possible and custom designed solutions where needed. The complexity of the data processing logic, including persistence, logging, alarm handling, command execution and the evaluation of data-driven business rules is encapsulated in the system's business layer. Users benefit from a suite of advanced graphical applications adapted to operations (synoptic views, alarm consoles, data analysis tools etc.), system maintenance and support.

*J. Stowisek, A. Suwalska and T. Riesco for the TIM Team*

## System Architecture



## Users and Data Sources

About 100 users from different operations teams use TIM today.

### END USERS

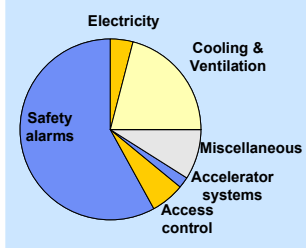
- Technical Infrastructure operators
- PS Access Control team
- Accelerator operators
- CLIC Test Facility operators
- Cryogenics operators (SM18)
- Equipment specialists
- Maintenance personnel

### INTERFACES

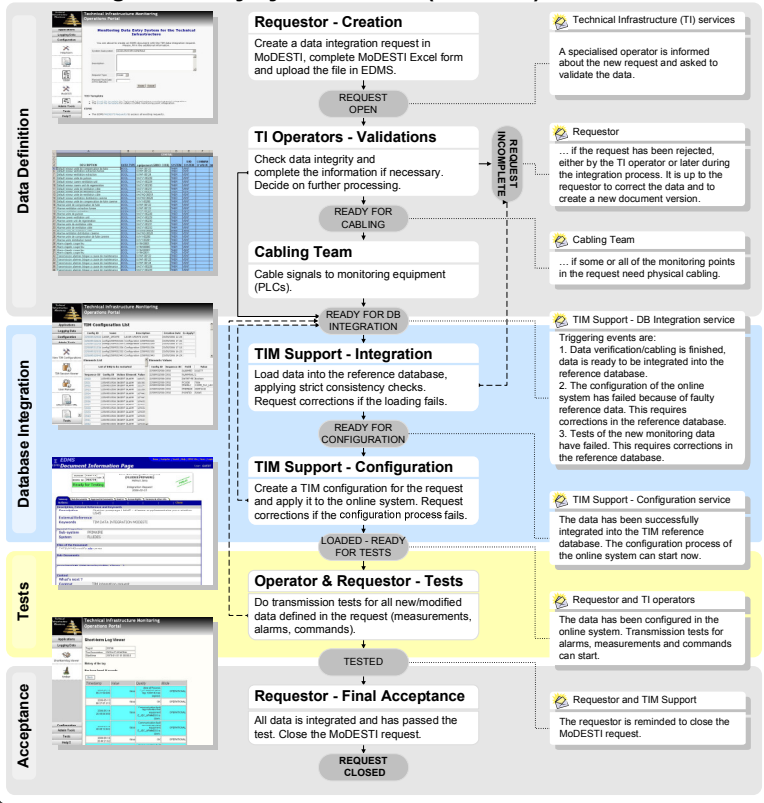
- LHC Alarm Service (LASER)
- LHC Logging System
- Data Interchange Protocol (DIP)

### DATA SOURCES

- (Monitored equipment)*
- Cooling, ventilation and air conditioning
  - Electrical power distribution network
  - Personal and technical safety alarms
  - Access control systems
  - Accelerator subsystems
  - Cryogenics



## Monitoring Data Entry System for TIM (MoDESTI)



## TIM in Numbers

In June 2006, TIM is processing about 1.3 million value changes per day.

### DATA ACQUISITION

- 100 data acquisition (DAQ) processes:
- 56 Siemens S-7 PLCs
  - 30 Wicon stations (OPC)
  - several DIP publishers
  - the Electrical Network Supervisor
  - the SPS Ventilation System

### DATA DEFINITIONS

- 25,500 data tags (inputs)
  - ✓ 2,220 analogue measurements
  - ✓ 2,800 digital equipment states
- 19,000 alarms
- 700 values for long term log
- 400 rules (composite states)
- 900 commands

### AVAILABILITY

During its first year of operation, the TIM core system had an availability of ~99.8%. The downtime includes 3 system crashes as well as scheduled maintenance interventions and system upgrades. The average downtime per crash was two hours. Now, the system has been running stable since January, 2006.

### OUTLOOK

Until LHC start-up, we expect the number of inputs to double. This implies that the load on the system will increase to approximately 2.5 million value changes per day. The system has been designed for this throughput so that no noticeable performance degradation is expected.