

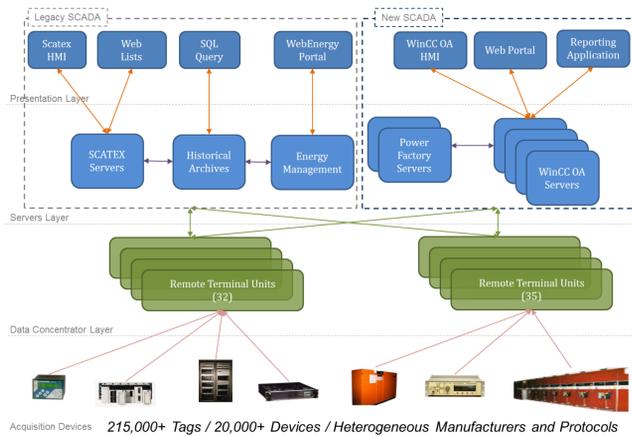
Anargyros Kiourkos, Jean Charles Tournier, Sonia Infante, Manuel Gonzalez-Berges, Piotr Golonka, Matija Zanko, Georges Burdet

## Abstract

The monitoring and control of the CERN electrical network consists of a great variety of devices and software: it spans from low level acquisition devices to high level data concentrators, supervision systems as well as power network simulation tools. The main issue faced nowadays for the engineering of such a large and heterogeneous system, including more than 20,000 devices and 200,000 tags, is that all devices and software have their own data engineering tool while a great part of the configuration data has to be shared between two or more devices: the same data needs to be entered manually to the different tools leading to duplication of effort and many inconsistencies. This paper presents a web-based application called ENSDM, mainly based on open technologies, aiming at centralizing all the data needed to engineer the monitoring and control infrastructure into a single database from which the configuration of the various devices is extracted automatically. Such approach allows the user to enter the information only once and guarantee the consistency of the data across the entire system. The paper also demonstrates the configuration workflow of different parts of the system, namely the remote terminal units, devices, the global supervision system (SCADA) and the power network simulation tools.

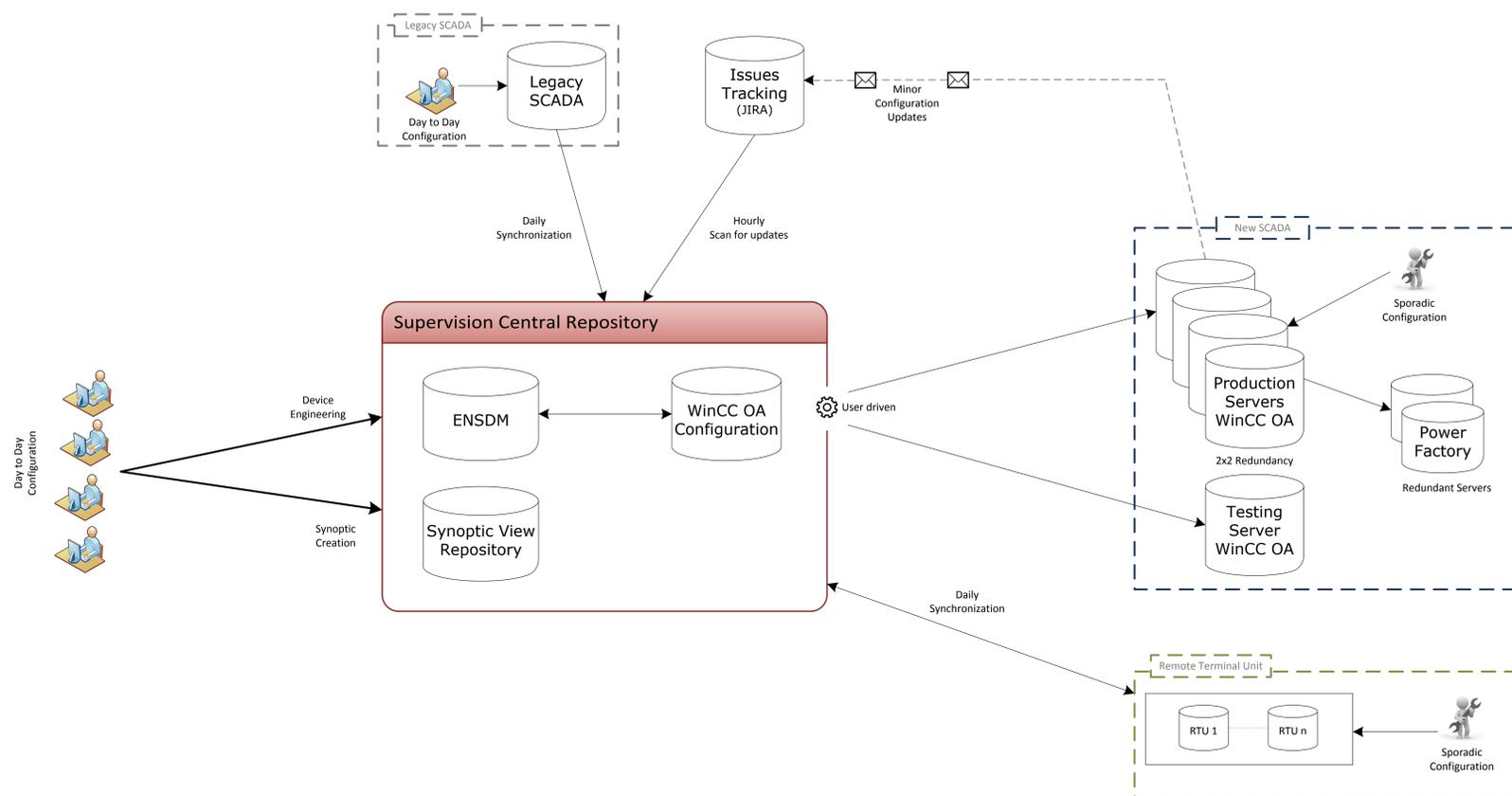
## Context & Motivations

- Monitor and control more than 200,000 tags
- Acquisition chain made of many different devices
  - SCADA, DMS, RTU, IED, PLC, DAU, etc.
- Each acquisition device has its own engineering tool

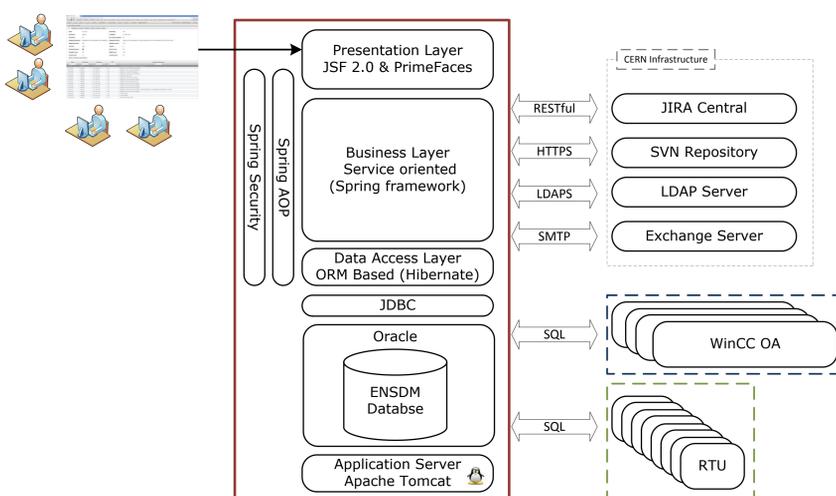


- Duplicated Engineering
- Time consuming Task
- Error-prone process, Inconsistencies
  - Alarm configuration, addresses, etc.

## ENSMDM: Engineer Once, Deploy Everywhere!



## ENSMDM Implementation



- Based on Java Platform Enterprise Edition (J2EE)
  - Business, Presentation and Data Access layers
- Standardized frameworks and tools
  - Spring, Hibernate, JDBC
- Relies on standard CERN services
  - ORACLE, JIRA, OpenStack Virtual Machine, etc.
- Extensible to other products