

The CMS Online Cluster: IT for a Large Data Acquisition and Control Cluster

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The CMS online cluster consists of more than 2000 computers, mostly under Scientific Linux CERN, running the 10000 applications instances responsible for the data acquisition and experiment control on a 24/7 basis.

The challenging dimension of the cluster constrained the design and implementation of the infrastructure:

- The critical nature of the control applications demands a tight security and independence of external networks, including the CERN's network, while maintaining a high availability of the services;
- The evolving nature of the acquisition applications requires an easy management and configuration infrastructure suitable for large scale installation and fast configuration turnaround: any failing computer can be replaced and fully configured automatically from scratch in less than 10 minutes; more than 1000 computers can be reinstalled concurrently in less than 60 minutes and the infrastructure is easily scalable to reduce the installation time and accommodate for more computers at the same time;
- The large number of subsystems and users imposes dealing with heterogeneous systems and services;
- In the next two years the cluster will increase its size more than 50% while the detector reaches its nominal capacity, which demands for easy scalability;

In this paper we will revise the tools and solutions used to fulfill the aforementioned requirements and others coming from the scale of the cluster. Details will be given on the problems and solutions adopted, ranging from the implementation of the redundant and load balanced network services (DNS, DHCP, LDAP, Kerberos, file serving, proxys...) to the configuration and deployment infrastructure based on quattor.

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