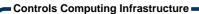


PAUL SCHERRER INSTITUT -

How to Manage Hundreds of Controls Computers Offering Different Functionalities with Only Two System Administrators

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The Controls section at Paul Scherrer Institut (PSI) is responsible for the Control Systems of PSI Large Accelerator Facilities which are two proton accelerators (HIPA, PROSCAN) and two electron accelerators, Swiss Light Source (SLS) and the Free Electron Laser (SwissFEL) Injector Test Facility Besides this, these large scale facilities need computer control at experimental setups scattered at their beamlines. Methods and tools, which are used to develop and maintain the challenging computing infrastructure used for the control systems of all the PSI facilities are described.



200 soft-IOCs

4.

400 VME IOCs

IOCs Require

- \Rightarrow service computers for development and booting, i.e. boot server and auto-save, and restore server, port server host, soft-IOC servers
- ⇒ NFS and storage file servers
- \Rightarrow Archive servers
- ⇒ Web servers
- ⇒ Operators consoles



new computers for installation

2 system administrators

Virtualization



200 virtual computers, of total 500

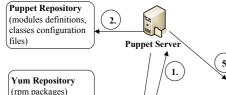
Service computers for development and booting are installed as virtual machines, they do not require a lot of CPU or memory.

"kickstart" and puppet

- ⇒ Scientific Linux (SL) distribution is used at PSI.
- ⇒ The OS installation mechanism is unified by using an installation method from Red Hat: Anaconda installer: kickstart. ⇒ Computer setup at PSI
 - 1. kickstart (primary installation)
 - 2. puppet (configuration and customization)

Keep the installer simple and fast, do the customization later.

Puppet Configuration Process



(3.

Puppet Clients

Database Server

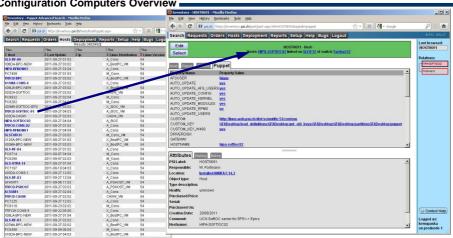
- 1. The puppet client sends a request for update.
- 2. The puppet server collects the configuration information.
- 3. The puppet server sends packages and executes the scripts.
- 4. The client gets the yum updates from the yum repository.
- 5. The configuration results are stored

Puppet Configuration File



Puppet configuration file for a boot server virtual machine. The statements in the first part get the already defined configuration for this computer class. The case statement in the second part shows the facility-based configuration.

Configuration Computers Overview



Puppet process is scheduled every 24 hours. Once finished, the results are collected in the Oracle database Database Web tool -Inventory integrates information about the configured host.