

Joint detector meeting on farm management

Libraries, binaries, drivers etc.

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Outline

- 1 Software maintenance
 - LFSes
 - Netbooted clients
 - Installation & configuration of client OS
 - Synchronization of client OS
- 2 Version selection
 - OS & kernel
 - Drivers
- 3 Emergency failover

Introduction

2 machine categories:

- **standalone machines:** servers, public machines, Control Room machines;
- **netbooted machines:** online farm nodes.

Requirements:

Tools for experts:

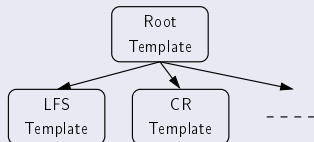
- necessary rights (sudo rules in LDAP);
- restricted only to netbooted nodes.

Distribution of the OS libraries & binaries

Tool:

Linux For Controls (**LinuxFC**): software environment allowing a **user defined installation** of Control PCs with Linux OS. Based on **Quattor**, a toolkit allowing an **automated installation, configuration and management** of clusters and farms running UNIX derivatives.

Architecture:



Advantages:

- useful for local installation on many identical configurations;
- useful to reinstall an identical machine.

Distribution of the OS libraries & binaries

Tool:

BWM: environment which builds ramdisk images with thinned version of Linux in order to boot from network or from USB sticks.

How?

After boot and network is available:

- full OS via `/usr` mounted from the LFS.
- TDAQ Software via `/sw` mounted from the LFS.

`/usr` and `/sw` are **synchronized** between the servers.

Characteristics:

- specially designed for heterogeneous systems like ATLAS;
- ramdisk provides the **same kernels** (UP or SMP) for all the machines;
- ramdisk provides a minimum set of binaries and libraries, **the same** on all the machines.

Installation & configuration of client OS

Installation of a client OS:

- 1 create reference repositories of SLC 3 & SLC 4;
- 2 RPM based installation after chroot in the repositories;
- 3 propagation via sync scripts on other servers.

Features:

- client nodes can query the list of installed packages;
- client nodes cannot add/remove packages.

Configuration of client OS:

- done in the postboot phase;
- configuration files and scripts stored in a directory tree;
- directory tree structured according to subdetectors and node functions.

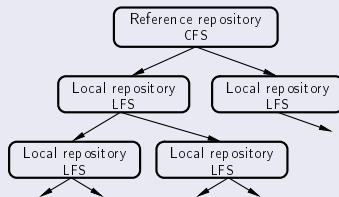
Synchronization of client OS

Tool:

Nile – parallel & cascaded distribution of commands on a given machines list

Application:

File system synchronization scripts using **Nile** and **rsync** (/usr, /sw ...)



Local repositories shared via NFS.

Selection of the operating system and the kernel

Netbooted machines

Versions:

OS:

- SLC 3;
- SLC 4.

Kernel:

- uniprocessor (UP);
- symetric multi-processor (SMP).

Tool:

rebootwith ▶ expert tool

Advantages:

- users may choose their environment (uni- and multi-processor; OS version);
- solving compatibility issues is easier (software tests on SLC 3 & SLC 4)

Selection of the operating system and the kernel

Netbooted machines

Example:

```
[aonea@pcatd104 ~] > sudo rebootwith
===== pcatd104 =====
Client configuration file [/client-home/home/boot/pcatd104]:
  SIGNATURE: [ 16/01/2007]
  COMMENT   : [ changed the kernel file names to generic ones]
Parent configuration file for this host found in [/client-home/generic/boot/pcatd]:
  SIGNATURE: [ 16/01/2007]
  COMMENT   : [ changed the kernel file names to generic ones]
===== pcatd104 =====
Options from CLIENT configuration file [/client-home/home/boot/pcatd104]:
[0] - default      [ bwm-slc4-up ]
[1] - bwm-slc3-up  [ kernel-slc3-up ]
[2] - bwm-slc3-smp [ kernel-slc3-smp ]
[3] - bwm-slc4-up  [ kernel-slc4-up ]
[4] - bwm-slc4-smp [ kernel-slc4-smp ]
[5] - dos-test-IPMI-FW-upgrade [ ipmifw/memdisk ]
[6] - dos-IPMI-FW-upgrade      [ ipmifw/memdisk ]
[7] - dos-ROS-BIOS-upgrade     [ ipmifw/memdisk ]
[8] - bwm-diagnose-slc3-up     [ kernel-slc3-up ]
=====
Enter your choice (0-8, q to quit):
```

Selection of the driver versions

Netbooted machines

TDAQ Drivers:

- Memory Manager (cmem)
- I/O Manager (io)
- Hardware specific (robin, quest, solar, vme, filar)

Why?

Not all the subdetectors are at the same level from software point of view.

Tool:

`select_daq_driver` ▶ expert tool

Advantages:

- experts may change by themselves the driver version.
- it is possible to choose the default cluster version or the machine specific version.

Selection of the driver versions

Netbooted machines

Example:

```
[aonea@pcatd104 ~] > sudo select_daq_driver
=====
                Selector for DAQ drivers versions
=====
Current driver version for this CLUSTER: [drivers-1.7.1-pre]
NO specific driver version selected for this HOST pcatd104.cern.ch
=====
Press 'c' for current cluster version, 'q' to quit or select a number below:
    [0]  drivers-1.6-pre
    [1]  drivers-1.6.1
    [2]  drivers-pre-1.4
    [3]  drivers-1.6
    [4]  drivers-1.4_oldkernel
    [5]  drivers-1.7.1-pre
    [6]  drivers-1.7.0
    [7]  drivers-1.4
    [8]  drivers-1.5-pre
Make your choice:
```

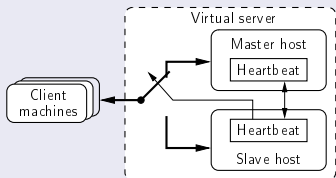
Emergency failover of the services

Question:

What if one of the services fails?

Tool:

Heartbeat allows a host (or hosts) to become **Highly Available**:



Applications at ATLAS TDAQ:

Currently tested in the test lab for:

- File sharing: NFS server.
- Authentication services: LDAP server.

Planned to be deployed in Point 1.

Other applications:

Web, Mail, DB, DNS, DHCP servers etc.