Quattor in LHCb

L. Brarda / CERN
LHCb Online System

~ 200

~ 400 CCPCs

~ 1000-1500

~ 20
Linux Computer types

- HLT farm nodes (Diskless)
- Farm Control Servers
- CreditCard PC nodes (Diskless): Embedded controllers
- CreditCard PC Control Servers
- Application gateways
- Infrastructure servers
  - DNS
  - NTP
  - NIS / LDAP
  - Kerberos
  - NFS/ Samba
  - Backups
  - Quattor
  - Disks servers?
Quatttor Structure

Managed nodes
- SW package Manager (SPMA)
- Installed software
  - kernel, system, applications...
- System services
  - AFS, LSF, SSH, accounting...
- Node Configuration Manager (NCM)
- CCM

Software Servers
- SWRep
- System installer
  - RH73, RHES, Fedora, ...
- Vendor

Install server
- Install Manager

Install
- base OS
- cache
- SW package
- RPM, PKG

Vendor
- System installer
  - RH73, RHES, Fedora, ...

SW package
- SWRep
- NFS, HTTP
- packages
- SW package

CDB

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LHCb quattor template structure

• Node profile
  - includes its hardware type template
  - defines its specific parameters
    • MAC and IP addresses
    • Name
    • Serial number
    • ...
  - includes disk partitioning template
  - includes system type template
LHCb quattor template structure (2)

- **Node profile**
  - includes its **hardware type template**
  - defines its specific parameters
    - **MAC and IP addresses**
    - **Name**
    - **Serial number**
    - ...
  - includes **disk partitioning template**
  - includes **system type template**
LHCb quattor template structure (3)

- Node profile
  - MAC and IP addresses
  - Name
  - Serial number
  - ... 

- Hardware type template
  - CPU type and nb
  - Memory type and capacity
  - Hard disk type and capacity
  - Network interface types
LHCb quattor template structure (4)

- **Node profile**
  - includes its hardware type template
  - defines its specific parameters
    - MAC and IP addresses
    - Name
    - Serial number
    - ...
  - includes disk partitioning template
  - includes system type template
LHCb quattor template structure (5)

**Node profile**
- **MAC and IP addresses**
- **Name**
- **Serial number**
- **...**

**System type (role) template**
- includes lhcb_(ux|sx) template
- includes base software template
- adds specific software
- configure specific components
LHCb quattor template structure (6)

- Node profile
  - includes hardware template
  - defines specific parameters
  - MAC and IP addresses
  - Name
  - Serial number

- Includes disk partitioning template
- Includes system type template
  - System type (role) template
  - lhcb_(ux|sx) template
    - defines general parameters
    - DNS, NTP, NIS, Kerberos ...

- lhcb_(ux|sx) template
  - defines general parameters
  - DNS, NTP, NIS, Kerberos ...
LHCb quattor template structure (7)

- Node profile
  - includes its hardware type template
  - defines its specific parameters
  - MAC and IP addresses
  - Name
  - Serial number

- includes disk partitioning template
- includes system type template

  - System type (Role) template
  - includes lhcb_(ux|sx) template
  - include base software template
  - adds specific software
  - configure specific components
LHCb quattor template structure (8)

- Node profile
  - includes its hardware type template
  - defines its specific parameters
  - includes disk partitioning template
  - includes system type template

  System type template
  - includes lhcb_(ux|sx) template
  - includes lhcb_uxs template
  - includes lhcb_sx template
  - includes lhcb_lx template

  Base software template
  - Base package (rpm) set:
    - Everything which is common to all linux installs.
  - Swrep Repositories
    - Where to get these rpms.
LHCb quattor template structure (9)

- Node profile
  - includes its hardware type template
  - defines its specific parameters
  - MAC and IP addresses
  - Name
  - Serial number

- includes disk partitioning template
- includes system type template

System type (Role) template
  includes lhcb_(ux|sx) template
  include base software template
  adds specific software
  configure specific components
LHCb quattor template structure (10)

- Node profile
  - Node profile
  - Hardware type template
  - defines specific parameters
  - Includes MAC and IP addresses
  - Includes name
  - Includes serial number

- System type template
  - Includes lhcb_(ux|sx) template
  - Includes base software template
  - Adds specific software
  - Configures specific components

- Example: for a server for diskless nodes, DHCPD should be installed and configured.
SWrep software repositories

• Each repository is a flat folder
  ➔ we don't use areas but multiples repositories for each platform type and software source:
    (i386|x86_64)_SL4(base|extra|onlycern|quattor|lhcb)
  ➔ i386_SL4_base, i386_SL4_extra, ...
• One defaults template for all repositories for a platform.
  (generated with RPMGetDefaults.pl)
Diskless nodes
Actual status

- ncm-diskless_server component from Vasilis Christaras & Matthias Schroeder
- Uses Redhat way of doing diskless nodes
- Server:
  - hosts PXE/DHCP/TFTP daemons
  - shares a readonly root filesystem with NFS
  - shares read/write folder for each diskless node
  - Quattor is run chrooted on the root filesystem with a special (proto) node template to do all software installation and general configuration
- Nodes:
  - Quattor is run for node specific configuration
Diskless nodes
Missing functions

• chrooted quattor is run once at server installation (from kickstart file), but there is no way to have it triggered on proto_node template change.

• When quattor change a service configuration on the chrooted environment, the service should be restarted on all diskless nodes.
Diskless nodes

Other ways to explore

• Have all /etc and /var on the writable fs
  - Have only spma chrooted on the server
  - Have all other components run on the nodes

• Use UnionFS / AUFS
  - make two filesystems (ro & rw) seen as one rw.
  - Same behaviour as before
Issues / wishes

• No way to test packages dependencies without installing a test node (Matthias Schroeder trick to have yum working on the test node helps a lot)

• Pan structures changes between quattor versions

• Totally outdated Pan User Conventions document (July 16, 2004)