

D0 Grid: CCIN2P3 at Lyon

Patrice Lebrun
D0RACE Wokshop
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IN2P3 Computing Center

French D0RACE Contact men:

Laurent Duflot

Patrice Lerbun

National Computing Center of IN2P3

- Resources shared by many other experiments (cms, atlas, Babar, Nuclear Physics ...)
- 3 platforms supported
 - ✓ Solaris
 - ✓ AIX
 - ✓ Linux (250 workers bipro.)
- Network (actual)
 - ✓ 155 Mbits/s with Chicago but only 20 Mbits/s Chicago - FNAL should be improved.
- Foreign logins are possible
 - ✓ webcc.in2p3.fr/user/logon



Data Grid Project vs D0

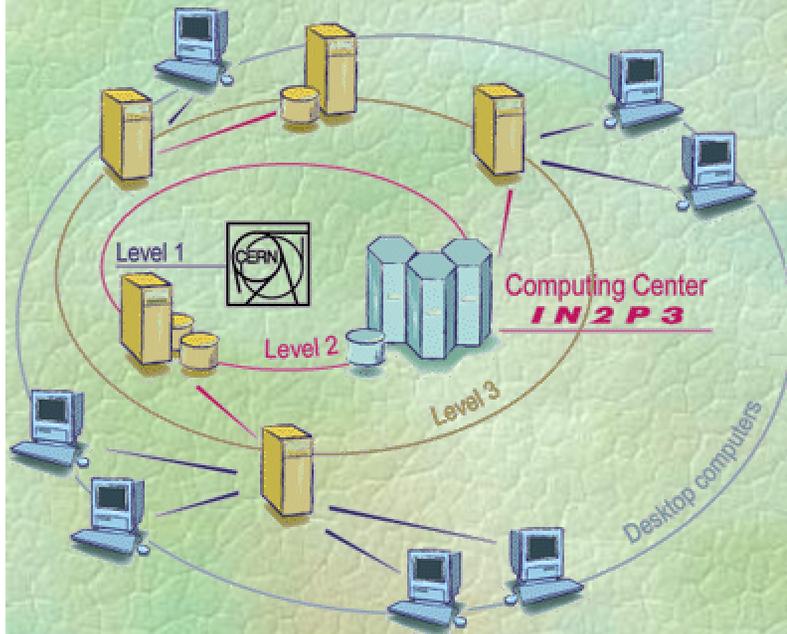
The In2p3 Computing Center Is Committed To Be Part Of The European Datagrid Project Testbed.

Maybe usefull for D0 collaboration

In this context, the IN2P3 Computing Center will provide its operational

infrastructure and its expertise to the project testbed. Fully integrated with the current production platform, the project testbed platform will be composed of two main components:

- Computing element
- Storage element



Computing Element

- Approximately 400 CPUs running Linux RedHat 6.1 (but shared with other experiments)
- Controlled by the home-grown **Globus-enabled batch scheduler**, BQS(Batch Queueing System).
- These resources are not dedicated for testing purposes, they are all available for the testbed.
- 130 more machines running Solaris, AIX which represent about 20.000 SpecInt95 may be integrated to the testbed platform as the project evolves.

Storage Element

- Data storage and retrieval is a key element.
- The current storage capacity is 35TB on disk.
- Besides the tape staging facility, a hierarchical mass storage service is provided based on **HPSS** (High Performance Storage System).
- 50TB of data are currently served by HPSS with a disk cache of 1TB. (about 4 TB is already used by D0)
- The tape vault has a capacity of 36000 high-end cartridges online.

SAM at CCIN2P3

↳ Sam Station is running at Lyon (ccin2p3-analysis)

- ↳ ccd0 station (the only dedicated station for D0)
- ↳ Very low cache size (at this time, only 5 Go and not used)
- ↳ HPSS used as local disk (many TB)
 - ✓ 500 Go of disk cache (
 - ✓ RFIO is used to access data but is not an official d0 implementation.
- ↳ Sam store intensively used for MC production to transfert files from Lyon to FNAL
 - ✓ Files Importation has to be tested
 - ✓ BBFTP with rfio is used
 - recompiled (rfio, to get file directly from HPSS, no intermediate disk used)
 - new bbrcp (nul file size means the file is in HPSS), we need here also an official implementation to take into account HPSS
- ↳ A new station will be created, used only for MC production.

Software Installation ...

⌘ NO major problem but:

- ☞ Need some time and some space (8 GB AFS partition used)
- ☞ we need to recompile IO package to access files on HPSS using RFIO (performance is identical as on local disk access)
 - ✓ /d0dist is a problem due to AFS
 - all pathes start with /afs/in2p3.fr/...
 - CCIN2P3 denies to create this directory on all frontal (login) machines
 - Only one machine is dedicated to have /d0dist (CCD0)
 - ✓ Solution:
 - have a new environment variable which redefines this path ?
- ☞ A CCIN2P3 version of ROOT
 - ✓ Shared library of libRFIO.so linked with a local libshift.a is used but low IO performance (under investigation)

Comments

∞ D0 Grid with Clones seems to be easy

but

∞ D0 has to do some effort to take into account sites where the architecture is little bit different

- ☞ I/O (RFIO)
- ☞ Disk sharing (AFS)
- ☞ Storage (HPSS)
- ☞ OS (Linux 6.1 vs 7.2)
- ☞ ...

∞ **The work is done but not official ...**

- ☞ Has to be take into account in official packages of D0

The Man power

↳ Installation software

- ↳ Smain Kermiche (CCPM Marseille)
- ↳ Michel Jaffré (LAL Paris)

↳ SAM

- ↳ Laurent Duflot (LAL Paris)
- ↳ Patrice Lebrun (IPN Lyon)

↳ MC Production

- ↳ Patrice Lebrun

↳ D0 Grid at ccin2p3

- ↳ Patrice Lebrun and Laurent Duflot
- ↳ Some one else at FNAL should be very useful ?

MOU

Memory Of Understanding between D0 and CCIN2P3 (may be for each RAC)

- ☞ CPU
 - ✓ platforms
 - ✓ CPU time needed
- ☞ Storage
 - ✓ disk
 - ✓ Tapes
- ☞ Network
 - ✓ bandwidth
- ☞ Middleware and Software
- ☞ Logins
- ☞ AOB