
D0CA Department Briefing

Data Handling and Databases

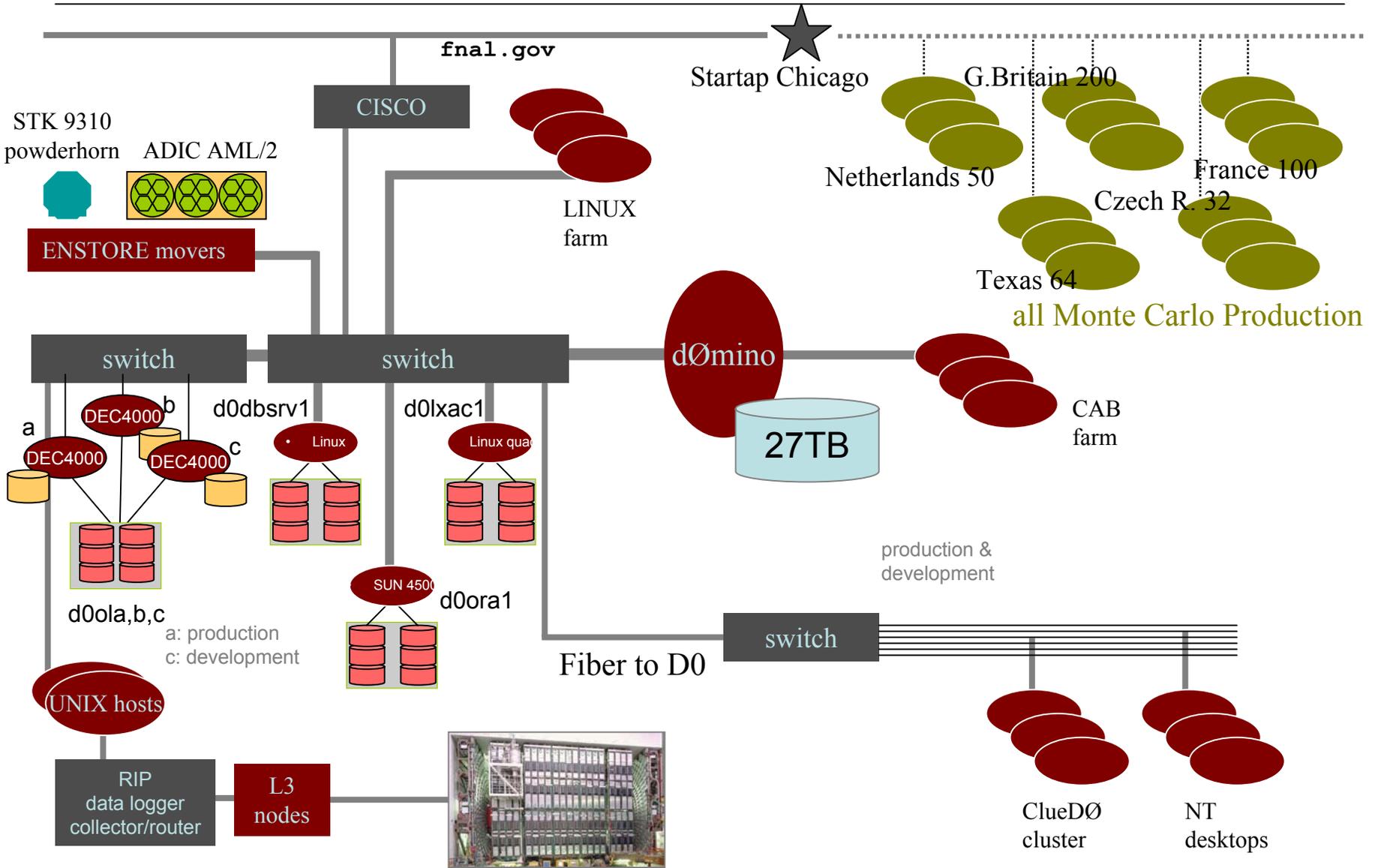
Data Handling

1. Projects
 - A. SAM
 - B. Testing
 - C. JIM
2. Operation
3. Manpower

Database

1. Projects
 - A. *DAN*
 - B. *Calibration Apps*
 - C. *Trigger DB*
 - D. *Luminosity*
2. Operations
3. Manpower

DØ data handling/database system architecture



Data Handling Projects (SAM)

- **Priority Tasks for Dzero**
 - dCache Integration
 - Pick events – 1. Debug, 2. Multi-tier, 3. Full feature
 - Improve user data storage metadata
 - Redesign of batch adapter and sam submit concepts
 - Other batch issues
- **Other tasks recently completed or on-going for remainder of 2002.**
 - Generalized routing for stations
 - Adapter(s) for general MSS's
 - Network attached files
 - Monitoring for admin and problem diagnosis
 - Test cluster configurations
 - Version and configuration management
 - Using Grid X.509 Credentials for user authentication

Data Handling Projects (SAM related Testing)

- **Extensive testing efforts**
 - CAB
 - ClueD0
- **Other areas being being watched**
 - NFS shared disk station configuration - d0Karlsruhe
 - stats for inter- and intra- station transfers
 - Sam_manager changes
 - File_status and file_content status
 - Solution for Friday Meltdown on D0mino
 - CRC file verification

Data Handling Projects (JIM)

- **JIM Overview**

- Globus MDS 2 for monitoring
- Globus GRAM and GASS for gate keeper and resource access at execution site.
- GSI security used with certificates from DoE Science Grid, GridPP, GridKa, and Globus.
- Condor-G for Request brokering and global job scheduling
- Close collaboration with the Condor team has been extremely beneficial. Association with Globus group also useful.

- **JIM testbed**

- Packaged in kits and provide instructions for installation
- Includes three site levels 1) Monitoring, 2) Job Execution, 3) Job submission.
- Initial sites included FNAL, Imperial College and UTA
- Expanding for SC2002 demo to also include MSU, MU, GridKa, and possibly Tata Institute (Bombay). Also CDF CAF sites.

Data Handling Operations

- **Operations “Helpdesk”**

- Problems channeled through sam-admin and sam user lists (d0 to provide bugzilla)
- D0 SAM shifters supposed to be front line triage, data aide tasks, registering new stations, nodes, disks, et cetera.
- Developers in D0CA, ODS, on-call pager rotation.

- **Major Stations**

- Central-analysis: Major user base, heavy use 470k files served in October, 14 TB Cache
- Datalogger-d0ola,b,c: Critical system, stable, provied 24/7 pager support
- ClueD0, CAB: Major operational load during current test phase
- Fnal-farm: Significant operational load. Issues may arise as it is scaled up by a factor of 5 in CPU.
- Remote processing centers and RAC's : Special attention to Karlsruhe. Expect similar for UTA, Lyon and other RACs soon
- Four dozen miscellaneous stations at various remote sites.

Data Handling Manpower

| Person | Affiliation | Development SAM (SAM-Grid) | Operations (includes Testing) |
|--------------------|-----------------|-------------------------------|----------------------------------|
| Sinisa Veseli | D0CA | 30% | 70% |
| Lauri Carpenter | D0CA | 30% | 70% |
| John Weigand | ODS | 50% (50%) | |
| Lee Lueking | D0CA | | 10% |
| Steve White | ODS | 10% | 10% |
| Carmenita Moore | ODS | 30% | 30% |
| Diana Bonham | ODS | 40% | 40% |
| Andrew Baranovski | ODS | 40% (30%) | 30% |
| Igor Terekhov | ODS | 20% (80%) | |
| Gabriele Garzoglio | ODS | (75%) | 5% |
| Kin Yip | BNL (D0 OSCoor) | | 20% |
| D0 Shifters | D0 Experiment | | SAM Shifts |

Database Projects (DAN and Calibration)

DAN

- **Features:** Multithreaded, Multiple database connections, Memory Cache, File Cache, SQL Proxy, Monitoring statistics, Configuration Manager.
- **Remaining Work**
 - Stress test File Cache and SQL Proxy.
 - Generate Graphs from the collected statistics.
 - Documentation.
 - Ups kit for remote installation.
 - Move generic code into calibration_db_server.
 - Provide an application able to rebuild a corrupted File Cache.
- **Outstanding Issues:** Large footprint of dbserver - SMT server ~350m, should be ~25m. (1 tree), Thread lockup.
- **Database Tables:** All applications finished except Calorimeter
- **DB Servers:** All servers have been built with DAN, All servers except Calorimeter running against production
- **C++ clients (Calibrators):** All calibrators except calorimeter built in d0reco p13.01 and later releases, Memory footprint improved for smt, needs work for cft
- **Data transfers from online DB:** Up to date for all systems except calorimeter.

Calibration

Not having features is costing data entry time and ability to make needed changes to triggers quickly.

Database Projects (Trigger)

- **General Support Issues (rely upon department help):** DAN changes, Propagation of 'Current' Status flags, Views need tuning (very slow), Secure Web Server
- **Server:** Reorganize Makefiles for server, Double check StatUsed flags before delete/update, Checks in server lacking before db inserts, Duplicate methods were created due to rushed implementation of Streaming
- **XML Generator: Maintenance, Upgrades:** Most recently, changes for streaming, upcoming, changes for L2 preprocessors
- **Entry Client:** Triggerlist transformation, Mods for streaming, status interface, Ls preprocessor
- **Reporting client:** Dependency report, no Neoterms, streams need to be added
- **Tying trigger lists to releases:** New db tables, server and client methods. Add release info to report.
- **Long term needs:** flexibility in reports, searches, comparing trig elements. Rules checking, online downloads directly from DB. More help/documentation. L1 simulation to firmware mapping and L1 board and board component registry.

Database Projects (Luminosity)

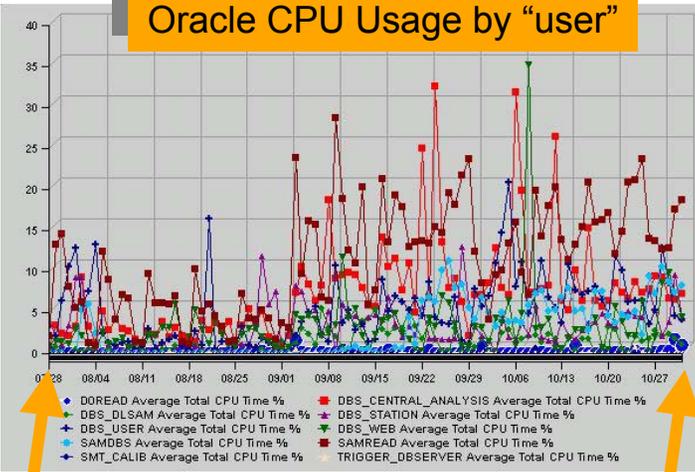
- **Online Luminosity:** Not an oracle db, but writing data to file, then cataloged in SAM
- **Review of Luminosity project being formed around Weerts. Plan ADM to discuss details soon.**
- **Luminosity: Estimated total time to production ~ 5 weeks**
- **Luminosity Database V2:** This is an offline only database that stores luminosity data contained in the luminosity DAQ stage2 files, along with some summarized file information needed for cross-checks and streaming. 10% remaining is designing of the file per luminosity block storage info.
- **Im_db lumDbAccess:** Access API for the file reader and/or lumDAQ to use the manipulate the luminosity database
- **luminosity_db_server:** Framework is in place, adding methods to emulate ImAccess API
- **ImAccess database integration:** Replace ImAccess file backend with CORBA dbServer calls to the luminosity database

Database Operations

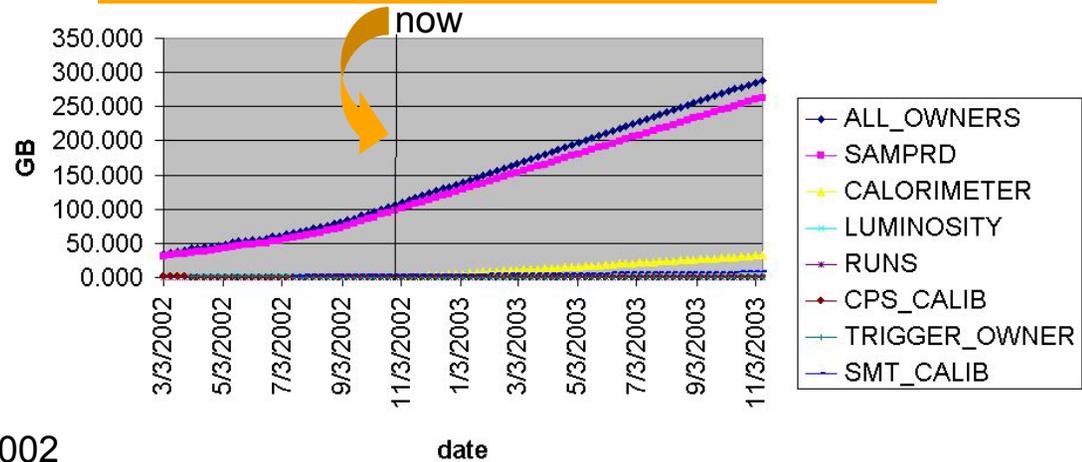
- **SAM shifters:** Nominally watching all sam and calibration db servers. Still in transition for the later, anticipating expanded operations.
- **Offline database instances:** d0ofdev1,d0ofint1, d0ofprd1 monitored by DBA's. Monthly OEM monitoring plots provided too.
- **Online database instances:** d0ondev1, d0onprd1 monitored by Vladimir Sirotenko. Support when needed from DBA's, concern over some user procedures.
- **Machines: d0ora1, d0ora3**
 - Sam, d0db (calibration), and trigger db servers
 - Production server is heavily loaded, plan to unload db servers to linux servers soon. Will purchase new 8 processor SUN with 32GB memory in Summer.
 - Backups require just under an hour for RMAN, 3 hours to tape. Looking for other solutions.
- **Machines: d0dbsrv1,d0dbsrv2**
 - Currently have one dual 750MHz node for Hardware is needed to support calibration db servers. Request 5 dual 1GHz with 2GB memory, assumes failover to each other. Needed Dec 1 if possible.

Database Operations

Oracle CPU Usage by "user"



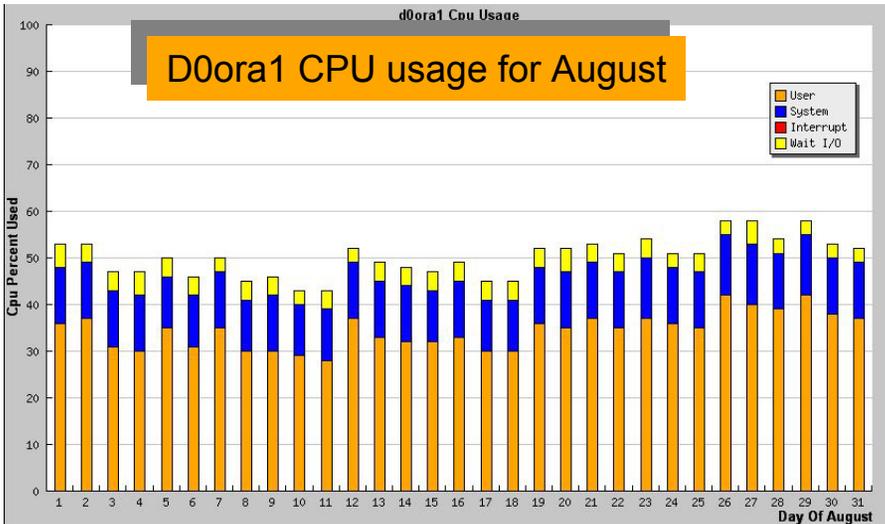
D0 Application Disk usage (actual and projected)



July 28, 2002

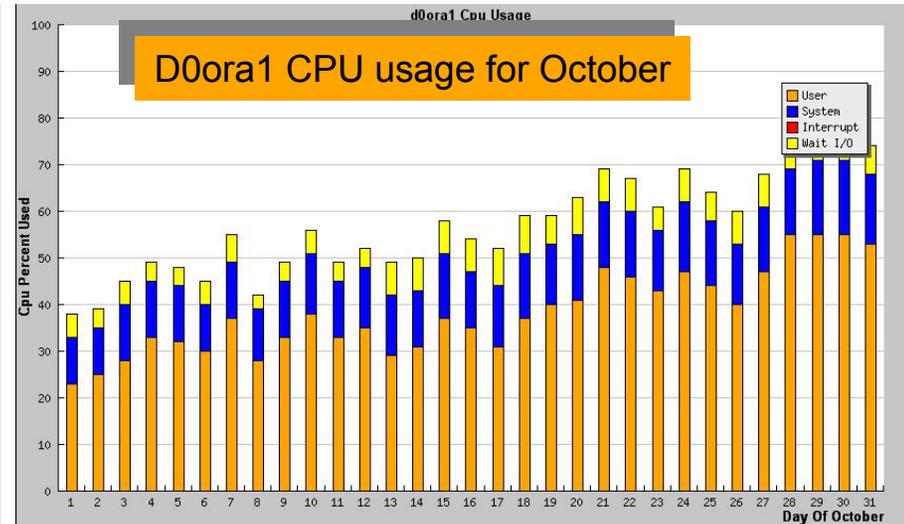
October 28, 2002

D0ora1 CPU usage for August



November 11, 2002

D0ora1 CPU usage for October



D0CA Department Briefing

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Database Manpower

| Person | Affiliation | Development | Operations (includes Testing) |
|--------------------|---------------|-------------|----------------------------------|
| Steve White | ODS | 60% | 20% |
| Diana Bonham | ODS | 10% | 10% |
| Anil Kumar | ODS | 20% | 30% |
| Elizabeth Gallas | D0CA | 50% | 50% |
| Robert Illingworth | D0CA | | 50% |
| Taka Yasuda | PPD/D0 | 50% | 50% |
| Jeremy Simmons | D0CA | 80% | 20% |
| App Owners | D0 Experiment | 5% | 5% |
| | | | |