Status of Production and Data Access and the Joint Projects

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D0 Workshop - 7/8/98

Run II Computing Joint Project

- Projects for CDF and D0
- CD provides/augments manpower and gives long term support for software/systems
- Working groups crystallize work to be done
- Now has a Project Management Plan and 2 coordinators - Ruth Pordes and Dane Skow
- Von Ruden said working well ..
- encouraged more - potentially big manpower savings

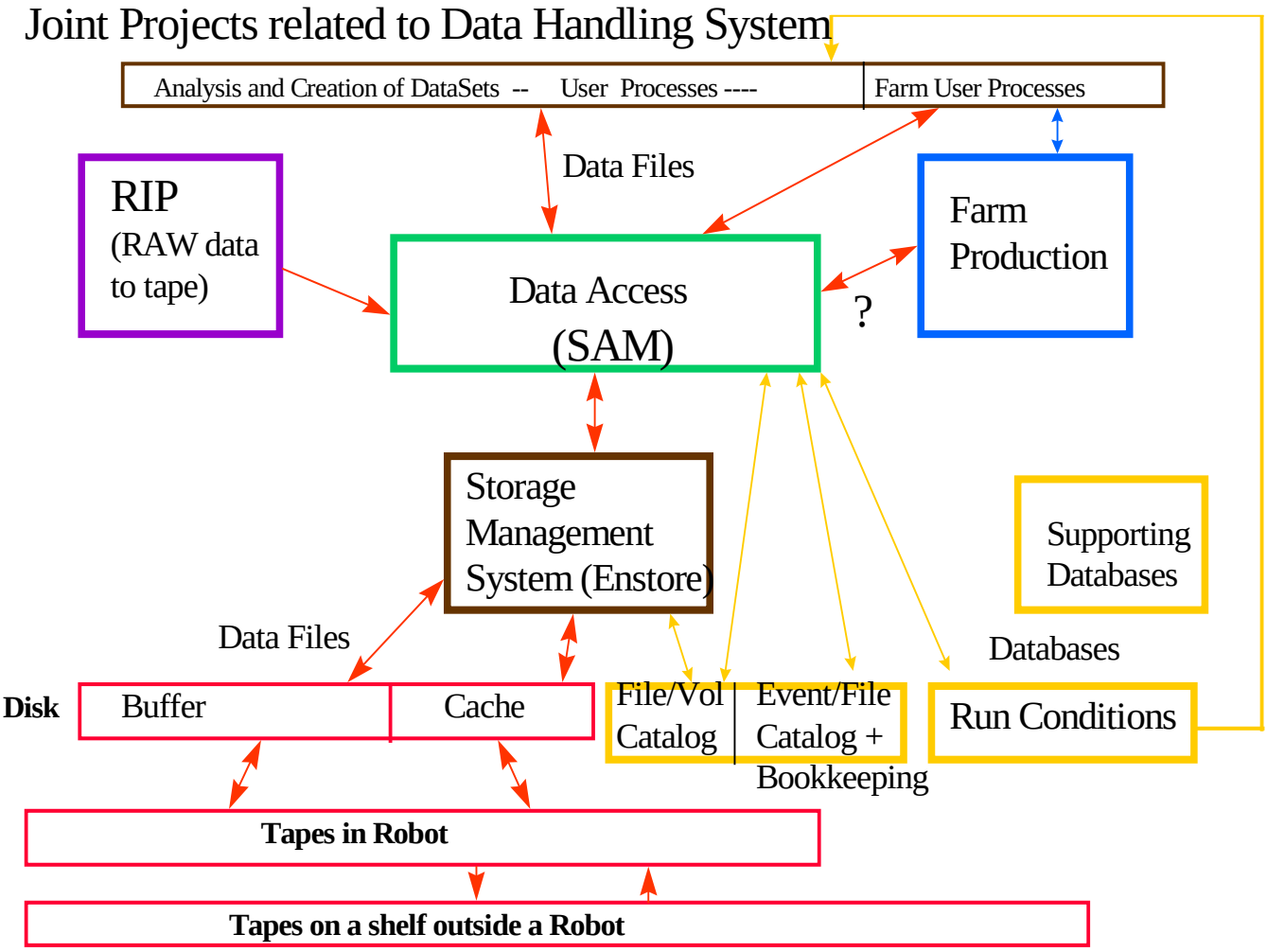
Joint CDF/CD/D0 Project

Software Systems	Procurement of Hardware	Tools & Infrastructure
Reconstruction Input Pipeline (RIP)	Serial Media Working Group	Fermilab Physics Class Library (ZOOM) + C++
Storage Management *	Mass Storage (Robot + tapes)	Configuration Management/Tools
Data Access *	Networking	Simulation & Event Generators
Production Farm	Reconstruction Farm/Processing	Support Databases
Physics Analysis	Physics Analysis	Visualization

Production and Data Access

- Part of an entire data handling framework most of which could, in principle, be common for D0 and CDF
- 5 of the Joint Projects aim to provide the basic building blocks for our experiment data management
- Much work in the last 6 months - in Data Access and Storage Management

Data Handling System



HPSS out/Enstore in

- Getting files into/out of a robot is a key component
- HPSS found to have functional deficiencies for Run II
  - lot of work/tests/reviews done
  - HPSS workshop - other labs
- Oct 97 Von Ruden said ‘develop alternatives’ …. so…..
- Developed a prototype based on DESY system and some of its components - called it Enstore (Petravick/Bakken - CD)

Storage Management

- Enstore is a simple scalable system to get/put files to tape in a robot. Functions like a copy

encp myfile robot/d0/…/bphysics

- SAM will build “D0 layer” on top of this.
- Enstore will be further specified and evolved as requirements from D0 and CDF for Data Access, RIP, Farms are further understood.

Data Access/ History

- 3 working groups -pending CDF decisions on Data Access Model
  - Sequential Access Method (SAM)
  - Objectivity Database
  - Lightweight Database
- SAM group (D0 + CD)
  - studied patterns, rates, architecture
  - investigated database issues
  - formulated Requirements
- DAM review complete -- still much work to do on data content, streaming details

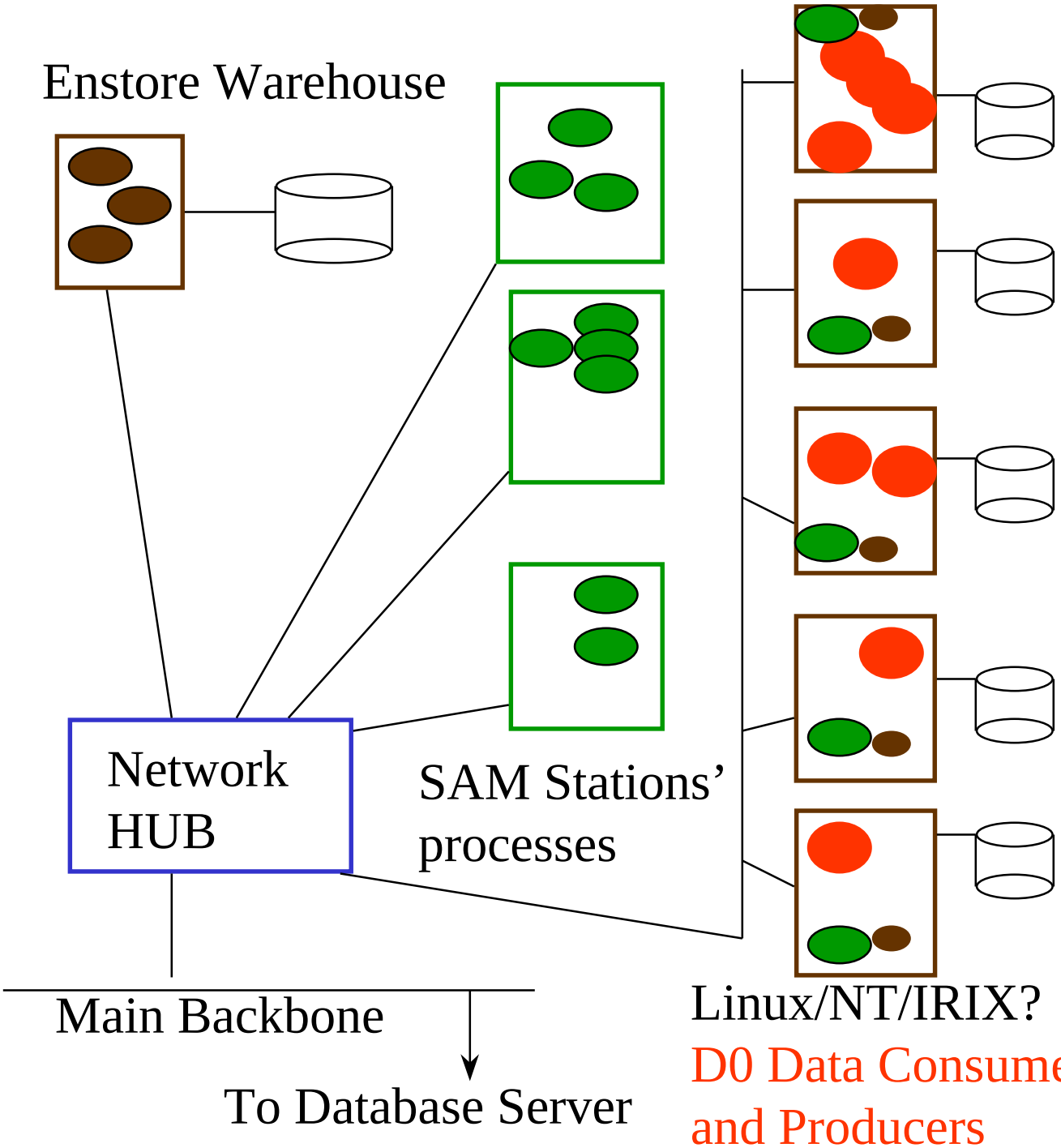
Data Access/SAM

- Von Ruden recommended proceed with a real PROJECT and build a prototype (Oct ?)
- Project Team formed - Lueking, White, Schellman, Terekhov, Vranicar (0.1), Trumbo(0.5), Wellner, Moibenko(Enstore liaison) (CD)
- Will prototype using PCs/Linux primarily
  - fully distributed system, databases,enstore ‘disk warehouse’ until robot comes

SAM Prototype

- Specify data to be accessed for analysis (a 'Project')& access mode
- Attach to a 'Station' which makes files for that Project accessible
- Create files of events. Catalog events, files. Do Bookkeeping.
- Interface to Enstore - get/put files - using SAM "Resource Manager"
- Build Analysis programs using D0 framework, d0om,….
- Demonstrate multiple Stations, Projects, Analysis consumers
- Be ready to handle MC data Jan 99

SAM Prototype - PCs testbed - still planning



SAM Prototype

- Does not prejudge Analysis Architecture or imply Linux
- Tests fully distributed scalable architecture which can be used for Single Analysis Server, Workgroup servers, Farm nodes, Desktops in any configuration
- Merely a testbed to exercise data access paths and system components
- Test with real robot when available and when Enstore supports it

RIP and Production Farms

- **RIP** - project to write the raw data into the robot from Online.
  - Now that we have a simple Storage Management layer of software RIP looks much simpler
  - not clear what CDF want
  - Holmgren (CD/HPPC) leader

(Diesburg,Fuess liaisons)

- **Production Farms** - designing
  - Regular meetings held by Schweitzer (CD/HPPC) leader

(Schellman, Lueking,Diesburg participating)

Production Farm Design

Support Databases

- "Project" just now forming
- CD people have helped
  - set up infrastructure for d0db
  - investigate Oracle 8 features and performance
  - be Database Administrators
- 1st Meeting with CDF to look for actual common projects
  - Data Export and Replication issues?
  - Servers in front of database?
  - ?

Oracle Network License

- Purchase in progress.
  - any number of Database Servers on up to 5 different m/c types e.g. Sun, DEC Unix, SGI, NT, AIX
  - total of 135 simultaneous logins for everything on site (excluding Lab Business Systems)
  - will allow us to replicate to improve performance, failover, have extra test systems as well as Online and Offline databases
  - need a 3-tier database model - clients -> our servers -> databases

Physics Analysis Software - the final stage for the data

- PASFRG functional requirements working group
- PASSUMA support and maintenance requirements WG
- now a new WG - PASREC to recommend one or more products to be ‘acquired’ and then supported (and further developed as necessary)
- Gaines, Kallenbach (CD - ldrs), Greenlee,Li, Watts (D0)
- Survey by July 15, Initial recommendation Sep 1.

Hardware Procurements

Serial Media Working Group	defer decision on technology, next generation drives may save us $1M-$2M, buy 'flexible' robot. Read the report...
Mass Storage (Robot + tapes)	Purchase of EMASS/Grau this FY. Will be available for MC challenge in Jan 99 ~200 cartridges, 40MB/sec initially. More in FY99
Networking	Single mode fiber FCC to D0 installation, using Air Blown Fiber. Gigabit technology choice FY99.
Rec. Farm	FY99
Physics Analysis	FY99

Tools and Infrastructure

going into maintenance phase. Evolving compiler issues to be studied	**Fermilab Physics Class Library (ZOOM) + C++**
Von Ruden said D0 short on help here. Ongoing needs.	**Configuration Management/ Tools**
MCFAST, ?	**Simulation & Event Generators**
Infrastructure work. Start of discussions on Calibration databases. Network Oracle licence -	**Support Databases**
Open Inventor support	**Visualization**

Conclusions

- Getting a lot of help through the joint projects.
- Reaching consensus can take time
- SAM prototype system for MC challenge - using components from the 5 different Joint Projects
- Global Computing WG will provide valuable input
- D0 must keep strong involvement with each Joint Project
  - talk to the liaisons/participants and make sure they represent your needs
- Lot of progress being made