

CDF SAM Deployment (CDF Perspective)

*CDF Data Handling's readiness for the 1 fb^{-1}
Challenge*

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Plan of talk

- Current status

 - Raw Data Logging - Production Farm- User ntupling jobs - User data stripping - MC storage

- Reasons for Delay

- Mitigation Steps

- Remaining Steps

- Schedule

- Conclusion

Current Status - Raw Data Logging to tape.

- Raw Data Logging to tape.
 - Raw Data metadata still logged into Data File Catalogue (DFC) **and** SAM DB schemas
 - System is not robust - too many computers and connections involved (3 Computers)
 - Online SGI machine -> disk -> offline SGI (fcdfsi1); SAM metadata transferred via ssh to Linux machine for upload into SAM
 - CRON job used to move metadata DFC schema to SAM schema when the normal ssh mechanism fails (failure at least once per month)

Current Status - Raw Data Logging (2)

- Raw Data Logging issues:
 - In 2008 the SGI machines will be no longer serviceable
 - SAM (v6 and v7) is not ported to SGI. SAM used have a client for SGI. (labor shortage at CDF is preventing further checking)
 - CDF does not have enough human resources to upgrade this part (Online or Offline) of the data handling system - (personnel limited not hardware limited)

Current Status - Production Farm

- Production Farm - SAM based
 - Running relatively smoothly since July
 - Old Farm decommissioned last week (26-Aug-05)
 - nodes now part of SAM Farm
 - Can process >2.5 TB data/day (18 M events)
 - Short term goal - 4 TB data/day
 - Issues:
 - Running v6 of SAM client/ DB server
 - Additional testing of SAM is required before going v7
 - Data Handling systems (not necessarily SAM) causing some inefficiency in processing.

Current Status - Users

- User Documentation - in very good shape and is evolving
 - **David Dagenhart** (lead editor) with help from mainly Valeria Bartsch and Ray Culbertson.
- User Knowledge base increasing
 - SAM use no longer - predominantly offsite users or “true believers” - Physics analysis groups have several users becoming very knowledgeable in SAM
 - CDF has a group of users acting as a SAM Help desk (led by **Rick St. Denis**)
 - Using a Wiki forum to answer users’ questions
 - Ray Culbertson** answering many questions.

Current Status - User Analysis - Ntupling

- CDF has deployed SAM v6 (client and DB servers) for now. - Users instructed to use how efficiently use SAM within CDF Framework (diskcache_i)
 - Rutgers MOU DHInput / diskcache_i expired (original author-Fedor Ratnikov)
 - now maintained by Valeria Bartsch
 - negotiating w/ Thomas Kuhr (Karlsruhe) on this topic.
- SAM V7 will be the default - Sep.15th downtime.
- Physics groups Ntupling of FY 2005 data is ramping up.
- CDF users having to adapt their analysis tools to SAM method of file delivery (different from DFC method).

Current Status - Secondary Dataset creation by Users

- Until the early July - it was nearly impossible for users to create secondary datasets (Data stripping using SAM v6 or v7)
 - Sinisa Veseli volunteered to modify the existing DB server (v7_0_*). This was vital for the Italians stripping jobs to work. Current DB servers allow for Data stripping (at some rate)
- SAM at CDF is not yet ready for production data stripping.
 - More testing and likely improvements needed.

Current Status - SAM Storage of MC (Users)

- Monte Carlo generated offsite using DFC tools to save MC data on tape
- SAM tools exist
 - Originally written by Fedor Ratnikov (He has left CDF!) (samStoreCdfFile_v6)
 - Further enhanced and developed by Armando Fella (and others from Italy) (sam_upload)
 - The Italians (lead by Donatella Lucchesi) are providing critical support for this product.
 - Still needs to be configured for efficient use of tapes
 - Not enough labor (DPB) to modify/test/deploy “new” autodev server (until it can be replaced by official SAM version)

Current Status - SAM Upload (Users) (2)

- SAM tools - concerns
 - samStoreCdfFile_v6 - written by former CDF collaborator (F. Ratnikov) - No clearly identified support person inside of SAM team or CDF!!!
 - Require to add luminosity information particular to CDF
 - Tool vital for CDF Production farm
 - CDF Autodest server - author (F. Ratnikov) has left the collaboration.
 - DPB providing minimal support, Randolph Herber beginning to provide database support.
 - Need to merge with official sam autodest server but will likely need CDF features added.

Reasons for Delay

- Management changes in both the SAM Team and CDF Data Handling group caused delays
 - Adam Lyon (CD/SAM project leader) and Krzysztof Genser (CD/CDF) have done an very good job despite the challenges
- Task much harder than either SAM Team or CDF imagined (and some of us have vivid imaginations ;-)
- Lack of human resources
 - Problem common to CDF (< 4 FTE's) and SAM team (SAM team losing people!!)
 - CDF will add another person (0.5 FTE) - Thomas Kuhr and lose a person (me - this Fall I become CAF SPL)

Reasons for delay (2)

- SAM limitations in CDF environment unknown until recently. (for example – files delivered/sec, Metadata declarations/reads per sec.)
- B group dataset stripping - big load on SAM - more so than production – (not possible with v7_0_0 DB server)
- SAM team seemed to focus on many different fronts.
 - SAM team now fully behind CDF's success - better coordination between and CDF and SAM team
- CDF did not present specifications until late in the process. CDF-SAM teams did not talk the same language
 - Current CDF draft spec's. very aggressive. (to be revised)
- All schedules presented too optimistic - **no contingency**

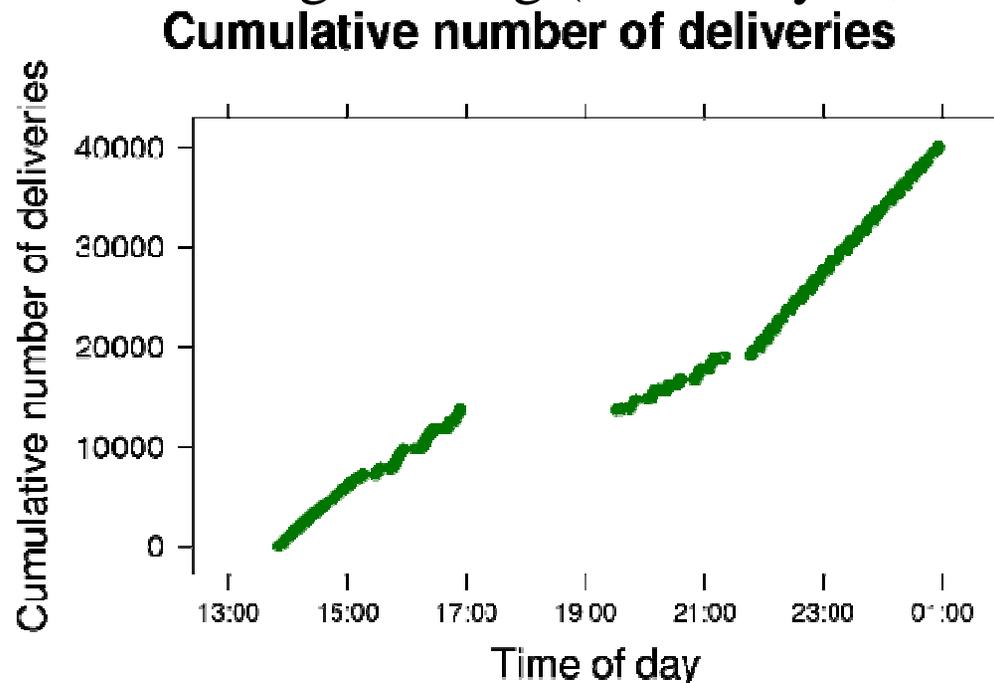
Mitigation steps taken

- Better partnership between SAM team and CDF experiment
 - SAM team providing guidance on improvements to sam_upload, B dataset stripping scripts
 - CDF/SAM team collaborating on testing limits of SAM.
- More effort available to help
 - No more vacations or babies for a while
 - CDF providing a person (T Kuhr) to focus on storing of CDF files, CDF Autodest server

Mitigation steps taken(2)

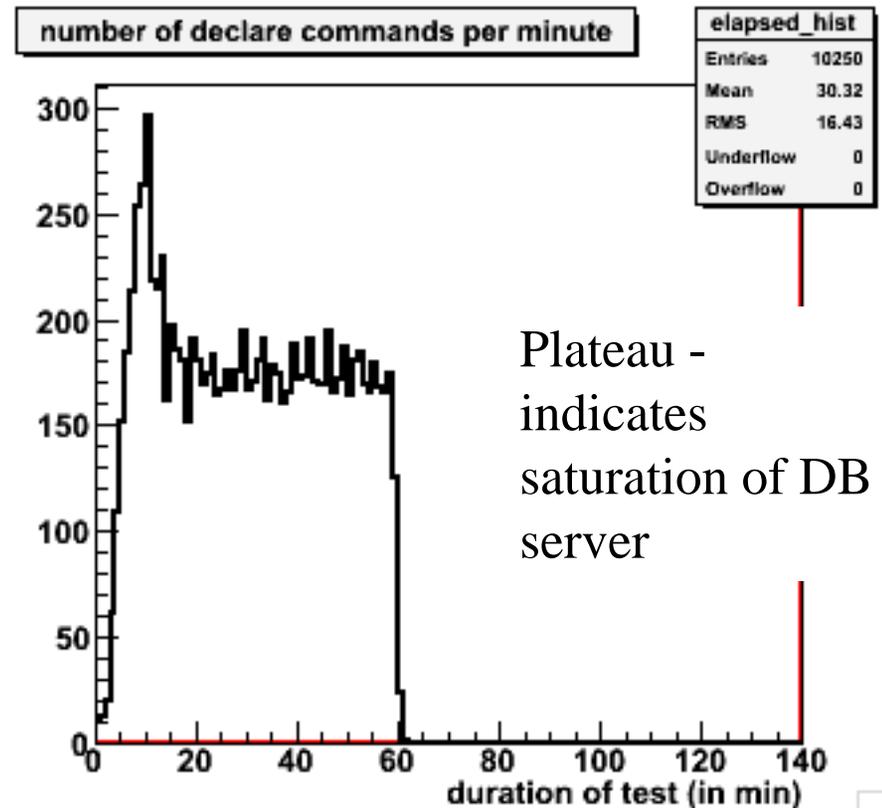
- Testing plan developed to factorize CDF use cases
 - CDF provided the hardware (Phase I SAM farm - Now using some nodes from old FBS farm)
 - Results from CAF like usage testing (Adam Lyon, Andrew Baranovski)

Result: 50-60%
improvements -
Now 0.5 sec per
file



Mitigation Steps (3)

- Factorized tests - for stripping/production cases
 - Metadata declaration
 - Reading of Metadata
 - Data file location (addLocation)
- Initial tests done
 - Initial results in plone.
 - DB server configuration changes (S White)
 - Oracle connection changes (S White - DBA's)



Client tests by DB - S White reviewed DB server logs

Remaining steps

- Further improvements to DB server to handle CDF dataset stripping
 - Will run simple python script emulating several stripping jobs
 - These tests will also apply to Production Farm
- 1-2 weeks of Phase I SAM farm data processing to test v7 DB server/ client ahead FARM upgrade
- Fully implement SAM_UPLOAD (software and hardware) for local and remote upload of MC data
- Improvements to CDF's use of the Issue tracker
 - decouple – cdfsam-admin from it, use another e-mail address and have someone from CDF assigned to add the issues properly.

Schedule

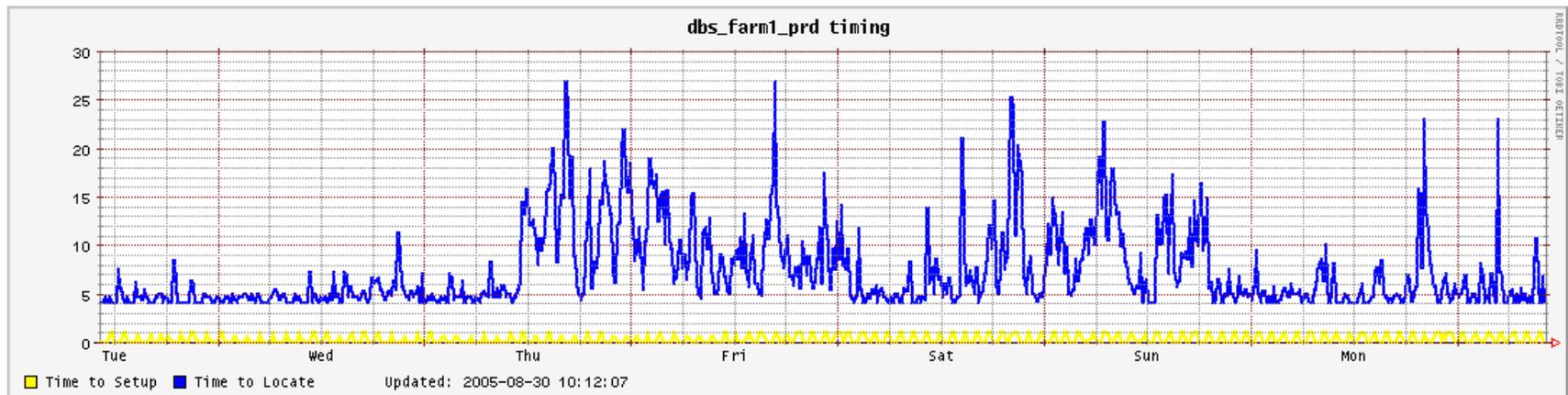
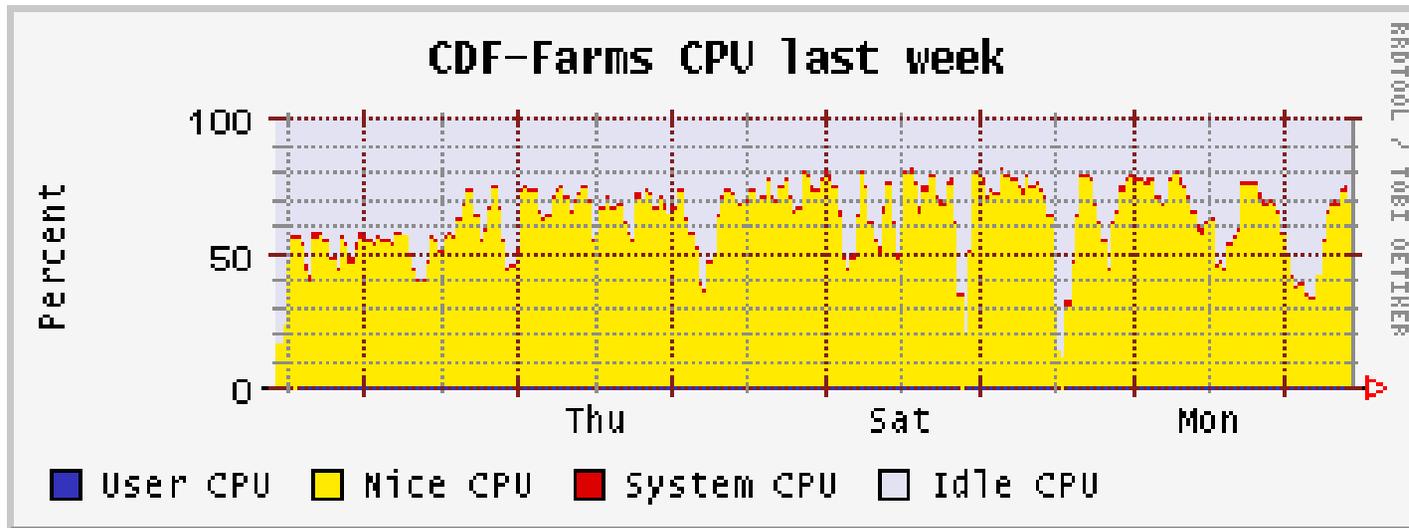
- SAM v7 default for users - 15-Sept-05
 - Already available for people to use now.
 - Data Quality monitoring (DQM) using v7.
- SAM v7 for B dataset skimming (on site or remote dCaf's) - ~ 4-6 weeks from now
- SAM v7 for Production Farm ~ 3-5 weeks after SAM V7 for dataset skimming
 - Production Farm productivity critical to CDF's success.*
 - (perhaps, wait until the accelerator shutdown)
- CDF data handling w/ SAM for Grid jobs (no guess)

Conclusions

- Much progress has been made towards the SAM deployment at CDF
- There is still a significant amount of work to do
- The deployment is personnel limited
- SAM deployment is proceeding on a *Running* experiment with a **physics-driven schedule (1 fb⁻¹ challenge) and resource needs**
 - B group dataset stripping requirements
 - MC upload requirements
 - B group ntupling requirements (data/CPU intensive)

Backup slides

Farm CPU vs Farm dobserver timing



Steps remaining

B dataset skimming

1. Determine the required metadata (intermediate (transient) files – final files)
2. Retest declare metadata w/ new DB servers
3. Retest get metadata
4. Retest add location
5. Write up results
6. Modify SAM to only store required metadata for intermediate files. (new tables?)
7. Retest it all...
8. Write up results

Production Farm

1. Determine the required metadata (intermediate (transient) files – final files)
2. Modify SAM to only store required metadata for intermediate files. (new tables?)
3. Test farm concatenation jobs with simple scripts (python initially)
4. Test on Phase I farm with Production Farm code for 2 weeks