Database System Status

post “taking stock”

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for the db/dh/dg group

CPB

06 November 2002

outline

quick status in each case:

- **assessment of current situation**

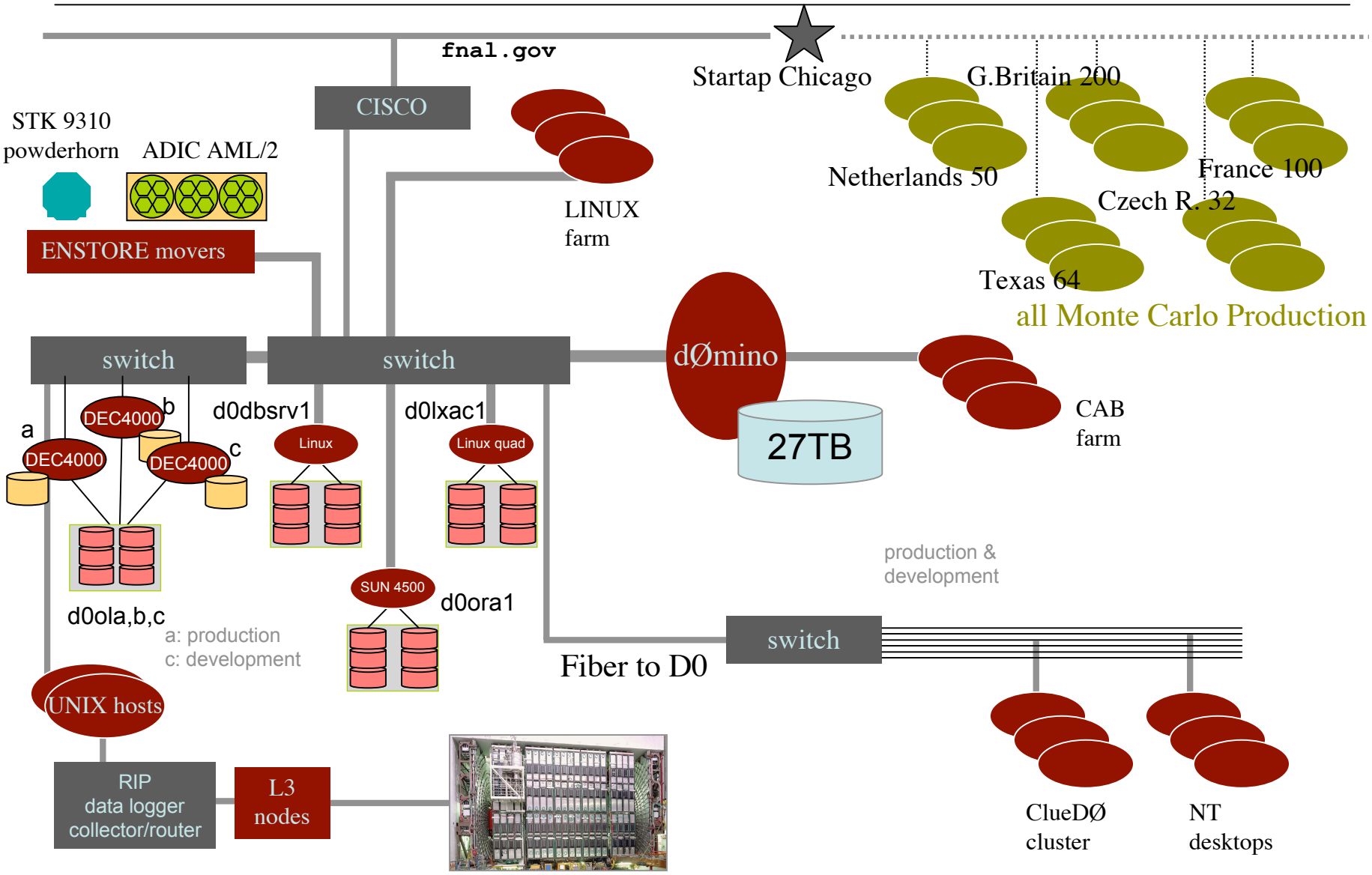
  issues from 11.01.02 “taking stock” db bi-annual session

- **plans/issues**

for

1. **db server upgrade**
2. **online DBs**
3. **offline DBs**
4. **DB servers**

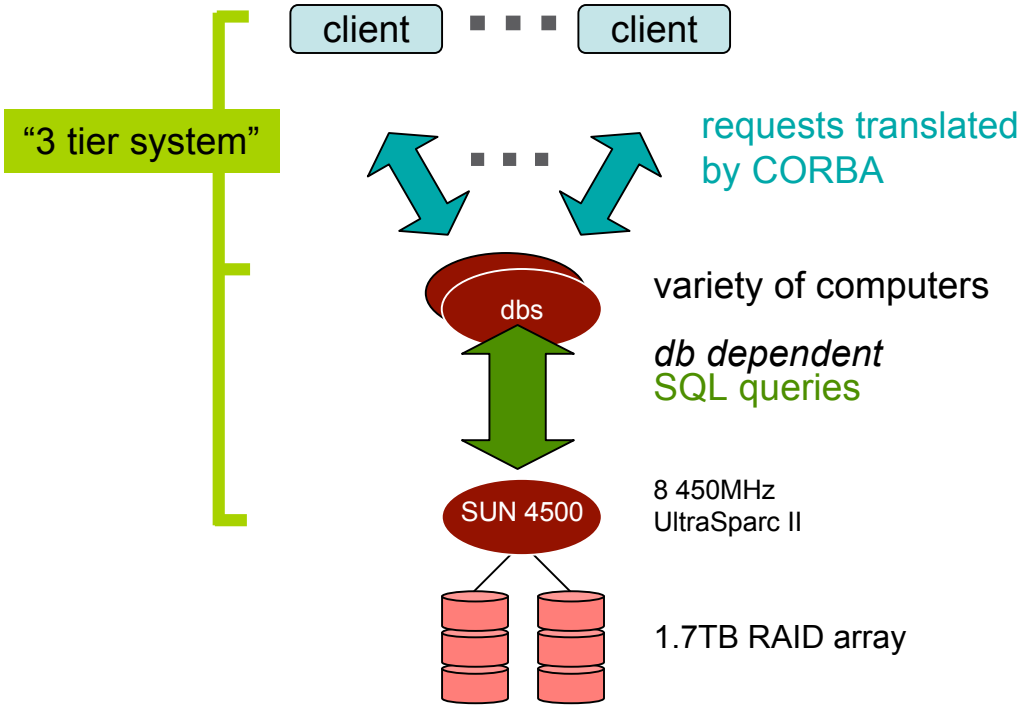
DØ data handling/database system architecture



dbserver upgrade: “DAN”

two configurations of the databases:

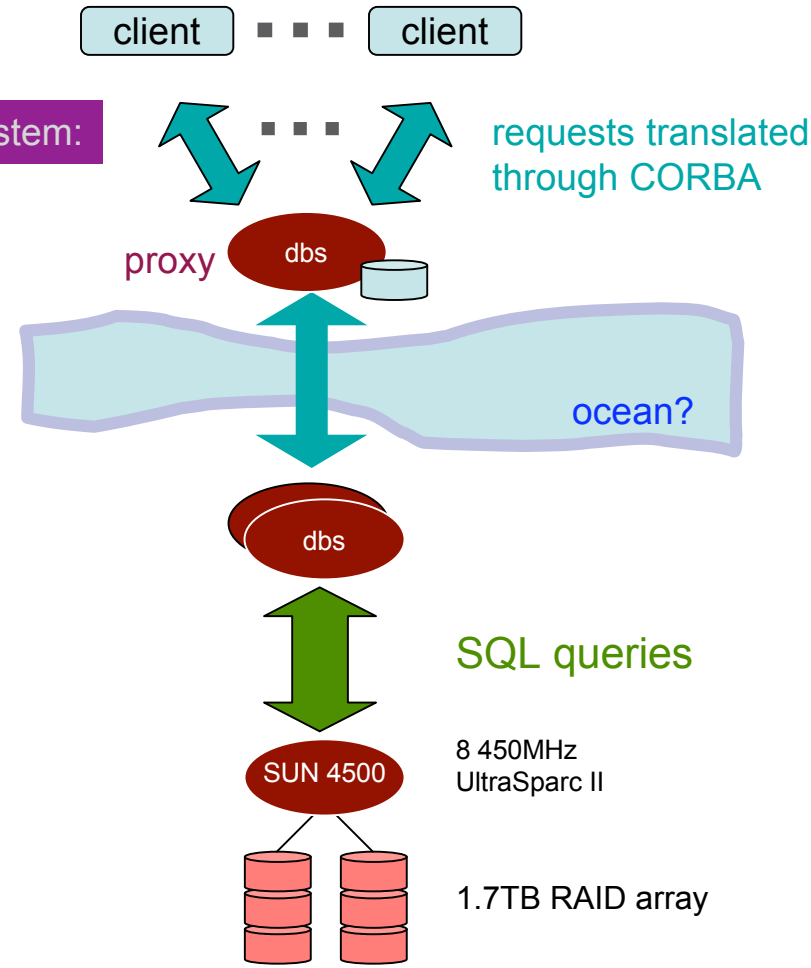
Current system:



Upgrade complete (Steve White)
- multi-threaded
- designed for speed, modularity
- designed to support proxies
- in use for ~1 month

now running both servers
occasional “lockup” which is still being debugged

Future system:



Proxy development has completed
currently (just started) testing proxy
1. initially on D0mino
2. will move to d0dblxac1, then offsite

combined → CFT

online DB - snapshot

Application Name	Design	Designer Owner	Application Owner	CVS Name(s)	UPS Name(s)	Tablespace Name	Dev/Int/Prd	Responsible Party(s)
Online Apps								
SMT Calibration	Y	smt_calib_design	smt_calib	onl_smt_calib_db	onl_smt_calib_db	smt_calib	~~D~~ P	~~Huaming Wang~~ Harold Fox
CAL Calibration	Y	cal_calib_design	cal_calib	onl_cal_calib_db	onl_cal_calib_db	cal_calib	~~D~~ P	~~Mrinmoy Bhattacharj~~ ~~Moustapha Thioye~~ Ursula Bassler
CFT Calibration	Y	cft_calib_design	cft_calib	onl_cft_calib_db	onl_cft_calib_db	cft_calib	~~D~~ P	~~Sailesh Chopra~~
FPS Calibration	Y	fps_calib_design	fps_calib	onl_fps_calib_db	onl_fps_calib_db	fps_calib	D	~~Sailesh Cho~~ Jadzia Worchol
CPS Calibration	Y	cps_calib_design	cps_calib	onl_cps_calib_db	onl_cps_calib_db	cps_calib	D	~~Sailesh Chopra~~
FPD Calibration	Y	fpd_calib_design	fpd_calib	onl_fpd_calib_db	onl_fpd_calib_db	fpd_calib	D	~~?????~~ Victor Bodyagin
Muon Calibration	Y	muon_calib_design	muon_calib	onl_muon_calib_db	onl_muon_calib_db	muon_calib	D	Andrzej Zieminski, Jundong Huang, Chunhui Luo
~~Luminosity~~	N	luminosity_design	luminosity	onl_luminosity_db	onl_luminosity_db	luminosity	none	Micheal Begel, Rich Partridge
~~L1 L2 Trigger~~	Y	l1l2_trigger_design (offline)	l1l2trigger					E.Gallas
~~L3 Trigger~~	Y	trigger_design (offline)						E. Gallas
Hardware Controls	Y	hdb_design	hdb	hdbAdmin	hdbAdmin	hdb	D/P	Stan K, Jeremy Simmons, V. Sirotenko
Run Controls	Y	run_ctl_design	run	onl_run_db	onl_run_db	run	D	Jeremy Simmons

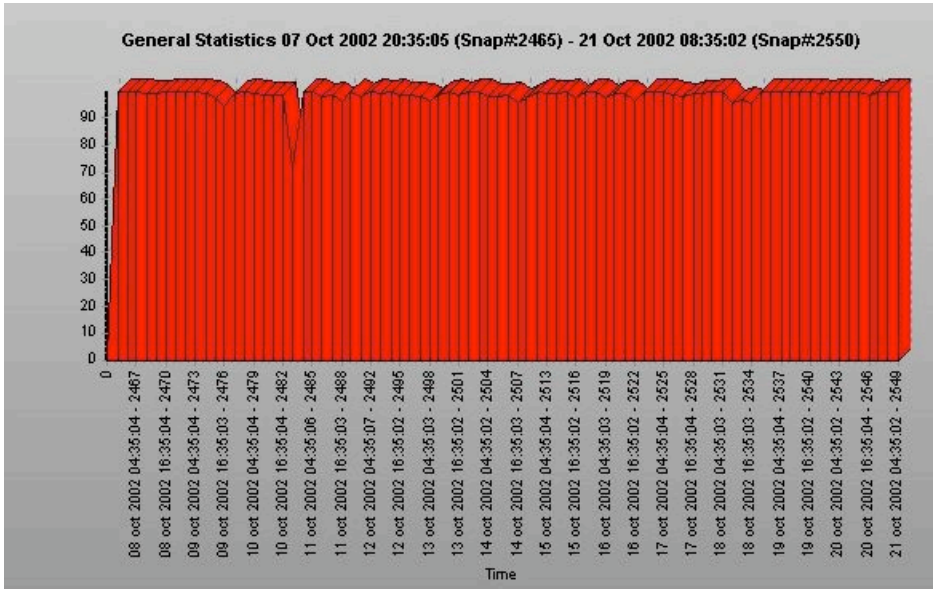
http://d0db.fnal.gov/d0db/~~db_infrastructure_052200_update.html~~
db_infrastructure_112901_update.html

online DB - assessment

general status: stable

stats, eg buffer hit ratio - % of requests satisfied by cache only

http://d0server1.fnal.gov/www/online_computing/documents/Database/OraclePlots.html



- online Luminosity is not an oracle db, but writing data to file, cataloged in SAM
  - Review of Luminosity project being formed around Weerts
- some combined db's, other changes
- no issues at the "taking stock" meeting

offline DB - snapshot

Offline Calibration Apps								
Offline CAL calibration	Y		cal_calib_design	ofl_cal_calib_db	ofl_cal_calib_db	cal_calib	D	Ursula Bassler ~~Bob Olivier~~
Offline SMT Calibration	Y	Ela	smt_calib_design	ofl_smt_calib_db	ofl_smt_calib_db	smt_calib	~~D~~ P	Ela Barber Marian Zdrazil
Offline Muo Calibration	Y	muon_calib_design	muon_calib_design	ofl_muon_calib_db	ofl_muon_calib_db	muon_calib	~~D~~ P	Andrzej Zieminski, Jundong Huang, Chunhui Luo
CFT Offline Calibration	Y		cft_calib_design	ofl_cft_calib_db	ofl_cft_calib_db	cft_calib	~~D~~ P	Andrei Mayorov
CPS Offline Calibration	Y		cps_calib_design	ofl_cps_calib_db	ofl_cps_calib_db	cps_calib	~~D~~ P	~~Suen Hou~~ Zhong-min Wang
FPS Offline Calibration	Y	fps_calibration_design	calibration_design	ofl_fps_calib_db	ofl_fps_calib_db	fps_calib	~~D~~ P	Zhong-min Wang
~~FPD Offline Calibration~~	~~Y~~		~~fpd_calib_design~~	~~ofl_fpd_calib_db~~	~~ofl_fpd_calib_db~~	~~fpd_calib~~	~~D~~	Christophe Royon
Offline luminosity and streams	N		luminosity_design	ofl_luminosity_db	ofl_luminosity_db	luminosity		~~Rich Partri~~ Schelman Begel Simons
L1 & L2 Trigger	Y	L1L2_design	L1L2_design	L1L2_db	L1L2_db	L1L2	~~D~~ P	Elizabeth Gallas.
L3	Y	trigger_design	trigger_design	trigger_db	trigger_db	trigger	D	Elizabeth Gallas, Carmem Silva.

http://d0db.fnal.gov/d0db/~~db_infrastructure_052200_update.html~~
db_infrastructure_112901_update.html

combined

offline DB - assessment

general status: stable

operations have been acceptable to good

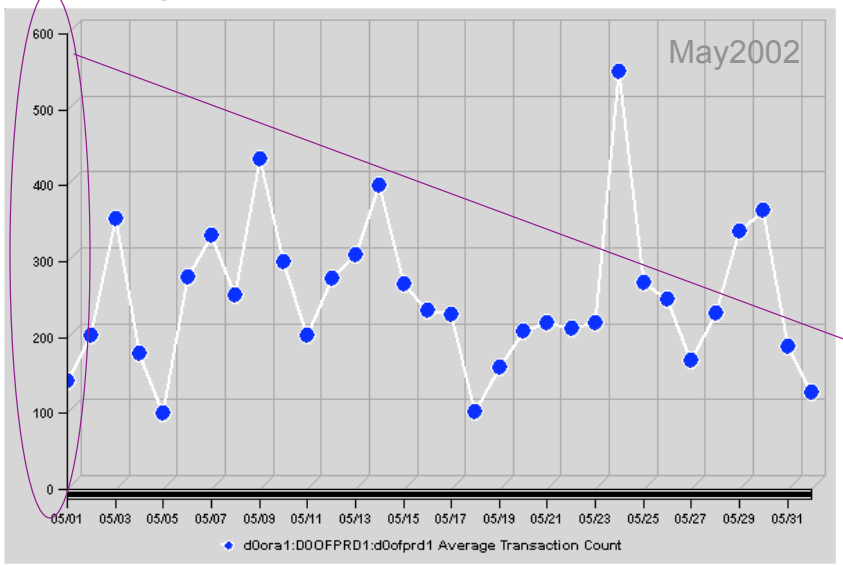
usage patterns are showing steady increases

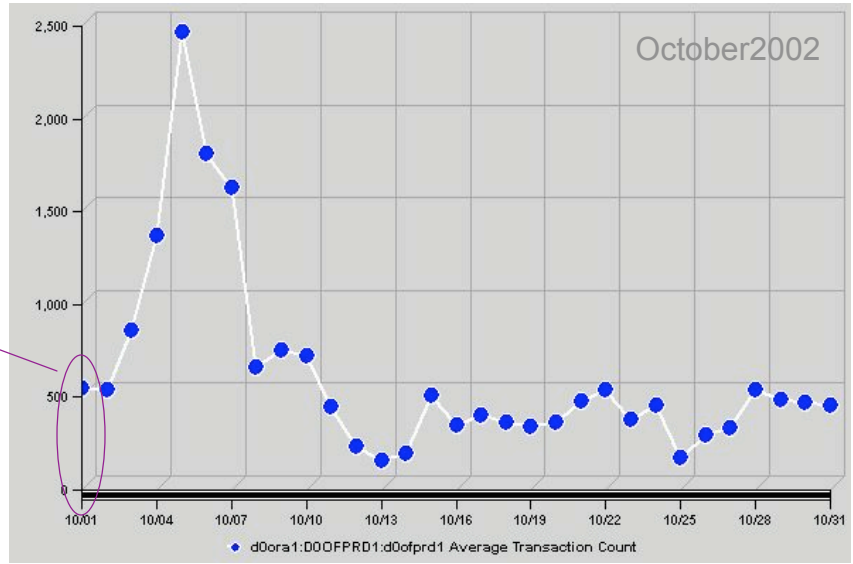
example of usage:

number of commits/day - want steady

spikes are allowed, dips are discouraged

Instance Response Time Analysis1





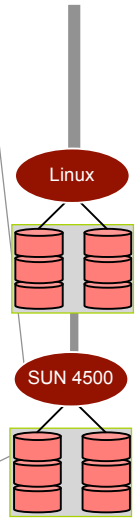
http://www-cdserver.fnal.gov/cd_public/ods/db_stats/data/Oct_2002/d0ofprd1/average%20transaction%20count.html

issues raised in the “taking stock” meeting

mostly all regarding off-line Oracle and dbserver

- **the dbservers are distributed:**

old db servers for < p13.xx
config, cal, lum
new db servers for ≥ p13.02
config, cal, lum



d0dbsrv1

d0ora1,3

d0dbsrv1.fnal.gov
Linux RH 7.1, kernel 2.4
2 750MHz processors; 1GB memory; swap, 1GB; 18GB + 6GB disk

d0ora1.fnal.gov
Solaris 2.6
8 400MHz processors; 4GB memory; 1.6TB RAID for db (prd+int)
3 18GB + 9 18GB SCSI drives for RMAN bckup

Oracle 8.1.7.4 db
db server for
trigger, SAM

Three issues, primarily:

1. backup of d0ora1
2. cpu usage on d0ora1
3. capabilities of dbsrv1

No solutions suggested yet. Not serious issues at this time.

1) backup/recovery of d0ora1

done using Oracle tool, RMAN for production, staged to disk, then tape

- **READ_ONLY tablespaces: weekly**

  40m/37GB disk; 8 wk tape rotation

- **everything else: daily**

  52m/85GB; 4wk tape rotation

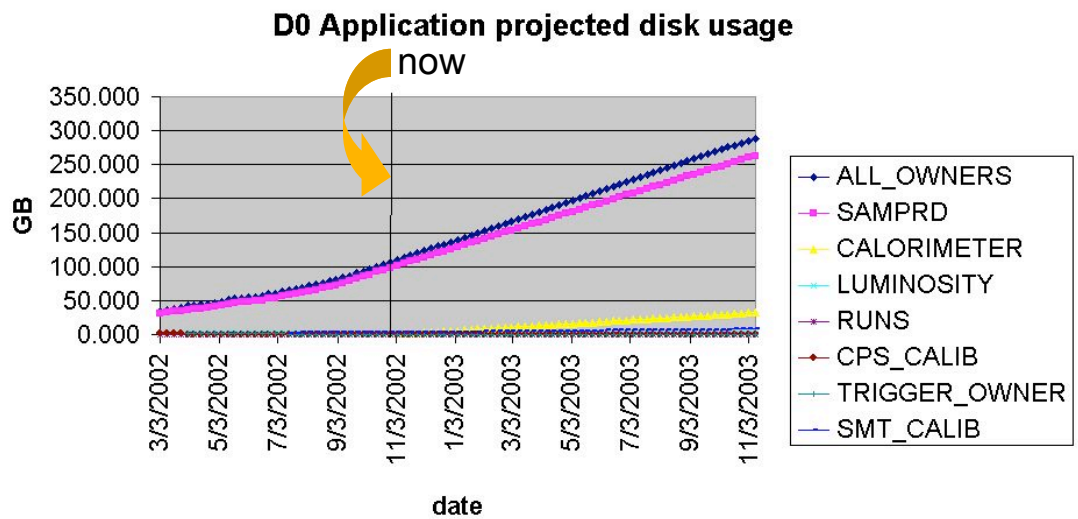
failure scenarios simulated, plus monthly drills

Backup sets are increasing in size.

projection based on since-August performance

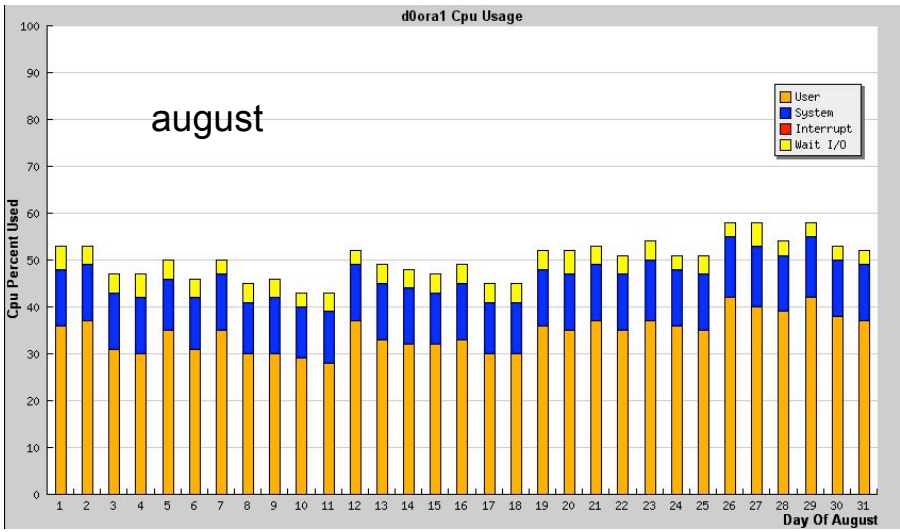
SAM is clearly driving backup need

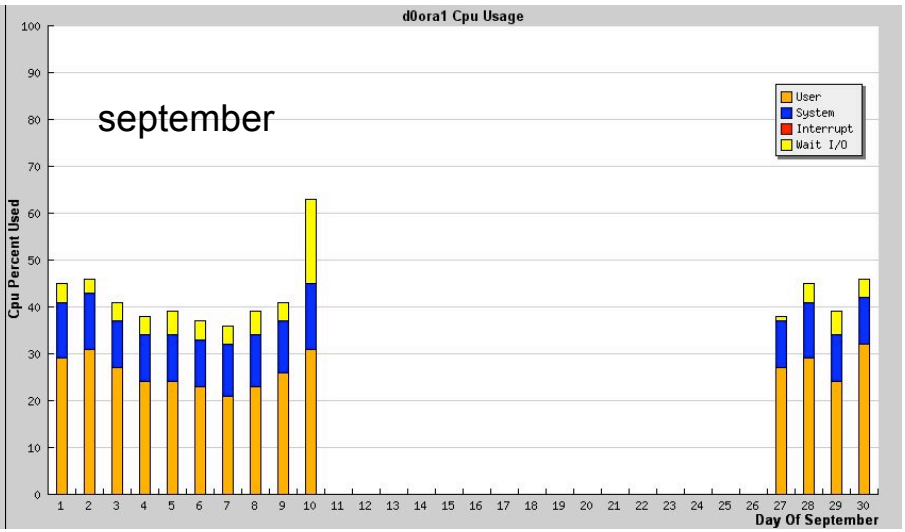
- Some concern about RMAN's performance with increasingly large sets. Little experience here.
- Probably seek to augment/replace 18GB drives with 72GB?

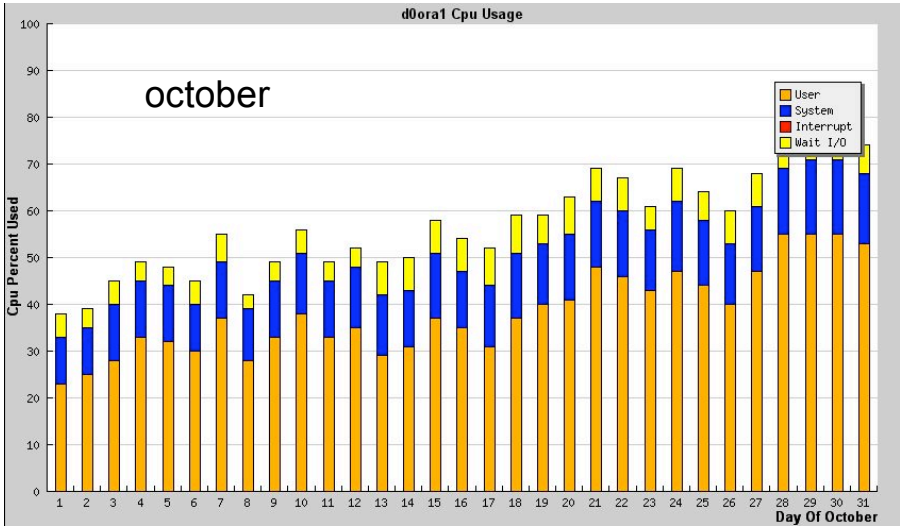


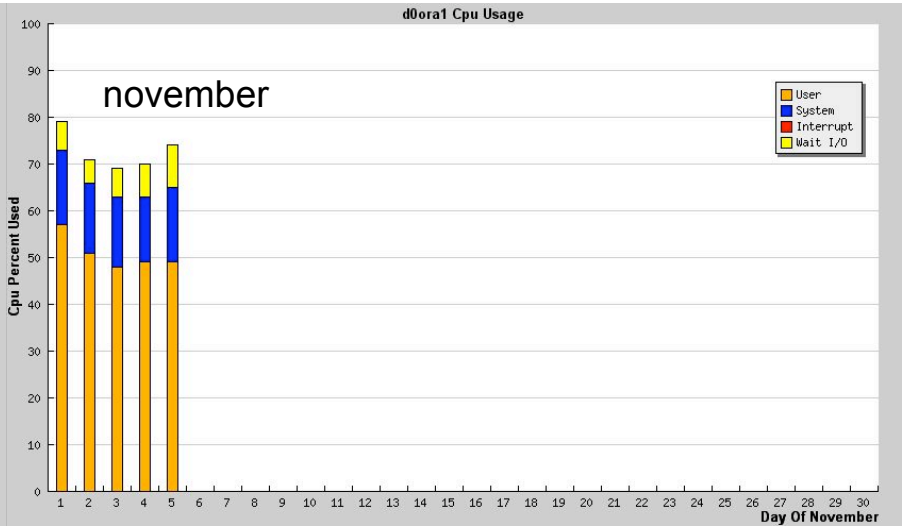
2) cpu usage, d0ora1

Is there a trend developing? watching it...

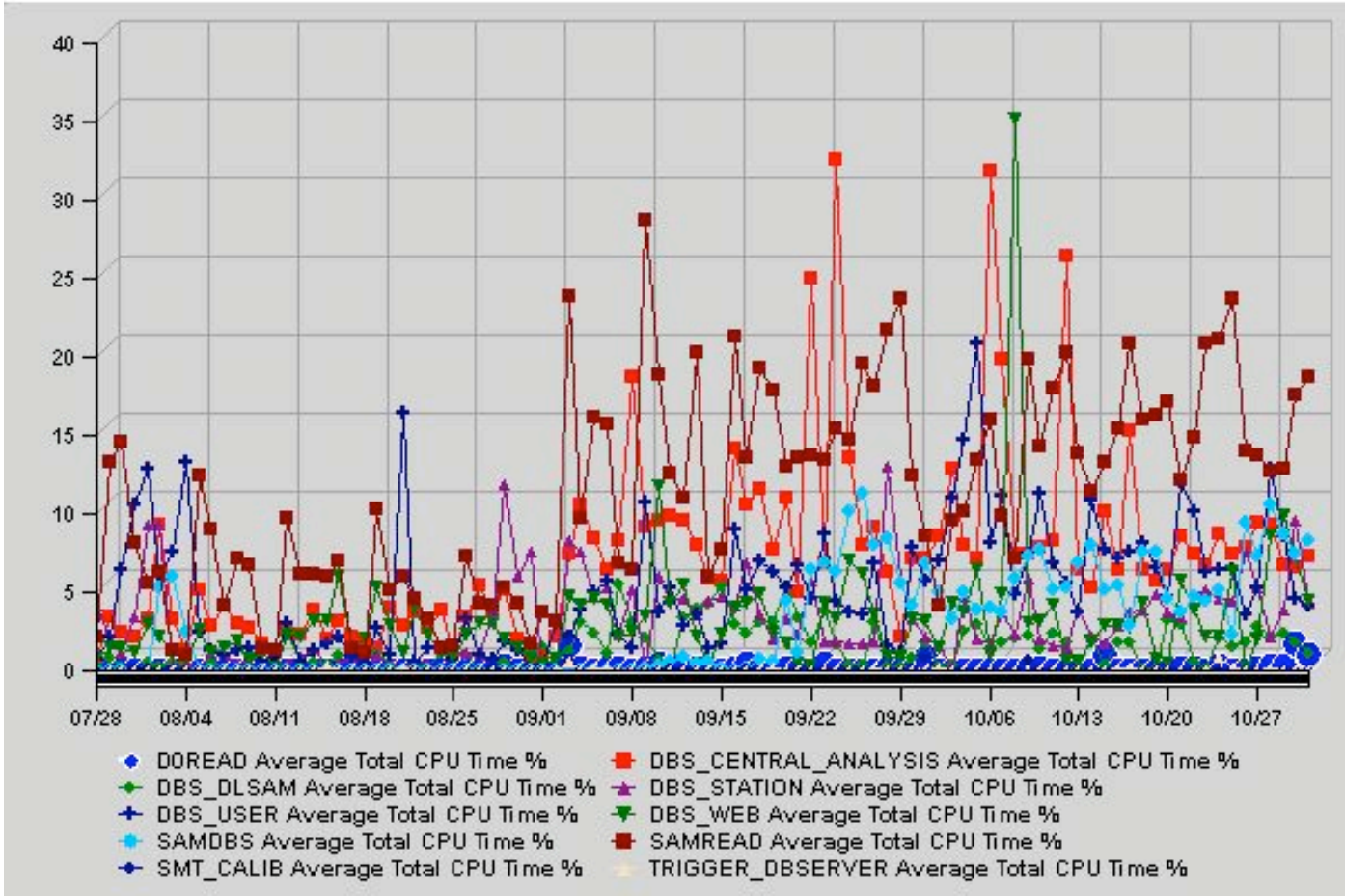








2) cpu usage, d0ora1, cont.



can clearly see the SAM cpu activity increasing around mid-september

correlates with disk db usage

3) general capabilities of d0dbsrv1

dual processor Linux machine

- **serving both old and new db's**

  2 sets of calibration constants require 800MB of memory

  1 set of calibration servers + 2 sets of constants saturate memory

  4 sets of constants saturate swap space

  it takes 10m to retrieve one SMT constants set from db → client

  it takes 50s to go from cache

  – anticipating multiple sets requested at any time gives one pause

- **will have to serve proxies as well**

Solution is to either

- **add multiple Linux nodes to run specific dbservers**

or

- **replace with a capable SUN node**

Support questions are leading to a meeting to discuss this.

offline DB - plans/issues

plans

- mostly waiting for testing in RECO - a switch in p13.02.00?
- luminosity will be the near term focus with review
- would like to create some graphical viewers

issues

documentation is mostly out of date

CAL is probably a critical path item

- when pulsar data are regularly written, the balloon goes up

losing Oracle expert at the end of the year

- between dba and physicist - critical expert need
- CDF has Oracle also, but also now uses SAM