

CDF Report on Tier 1 Usage

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Outline

- The CDF Computing Model
- Tier1 resources usage as today
- CDF portal for European GRID: lcgCAF
- People and Tier 1 support

CDF Computing Model: Analysis Data & MC flow

User Desktop



DH= Data access,
catalog is SAM



Robotic
Tape Storage



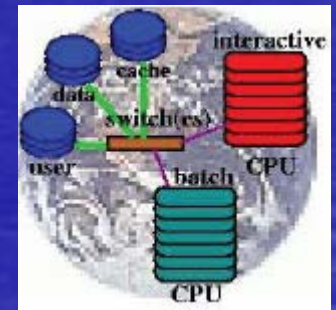
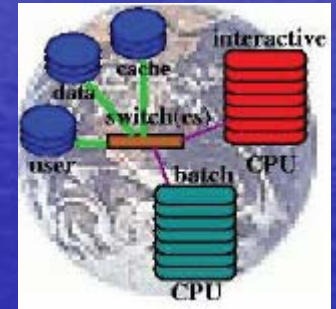
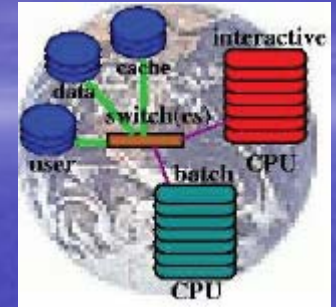
Data processing



Central Analysis System
(Central Analysis Facility CAF)

Remote Analysis System
CDF=CAFs DO=Remote Farms

Monte Carlo Production



CDFCAF

CDF need to migrate to GRID

- Need to expand resources luminosity expect to increase by factor 8
- Resource are in dedicated pools, limited expansion and need to be maintained
- Resource at large

CDF has three projects:

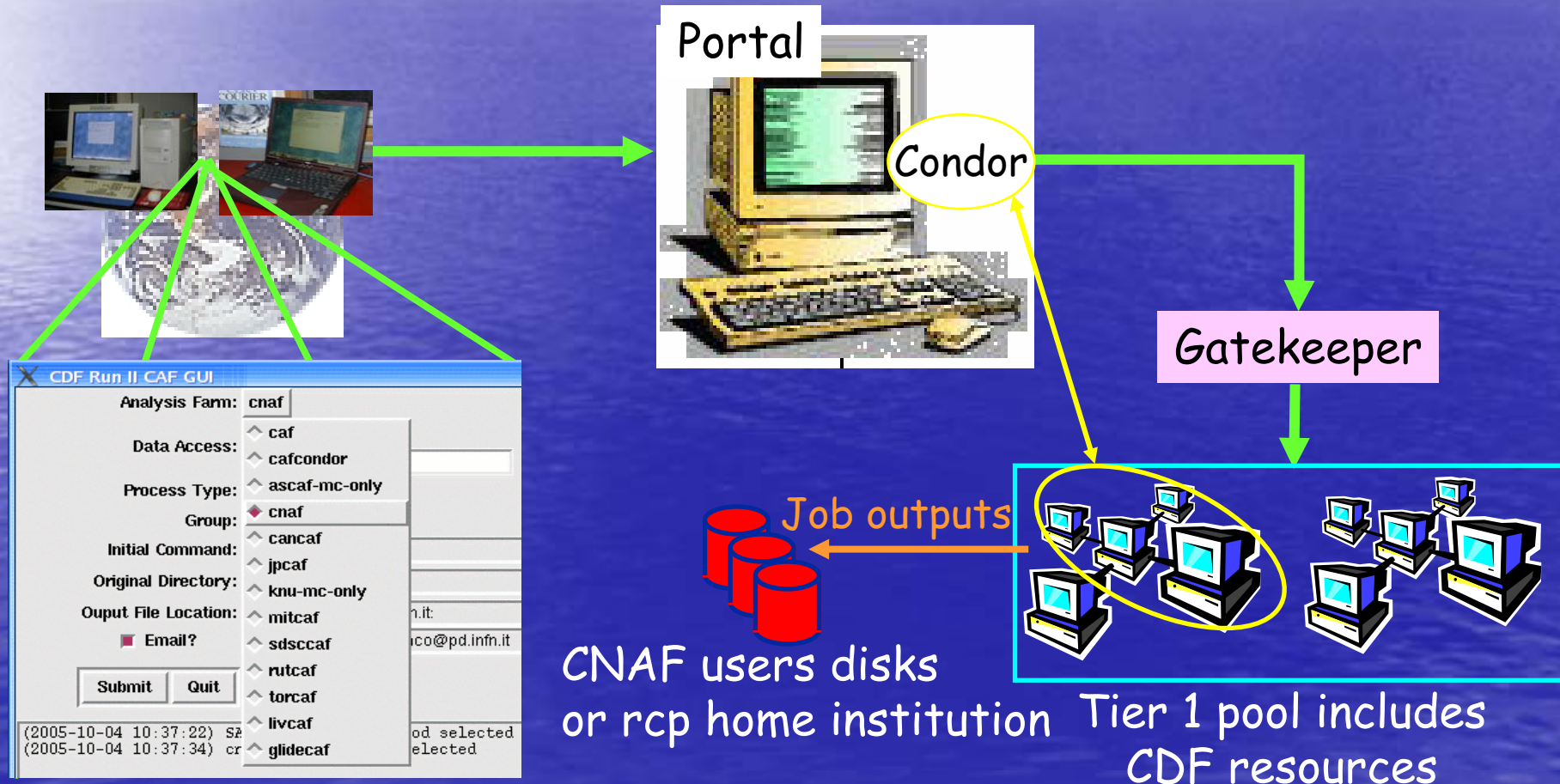
- ✓ **GlideCAF**: MC production on GRID, data processing at T1
Production systems: CNAF, San Diego, Fermilab, Lyon.
- **LcgCAF**: MC production on GRID
- **OSGCAF**: " (USA)

CDF priorities for computing outside Fermilab:

- ❑ Monte Carlo production
- ❑ Few selected site will become Physics centers
CNAF the Italian Tier 1 chosen for B physics (partially already used as)

Current CDF Resources Access : GlideCAF

- Developed by **S. Sarkar** with **I. Sfiligoi** help
- Maintained @CNAF by **Subir Sarkar**
- Production since Sept. 2005, pure GlideCAF Dec. 2005



Current CDF Resources : Disk space

Data Storage:

- o 65 TB in total; 40 TB used
- o Major B Physics datasets and skimmed data up to September 2005. New data import in progress

Users disk space (icaf) :

- o 6.5 T only for Italians

Data files are copied to wn, analyzed and the output stored icaf (Italians) or copied to own institution (non-Italians)

Grid storage element (SE):

- o 1.7 TB for Monte Carlo Production

Current CDF Resources : Disks

Data disks

Filesystem	Size	Used	Avail	Used%	Mounted on
/dev/gpfs_cdf1	11T	11T	644G	95%	/storage/gpfs_cdf1
/dev/gpfs_cdf2	11T	11T	918G	92%	/storage/gpfs_cdf2
/dev/gpfs_cdf3	7.6T	5.4T	2.2T	71%	/storage/gpfs_cdf3
/dev/gpfs_cdf4	7.2T	427G	6.7T	6%	/storage/gpfs_cdf4
/dev/gpfs_cdf5	7.2T	414G	6.7T	6%	/storage/gpfs_cdf5
/dev/gpfs_cdf6	7.2T	544G	6.6T	8%	/storage/gpfs_cdf6
/dev/gpfs_cdf7	7.2T	542G	6.6T	8%	/storage/gpfs_cdf7
/dev/gpfs_cdf8	7.2T	559G	6.6T	8%	/storage/gpfs_cdf8

Users disk space : 6.5 T only for Italians

cdfdata01.cr.cnaf.infn.it:/cdf/data/01-06

Grid storage element (SE):

dsgridit.cnaf.infn.it:/flatfiles/SE00/cdf 1.7T 821G 904G 48%
/cdf/data/SE-test

Dataset	Description	Files	Events	Cached	Locked
skbh01	Bs->Dspi(Ds->Phipi)	108	1780764	none	none
skbh12	B+ ->D0pi(D0 ->Kpi) Cabibbo Suppress	390	6976384	none	none
skbh02	Bs->Dspi(Ds->3pi)	758	12998672	none	none
skbh03	Bs->Ds 3pi(Ds->Phipi	698	12154391	none	none
skbh04	B0->D+pi(D+ ->Kpipi)	843	14959016	none	none
skbh05	B0->D+3pi(D+ ->Kpipi)	1387	25216343	none	none
skbh06	B+ ->D0pi(D0 ->Kpi)	404	7207271	none	none
skbh07	skim-2 Decay D* ->D0pi(D0 ->Kpi)	281	5350494	none	none
bhel0d	HIGH_PT_ELECTRON	4813	26499559	4759(99%)	4759(99%)
chdr08	Dataset for BsDsKsK	765	15242505	all	all
chdl01	Dataset for BD0K3pi	655	12977735	653(100%)	653(100%)
chdl02	Dataset for BD0KK	230	4534193	228(99%)	228(99%)
chdl04	Dataset for BD0pipi	130	2429423	all	all
chdl07	Dataset for BsDsPhipi	100	1827438	99(99%)	99(99%)
chdl09	Dataset for BsDsK*K	814	17104942	all	all
mbot0w	Pythia all processes select b semimuonic	33	247144	all	all
xbmu0d	B_MUON_COMPRESSED	4295	25645441	4290(100%)	4290(100%)
xbhd0d	B_HADRONIC_COMPRESSED, Stream H	42121	270149101	35046(83%)	35046(83%)
xbhd0h	B_HADRONIC_COMPRESSED, Stream H	13859	205848210	6853(49%)	6816(49%)
xbel0d	B_ELECTRON_COMPRESSED	6043	37051608	3638(60%)	none

CDF Catalog and disks access

SAM is used as catalog for data and right now also as disk space manager but really painful.

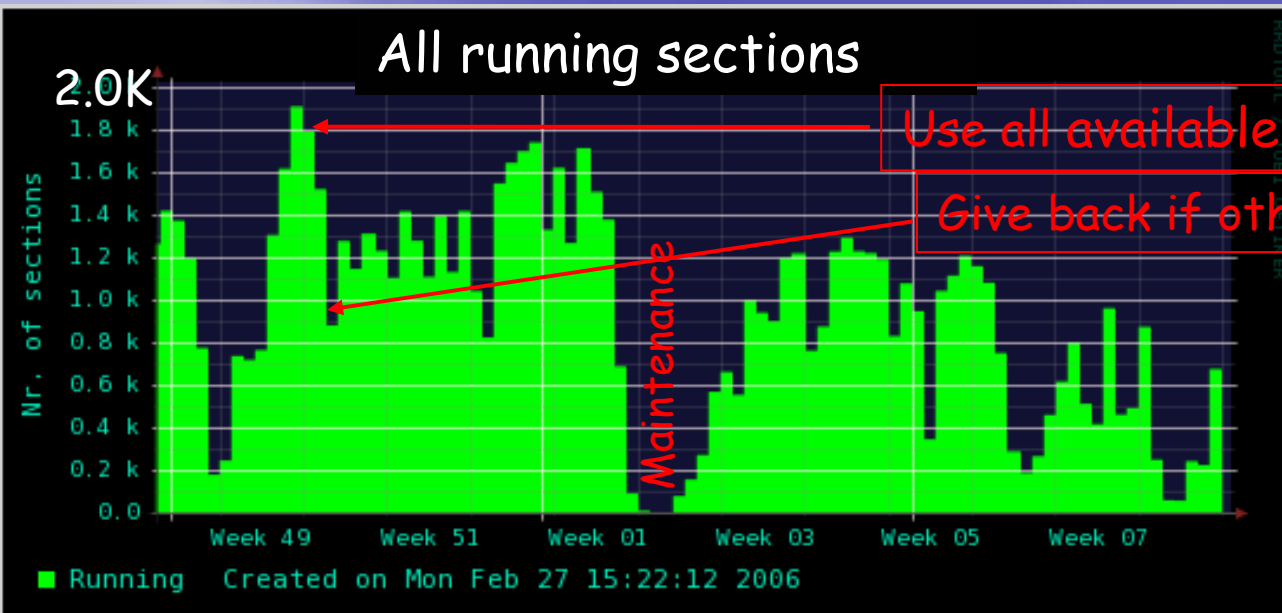
Maintained by D. Lucchesi and **Gabriele Compostella**
(Trento PhD student)

SAM/SRM interface under development

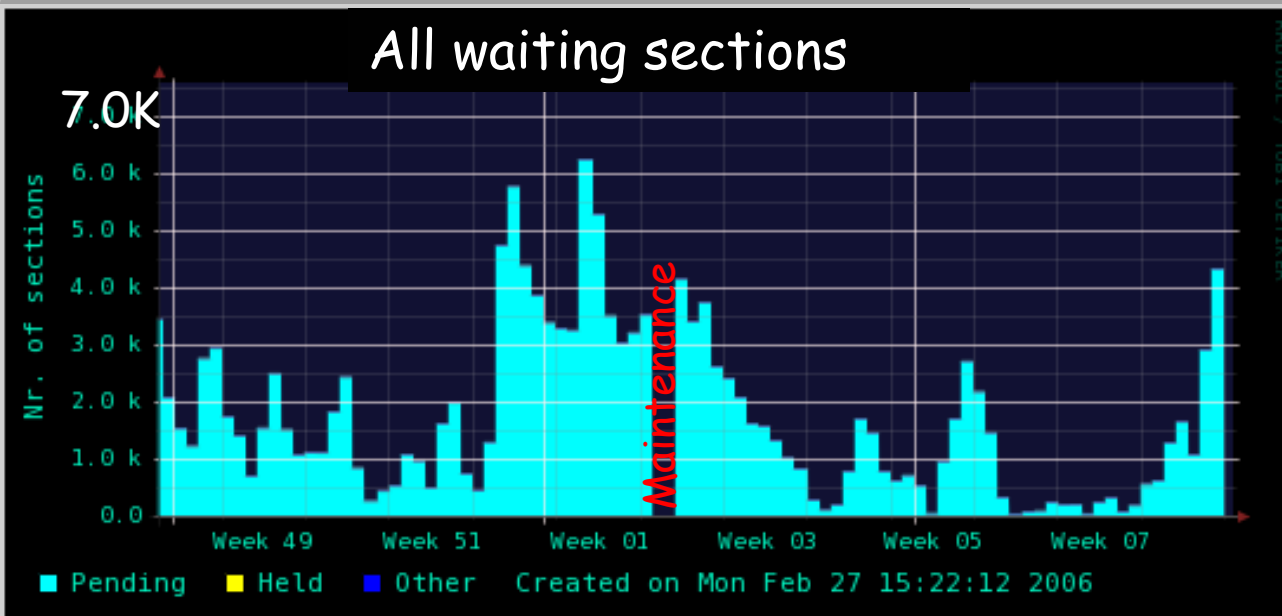
(1 person paid by Italy now at fnal to work on that)

Need to collaborate also with CNAF to make it CASTOR compliant.

GlideCAF: CPU usage



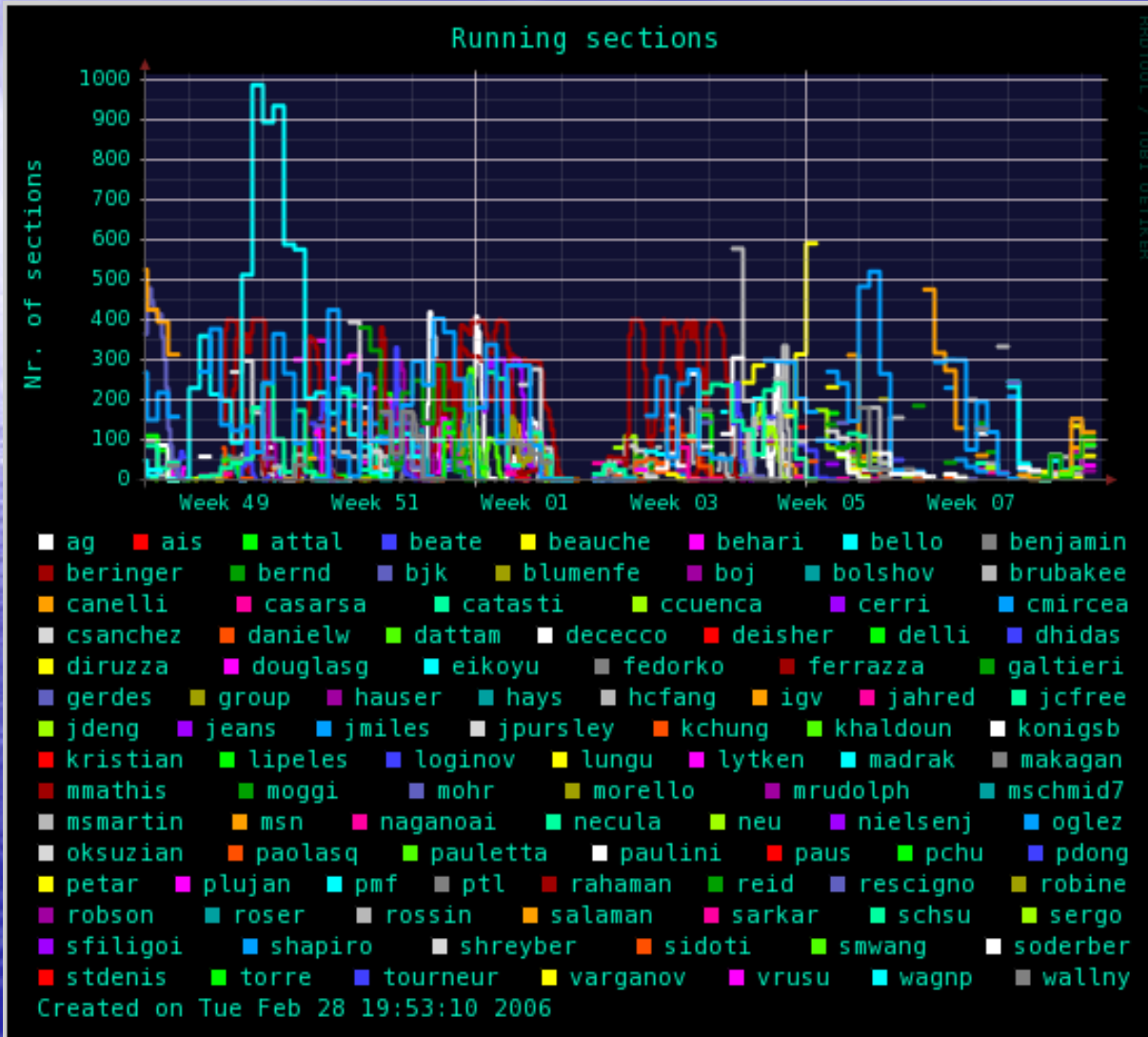
~200 active users
~670K jobs



GlideCAF: Users

~200 active users

Users in the last 3 months

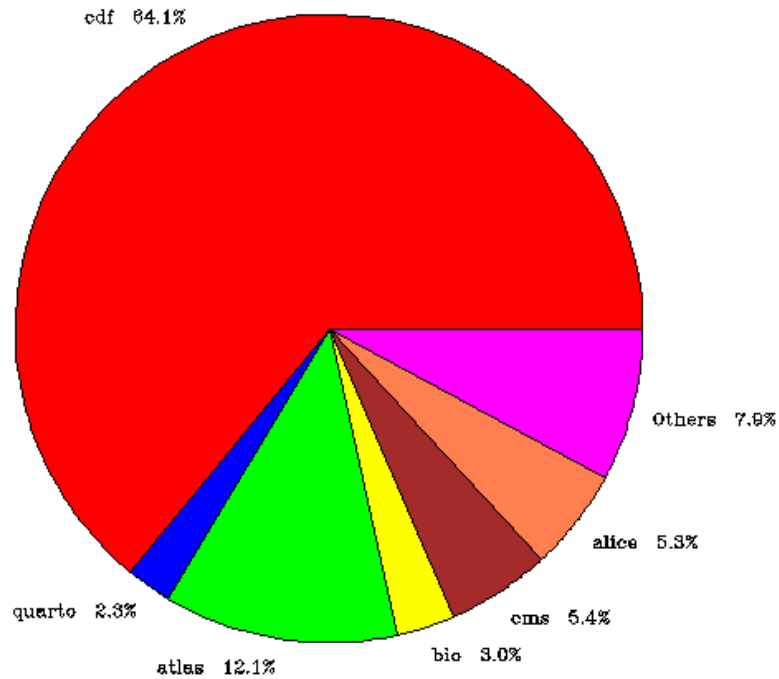


Used for:

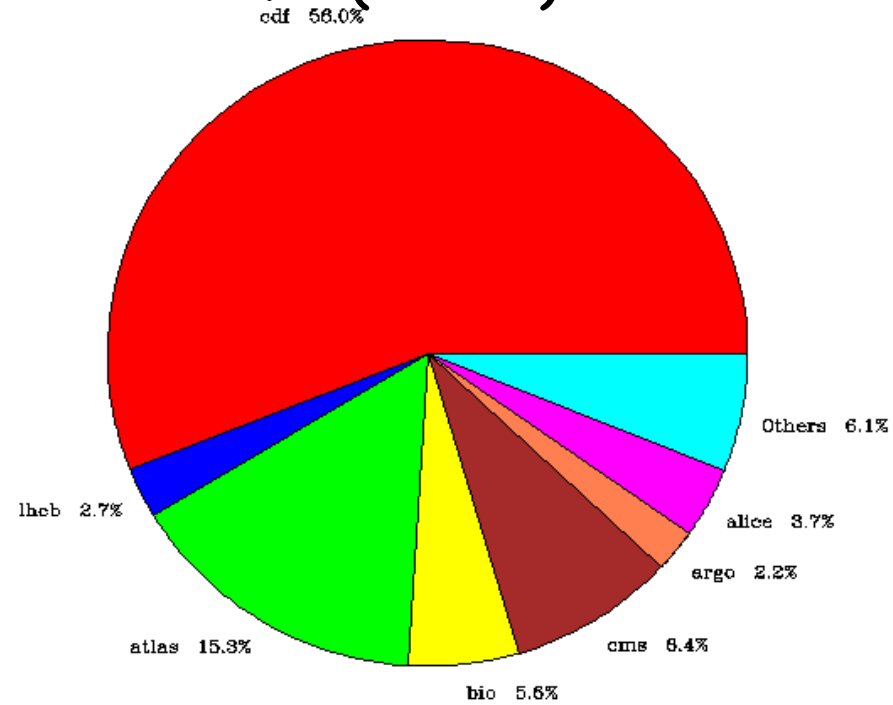
- ✓ MC production
All users
- ✓ ntuples production
Mainly Italians
- ✓ Second skimming
performed by LBL
people

January Tier 1 usage

CPU time (hours)

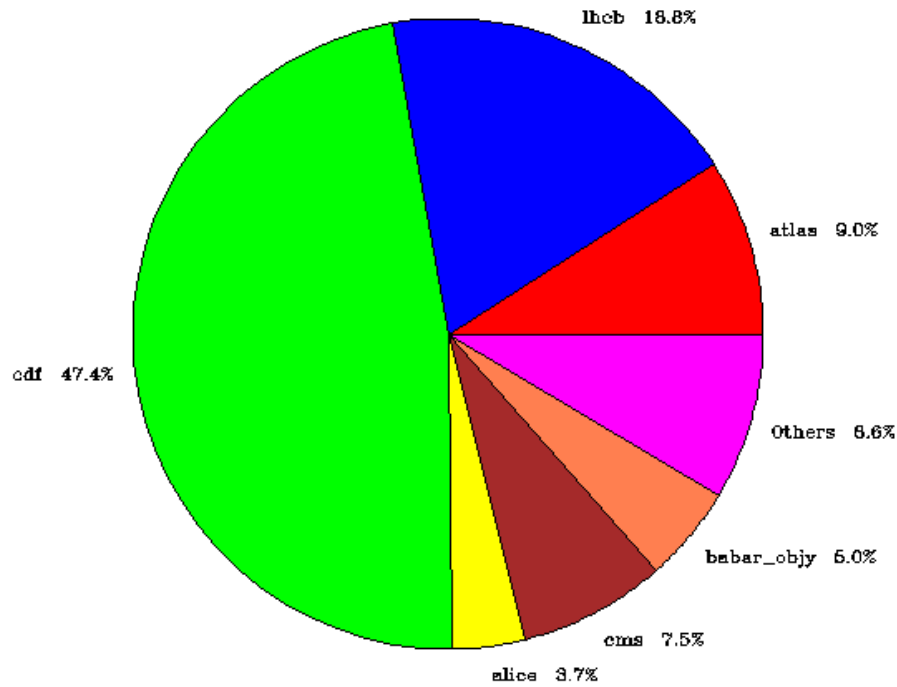


Total time (hours)

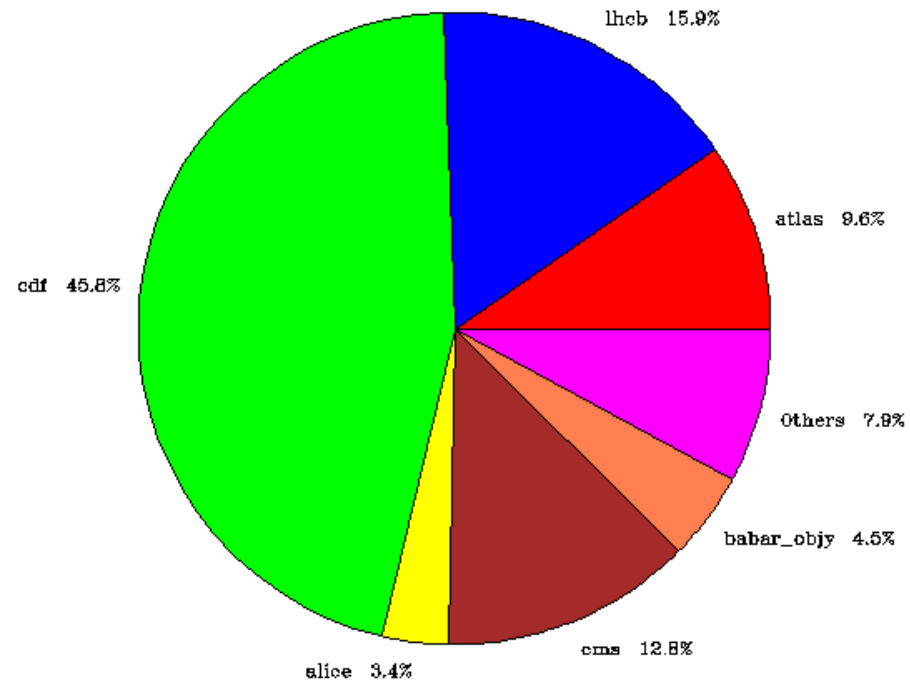


Tier 1 usage since April 24 2005

CPU time (hours)

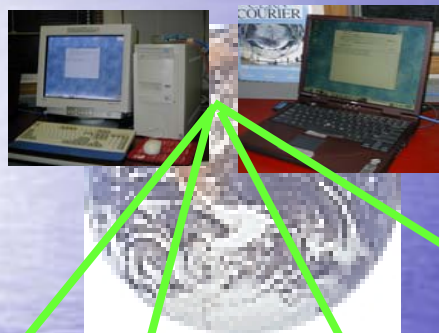


Total time (hours)



Porting to GRID: "Icgcac"

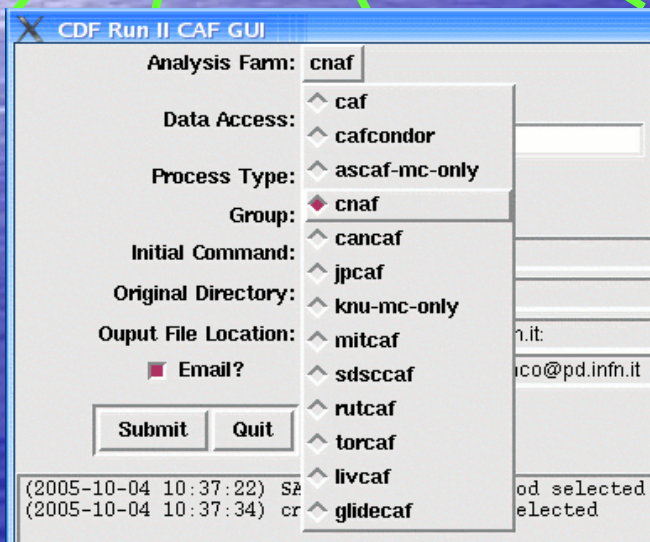
- Developed by: **F. Delli Paoli**, **D. Jeans**, **A. Fella** with **S. Sarkar** and **I. Sfiligoi** help
- Maintained by **F. Delli Paoli**



Secure connection
via Kerberos

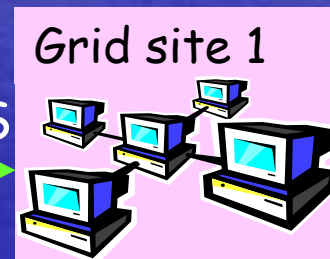


Head node \cong
User Interface

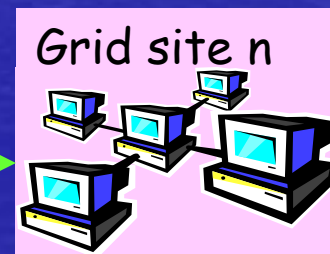


Resource Broker

CDF code via AFS



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CDF
Storage
Element

Job output

Monitoring

Home made to mimic existing monitor developed by **D. Jeans**
CDF jobs summary: web monitoring.
Every 5 minutes queries to LB services and information caching.

lbg CAFnew overview [History]

System Info

Total VMs	Claimed	Load=0	Load<30	Assigned	Free	VM Load	Load
744	744	0	0	0	0	402	372

Total CAFMarks	Claimed CAFMarks	Free CAFMarks	VM Load CAFMarks	Avg. CAFMarks/VM
248.0k	248.0k	0.0k	134.2k	333.0

/hour	Started sections	Finished sections	Submitted jobs	Terminated jobs
Last 20 mins	0.00	0.00	0.00	0.00
Last 120 mins	0.00	0.00	0.00	0.00

Sections by Accounting Group(ordered by AcctGroup)

Accounting Group	Quota	Running	Assigned	Idle	Wait	Held	Completed	Removed	Total	Jobs
common	-	744	0	0	273	0	0	0	1017	22
Total (1)		744	0	0	273	0	0	0	1017	22

User Sections (ordered by User)

User	Running	Assigned	Idle	Wait	Held	Completed	Removed	Total	Jobs
delli	743	0	0	273	0	0	0	1016	21

Lcgcaf: Status

Middleware configuration:

- gLite WMS 1.4.1 (CDF patches) to use the DAG jobs

CDF configuration:

- Code: distributed via AFS
- Run condition data: Frontier server at FNAL and a Squid Proxy/caching service at CNAF

Beta test: used to produce Monte Carlo, two million of events produced on CNAF Tier1 and Padova Tier 2

Output on CDF SE then to FNAL

Efficiency: ~95%

Mainly authentication errors

Lcgcaf: Future

- The lcgcaf portal at CNAF will allow to use the European GRID.
- Tests performed with Barcelona: OK
- Lyon is another site we would like to include.
- Waiting for gLite 3 (next week) to start a massive MC production and see if a running experiment efficiency level can be reached.
- Data Processing for the moment using GlideCAF at T1

CDF persons and Tier 1 interaction

CDF experience with CNAF is good.

So good that now the CDF service work is allowed also at CNAF, **Luca Brigliadori** (CDF- Bologna) is the first physicist.

Currently CDF FTE:

D. Lucchesi, F. Delli Paoli (Padova)	1.7
I. Sfiligoi (LNF) now at FNAL	~0.5
S. Sarkar, D. Jeans (CNAF)	1.5
G. Compostella (Trento)	0.2
Luca Brigliadori (Bologna)	0.5

CDF persons and Tier 1 interaction cont'd

Maintained by CNAF:

- CDF VOMS server (for the all collaboration)
- CDF farm now part of T1 farm
- Disks

Good interaction also for GRID porting:

- Support for middleware modification to easy adapt CDF environment (CA support, WMS for DAG submission, speed up submission,...)
- Support for tests (lcgCAF queue create for us for tests to not interfere with production queue)
- ... anything I miss