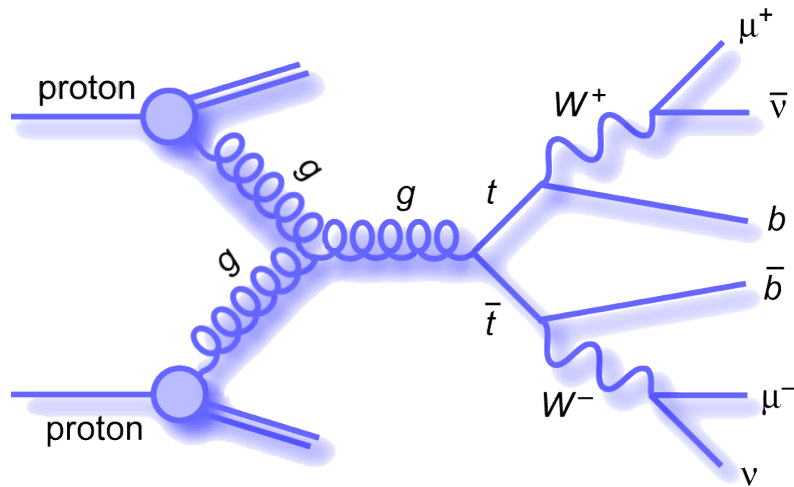


NAF User Feedback / use cases: CMS

DESY CMS Top Group



Wolf Behrenhoff

NAF User Meeting

5th Annual Workshop of the Helmholtz Alliance
“Physics at the Terascale”

Bonn, 2011-12-08

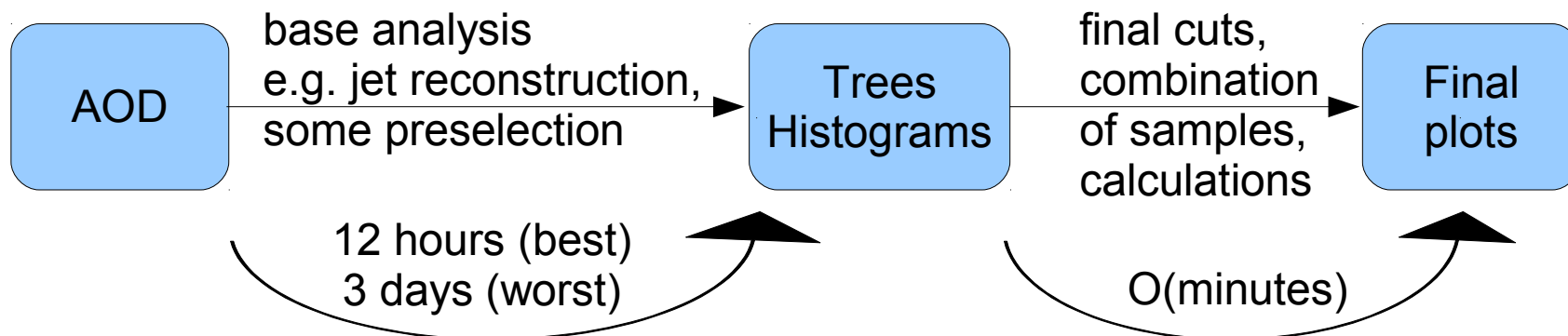
Contents

- Use case: DESY and Hamburg University Top Groups
- Performance
- Problems & wishes
- Summary

Warning:
my feedback has a bias, I don't speak for all users!



Analysis in the DESY/UHH Top groups

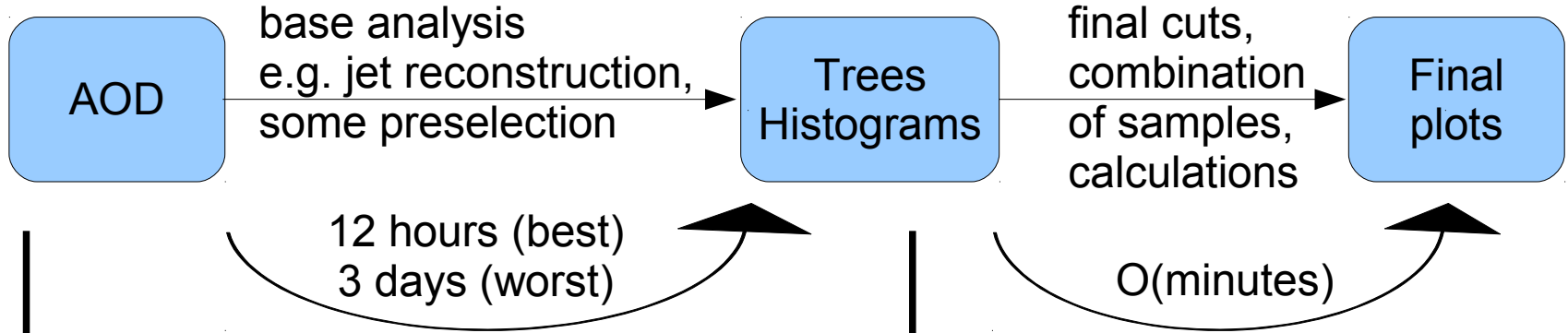


Dilepton final states

Sample	Size (AOD)	Size (Tree)
Data	16 T	770 M
Top	800 G	300 M
Drell-Yan	5.3 T	1.6 G
W+Jets	12 T	15 M
QCD	24 T	60 M
WW / WZ / ZZ	100 G	200 M

- Old analysis chain: only final selection in Ntuples not flexible enough – size: 10 MB per dataset
- Modified analysis chain contains more information in trees

Analysis in the DESY/UHH Top groups II



> (Almost) all required datasets stored at DESY

> Able to avoid using Grid tools (CRAB)

- Skimming much more reliable and less error prone
- Easier and faster to track down problems
- Jobs start faster

> Skimmed output files stored on Lustre scratch space

> Macros to generate final plots

- creates output files (png/eps)
- drastically varying performance (2 min / 20 min)

See also: talk from Oliver Oberst (FSP meeting 2011)

<https://indico.cern.ch/materialDisplay.py?contribId=31&sessionId=6&materialId=slides&confId=146781>



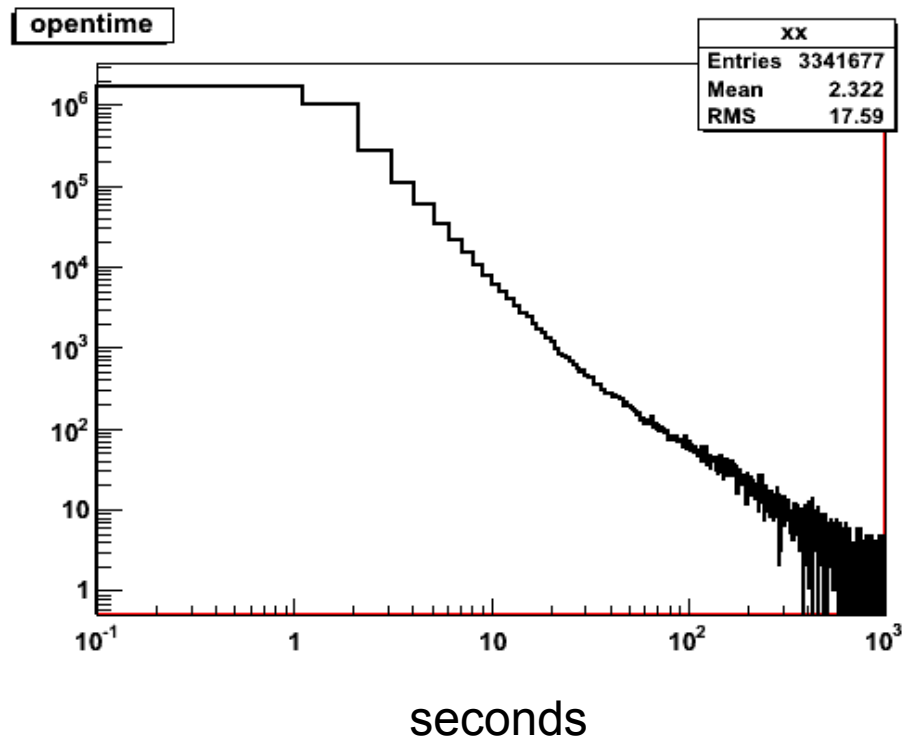
Some statistics

- Based on jobreport.xml files generated by cmsRun
 - read output of cmsRun to associate the amount of data to corresponding files
- 307 hosts, 65k files, 3 M file open operations, collected since June
- Only results of successful jobs



Some statistics

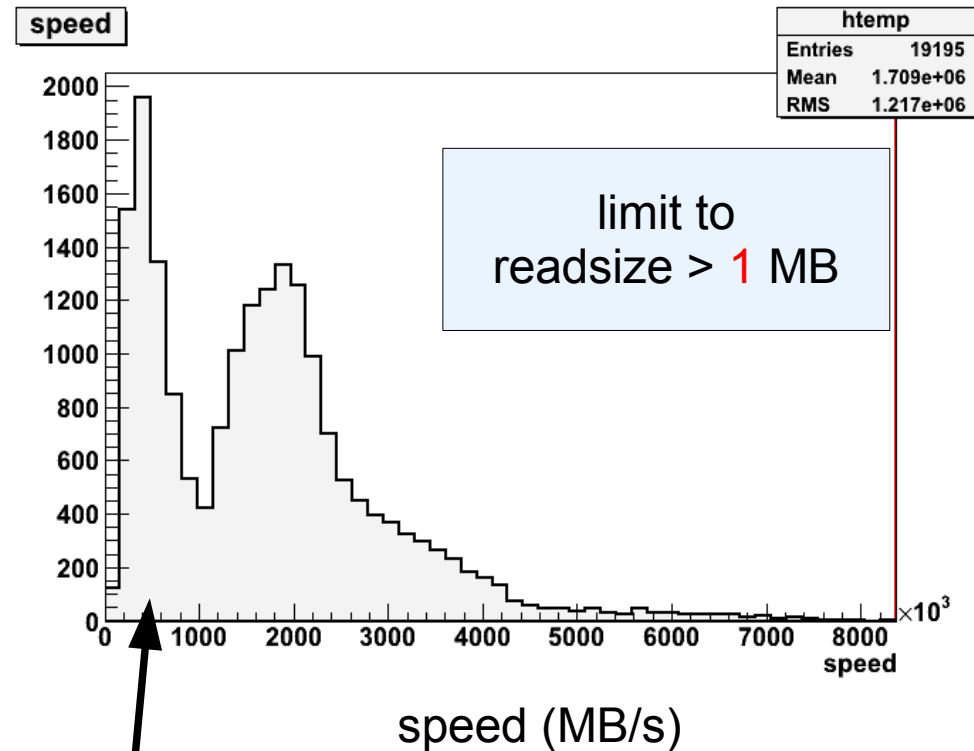
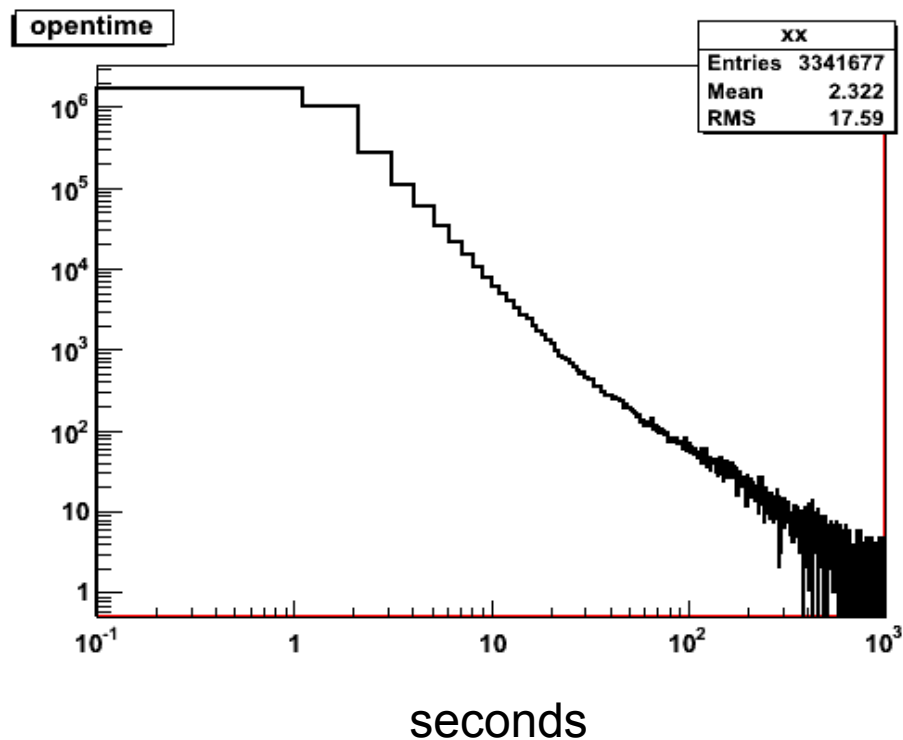
- Based on jobreport.xml files generated by cmsRun
- 307 hosts, 65k files, 3 M file open operations, collected since June



- Time it takes to open a file
- Mostly very fast
- Long tail – extends to length of queue

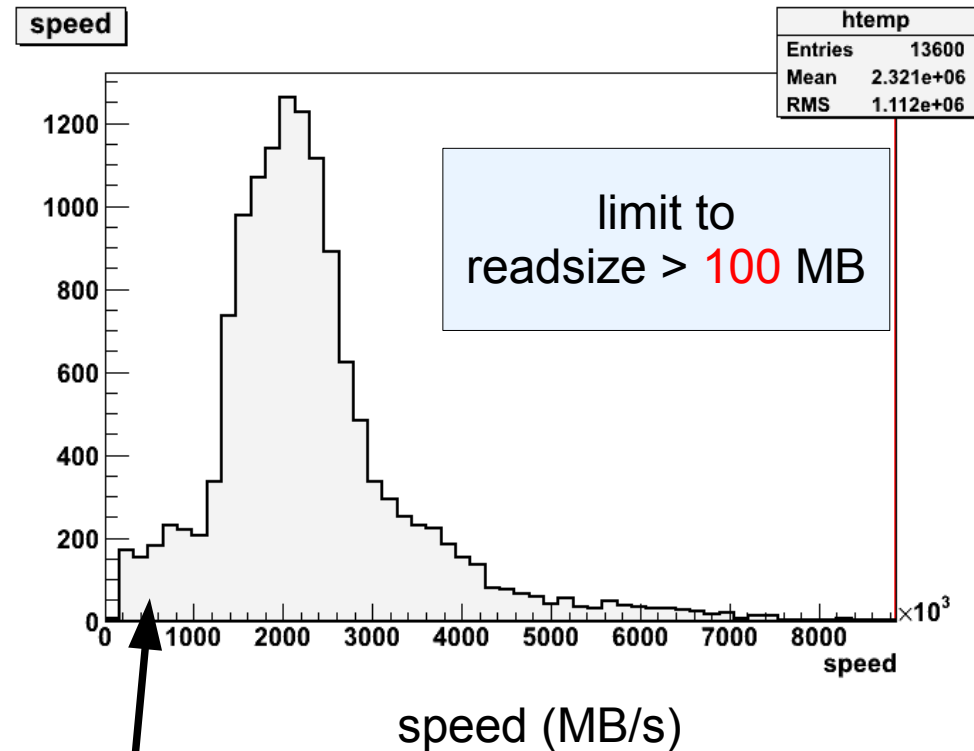
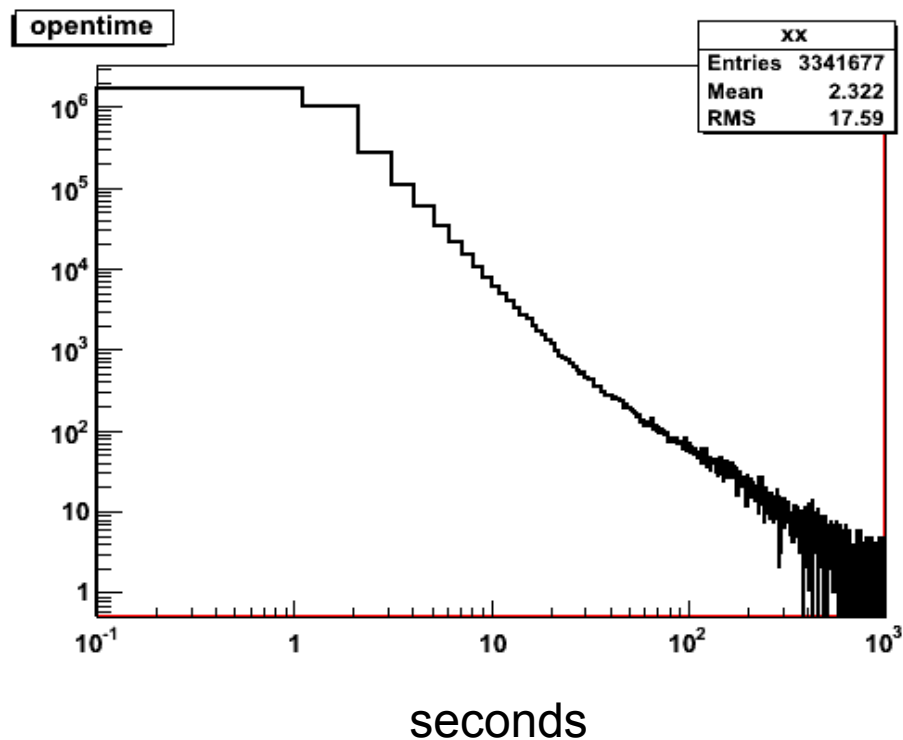
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Some statistics

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there is always one slow job!



Possible improvements

> Increased resources on the NAF:

- Jobs start faster than before
- More jobs at a time → faster turn around time

noticed the improvement
before it was announced

> Lustre is *sometimes* VERY slow

- removing a directory with 100 files can take several minutes
- even read-only operations like “ls” can be slow

> Many different areas to store your files

- Lustre (scratch)
- AFS (scratch)
- AFS (home)
- dCache

> DCache has varying performance



Wishlist...

> Make login easier

- proxy certificate (current gLite only available for 64bit machines)
- AFS access from non SL5 machine? → Works with “old” Kerberos versions only

> Working on the NAF

- No modern programming environments (e.g. Eclipse, KDevelop4) installed on workgroup servers → provide workgroup servers with pre-installed IDEs

```
/// unsigned int lumibl = /Event Info////////////////////
runno = iEvent.id().run();
lumibl = iEvent.id().l;
eve
Best matches
edm::LuminosityBlockNumber_t luminosityBlock() const
Returns: edm::LuminosityBlockNumber_t Container: EventID
Public
edm::LuminosityBlockNumber_t luminosityBlock() const
iEv
```

CMS uses C++ and Python
IDE should support both

```
p = cms.Sequence()
p.insl
Global or imported declarations
#function void (mixed, mixed) insert(mixed index, mi
#function void (mixed, mixed, mixed) insertInto(mixed param
```

- provide more graphical tools (e.g. kompare instead of diff)
- provide easy remote access (e.g. NoMachine NX)

> Drawback of current setup

- When using an IDE on a local (non-NAF) machine → no access to Lustre file system
- export also scratch filesystem, upgrade Kerberos



Summary

- Overall NAF is in good shape
- Many job slots, usually jobs start fast
- Storage should be improved
- Would like to have more and recent graphical software available

```
All users: 2930 running, 7129 queuing, 10193 total.  
You:      18 running, 551 queuing, 569 total.
```

```
*****
```

RUNNING JOBS		WAITING JOBS	
2021 Ph		3643 De	
339 Ma		1979 Ph	
137 OL		551 Wo	
112 Jo		479 Fe	
112 Bo		473 OL	
60 Ch		4 Ta	
55 De			
45 Iv			
18 Wo			
15 Fe			
7 Ha			
3 Ih			
1 Mi			
1 Ju			
1 Ho			
1 Go			
1 De			
1 Ty			

NAF Batch Farm

**Status on
Fri, Dec 2nd
16:30**

18 users

