CPU Efficiency

WLCG MB

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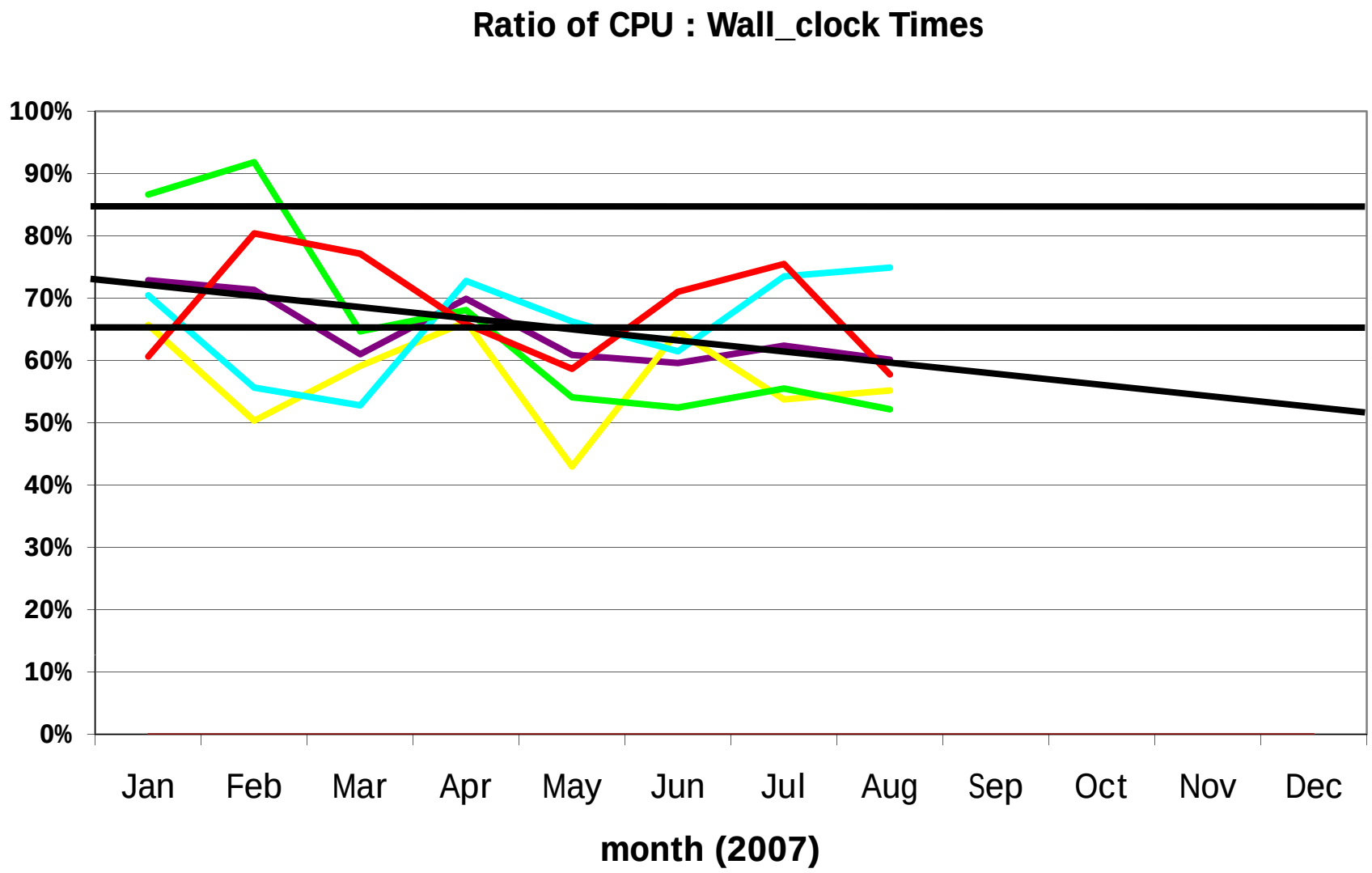
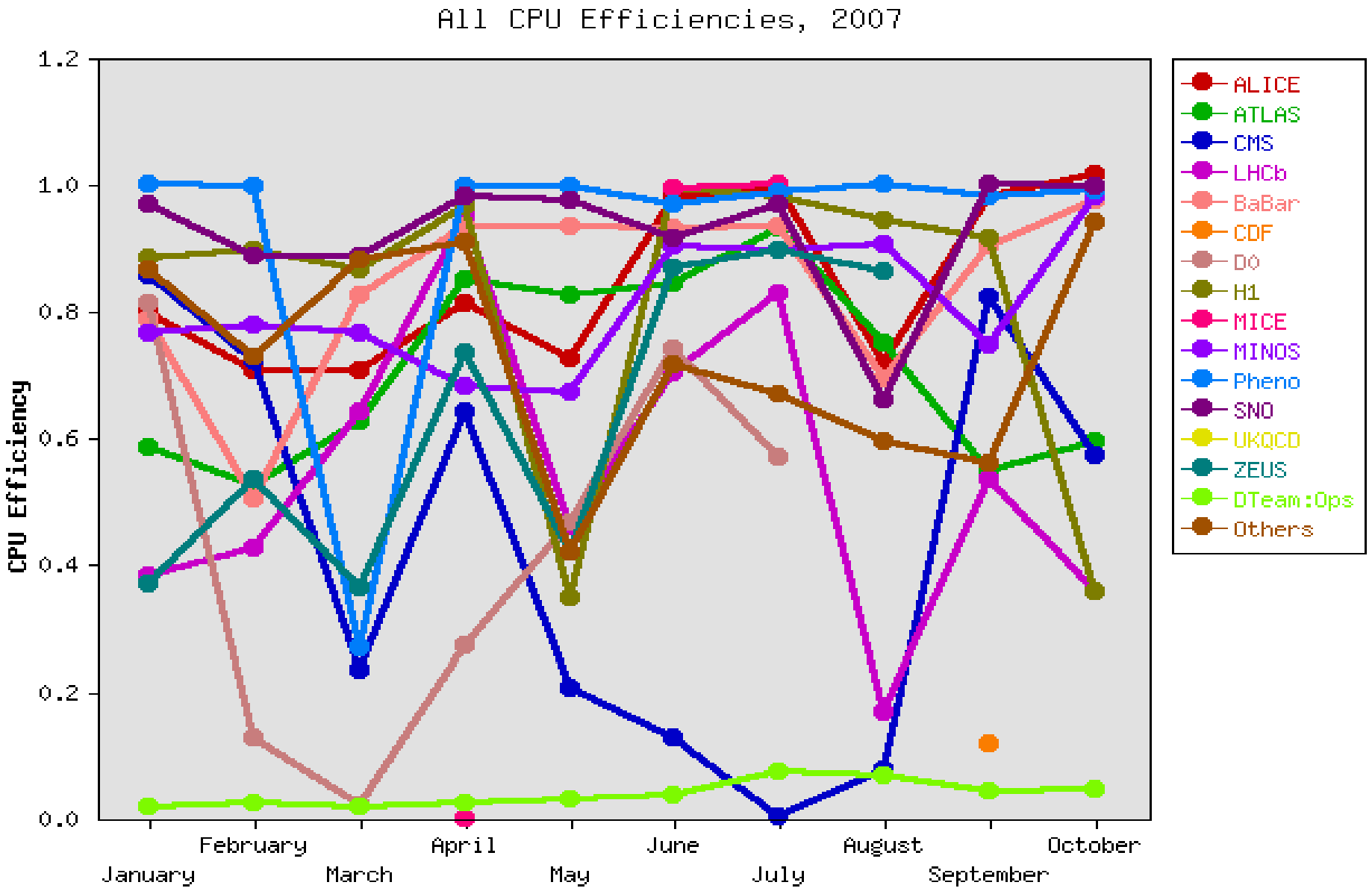
With thanks to Fabio Hernandez, Holger Marten & Andrew Sansum for input.

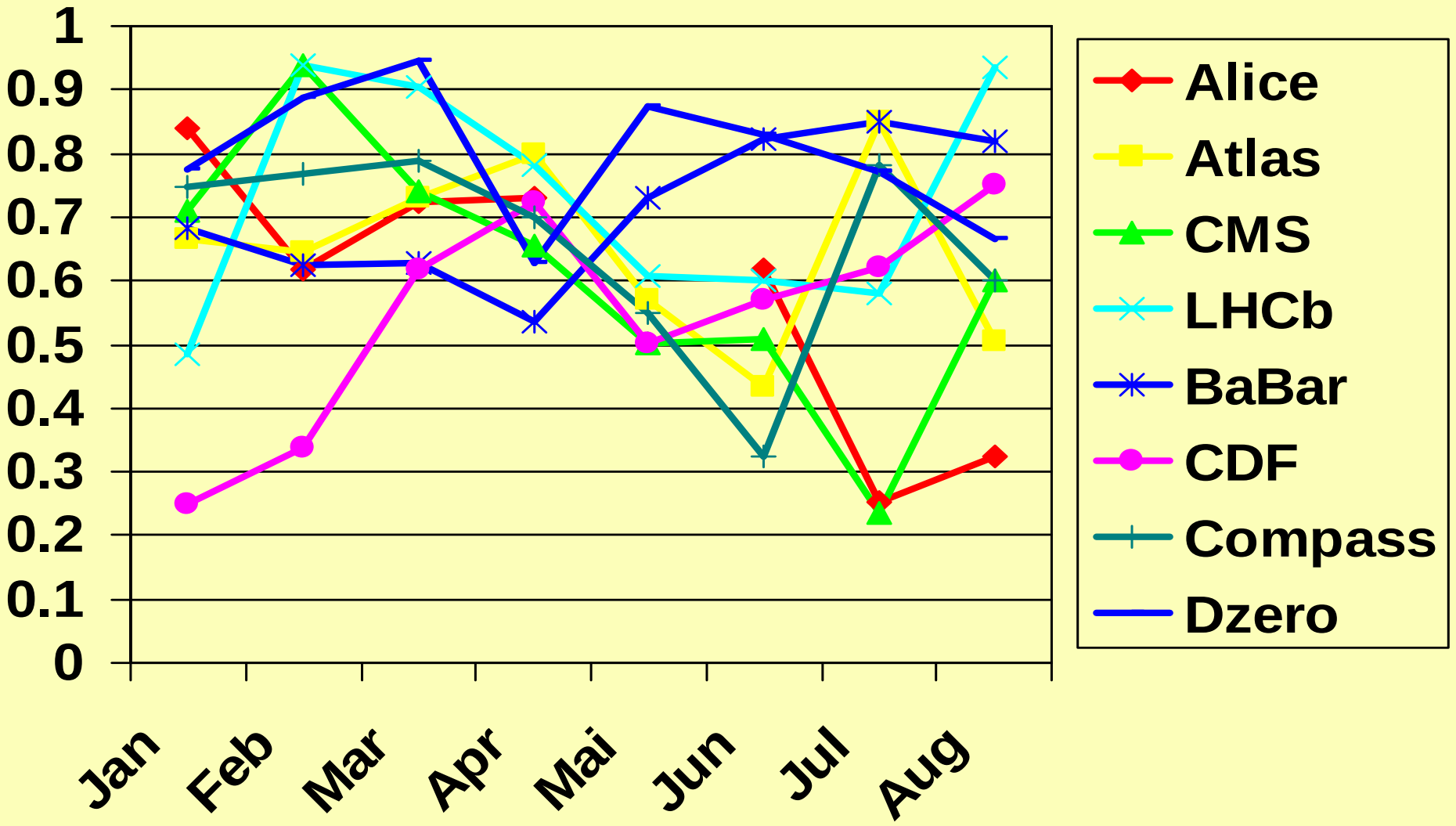
Why?


Ratio of CPU : Wall_clock Times
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
month (2007)

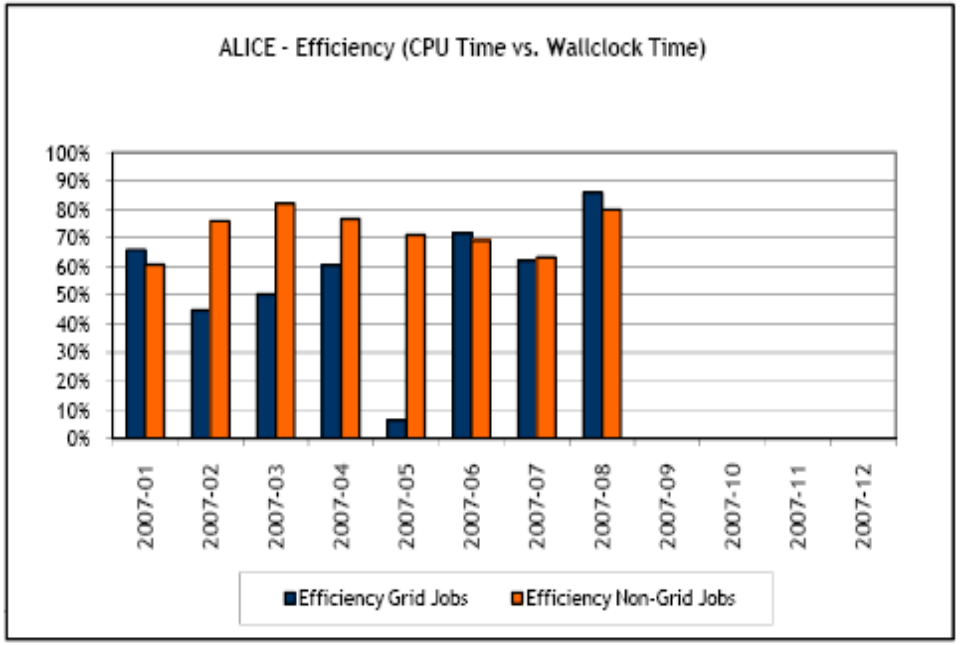
RAL

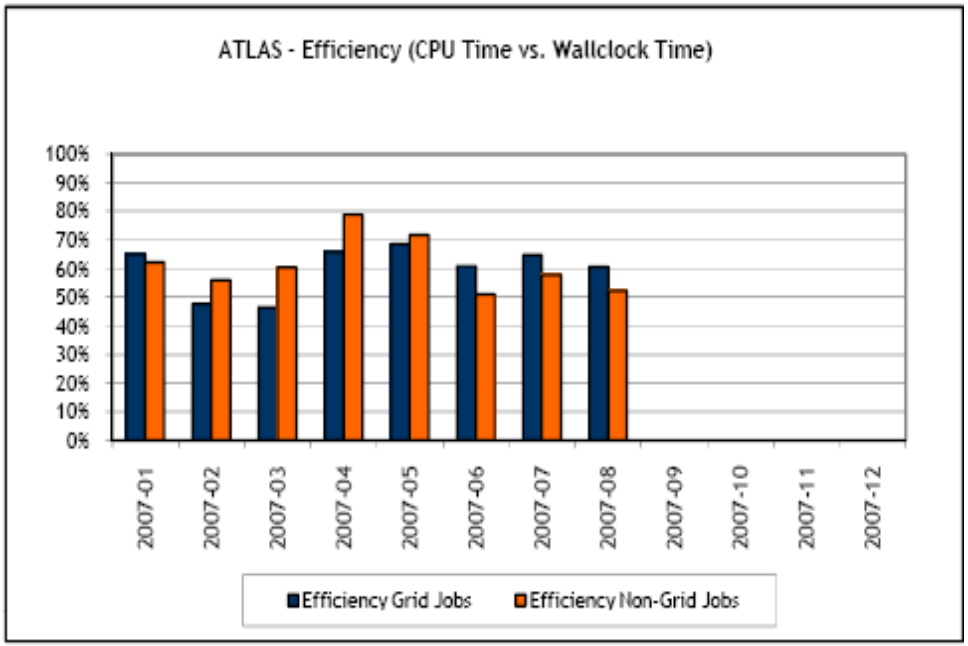

All CPU Efficiencies, 2007
CPU Efficiency
1.2
1.0
0.8
0.6
0.4
0.2
0.0
January
February
March
April
May
June
July
August
September
October
ALICE
ATLAS
CMS
LHCb
BaBar
CDF
D0
H1
MICE
MINOS
Pheno
SNO
UKQCD
ZEUS
DTeam:Ops
Others

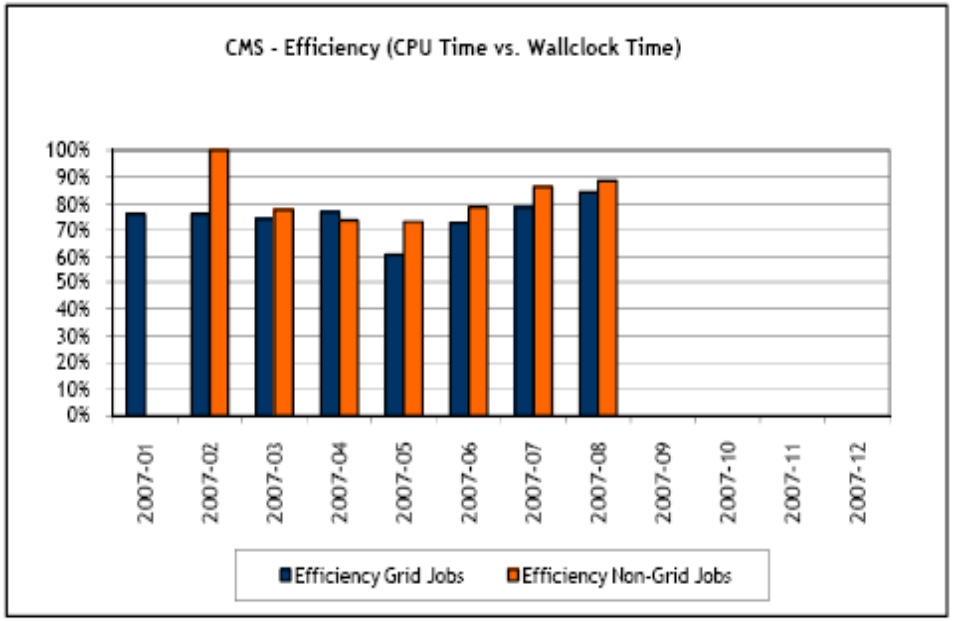
FZK

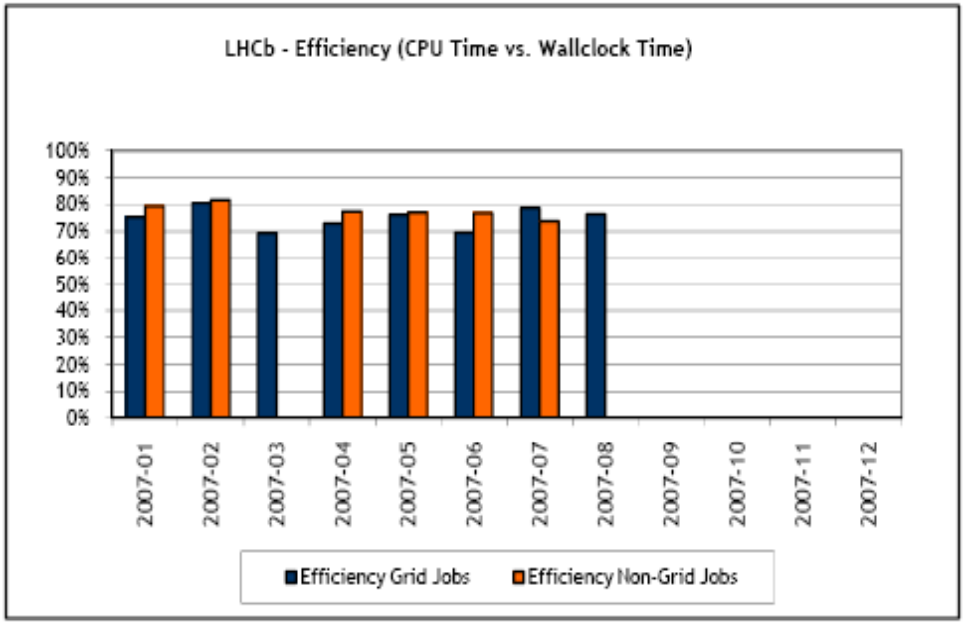

1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Jan
Feb
Mar
Apr
Mai
Jun
Jul
Aug
Alice
Atlas
CMS
LHCb
BaBar
CDF
Compass
Dzero

IN2P3

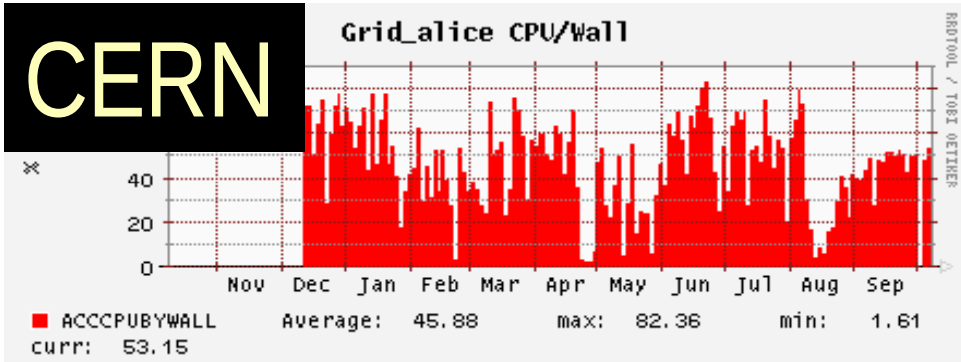

ALICE - Efficiency (CPU Time vs. Wallclock Time)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2007-01
2007-02
2007-03
2007-04
2007-05
2007-06
2007-07
2007-08
2007-09
2007-10
2007-11
2007-12
Efficiency Grid Jobs
Efficiency Non-Grid Jobs

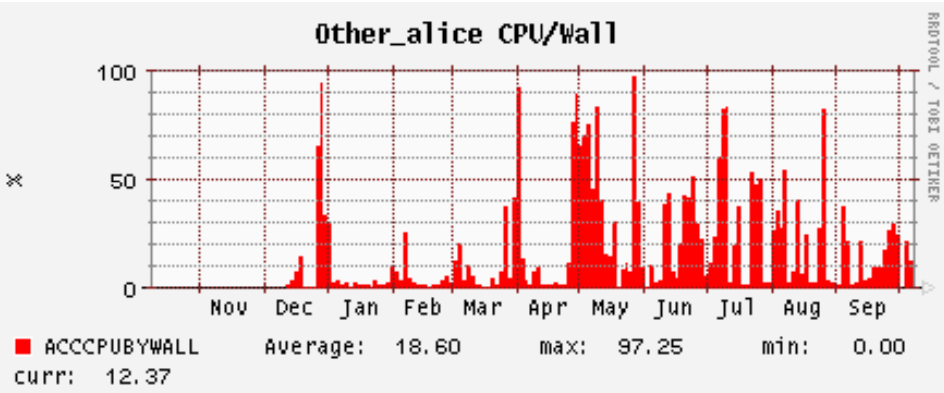

ATLAS - Efficiency (CPU Time vs. Wallclock Time)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2007-01
2007-02
2007-03
2007-04
2007-05
2007-06
2007-07
2007-08
2007-09
2007-10
2007-11
2007-12
Efficiency Grid Jobs
Efficiency Non-Grid Jobs

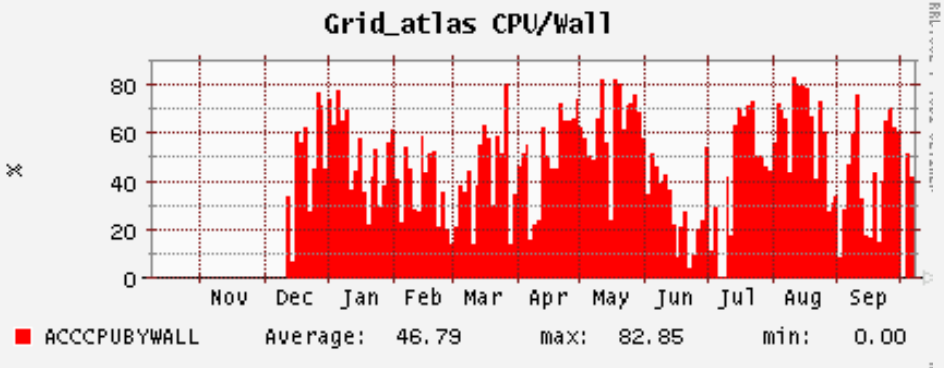

CMS - Efficiency (CPU Time vs. Wallclock Time)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2007-01
2007-02
2007-03
2007-04
2007-05
2007-06
2007-07
2007-08
2007-09
2007-10
2007-11
2007-12
Efficiency Grid Jobs
Efficiency Non-Grid Jobs

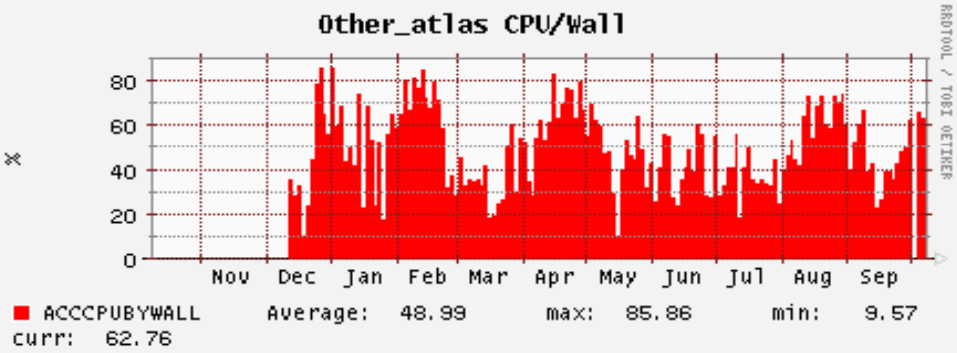

LHCb - Efficiency (CPU Time vs. Wallclock Time)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2007-01
2007-02
2007-03
2007-04
2007-05
2007-06
2007-07
2007-08
2007-09
2007-10
2007-11
2007-12
Efficiency Grid Jobs
Efficiency Non-Grid Jobs

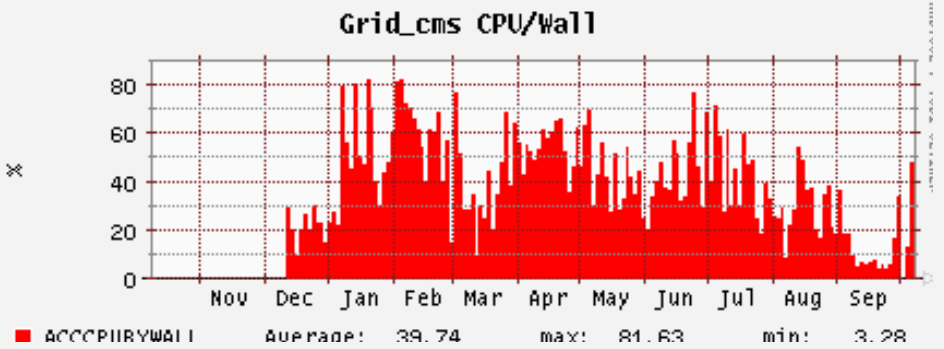
CERN

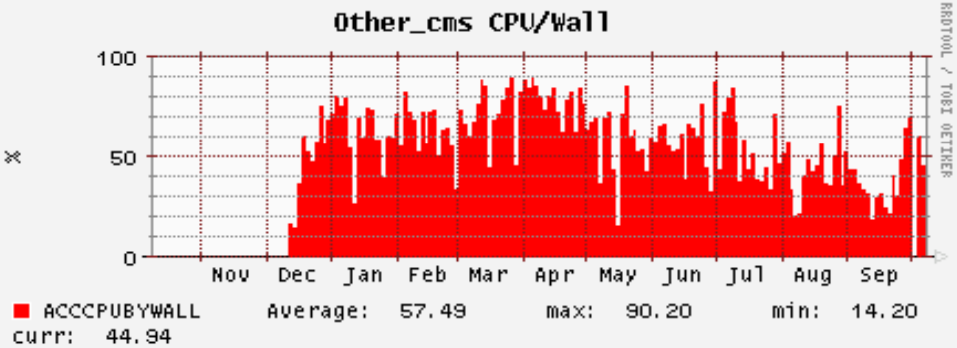

Grid_alice CPU/Wall
%
100
80
60
40
20
0
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
ACCCPUBYWALL Average: 45.88 max: 82.36 min: 1.61
curr: 53.15

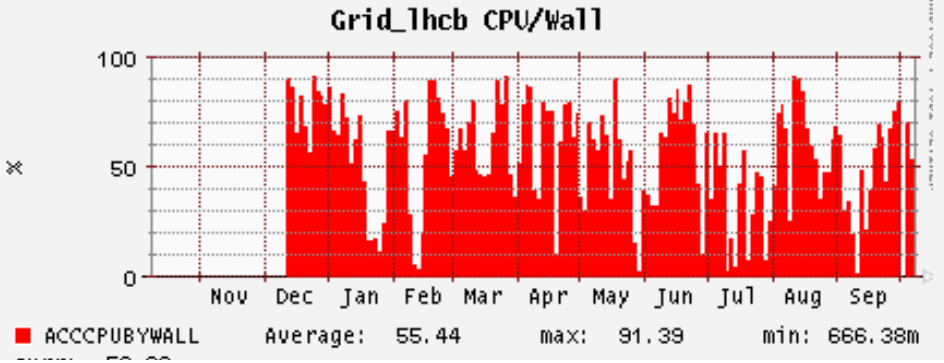

Other_alice CPU/Wall
%
100
50
0
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
ACCCPUBYWALL Average: 18.60 max: 97.25 min: 0.00
curr: 12.37

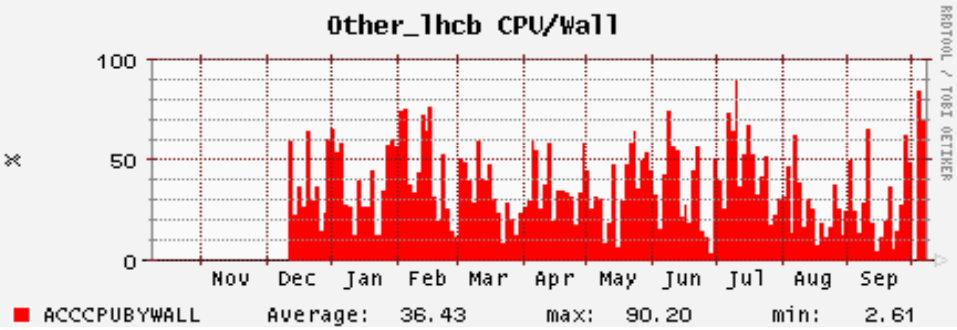

Grid_atlas CPU/Wall
%
100
80
60
40
20
0
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
ACCCPUBYWALL Average: 46.79 max: 82.85 min: 0.00


Other_atlas CPU/Wall
%
100
80
60
40
20
0
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
ACCCPUBYWALL Average: 48.99 max: 85.86 min: 9.57
curr: 62.76

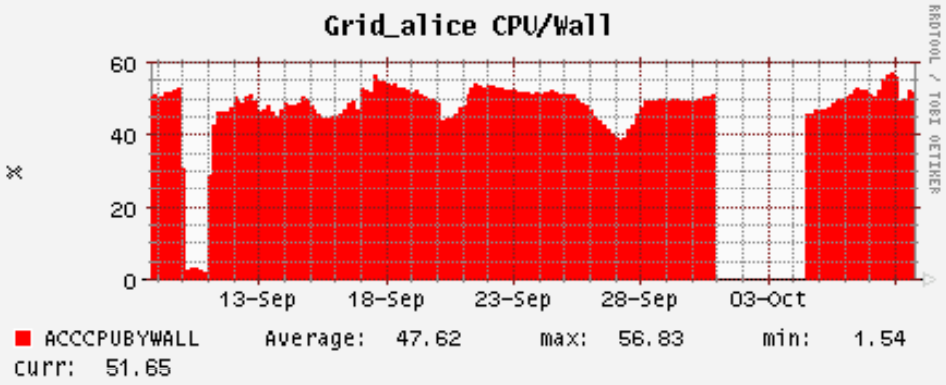

Grid_cms CPU/Wall
%
100
80
60
40
20
0
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep

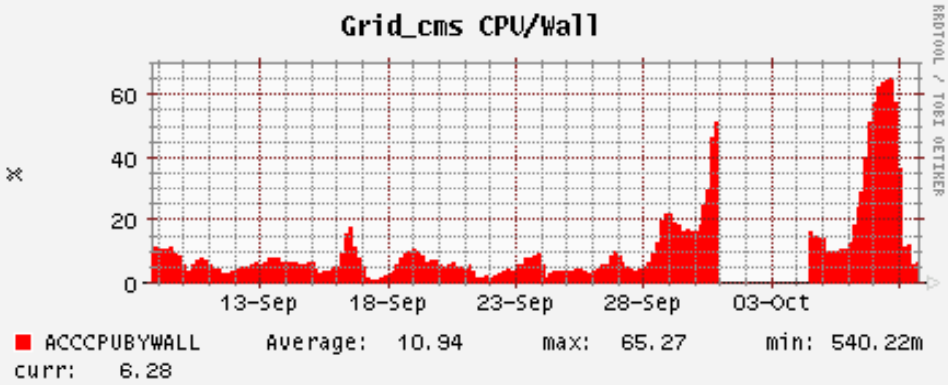

Other_cms CPU/Wall
%
100
50
0
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
ACCCPUBYWALL Average: 57.49 max: 90.20 min: 14.20
curr: 44.94

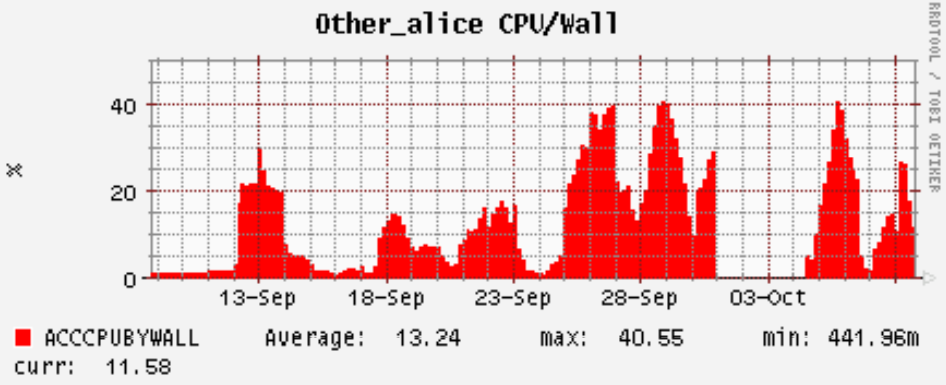

Grid_lhcb CPU/Wall
%
100
50
0
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
ACCCPUBYWALL Average: 55.44 max: 91.39 min: 666.38m

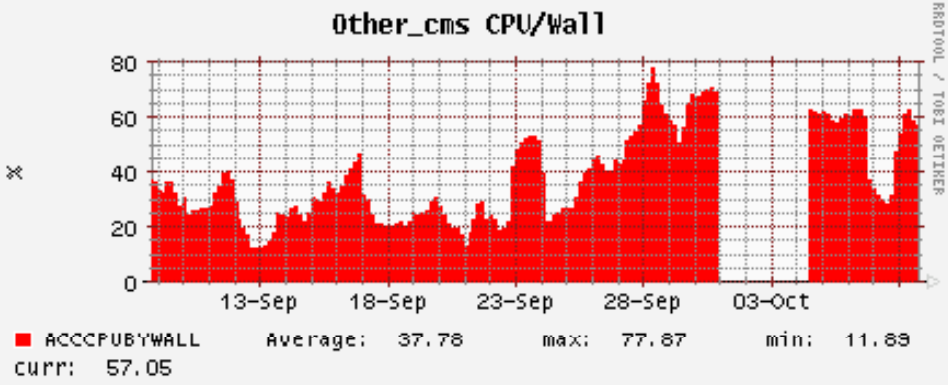

Other_lhcb CPU/Wall
%
100
50
0
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
ACCCPUBYWALL Average: 36.43 max: 90.20 min: 2.61

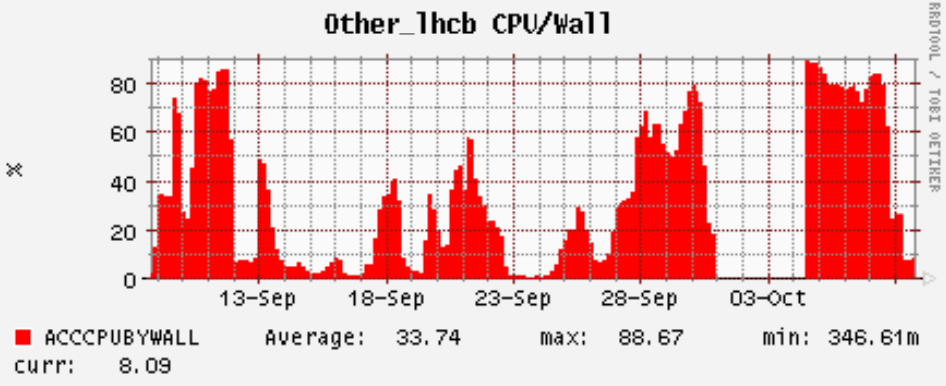
More from CERN

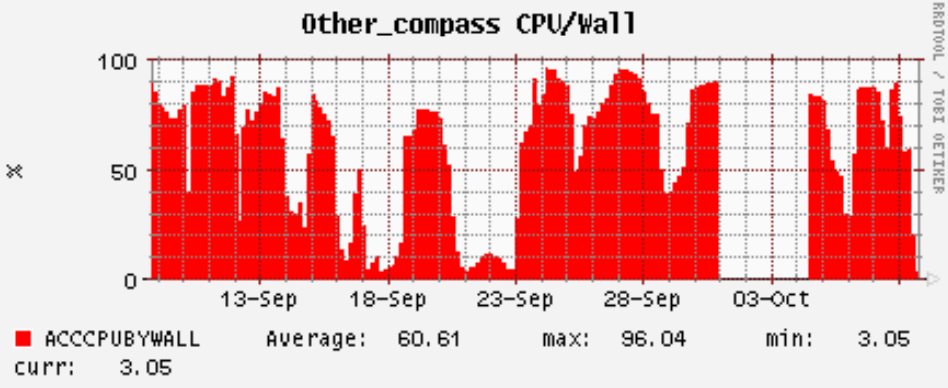




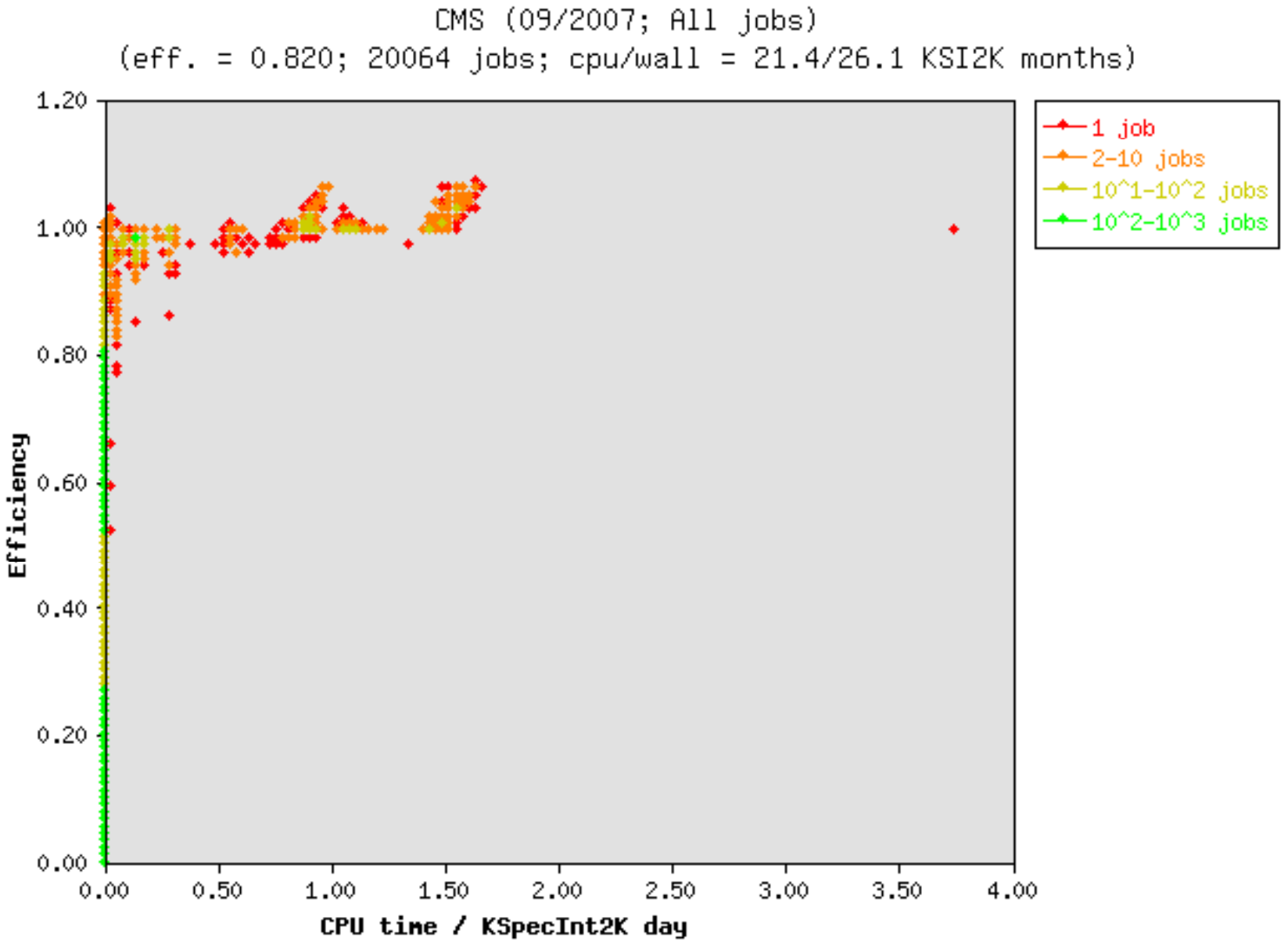








More from RAL



Poor CPU efficiency…

- … suggests resources could be used more efficiently
- … concerns both sites and experiments
- … may be related to problems with data access
  - but looks to be independent of mass storage system
- … should be tackled now
  - Grid job efficiency is now much better
  - dealing with this problem will only get harder as real data approaches
- … should be tackled by experiments and sites
  - need experiments to nominate knowledgeable person to be concerned with efficiency
    - » c.f Philippe: “something smarter must be implemented in the experiment's frameworks”
  - these people should look at sites where efficiency is poor
    - » either overall or change compared to previous days