

Performance Timing Test

Did a timing test of Luca's analysis code on the Mac/SLC4 and on CERN/lxplus. I used the same source file, header file, and data file, and made five successive runs. The timing started in the "run" function of the code, before the histograms were created, and ended after all plots were made.

Mac/SLC4 2.2 GHz, 1 Gbyte (Linux) RAM, OSX.4, 128 Mbytes VRAM	
<i>Real Time (s)</i>	<i>CPU Time (s)</i>
93.4	19.0
43.2	16.7
45.5	17.1
41.0	16.6
41.2	16.8

Mac/SLC4 2.5 GHz, 1 GByte (Linux) RAM, OSX.5, 512 Mbytes VRAM	
<i>Real Time (s)</i>	<i>CPU Time (s)</i>
46.0	15.9
15.5	11.3
14.5	11.8
15.2	12.9
13.1	10.6

CERN/lxplus	
<i>Real Time (s)</i>	<i>CPU Time (s)</i>
203	14.8
194	14.1
198	13.6
199	14.9
201	14.2

Discussion: The slowness of lxplus Real Time was due to the time it takes to pop X windows over the internet, for the plots. The comparison is also somewhat uncontrolled since the loading of the two machines was different (see image below). It is really just a qualitative illustration that analysis on a laptop is feasible. The Mac CPU is only used at the 40% level for this version of the code, presumably the running is dominated by i/o since the analysis is pretty simple so far, not many calculations.

* Screen shot of Mac/SLC4 and CERN/lxplus system loads:

```

Terminal
File Edit View Terminal Tabs Help
top - 14:13:41 up 4:21, 4 users, load average: 0.10, 0.06, 0.08
Tasks: 92 total, 1 running, 91 sleeping, 0 stopped, 0 zombie
Cpu(s): 1.2% us, 2.3% sy, 0.0% ni, 93.6% id, 2.9% wa, 0.0% hi, 0.0% si
Mem: 1035696k total, 1012352k used, 23344k free, 51724k buffers
Swap: 265064k total, 0k used, 265064k free, 760428k cached

  PID USER      PR  NI  %CPU   TIME+  %MEM  VIRT  RES  SHR  S  COMMAND
  4744 root        15   0   1.3   1:34.69  2.7  49400  26m 6376  S  X
  3786 root        16   0   0.3   0:16.31  0.2   5780  2424 1348  S  hald
  8322 brooksw    16   0   0.3   0:04.52  0.3   5388  2760 1720  S  ssh
  9312 brooksw    17   0   0.3   0:00.69  0.1   2720  1016  768  R  top
    1 root        16   0   0.0   0:00.25  0.1   2748   540  460  S  init
    2 root        34  19   0.0   0:00.00  0.0     0     0     0  S  ksoftirqd/0
    3 root         5 -10   0.0   0:00.00  0.0     0     0     0  S  events/0

Terminal
File Edit View Terminal Tabs Help
top - 18:24:31 up 25 days, 9:33, 98 users, load average: 3.54, 4.25, 4.39
Tasks: 526 total, 6 running, 517 sleeping, 1 stopped, 2 zombie
Cpu(s): 0.1% us, 29.3% sy, 45.0% ni, 25.4% id, 0.0% wa, 0.0% hi, 0.2% si
Mem: 8150020k total, 7006800k used, 1143220k free, 398516k buffers
Swap: 16771520k total, 544k used, 16770976k free, 4451396k cached

  PID USER      PR  NI  %CPU   TIME+  %MEM  VIRT  RES  SHR  S  COMMAND
 31154 rcardina   39  19   93  12:39.11  8.6   735m  685m  12m  R  grv
  5271 root        34  19   59 228:54.23  0.0     0     0     0  S  kipmi0
10690 zhongua    35  19   44 46:01.65  1.2   468m   98m  42m  R  python
28859 iueda      20   2     2 41:58.12  0.0  53972 1332  992  S  show_free_space
11901 brooksw    16   0     1  0:01.08  0.0   6584 1508  848  R  top
    4 root        RT   0     0  0:13.22  0.0     0     0     0  S  migration/1
    1 root        16   0     0  0:21.01  0.0   4756  616  520  S  init
    2 root        RT   0     0  0:12.56  0.0     0     0     0  S  migration/0
    3 root        34  19     0  0:25.40  0.0     0     0     0  R  ksoftirqd/0
    5 root        34  19     0  0:27.08  0.0     0     0     0  S  ksoftirqd/1
    6 root        RT   0     0  0:11.07  0.0     0     0     0  S  migration/2
    7 root        34  19     0  0:24.67  0.0     0     0     0  S  ksoftirqd/2
    8 root        RT   0     0  0:09.07  0.0     0     0     0  S  migration/3

```

-- WillBrooks - 24 Jun 2008

Truth Containers in DPD files

Comment: Looking for "Truth" containers in Luca's 10,000 event file. Using the command checkFile.py, find:

Size: 341301.356 kb

Nbr Events: 10000

Mem Size	Disk Size	Size/Evt	items (X)	Container Name (X=Tree or Branch)
27645.582 kb	1457.248 kb	0.146 kb	10000	(T) DataHeader
606.968 kb	39.731 kb	0.004 kb	10000	(B) TruthParticleContainer_p5_SplMC
594.233 kb	140.887 kb	0.014 kb	10000	(B) MissingET_p1_MET_RefFinal
6000.142 kb	1691.074 kb	0.169 kb	10000	(B) MuonContainer_p1_StacoMuonCollection
28206.896 kb	2290.039 kb	0.229 kb	10000	(B) EventInfo_p2_McEventInfo
10683.812 kb	2291.983 kb	0.229 kb	10000	(B) Rec::TrackParticleContainer_tlp1_StacoTrackParticles
3264.956 kb	2323.832 kb	0.232 kb	10000	(B) MissingEtTruth_p1_MET_Truth
9226.639 kb	5336.529 kb	0.534 kb	10000	(B) TrackRecordCollection_p2_MuonEntryLayerFilter
25721.989 kb	6564.581 kb	0.656 kb	10000	(B) ElectronContainer_p1_ElectronAODCollection
32789.641 kb	12236.253 kb	1.224 kb	10000	(B) egDetailContainer_p1_egDetailAOD

155019.156 kb	25521.351 kb	2.552 kb	10000	(B) ParticleJetContainer_p1_Cone4H1TopoParticleJets
192143.969 kb	38237.322 kb	3.824 kb	10000	(B) ParticleJetContainer_p1_Cone4TruthParticleJets
154408.950 kb	56172.657 kb	5.617 kb	10000	(B) Rec::TrackParticleContainer_tlp1_TrackParticleCandidate
323847.991 kb	84230.634 kb	8.423 kb	10000	(B) TrigDec::TrigDecision_p1_TrigDecision
272859.932 kb	97964.390 kb	9.796 kb	10000	(B) McEventCollection_p3_GEN_DPD
1243020.856 kb	336498.511 kb	33.650 kb	10000	TOTAL (POOL containers)

Found ./ atlas/ PhysicsAnalysis/ TruthParticleID/ McParticleEvent/ src/ TruthParticleContainer.cxx .
Contains, e.g.,

```
TruthParticleContainer::TruthParticleContainer( const TruthParticleContainer& rhs ) : DataVector( rhs ),
m_genEvent ( rhs.m_genEvent ), m_etIsolations( rhs.m_etIsolations ), m_particles ( rhs.m_particles ) { }
```

How to set branch address? Tried:

```
#include "McParticleEvent/TruthParticleContainer.h"
...
TBranch* br_mc;
TruthParticleContainer* MC;
trans->SetBranchAddress("SpclMC",&MC,&br_mc);
and it compiled
```

How to look at root file directly with TBrowser? Get "no dictionary" warnings, e.g.,

Warning in <TClass::TClass>: no dictionary for class

Navigable<JetCollection,double,vector<pair<ElementLink<JetCollection,DataProxyStorage,ForwardIndexingPolicy>,double>>> is available Warning in <TClass::TClass>: no dictionary for class

Navigable<Rec::TrackParticleContainer,double,vector<pair<ElementLink<Rec::TrackParticleContainer,DataProxyStorage,ForwardIndexingPolicy>,double>>> is available Warning in <TClass::TClass>: no dictionary for class

Navigable<ElectronContainer,double,vector<pair<ElementLink<ElectronContainer,DataProxyStorage,ForwardIndexingPolicy>,double>>> is available Warning in <TClass::TClass>: no dictionary for class

Navigable<Analysis::MuonContainer,double,vector<pair<ElementLink<Analysis::MuonContainer,DataProxyStorage,ForwardIndexingPolicy>,double>>> is available

-- WillBrooks - 29 Jul 2008

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