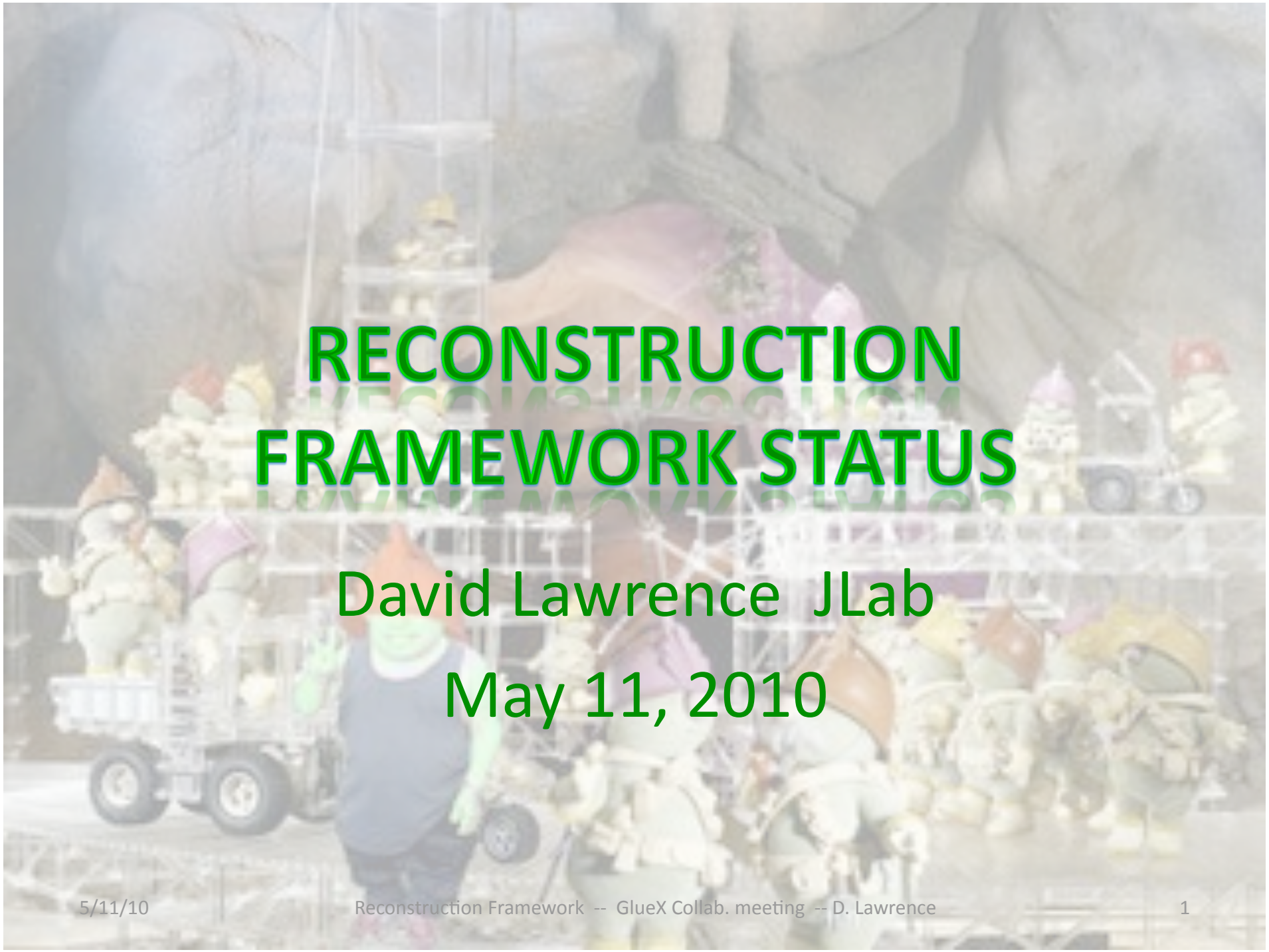

RECONSTRUCTION FRAMEWORK STATUS

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May 11, 2010

Configuration Parameters

- JANA implements configuration parameters (CF) that can be set via command line or configuration file
- The CF are numbers with hard coded defaults that are not expected to change (i.e. NOT calibration constants)
  - e.g. TRKFIND:MIN_SEED_HITS (the minimum number of hits needed to "seed" a track candidate)
- Complete list of CFs can be dumped into a file by any JANA program (option --dumpconfig)
  - same file can be read in on subsequent invocations with --config=*filename* option

Configuration Parameter Code Example

in a factory's init method one might write …

```
MAX_SEED_DIST = 5.0;
MAX_SEED_HITS = 10;
MIN_SEED_HITS = 4;
MAX_STEP_SIZE = 3.0; // cm
```

Variables are member data of factory class

If user specifies alternate value at run time, local variable is overwritten

```
gPARMS->SetDefaultParameter("TRKFIND:MAX_SEED_DIST",MAX_SEED_DIST);
gPARMS->SetDefaultParameter("TRKFIND:MAX_SEED_HITS",MAX_SEED_HITS);
gPARMS->SetDefaultParameter("TRKFIND:MIN_SEED_HITS",MIN_SEED_HITS);
gPARMS->SetDefaultParameter("TRK:MAX_STEP_SIZE" , MAX_STEP_SIZE
    , "Maximum step size in cm to take when swimming a track with adaptive step sizes");
```

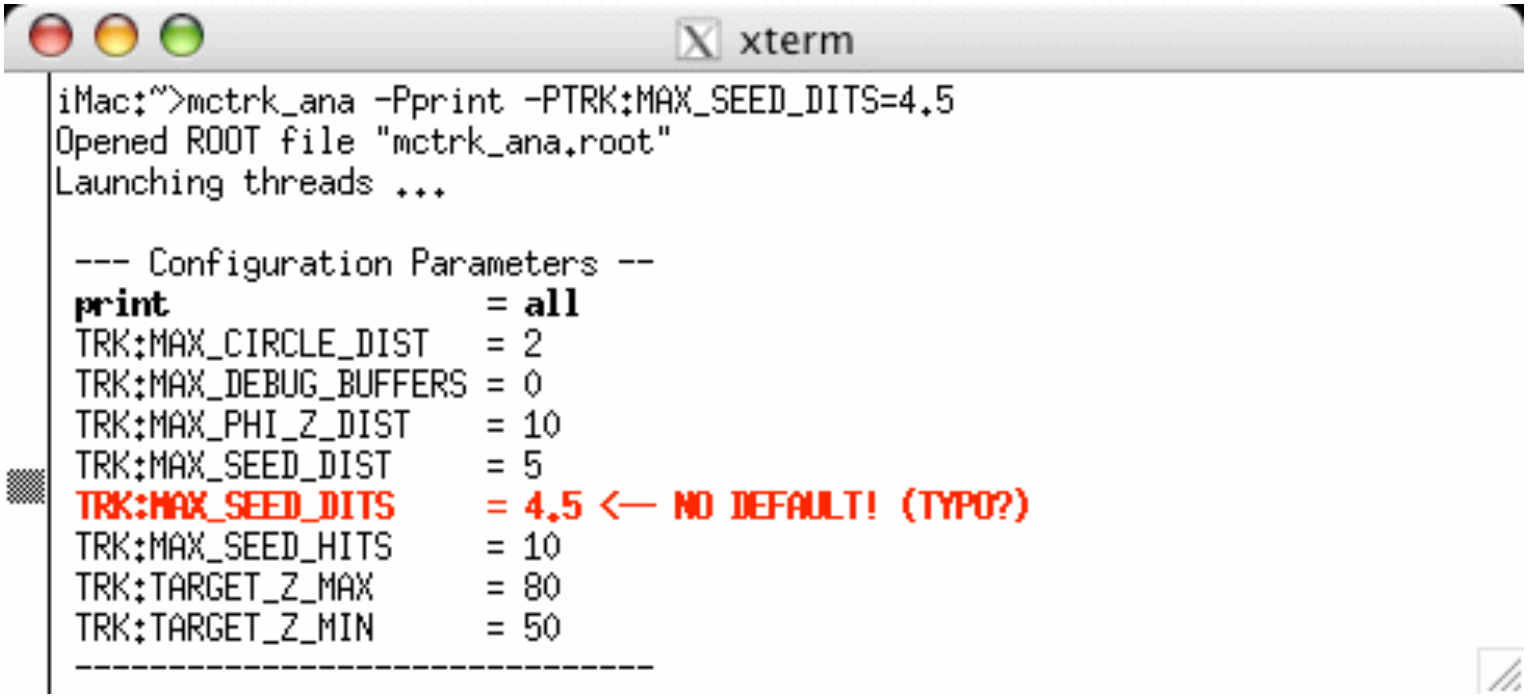
NEW: *Optional 3rd argument allows description to be stored with parameter*

Example Configuration Parameter dump file

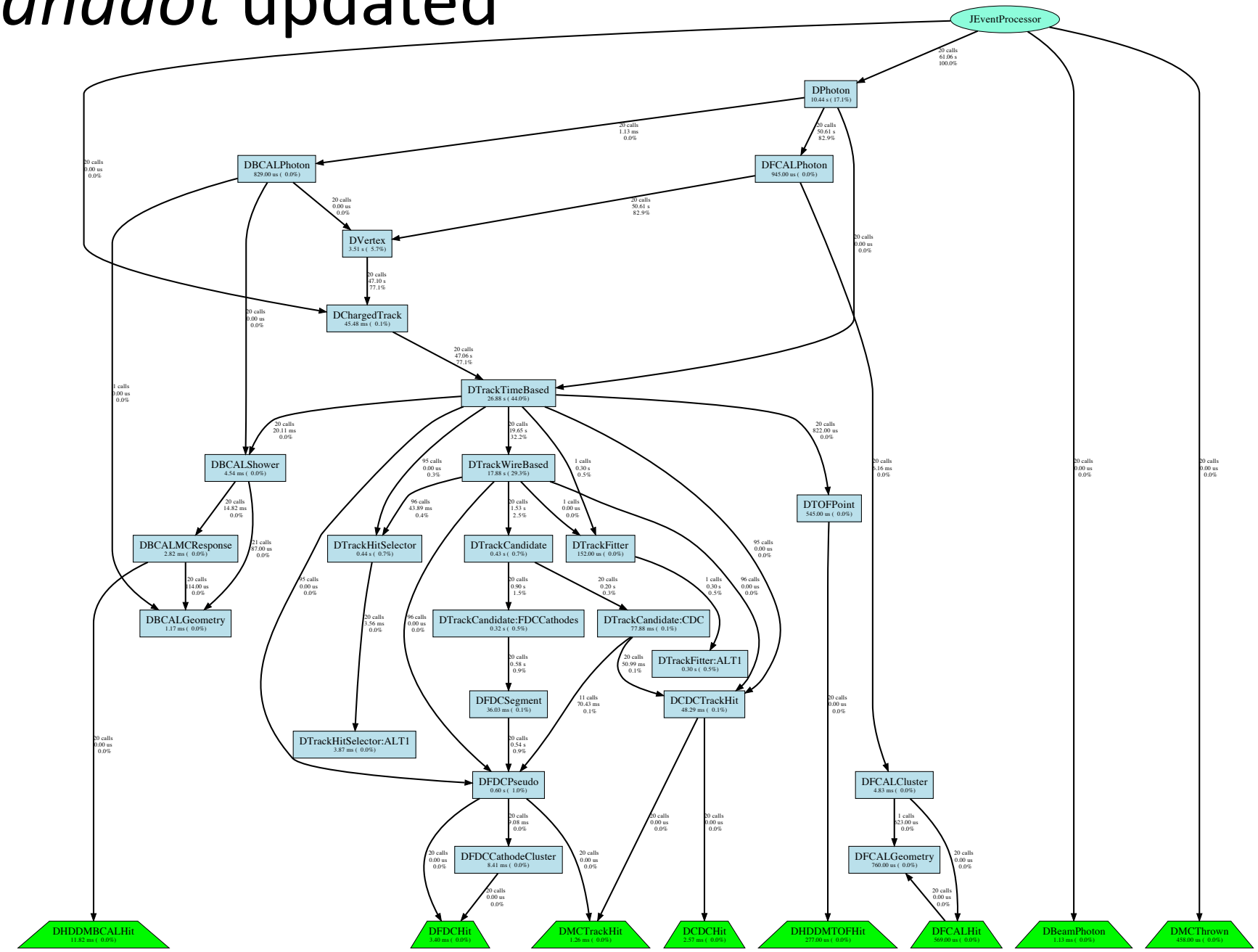
```
#
# JANA Configuration parameters (auto-generated)
#
# created: Wed May  5 11:32:54 2010
# command: hd_ana --dumpconfig -PEVENTS_TO_KEEP=1 --auto_activate=DChargedTrack hdgeant_smeared.hddm
#

BCALRECON:BREAK_THRESH_TRMS                   5
BCALRECON:CLUST_THRESH                        0.02
BCALRECON:MERGE_THRESH_DIST                   40
BCALRECON:MERGE_THRESH_TIME                   2.5
BCALRECON:MERGE_THRESH_XYDIST                 40
BCALRECON:MERGE_THRESH_ZDIST                  30
BCALRESPONSE:CELL_THRESHOLD_OUTER             0.001
BCALRESPONSE:CROSS_TALK_PROB                  0.03
BCALRESPONSE:DARK_RATE_GHZ                    0.041
BCALRESPONSE:DEVICE_PDE                       0.12
BCALRESPONSE:FADC_WINDOW_NS                   100
BCALRESPONSE:OCCUPANCY_FRACTION_LIMIT         0.05
BCALRESPONSE:PHOTONS_PER_SIDE_PER_MEV_IN_FIBER 75
BCALRESPONSE:SAMPLING_COEF_A                  0.042
BCALRESPONSE:SAMPLING_COEF_B                  0.013
BCALRESPONSE:SAMPLING_FRACTION                0.15
BCALRESPONSE:TIMESMEAR_COEF_A                 0.0989949
BCALRESPONSE:TIMESMEAR_COEF_B                 0
BFIELD_MAP                                    Magnets/Solenoid/solenoid_1500_poisson_20090814_01
BFIELD_TYPE                                   CalibDB
CDC:Z_MAX                                     167
CDC:Z_MIN                                     17
EVENTS_TO_KEEP                                1                                  # Maximum number of events for which event processors are cal
EVENTS_TO_SKIP                                0                                  # Number of events that will be read in WITHOUT calling event
FCAL:BUFFER_RADIUS                            8
FCAL:FCAL_CRITICAL_ENERGY                     0.035
FCAL:FCAL_RADIATION_LENGTH                    3.1
FCAL:FCAL_SHOWER_OFFSET                       1
FCAL:MIN_CLUSTER_BLOCK_COUNT                  2
FCAL:MIN_CLUSTER_SEED_ENERGY                  0.035
FCAL:NON_LIN_COEF_A1                          0.53109
FCAL:NON_LIN_COEF_A2                          0.463044
FCAL:NON_LIN_COEF_alfa1                       1.01919
FCAL:NON_LIN_COEF_alfa2                       1.03614
FCAL:NON_LIN_COEF_B1                          2.66426
FCAL:NON_LIN_COEF_B2                          2.4628
FCAL:NON_LIN_COEF_C1                          2.70763
FCAL:NON_LIN_COEF_C2                          2.39377
FCAL:RHG_RADIUS                               30
GEOM:ENABLE_BOUNDARY_CHECK                    1                                  # Enable boundary checking (superceeds any setting in DRefere
GEOM:MAX_BOUNDARY_SEARCH_STEPS                30                                 # Maximum number of steps (cells) to iterate when searching f
JANA:JERR_TAG                                 JANA ERROR>>                       # string prefixed to all lines sent to jerr ofstream
JANA:JERR_THREADSTAMP_FLAG                    0                                  # if non-zero, prepend pthread_id to each message printed to
```

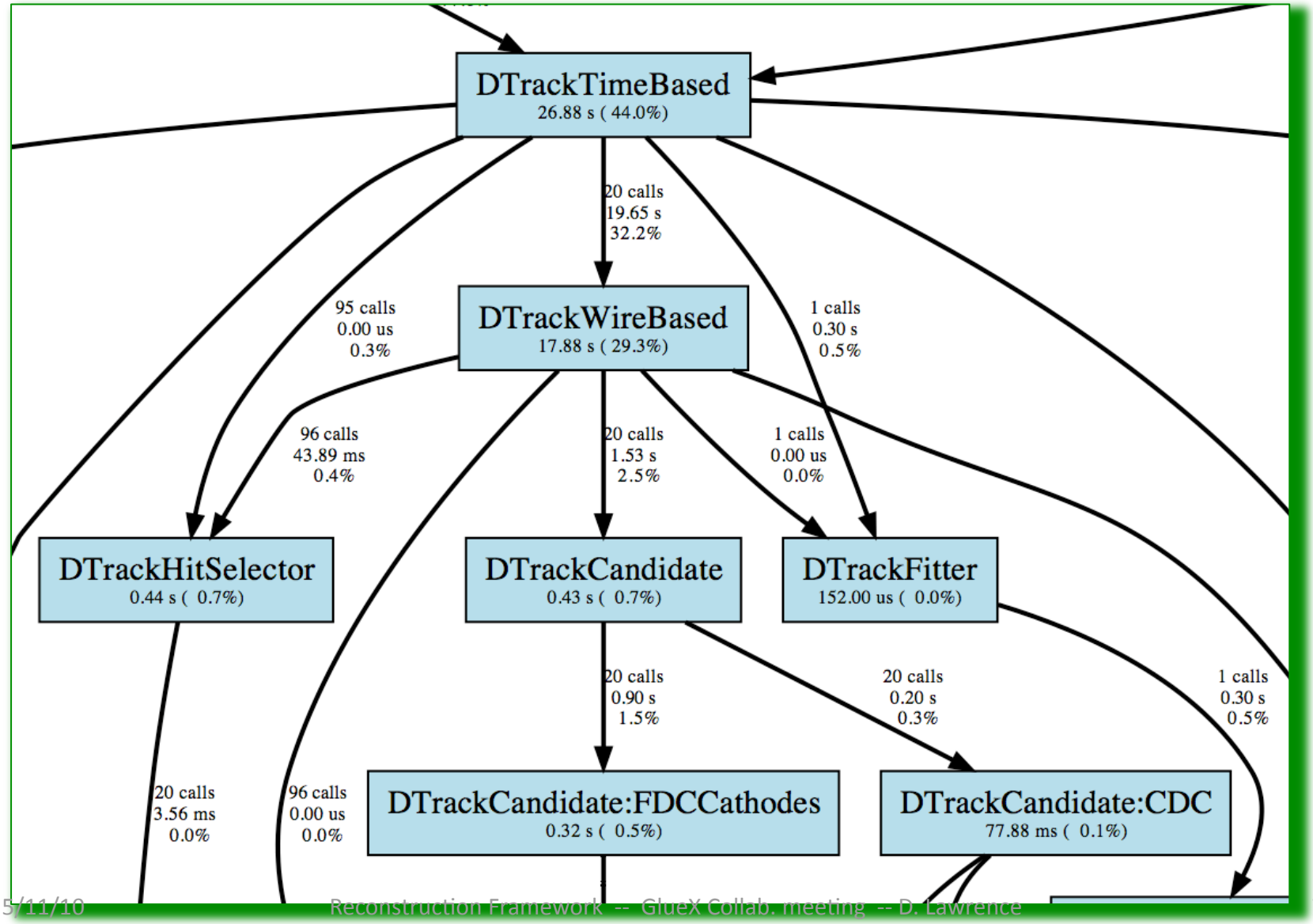
Configuration Parameters



janadot updated



A closer look at *janadot*



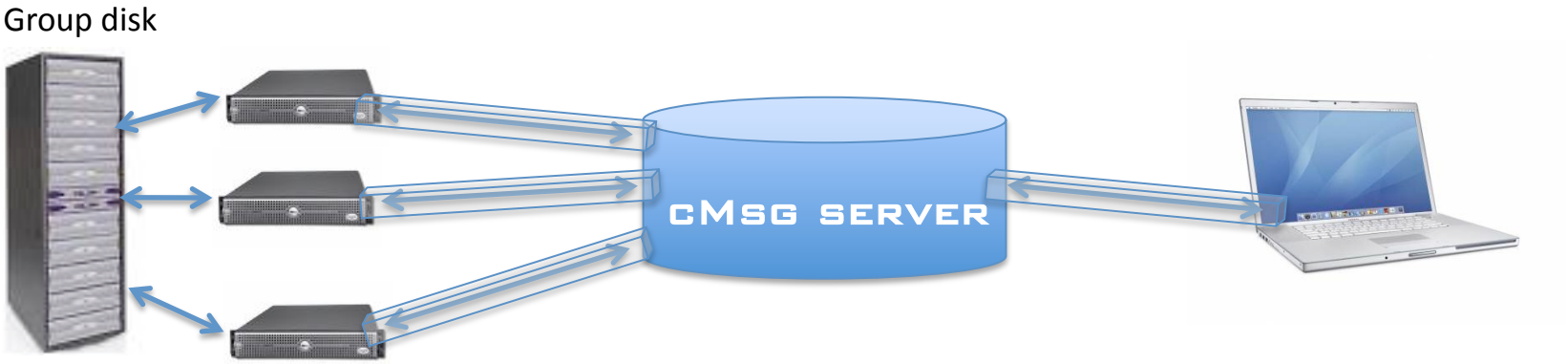
danaevio

- EVIO (aka *CODA format*) is a binary data file format devised and used by the JLab DAQ group for many years
- Hall-D raw data will be recorded in EVIO formatted files
- Hall-D reconstruction software (DANA) will have to be able to read in raw data files
- Reading in EVIO format allows one to:
  - Define exact raw data format
    - normal data taking (cumulative values only)
    - Debug mode (full flash samples)
  - Accurately determine event size
    - better estimate required resources
  - Develop translation table database
    - convert crate/slot/channel to detector ID
  - Develop and test monitoring system
    - will be used for all stages of commissioning
      - beam tests in other halls

danaevio plugin can:

- *Write out selected DANA objects to a file*
- *Record full object association table for each event*

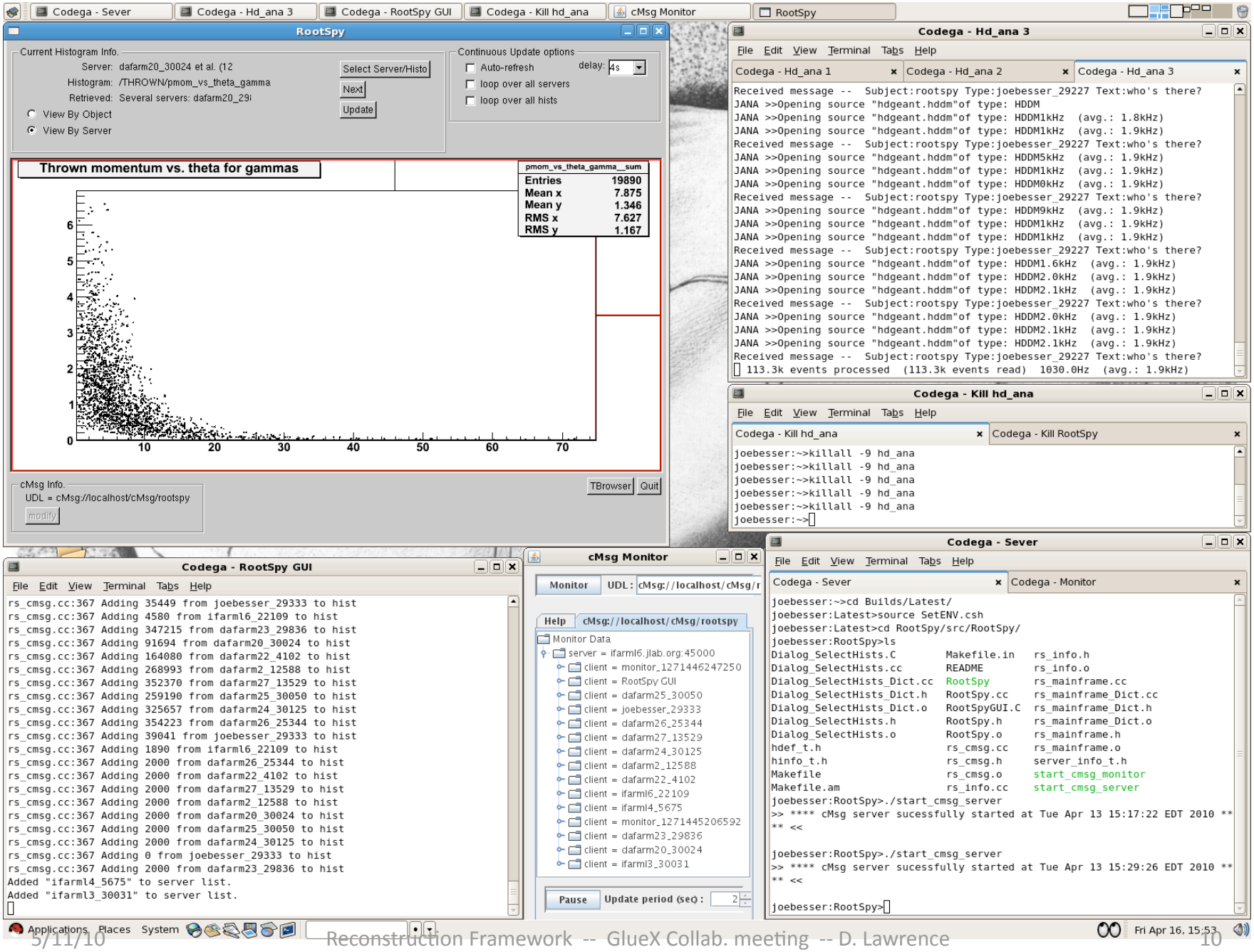
RootSpy Test Run



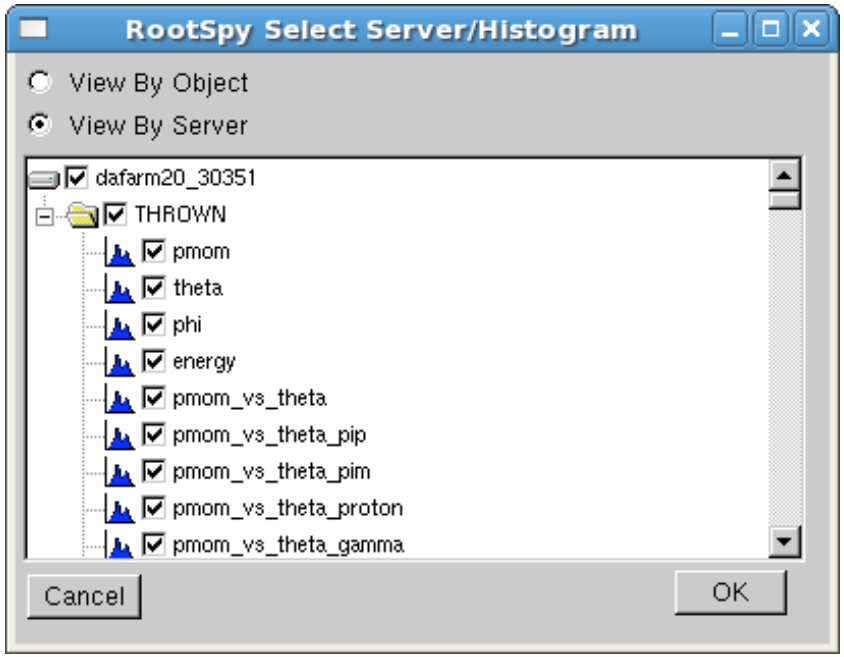
A test was run on April 16th that included:

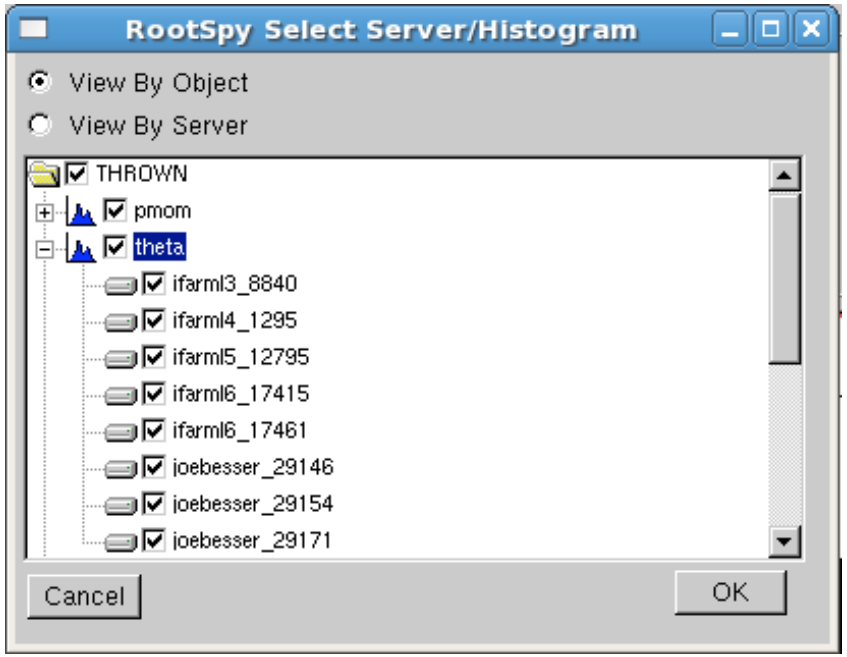
- 8 dafarm computers
- 3 ifarm 32bit Linux machines
- 1 ifarm 64bit Linux machine
- 1 office desktop (Linux)
- 1 laptop (Mac OS X)

All connections (except 1) made via ssh tunnels
cMsg server run on ifarml6


Codega - Sever
Codega - Hd_ana 3
Codega - RootSpy GUI
Codega - Kill hd_ana
cMsg Monitor
RootSpy
RootSpy
Current Histogram Info.
Server: dafarm20_30024 et al. (12
Histogram: /THROWN/pmom_vs_theta_gamma
Retrieved: Several servers: dafarm20_29i
View By Object
View By Server
Select Server/Histo
Next
Update
Continuous Update options
Auto-refresh
delay: 4s
loop over all servers
loop over all hists
Thrown momentum vs. theta for gammas
pmom_vs_theta_gamma__sum
Entries 19890
Mean x 7.875
Mean y 1.346
RMS x 7.627
RMS y 1.167
cMsg Info.
UDL = cMsg://localhost/cMsg/rootspy
modify
TBrowser
Quit
Codega - Hd_ana 3
File Edit View Terminal Tabs Help
Codega - Hd_ana 1
Codega - Hd_ana 2
Codega - Hd_ana 3
Received message -- Subject:rootspy Type:joebesser_29227 Text:who's there?
JANA >>Opening source "hdgeant.hddm"of type: HDDM
JANA >>Opening source "hdgeant.hddm"of type: HDDM1kHz (avg.: 1.8kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM1kHz (avg.: 1.9kHz)
Received message -- Subject:rootspy Type:joebesser_29227 Text:who's there?
JANA >>Opening source "hdgeant.hddm"of type: HDDM5kHz (avg.: 1.9kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM1kHz (avg.: 1.9kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM0kHz (avg.: 1.9kHz)
Received message -- Subject:rootspy Type:joebesser_29227 Text:who's there?
JANA >>Opening source "hdgeant.hddm"of type: HDDM9kHz (avg.: 1.9kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM1kHz (avg.: 1.9kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM1kHz (avg.: 1.9kHz)
Received message -- Subject:rootspy Type:joebesser_29227 Text:who's there?
JANA >>Opening source "hdgeant.hddm"of type: HDDM1.6kHz (avg.: 1.9kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM2.0kHz (avg.: 1.9kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM2.1kHz (avg.: 1.9kHz)
Received message -- Subject:rootspy Type:joebesser_29227 Text:who's there?
JANA >>Opening source "hdgeant.hddm"of type: HDDM2.0kHz (avg.: 1.9kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM2.1kHz (avg.: 1.9kHz)
JANA >>Opening source "hdgeant.hddm"of type: HDDM2.1kHz (avg.: 1.9kHz)
Received message -- Subject:rootspy Type:joebesser_29227 Text:who's there?
113.3k events processed (113.3k events read) 1030.0Hz (avg.: 1.9kHz)
Codega - Kill hd_ana
File Edit View Terminal Tabs Help
Codega - Kill hd_ana
Codega - Kill RootSpy
joebesser:~>killall -9 hd_ana
joebesser:~>killall -9 hd_ana
joebesser:~>killall -9 hd_ana
joebesser:~>killall -9 hd_ana
joebesser:~>killall -9 hd_ana
joebesser:~>
Codega - RootSpy GUI
File Edit View Terminal Tabs Help
rs_cmsg.cc:367 Adding 35449 from joebesser_29333 to hist
rs_cmsg.cc:367 Adding 4580 from ifarml6_22109 to hist
rs_cmsg.cc:367 Adding 347215 from dafarm23_29836 to hist
rs_cmsg.cc:367 Adding 91694 from dafarm20_30024 to hist
rs_cmsg.cc:367 Adding 164080 from dafarm22_4102 to hist
rs_cmsg.cc:367 Adding 268993 from dafarm2_12588 to hist
rs_cmsg.cc:367 Adding 352370 from dafarm27_13529 to hist
rs_cmsg.cc:367 Adding 259190 from dafarm25_30050 to hist
rs_cmsg.cc:367 Adding 325657 from dafarm24_30125 to hist
rs_cmsg.cc:367 Adding 354223 from dafarm26_25344 to hist
rs_cmsg.cc:367 Adding 39041 from joebesser_29333 to hist
rs_cmsg.cc:367 Adding 1890 from ifarml6_22109 to hist
rs_cmsg.cc:367 Adding 2000 from dafarm26_25344 to hist
rs_cmsg.cc:367 Adding 2000 from dafarm22_4102 to hist
rs_cmsg.cc:367 Adding 2000 from dafarm27_13529 to hist
rs_cmsg.cc:367 Adding 2000 from dafarm2_12588 to hist
rs_cmsg.cc:367 Adding 2000 from dafarm20_30024 to hist
rs_cmsg.cc:367 Adding 2000 from dafarm25_30050 to hist
rs_cmsg.cc:367 Adding 2000 from dafarm24_30125 to hist
rs_cmsg.cc:367 Adding 0 from joebesser_29333 to hist
rs_cmsg.cc:367 Adding 2000 from dafarm23_29836 to hist
Added "ifarml4_5675" to server list.
Added "ifarml3_30031" to server list.
cMsg Monitor
Monitor
UDL: cMsg://localhost/cMsg/r
Help
cMsg://localhost/cMsg/rootspy
Monitor Data
server = ifarml6.jlab.org:45000
client = monitor_1271446247250
client = RootSpy GUI
client = dafarm25_30050
client = joebesser_29333
client = dafarm26_25344
client = dafarm27_13529
client = dafarm24_30125
client = dafarm2_12588
client = dafarm22_4102
client = ifarml6_22109
client = ifarml4_5675
client = monitor_1271445206592
client = dafarm23_29836
client = dafarm20_30024
client = ifarml3_30031
Pause
Update period (sec):
Codega - Sever
File Edit View Terminal Tabs Help
Codega - Sever
Codega - Monitor
joebesser:~>cd Builds/Latest/
joebesser:Latest>source SetENV.csh
joebesser:Latest>cd RootSpy/src/RootSpy/
joebesser:RootSpy>ls
Dialog_SelectHists.C Makefile.in rs_info.h
Dialog_SelectHists.cc README rs_info.o
Dialog_SelectHists_Dict.cc RootSpy rs_mainframe.cc
Dialog_SelectHists_Dict.h RootSpy.cc rs_mainframe_Dict.cc
Dialog_SelectHists_Dict.o RootSpyGUI.C rs_mainframe_Dict.h
Dialog_SelectHists.h RootSpy.h rs_mainframe_Dict.o
Dialog_SelectHists.o RootSpy.o rs_mainframe.h
hdef_t.h rs_cmsg.cc rs_mainframe.o
hinfo_t.h rs_cmsg.h server_info_t.h
Makefile rs_cmsg.o start_cmsg_monitor
Makefile.am rs_info.cc start_cmsg_server
joebesser:RootSpy>./start_cmsg_server
>> **** cMsg server sucessfully started at Tue Apr 13 15:17:22 EDT 2010 **
** <<
joebesser:RootSpy>./start_cmsg_server
>> **** cMsg server sucessfully started at Tue Apr 13 15:29:26 EDT 2010 **
** <<
joebesser:RootSpy>
Applications Places System
Fri Apr 16, 15:53

View by object or server





Summary

- JANA framework continues to have features added and enhanced
  - Configuration Parameter descriptions
  - *janaroot* diagnostic enhanced
- *danaevio* plugin created
  - first step to create files in raw data format
- *RootSpy* test completed with 14 servers
  - *Online monitoring system*
  - *Localized code development*