

Monitoring Update

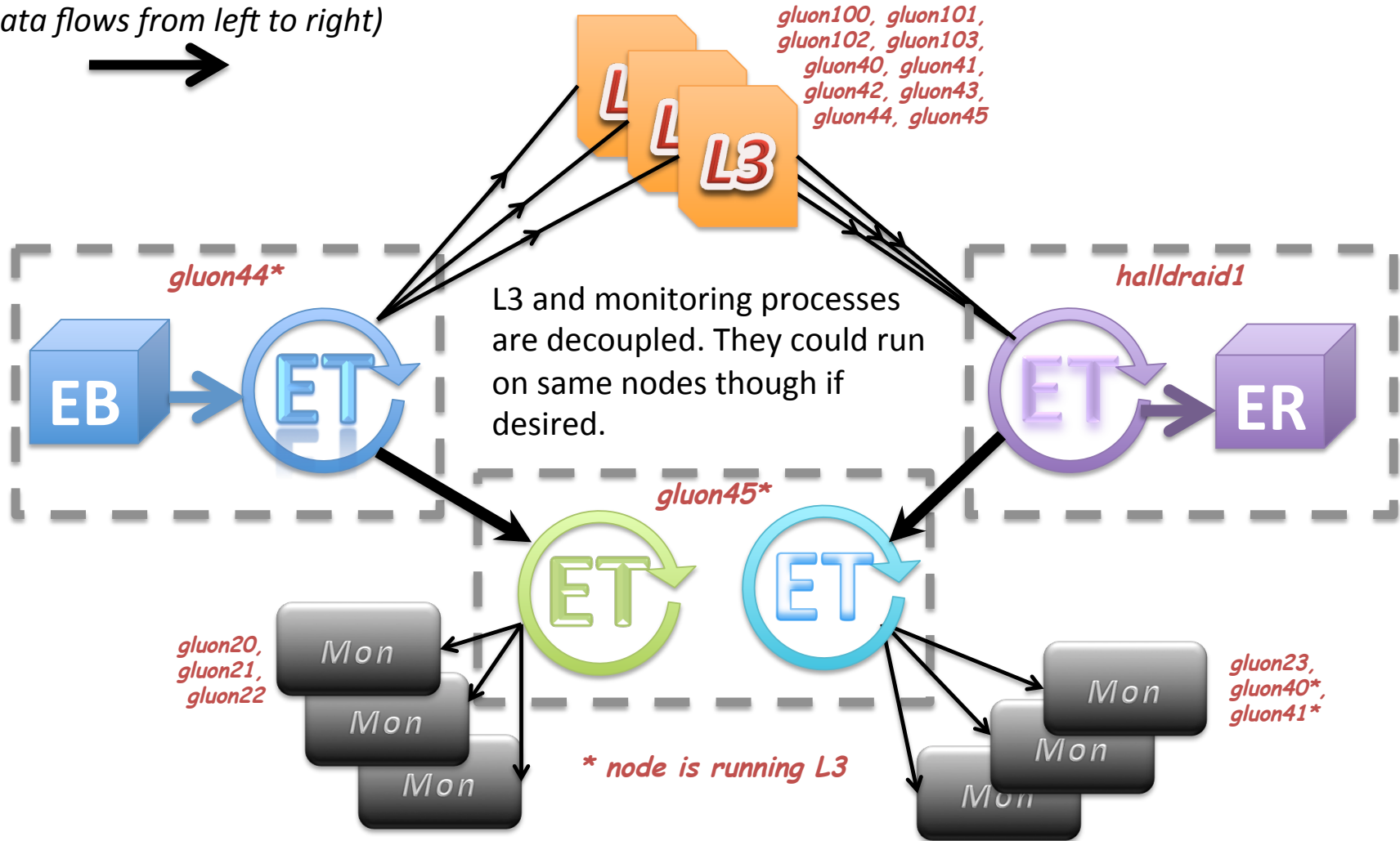
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L3 and monitoring architecture

for 2013 Online Data Challenge

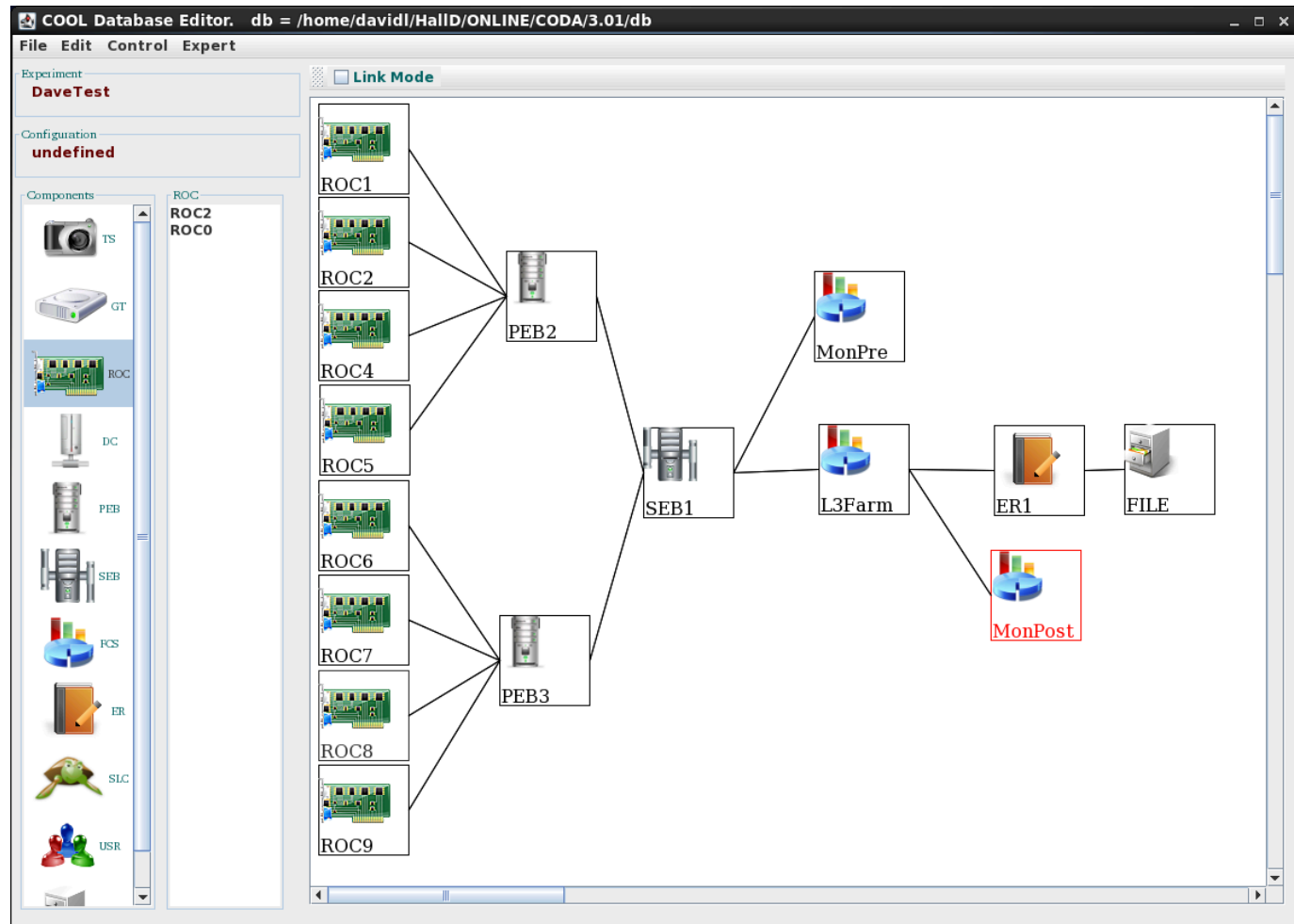
(Data flows from left to right)



*n.b. all L3 machines connected via InfiniBand

Farm Controller CODA Component

- Farm Manager process will be a full CODA component (i.e. required component of the DAQ system)
- Individual farm processes will not be CODA components
- Farm Manager will (re)launch farm processes as needed via ssh
- System allows processes to come and go during run so long as minimum number of processes are active



Status: Farm manager is written but not fully tested by DAQ Group and not yet released to us for testing

hdlog

Farm processes output will be captured to log files using *hdlog* utility

```
hdlog hd_ana --config=$HDCONFIG/mon_pre.conf
```

- Output is automatically appended to log file in directory specified by HDLOG environment variable
- File name based on program name and node name (e.g. *hdmon_gluon100.log*)
- File is automatically truncated as needed to limit size.
(truncation is done at newline boundary)
- Markers indicating start and end times as well as resource usage are recorded into log file

```
----- hdlog starting: Mon Feb 17 07:36:56 2014 -----  
  
Factory List  
-----  
DBCALDigiHit  
DBCALTDCDigiHit  
...  
DMCTrigger  
DL3Trigger  
  
125 factories registered  
  
----- hdlog ending: Mon Feb 17 07:36:56 2014 -----  
          user time: 0.09753 sec  
          system time: 0.029359 sec  
          max. mem usage: 25436 kB  
  
----- hdlog starting: Mon Feb 17 07:37:37 2014 -----  
  
Factory List  
-----  
DBCALDigiHit  
DBCALTDCDigiHit  
...
```

example log file obtained by running "hd_dump -L" multiple times

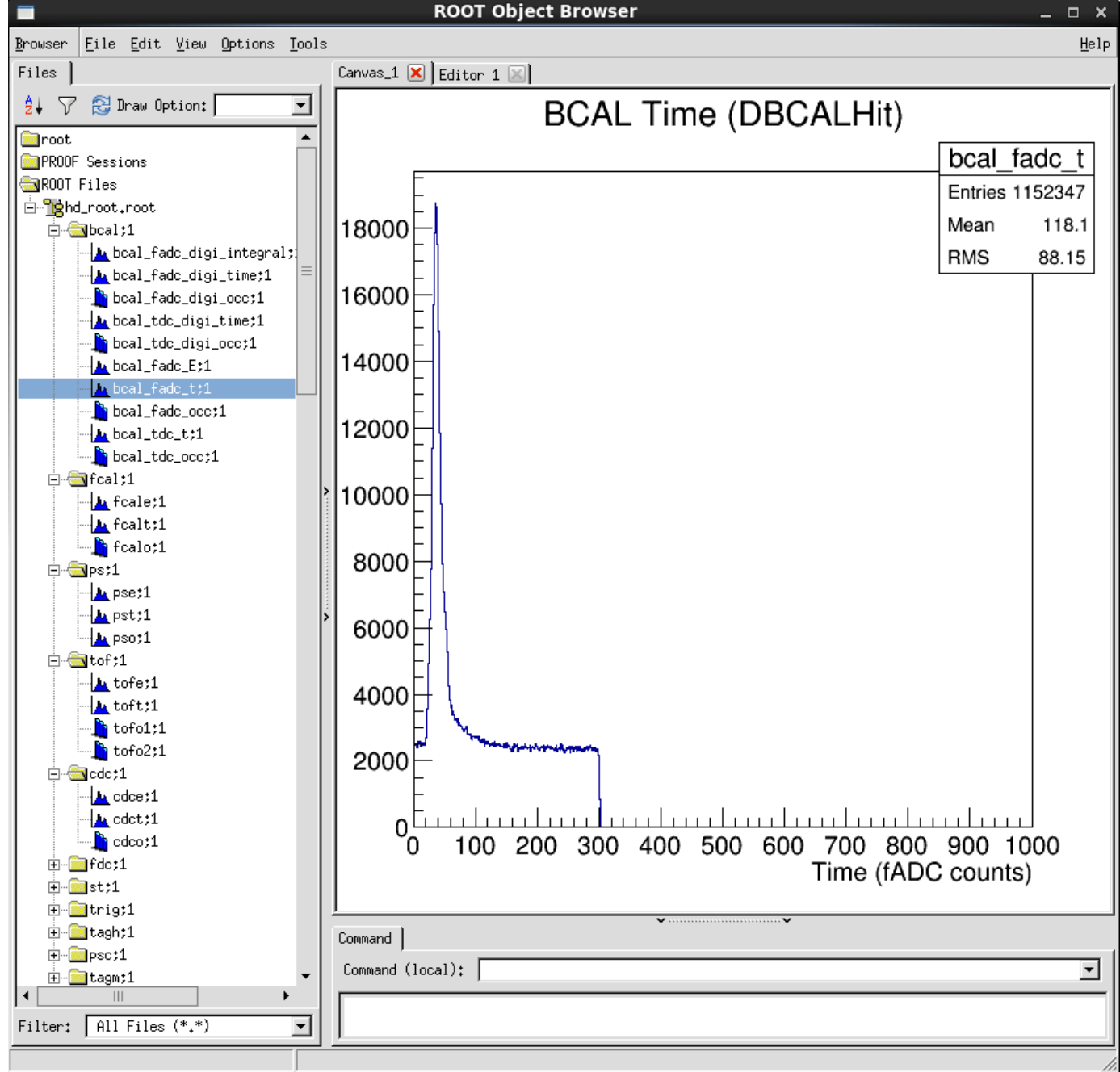
Online monitoring plugins

Each monitoring process will attach a set of plugins to produce histograms for all detector systems

Existing PLUGINS

BCAL_online
CODA_online
FCAL_online
L3_online
PS_online
TAGH_online
TOF_online
CDC_online
EVNT_online
FDC_online
PSC_online
ST_online
TAGM_online
TRIG_online

plugins created and tested by Elliott Wolin

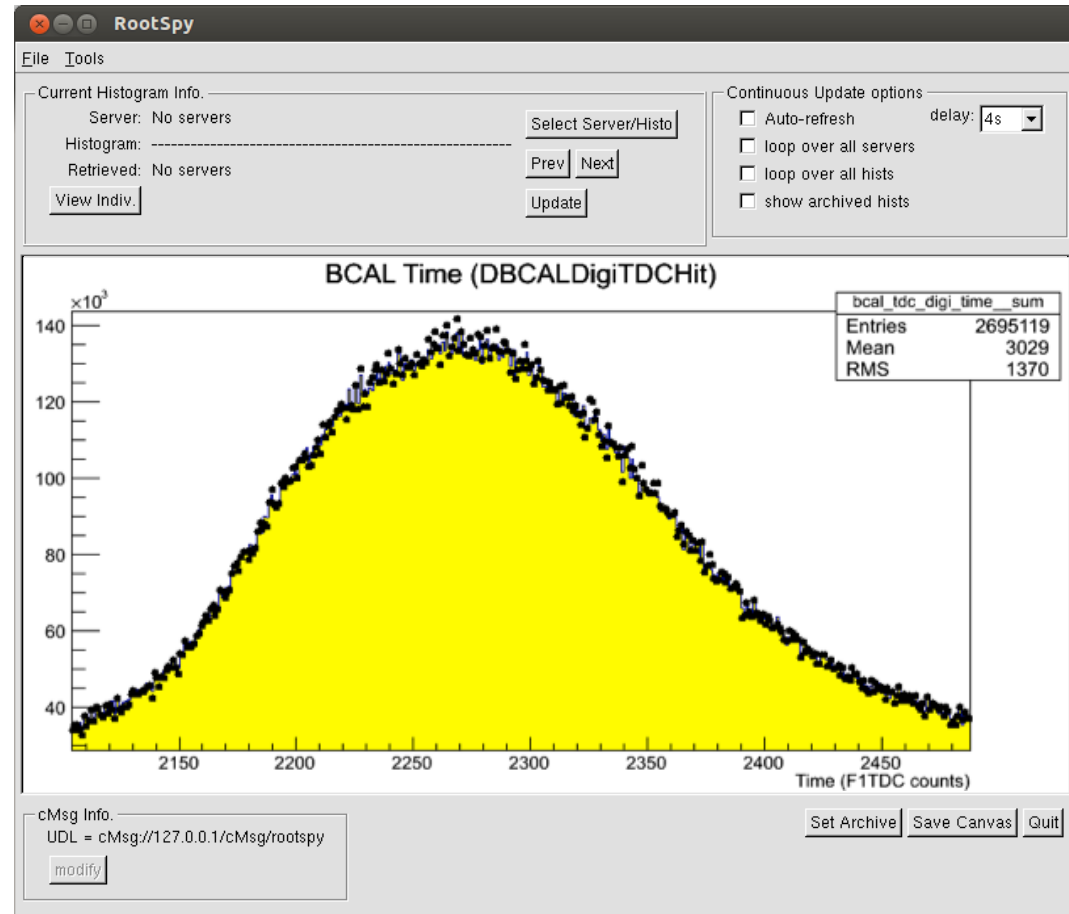


https://hallweb1.jlab.org/wiki/index.php/Monitoring_plugins_in_offline_environment

ROOTSpy

ROOTSpy: System for reading histogram definitions from global memory and publishing them to the network

- JANA programs and plugins are written to produce histograms in the standard way
- The *rootspy* plugin is attached and will automatically find all defined histograms (including *ROOT* directory structure)
- Histograms published to network via cMsg*
- Central process gathers histograms from all nodes and automatically sums similar histograms.
- GUI allows users to overlay live histograms on top of reference histogram for easy visual comparison




- Users can view histograms from individual nodes
- Currently maintained and developed by Northwestern ([Sean Dobbs](#))

*cMsg is a publish/subscribe network messaging package written by JLab DAQ group and used extensively in the DAQ and online systems

ROOTSpy Archiver



- Archiver is command-line program that continuously records histograms to file from ROOTSpy system
- Output ROOT files from archiver will be available on computers in counting house but will also be copied to tape library for permanent storage alongside raw data
- Configuration done via file (NEW!) 
- “Final Event” mechanism has been designed, but no testing done yet

```
[main]
rootspy_udl = cMsg://127.0.0.1/cMsg/rootspy
daq_udl = cMsg://127.0.0.1/cMsg
#session_name = ## empty by default
poll_delay = 60
min_poll_delay = 10
output_filename = current_run.root
archive_pathname = <nopath>

[output]
html_output = false
pdf_output = false
html_base_dir = <nopath>
```

Remaining work

- Finish implementation and testing of “last event” paradigm
- Fill in detector system plugins with appropriate histograms (*detector groups*)
- Test farm-manager CODA component

Monitoring Summary

- Data flow design including pre-L3 and post-L3 monitoring passed initial test ([ODC2013](#))
- Farm Manager CODA Component is written, (by DAQ group) but not yet tested
- *hdlog* logging utility completed
- Prototypes for detector system histogram plugins exist, but need review by detector groups
- ROOTSpy system, including prototype archiver, tested and working ([ODC2013](#)). Additional feature testing will be done during ODC2014
- Solutions exist and have been tested for all major aspects of the monitoring system. Remaining items have been identified and are on track for completion well in advance of detector commissioning.