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DHCAL Extensions to CALICE DAQ : Status Report

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Overview

- Development and testing has been done on notebook Linux PC
- All of the modules requiring modification or development have been coded
- Modules which do not interact with actual hardware have been tested
- Preliminary 'runner' application has been built and tested
- Electronic Logbook functionality has been added
- Some issues remain to be addressed

Development Status Summary

Module	*Purpose*	*Status*	*Comment*
DaqBusAdapter	Use HAL CAEN Linux bus adapter	Modified	
DaqConfiguration	Customize settings for run types	Modified	Needs additional customization
DaqRunType	Define run types	Modified	Added run type for DHC operation
SubRecordType	Defines types of subrecords	Modified	Added record types to configure and readout DHC
DhcConfiguration	Load configuration records	Coded	Need method to input parameters from ecternal file
DhcbeConfigurationData	Defines structure of DCOL configuration	Coded	
DhcFeConfigurationData	Define structure of DCAL front end configuration	Coded	
DhcEventData	Define structure of front end hit data	Coded	
DhcReadoutConfigurationData	Define structure of settings for readout options	Coded	Needs additional customization
DhcSerialCommand	Template to build command sent to FE chip	Coded	
DhcSeriaHheader	Builds structured message sent to FE chips	Coded	
DhcReadout	Manages the configuration and readout of DCOL	Coded	
DhcVmeDevice	Executes the DCOL access via HEL library	Coded	Not tested
DhcLocation	Define physical location of DCOL	Coded	
DhcLocationData	Template to associate DCOL data with location	Coded	
TtmConfigurationData	Define structure of TTM configuration	Coded	
Ttmreadout	Manages configuration and readout of TTM	Coded	
TtmVmedevice	Executes the TTM access via HAL library	Coded	Not tested
TtmLocation	Defines physical location of TTMs	Coded	
TtmLocationData	Template to associate TTM data with location	Coded	
RunLogger	Create automatic ELOG entries at transitions	Coded	

Operation

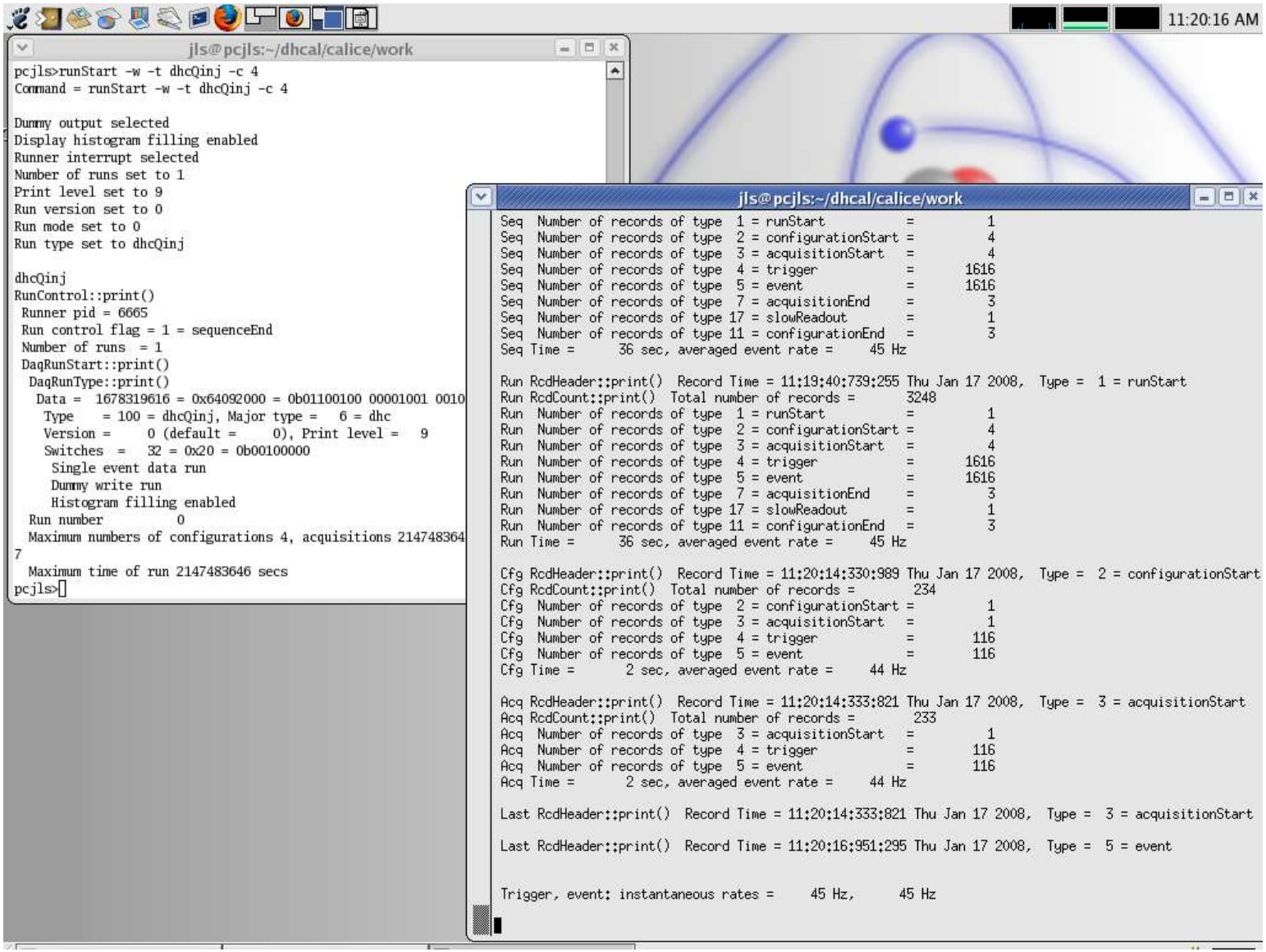
- DAQ program initialized with 'startUp' command, runs in background
- Runs are controlled via 'runStart' and 'runEnd' commands
- Run type selected on 'runStart' command line, e.g. Noise, Qinj or Cosmics
- Runs can also end automatically based on time, number of events or other parameters
- Runs can be sequenced, e.g. cosmics for a specified time interval immediately followed by a noise run.
- Run progress can be monitored

```
pcjls>startUp
Deleting payloads
Log file used: data/log/Log1200590077.out_pcjlsHst
Log file used: data/log/Log1200590078.out_pcjls
pcjls>runStart -h

runStart options:
 -w  (bool)    Make output file, default +w = true
 +a  (bool)    Ascii output file, default -a = false
 -d  (bool)    Enable displays, default +d = true
 -i  (bool)    Interrupt runner, default +i = true
 -t  (string)  Run type, default crcNoise
 -n  (int)     Number of runs, default 1
 -p  (int)     Print level, default 9
 -v  (int)     Run type version (type-dependent), default 5
 -m  (int)     Run type mode, default 0
 -c  (int)     Maximum number of configurations, default 2147483647
 -q  (int)     Maximum number of acquisitions, default 2147483647
 -e  (int)     Maximum number of events, default 2147483647
 -s  (int)     Maximum time of run (secs), default 2147483647

pcjls>
```

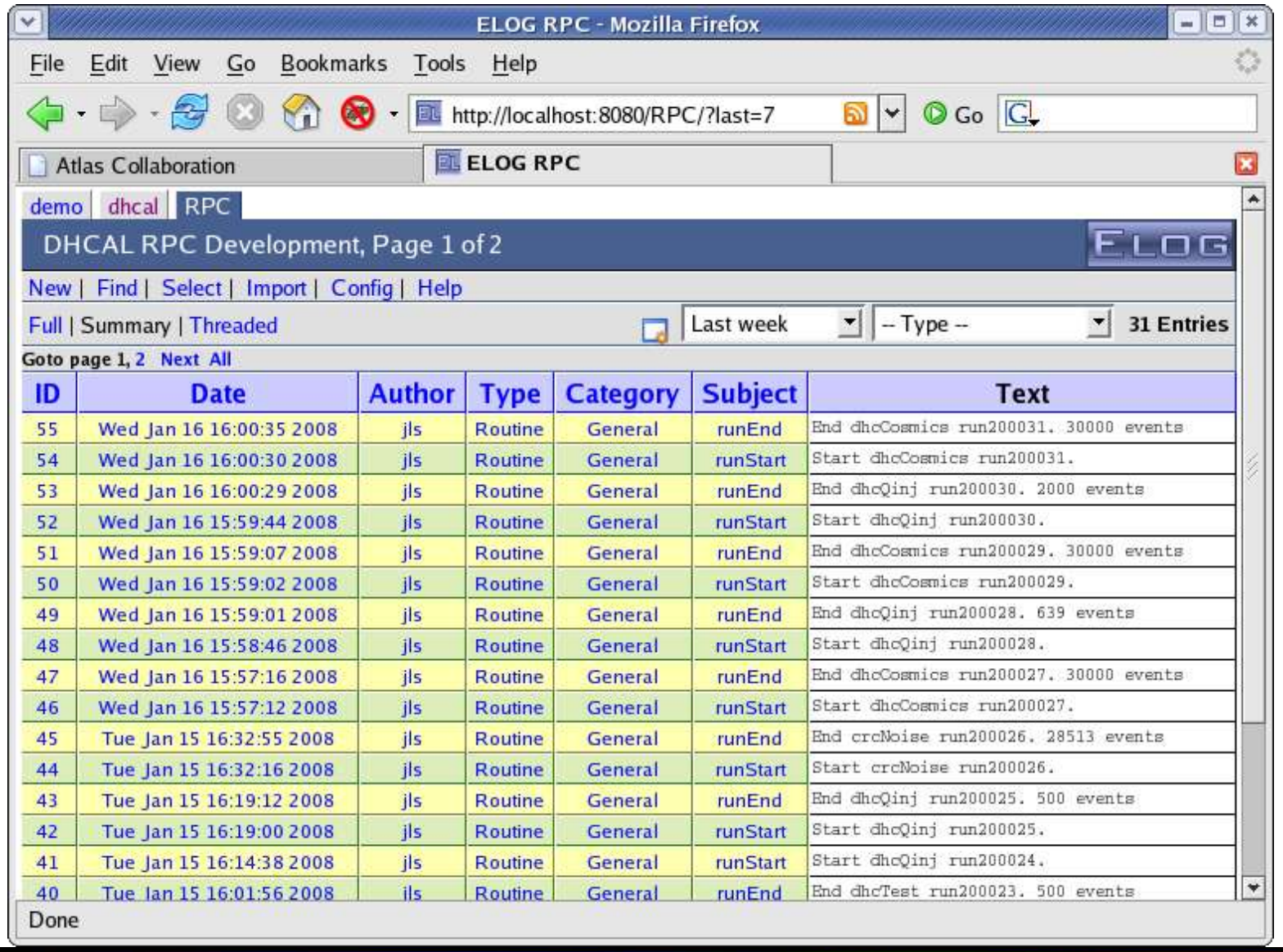
Screen shot of runStart, runMonitor for Qinj run



Electronic Logbook - ELOG

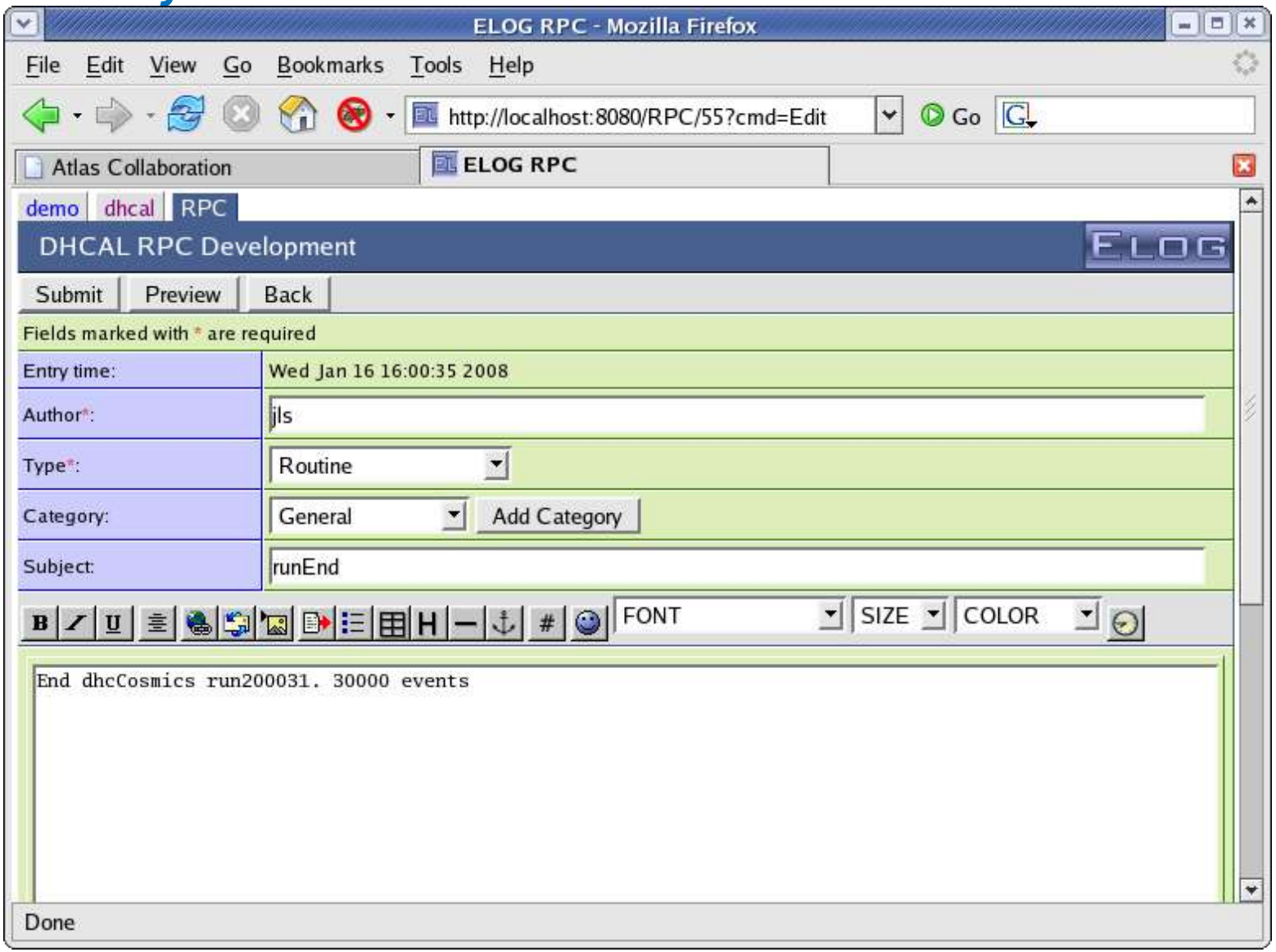
- ELOG package by Stefan Ritt
  - http://midas.psi.ch/elog/
- Has been used for ATLAS TDAQ commissioning
- Easy to configure, easy to use weblog.
- Automatic entries can be made via command line client application, 'elog'
- Dedicated server, 'elogd' does not require any other Web server.
- Entries can be viewed, edited with any web browser.
- RunLogger module has been developed to log entries at 'runStart' and 'runEnd' transitions

ELOG entries created automatically



ID	Date	Author	Type	Category	Subject	Text
55	Wed Jan 16 16:00:35 2008	jls	Routine	General	runEnd	End dhcCosmics run200031. 30000 events
54	Wed Jan 16 16:00:30 2008	jls	Routine	General	runStart	Start dhcCosmics run200031.
53	Wed Jan 16 16:00:29 2008	jls	Routine	General	runEnd	End dhcQinj run200030. 2000 events
52	Wed Jan 16 15:59:44 2008	jls	Routine	General	runStart	Start dhcQinj run200030.
51	Wed Jan 16 15:59:07 2008	jls	Routine	General	runEnd	End dhcCosmics run200029. 30000 events
50	Wed Jan 16 15:59:02 2008	jls	Routine	General	runStart	Start dhcCosmics run200029.
49	Wed Jan 16 15:59:01 2008	jls	Routine	General	runEnd	End dhcQinj run200028. 639 events
48	Wed Jan 16 15:58:46 2008	jls	Routine	General	runStart	Start dhcQinj run200028.
47	Wed Jan 16 15:57:16 2008	jls	Routine	General	runEnd	End dhcCosmics run200027. 30000 events
46	Wed Jan 16 15:57:12 2008	jls	Routine	General	runStart	Start dhcCosmics run200027.
45	Tue Jan 15 16:32:55 2008	jls	Routine	General	runEnd	End crcNoise run200026. 28513 events
44	Tue Jan 15 16:32:16 2008	jls	Routine	General	runStart	Start crcNoise run200026.
43	Tue Jan 15 16:19:12 2008	jls	Routine	General	runEnd	End dhcQinj run200025. 500 events
42	Tue Jan 15 16:19:00 2008	jls	Routine	General	runStart	Start dhcQinj run200025.
41	Tue Jan 15 16:14:38 2008	jls	Routine	General	runStart	Start dhcQinj run200024.
40	Tue Jan 15 16:01:56 2008	jls	Routine	General	runEnd	End dhcTest run200023. 500 events

Entries may be edited with browser



Tasks Remaining

- Test HAL modules
  - DhcVmedevice, TtmVmedevice
- Configuration Issues
  - finalize list of defined actions and settings for standard run types
  - provide interface to load commonly changed parameters via external file
    - *type of file? flat text, XML*
  - integrate SQLite database access
- Data file conversion applications
  - convert data files to formats currently used for offline analysis