

Online Software Test (Phase-II) Report

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Abstract

The second dry run for the PrimEx online monitoring softwares were performed in Hall-B counting house. In addition to debugging previously tested programs, the online monitoring programs for LMS and GUI histogram browser program are tested for the first time.

1 Introduction

The online softwares were tested in the counting house again. The primary program of this dry run was to test new programs such as online monitoring of the LMS and a GUI histogram browser for the first time as well as revisiting previously found problems to inspect if they were fixed or not. In the Sec.2, a newly found problems are listed in addition to previous problems. The previously found problems are in **red** and presently found ones are black text color. The text color in **blue** are resolved items. The name in the curly bracket is who is in responsible. The document in *italic* fonts followed by an arrow is the current status or solution of an item.

2 Results

2.1 ROOT system

1. Some of monitors in Hall-B counting house are incompatible with ROOT X11 environment at this moment. (Aram)
→ *proper DISPLAY environment will resolve.*
2. Root server program crashes, when request is sent from client except for hycal_calib.

2.2 PMonitor

1. Currently, the executable name is hard coded in the program. If PMonitor fails to recognize the executable name, it won't assigned the adequate port number for the online program. Therefore, the online monitoring/calibration program needs to be executed without PATH to the it. Unless a new routine to strip off the PATH is implemented, this must be explicitly documented in the online software instructions. (David)
→ *solved*

2.3 ET system

1. The data feeding through ET system automatically assigns run number #10 by default. This arbitrary run number is not clear for online programs which calibration constants to be employed, since the run number plays a key role to select calibration constants from a database. (David)
→ *linked with item 2.*
2. Presently, all the online program requires -R option to specify the run number. Need to be picked up the run number from circulating data without specification of run number from the command line. (David)
→ *Inserted Run number in the data stream event by event basis, but `hycal_calib`, `ps_calib` could not pick up run number from data.*
3. The root server becomes unresponsive when data stops flowing in the ET-system. (David)
→ *Solved.*
4. `file2et` core dumps at the end of file. (David)
→ *stay with it.*
5. `file2et` kills `et2et` when raw data and `psim_digitized` data files are fed simultaneously. (David)
→ *Never happens during real data acquisition.*
6. The alarm system need to be implemented when `et2et` system dies. (David)
→ *Not yet solved.*
7. `et2et` might not be working. Failed to transfer data from `clon10` to `clon01`.

2.4 PEV

1. Some environment variables in `primex_jlab` needed to be modified to operate PEV in SunOS. This modification may not be compatible with LINUX. Presently, `primex_jlab` scripts calls five different scripts and makes it complicated to maintain and diagnose problems. (Mark)
→ *This is the way it is.*

2.5 `tac_calib`, `tagger_mon`

1. Some 2-dimensional plots with so many bins takes more than 5 seconds to draw. This may be because that such a two dimensional histograms contains plenty of information and takes time to correct all the information through the network. A solution besides a coarse binning needs to be investigated. (Itaru)
→ *One of the possible solution is to compress the histogram before it is broadcasted. However, there is no ROOT built-in function to do it at this moment. ROOT developers promised to add it to the project but when it becomes available is not known.*

2.6 `tagger_calib`

1. The basis of the program is not up to date. Doesn't take `-R` option (Eric)
→ *Still not up to date.*

2.7 `ps_calib`

1. Crashes when `ps_fid_vs_bid_in_time` histogram is drawn with "segmentation error message. (Aram)
→ *This doesn't happen when data are fed directly from file with ROOT version 3.05 on LINUX. Need to check if ROOT version (3.04) or the architecture or data feeding through ET system cause the problem.*
2. After running ps calibration program, ROOT loose the connection to the host server. (Aram)
→ *Sending incomplete object? Fill hists from the file.*
3. Online compiled binary do not run offline. (Aram)

2.8 `veto_calib`

1. The program hasn't be able to tested. The current program is designed differently with the way secondary particles are stored in the Monte Carlo data. Eric is working on it and it will be tested in next dry run in April. (Eric)
→ *Eric fixed the problem, but the program couldn't be tested because of problem 2.1-2.*

2.9 hycal_ped

1. Combining with snake and luminosity data circulating in the ET system screws up hycal_ped program. Presumably a trigger type selection may needed to be implemented. (David)
→ *filter clock trigger at the beginning of every run.*

2.10 hycal_snake

1. The current version hycal_snake program is written based on paw/cernlib base. Because of the memory limitation of the global session, the program cannot handle all the HYCAL channels. As a temporary solution, glass_snake, which calculate energy calibration constants only for the glasses, is tested using the paw global section and confirmed it works. This program is planned to be revised to use standard root tools as other online programs do by April. (Raphael)
→ *Not yet ready.*

2.11 hycal_calib

1. Shows warning message "TH2F pointer will be zero" when calEdiag_MCDEP_HYCALHIT_Ediff histogram is drawn. (Dustin)
2. Either TBrowser or other GUI may need to be implemented in order to browse 30 to 40 histograms. Typing in each histogram name in the command line is not practical. (Aram)
→ *PrimEx online GUI takes the place of this.*
3. Some of histograms are not understood well. Particularly with snake data and π^0 plus accidental combined spectra, since this was the first occasion to see the combined data. Need more study about each spectra. (Dustin)
4. Online projection of 2-dimensional histogram on ROOT did not work. (Aram)
→ *Implement option in GUI.*
5. Crashes when accidental merged data are fed. This may related with undefined MC deposited system seen when it crashed. A merging program needs to be reviewed if there is the byte swap kind of issues exists. (Dustin)
6. radial_distance_beamline raw spectrum does not reproduce MC generated spectrum (Dustin)
7. The energy deposited in HYCAL is always smaller than generated energy: i.e. $\sum \text{MCDEP} \leq \sum \text{MCPART} + 200 \text{ MeV}$. (Dustin)

2.12 Program name

1. Some programs do both calibration and monitoring. Utilizing program called `..._calib` for monitoring purpose may drive users into confusion. This naming issue must be unified to avoid introducing unnecessary confusions. (Software group)
→ *Will implement GUI to execute the online monitoring programs so that program names are not issue for user/shift takers.*

2.13 LMS

1. A little slow, but it works.
2. No alarm feature at this moment. Flush the screen is doable. Crucial data must be sent to EPICS to use alarm feature.
3. Need to be modified to display as a function of date/time, instead of data points.
4. Shutdown access possible even if the LabVIEW crashes as long as the OS is alive. Better implement the way to remotely reboot PC even when the OS freezes.

2.14 GUI

1. Successfully showed the histogram. Currently a histogram name is hard-coded in the program. Will implement function to grab histogram list from ET.
2. Display window supposed to be scaled with the graph scale.
3. Execute macro feature from GUI.

2.15 Environment

1. No any good solution yet for users to update and compile the program.
2. "use" command in the `primex_jlab` has been broken. Once it is fixed, it results in screwing up existing `LD_LIBRARY_PATH` which is crucial to run online coda.

3 Summary

The online softwares were tested in the counting house again. 9 out of 26 previously raised problems were confirmed to be fixed by now. The solutions to many of previous problems could not be inspected primarily because of the problem in the ROOT server-client communication problem. The online monitoring LMS worked well in the `clon` machines. The GUI is still a developing stage, but it demonstrated quite user friendly histogram browsing. This dry run might demonstrate the difficulty to cope with problems quickly without David's appearance on site. Some of problems may be able to be fixed by him quickly and might be able to move on to further test. We need to lesson from this to share the knowledge with him as much as possible.