

E906 Analysis on Rivanna

Prerequisite

The analysis of the E906 data on Rivanna and its documentation expect you to have the following knowledge. If any of them is not well documented somewhere else, it should be explained further in this page.

- Basic knowledge of Linux commands.
 - ls, cd, less, cp, mv, text editor, etc.
- Basic knowledge of C++ and ROOT.
- Use of a text terminal with graphic (i.e. X11) support.
 - SSH over UVA More Secure Network (VPN), or
 - FastX Web Portal.
- Concept of the file hierarchy on Rivanna.
 - Usage of "/project/ptgroup" and "/scratch".
- Concept of the job submission on Rivanna.
 - Usage of "sbatch", "squeue", etc.
- Basic knowledge of SeaQuest spectrometer.
 - [Basics of SeaQuest/SpinQuest](#)
- Fermilab Services and Kerberos accounts.
 - Services account to access DocDB and Redmine webpage.
 - Kerberos account to access Redmine Git repository.

Analysis Software on Rivanna

A compact analysis program dedicated for the E906 data analysis is available at a Git repository on Fermilab Redmine. If you don't have a permission to read the web page or the repository, please contact Kenichi.

<https://cdcvns.fnal.gov/redmine/projects/e906-root-ana/repository/revisions/master/entry/README.md>

The instructions given in "REAMD.md" should be detailed enough for new users to go through the whole analysis steps. But any questions/suggestions are very welcome, since the software is still under development.

E906 Datasets

Dataset	Period	Roadset	Run ID	Spill ID	Availability on Rivanna
2	2013/12-2014/07	57, 59, 62			Yes
3	2014/12-2015/07	67, 70			No
4	2015/12-2016/02				No
5	2016/03-2016/07	78			No
6	2017/01-2017/07	78			Yes

Management Info

Normal users (=analyzers) need not look into the information below.

Data Transfer

The SeaQuest data files are stored in one sub-directory every 100 runs (like "02/87/" for runs 0287**). Thus one data-transfer process is launched per sub-directory, namely a set of 100 runs. Two types of the data files exists;

- Event info = digit file = "digit_*****_009.root"
- Reconstructed info = vertex file = "vertex_*****_r1.7.0.root"

The total size of the data files:

Dataset	Digit File	Vertex File
6	3.6 TB 900 MB * 4000 runs	1.5 TB 400 MB * 4000 runs

The transfer method:

- Via a shell script that uses rsync and ssh.
- 20 MB/s on average, measured on 2021-08-28.
- All the data file of dataset 6 (~5 TB) will take 70 hours for transfer, but might take a much longer time to retrieve the data files from tape at Fermilab.

System-Level Software

Several system-level files are placed under "/project/ptgroup/seaquest/software". Normal users (=analyzers) need not look into it except the data container classes such as "SRawEvent" and "SRecEvent".

- "software/" = The standard E906 software, which contains...
- "data/" = SeaQuest data files. They are being transferred from Fermilab.
- "etc/" = SeaQuest-specific configuration files of external software. Only the Kerberos configuration file (krb5.conf) is included at present.
- "list/" = Lists of good runs/spills etc. The user-level program below automatically finds and reads a proper list case-by-case.

User-Level Software

It relies on the system-level files mentioned above, and contains only a set of files that analyzer can/should modify for one's analysis purpose.

Analysis via Fermilab's Kerberos

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