Pocket DAQ manual (2014.7.19) rev.11654
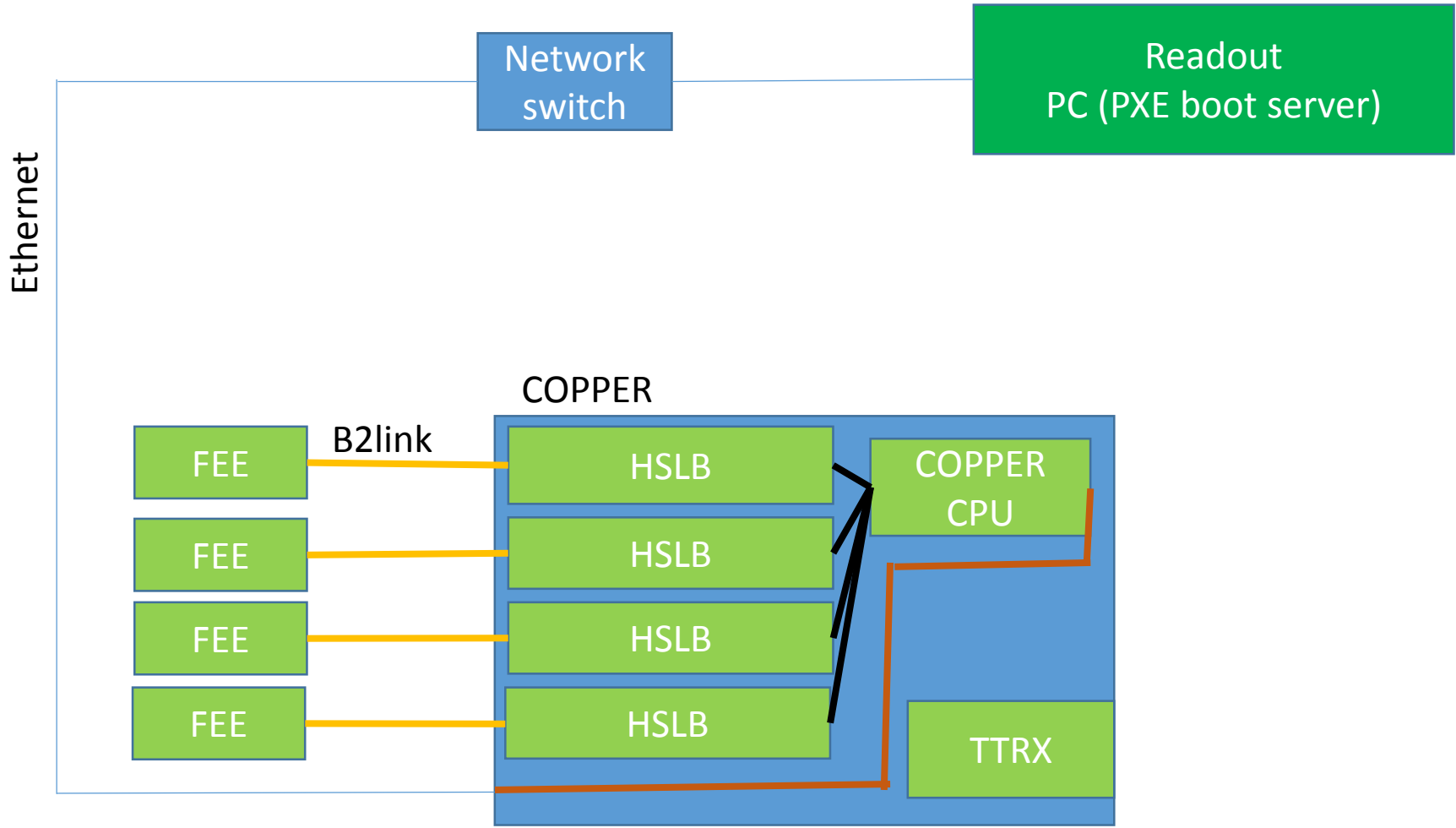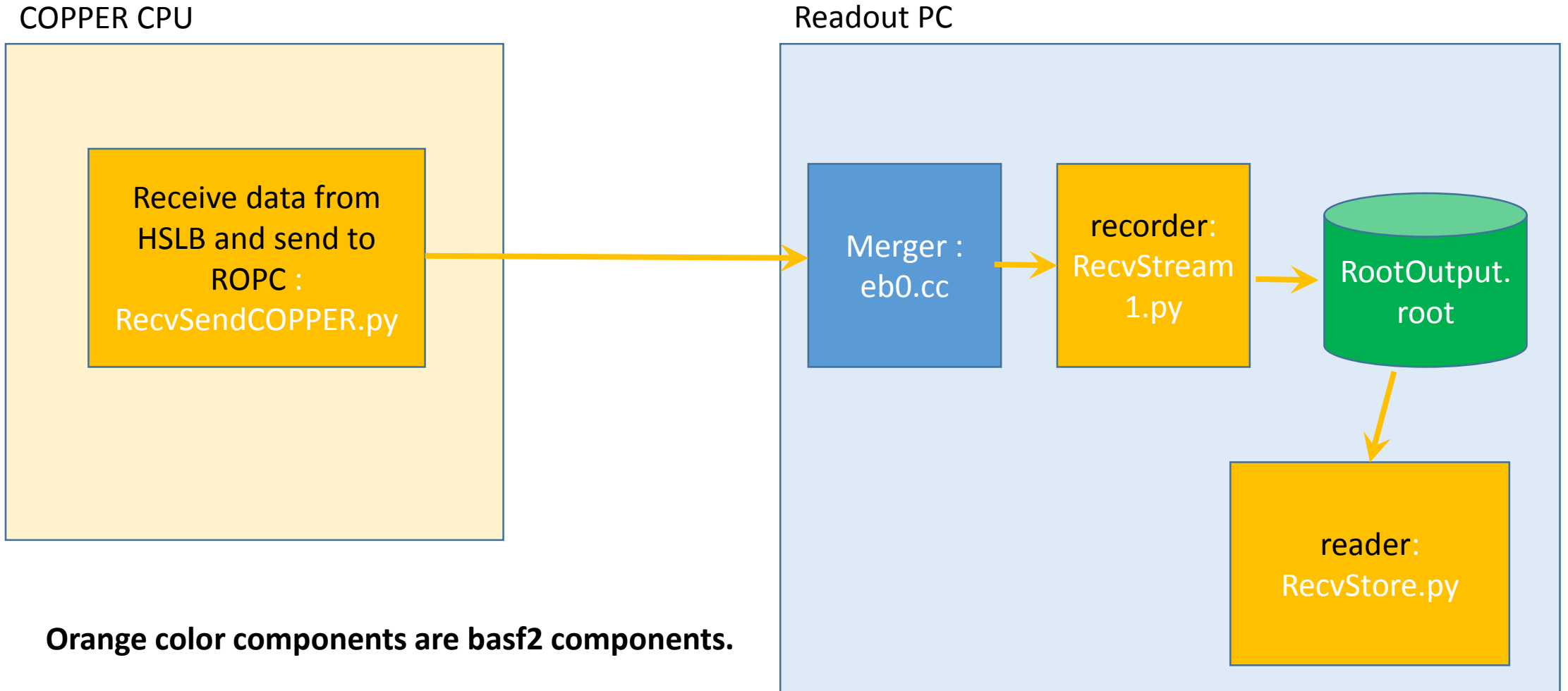
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Connection between components

Software components

These are stored under https://belle2.cc.kek.jp/svn/trunk/software/daq

COPPER CPU

Readout PC

Receive data from HSLB and send to ROPC : RecvSendCOPPER.py

Merger : eb0.cc

recorder: RecvStream 1.py

RootOutput. root

reader: RecvStore.py

Orange color components are basf2 components.

Pocket DAQ w/o slow controller and GUI

0. Before using pocket DAQ

- Setup a PXE boot server for COPPER CPU and install driver for COPPER etc
  - See https://belle2.cc.kek.jp/~twiki/bin/view/Detector/DAQ/PocketDAQ
- Install basf2 on both COPPER CPU and Readout PC
  - See https://belle2.cc.kek.jp/~twiki/bin/view/Software/SoftwareInstallation .
    "addpkg all" does no install the daq package. You need to do "addpkg daq".
  - Check daq/Sconscripts and check if env['CONTINUE'] = False is commented out.
  - Compile with scons.
- Compile eventbuilder
  - cd ${BELLE2_LOCAL_DIR}/daq/eventbuilder/evb0/ ; gmake eb0

Install GLEW for running basf2 program

After external ver.0.5.0?, basf2 requires GLEW(The OpenGL Extension Wrangler Library).

The following procedure worked fine.

1, install the yum epel repository.

ropc01$ wget http://ftp-srv2.kddilabs.jp/Linux/distributions/fedora/epel/5/i386/epel-release-5-4.noarch.rpm

ropc01$ ssh cpr** -lroot

cpr**# rpm -ivh epel-release-5-4.noarch.rpm

cpr**# ls -lrt /etc/yum.repos.d/

cpr**# exit

2, install glew on COPPER

ropc01$ sudo yum install glew --installroot=/tftpboot/copper/root

1, Set parameters(1)

[ROPC] % cd ${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts

[ROPC] % emacs run_start.sh

Set arguments of start_copper.sh
Usage : start_copper.sh **<HOSTNAME> <COPPER node ID> <FINNESSE bit flag: A=1, B=2, C=4, D=8> <Use network shared memory : Yes=1, No=0> <node name>**
e.g.)
/usr/bin/xterm -fn 7x14 -geometry 102x10+0+642 -e ${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts/start_copper.sh cpr006 1 1 0 0&
/usr/bin/xterm -fn 7x14 -geometry 102x10+750+642 -e ${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts/start_copper.sh cpr007 2 3 0 0&

<COPPER node ID> will be attached to RawCOPPER header.

1, Set parameters(2)

NOTICE : Environment variables for basf2

In ${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts/copper.sh, a line, "source ~/.bash_profile", is for setting up basf2 environment. You need to add basf2 setting commands in your .bash_profile (or other script file).

Please see "Setup of Software Tools" at https://belle2.cc.kek.jp/~twiki/bin/view/Software/SoftwareInstallation **for details.**

[${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts/copper.sh]
#
setup basf2 environment (See "Setup of Software Tools" at
https://belle2.cc.kek.jp/~twiki/bin/view/Computing/SoftwareInstallation
#
source ~/.bash_profile

1, Set parameters(3)

Specify whether communication with GUI via shared memory will be used or not :

1, Edit ${BELLE2_LOCAL_DIR}/daq/rawdata/examples/RecvStream1.py

If you use GUI, set 'UseShmFlag' = 1
receiver.param('UseShmFlag', 1)
If you don't use GUI set 'UseShmFlag' = 0
receiver.param('UseShmFlag', 0)

2, Edit ${BELLE2_LOCAL_DIR}/daq/rawdata/examples/RecvStream1.py

If you use GUI, set 'UseShmFlag' = 1
receiver.param('UseShmFlag', 1)
If you don't use GUI set 'UseShmFlag' = 0
receiver.param('UseShmFlag', 0)

2, Setting of merger (eb0) (1)

1, compile
$ cd ${BELLE2_LOCAL_DIR}/daq/eventbuilder/evb0
$ make

2, edit eb0.sh

cd /home/usr/b2daq/eb # change to cd "your local BelleII directroy"/daq/eventbuilder/evb0/eb-xinetd

(e.g. cd /home/usr/yamada/basf2/release/daq/eventbuilder/evb0/eb-xinetd)

If you wan to read data from COPPERs with hostnames of cpr010, cpr011 and cpr012, use the following
./eb0 cpr010:33000 cpr011:33000 cpr012:33000

2, Setting of merger (eb0) (2)

3, edit eb0's part in ${BELLE2_LOCAL_DIR}/daq/eventbuilder/evb0/eb-xinted

Modify user and server.

```
service eb0
{        bind = 127.0.0.1
         socket_type = stream
         type = UNLISTED
         port = 5101
         wait = no
         user = g0cdc  # Change to your user name (e.g. yamagata)
         server = /home/usr/b2daq/eb/eb0.sh
         #  change to "your Belle2 local directory"/daq/eventbuilder/evb0/eb0.sh
         #                              (e.g. /home/usr/yamagata/basf2/release/daq/eventbuilder/evb0/eb0.sh)
}
```

You need to change the other services in eb-xinetd (eb1tx, eb1rx, eb2tx, eb2rx ….) in the same way.

2, Setting of merger (eb0) (3)

4, Set link to eb-xinetd
cd /etc/xinetd.d/
ln –s ${BELLE2_LOCAL_DIR}/daq/eventbuilder/evb0/eb-xinetd eb-xinetd
/sbin/service xinetd restart

The eb0 daemon will be automatically invoked when a basf2 program on a readout PC connects to a port specified in eb-xinted.

3, How to start DAQ

[ROPC] % cd ${BELLE2_LOCAL_DIR}/release/daq/copper/daq_scripts

[ROPC] % ./run_start.sh

4, How to stop DAQ

- No stop button for now (If you use GUI, you have.)
- You need to specify max # of events or time to stop the run on a basf2 python file.

ROPC % cd ${BELLE2_LOCAL_DIR}/daq/rawdata/examples
Edit RecvStream1.py

You can set following paramters to stop a run.
receiver.param('MaxTime', 300.)
receiver.param('MaxEventNum', 30.)

-1 means inifinite.

5. Read an output file and extract FEE buffer

- Output file name
  - ${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts/root_output.root
  - You can change the filename by editing ${BELLE2_LOCAL_DIR}/daq/rawdata/examples/RecvStream1.py
- Read the root file
  - Please see dataformat and unpacker manuals.
  - Data format
    - https://belle2.cc.kek.jp/svn/trunk/software/daq/copper/doc/SetupPocketDAQ_4p1_RawCOPPERDataHandling.pdf
  - Unpacker
    - https://belle2.cc.kek.jp/svn/trunk/software/daq/copper/doc/SetupPocketDAQ_4p5_RawDataUnpackerPacker.pdf

End

Revision history

- 2013/10/16
  - Change explanation about option of run_start.sh script
- 2014/7/15 (rev. 11619)
  - To specify FINESSE bit field, you need to use decimal value (not hexadecimal).
  - Add an argument of RecvSenDCOPPER.py
  - Update eb0 related issues.
    - About eb0.sh
    - About eb0-xinted
- 2014/7/16(rev. 11654)
  - eb0.sh and eb-xinetd need more modification
- 2014/7/19
  - Add a comment about "addpkg daq"

Test bench at Tsukuba B3