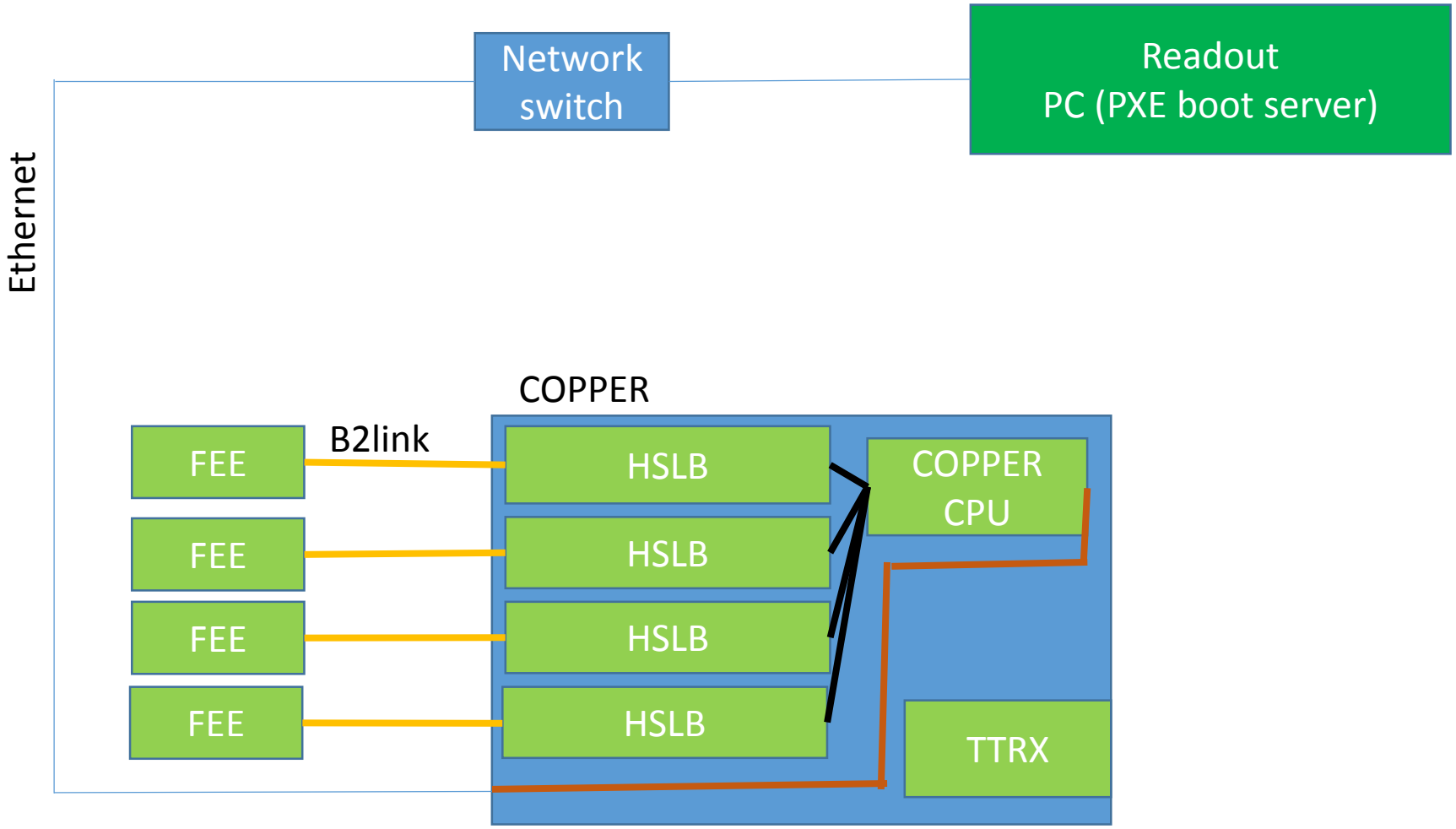
Pocket DAQ manual (2013.09.27)

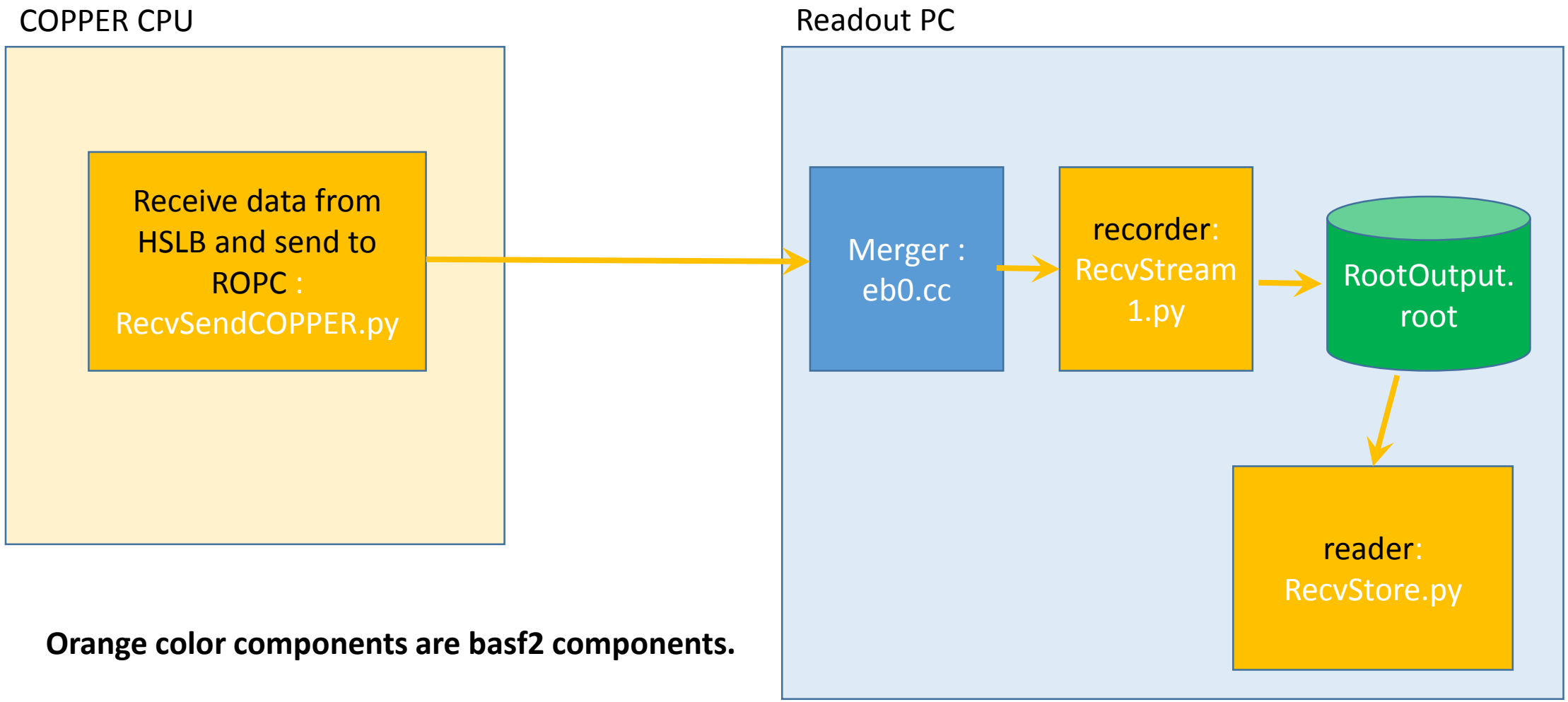
Satoru Yamada

Connection between components



Software components

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



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/Computing/SoftwareInstallation
- For a release/daq directory, checkout the latest revision.
  - 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

0.5 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=0x1, B=0x2, C=0x4, D=0x8>**

/usr/bin/xterm -fn 7x14 -geometry 102x10+0+642 -e ${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts/start_copper.sh cpr006 1 1&
/usr/bin/xterm -fn 7x14 -geometry 102x10+750+642 -e ${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts/start_copper.sh cpr007 2 3 &

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

[ROPC] % emacs start_eb0.sh

Set arguments of start_eb0
Usage : eb0 –n **<# of COPPERs> <COPPER HOSTNAME1> <COPPER HOSTNAME2> … <COPPER hostname n>**
-b(send data to downstream basf2) –D(not send data to HLT)
/usr/bin/xterm -fn 7x14 -geometry 102x10+0+342 -e ${BELLE2_LOCAL_DIR}/daq/eventbuilder/evb0/eb0 -n 2 cpr006 cpr007 -b -D

0.5 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/Computing/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

0.5 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)

1, How to start DAQ

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

[ROPC] % ./run_start.sh

2, 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.)

3. 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
  - [ROPC] % cd ${BELLE2_LOCAL_DIR}/daq/copper/daq_scripts
  - [ROPC]% ./ReadStore.sh root_output.root
  - Modify ${BELLE2_LOCAL_DIR}/ daq/rawdata/modules/src/PrintData.cc as you like.

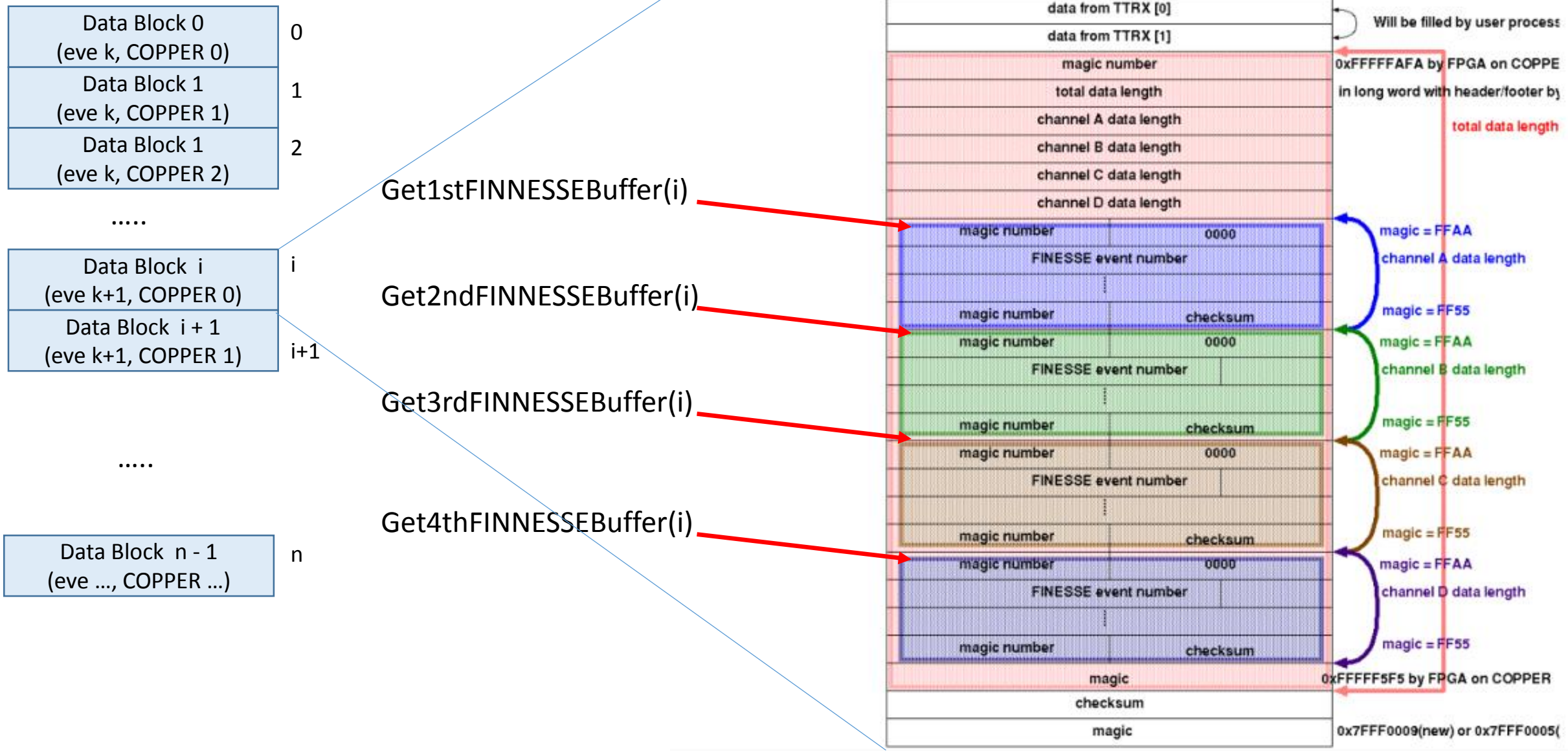
You can obtain a pointer to FEE data like this in event() function of PrintData.cc.

```
int* finnesse_buf_1st;
…
int* finnesse_buf_4th;

 finnesse_buf_1st = rawcprarray[ j ]->Get1stFINNESSEBuffer(i);
  …
 finnesse_buf_4th = rawcprarray[ j ]->Get4thFINNESSEBuffer(i);
```

See next page

Structure of
RawCOPPER's buffer



End

Test bench at Tsukuba B3