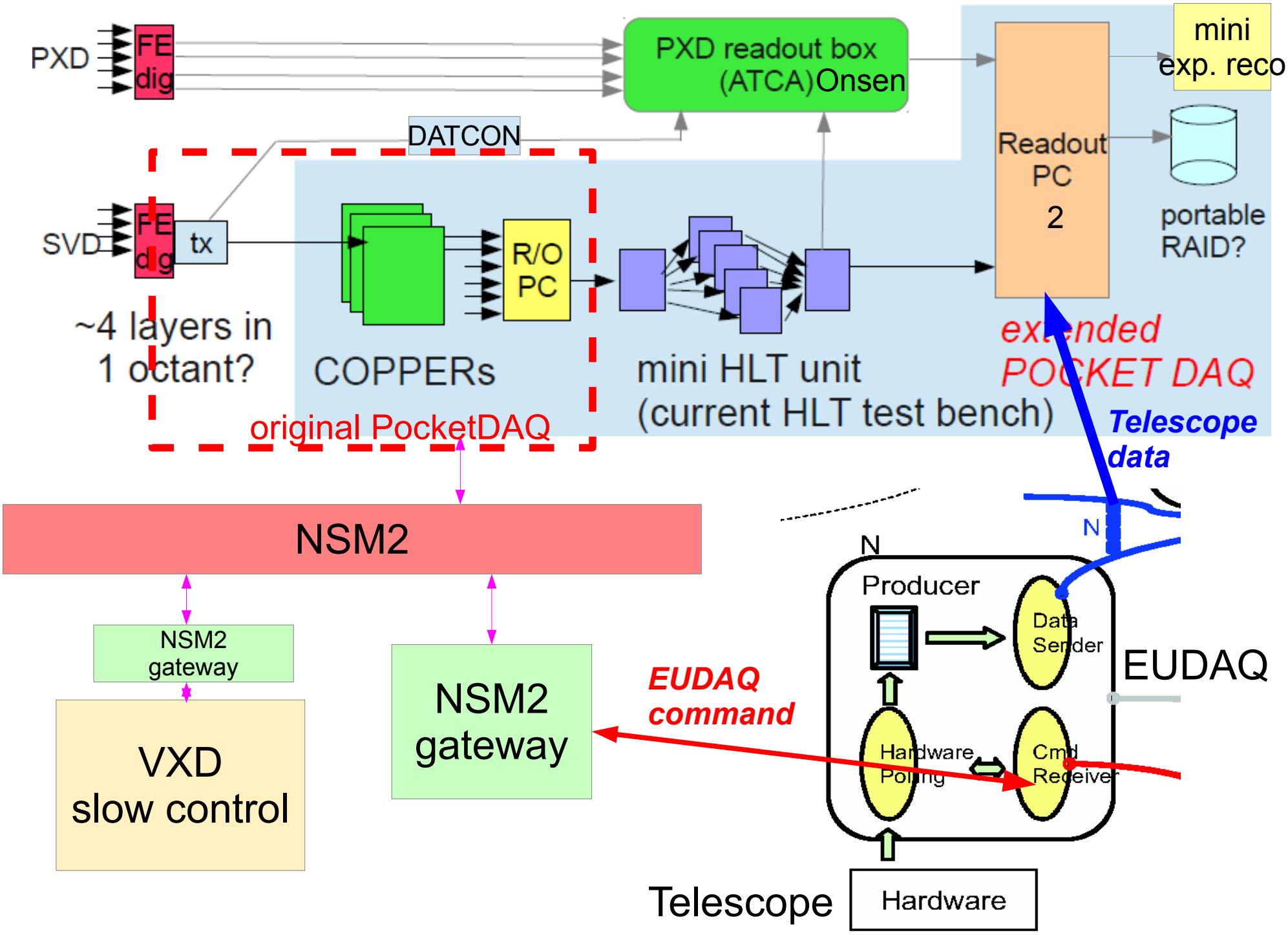
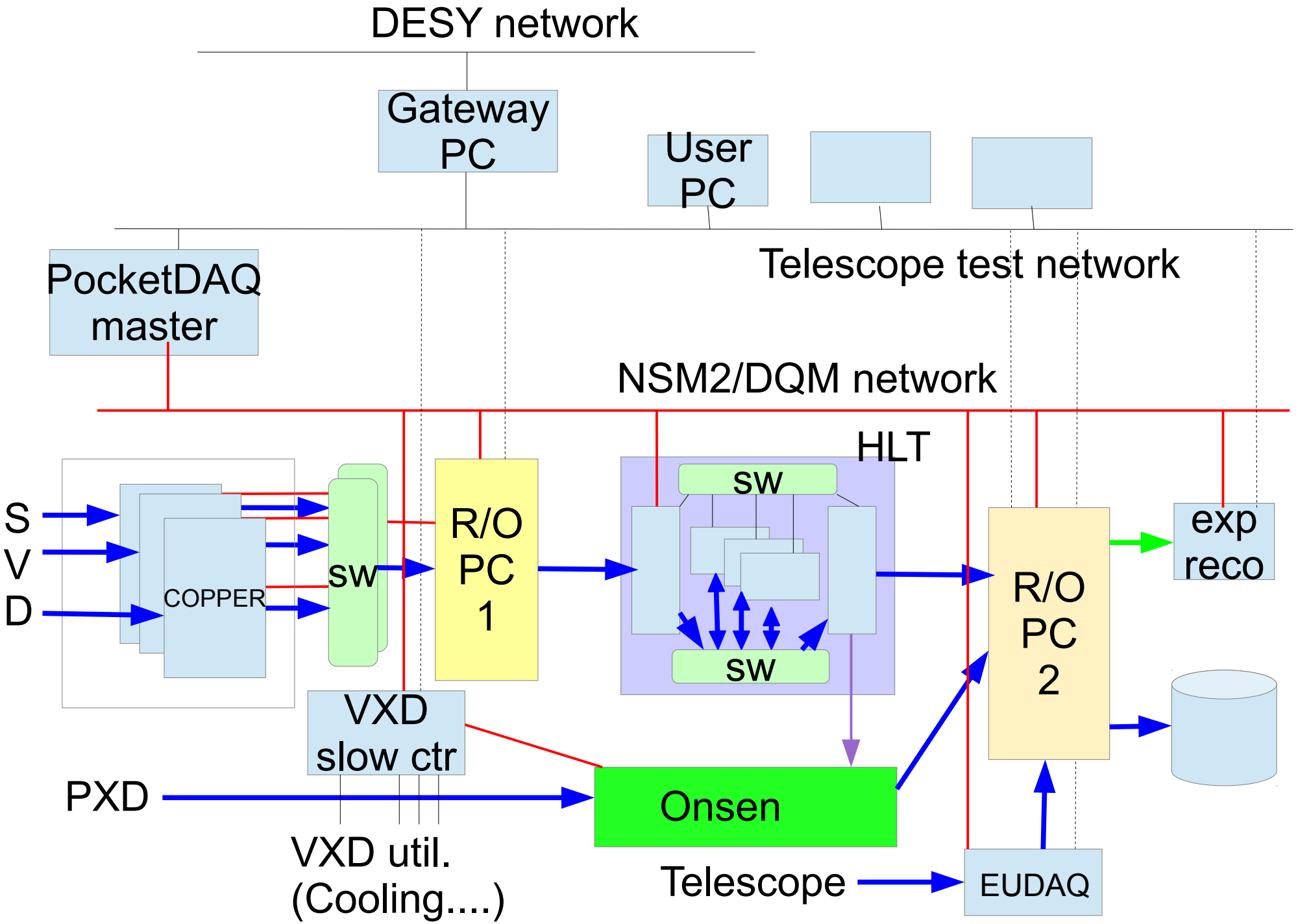
Issues to be discussed on DAQ for telescope test (recompiled from list assigned to me by Higuchi-san)

R.Itoh, KEK

1. Gereral layout of VXD-DAQ for telescope test
   * How to migrate EUDAQ (for Mimosa) in Pocket DAQ?
     - Data flow from Mimosa (and other beamline detectors)
     - Slow control
   * Network topology
2. Prospect for Pocket DAQ
3. DQM implementation
   * DQM for SVD (PocketDAQ)
   * DQM for Onsen
   * DQM at mini-express reco
4. HLT
5. Procurement of PC equipments for test
6. Dry-run test bench
   * At DESY
   * At KEK

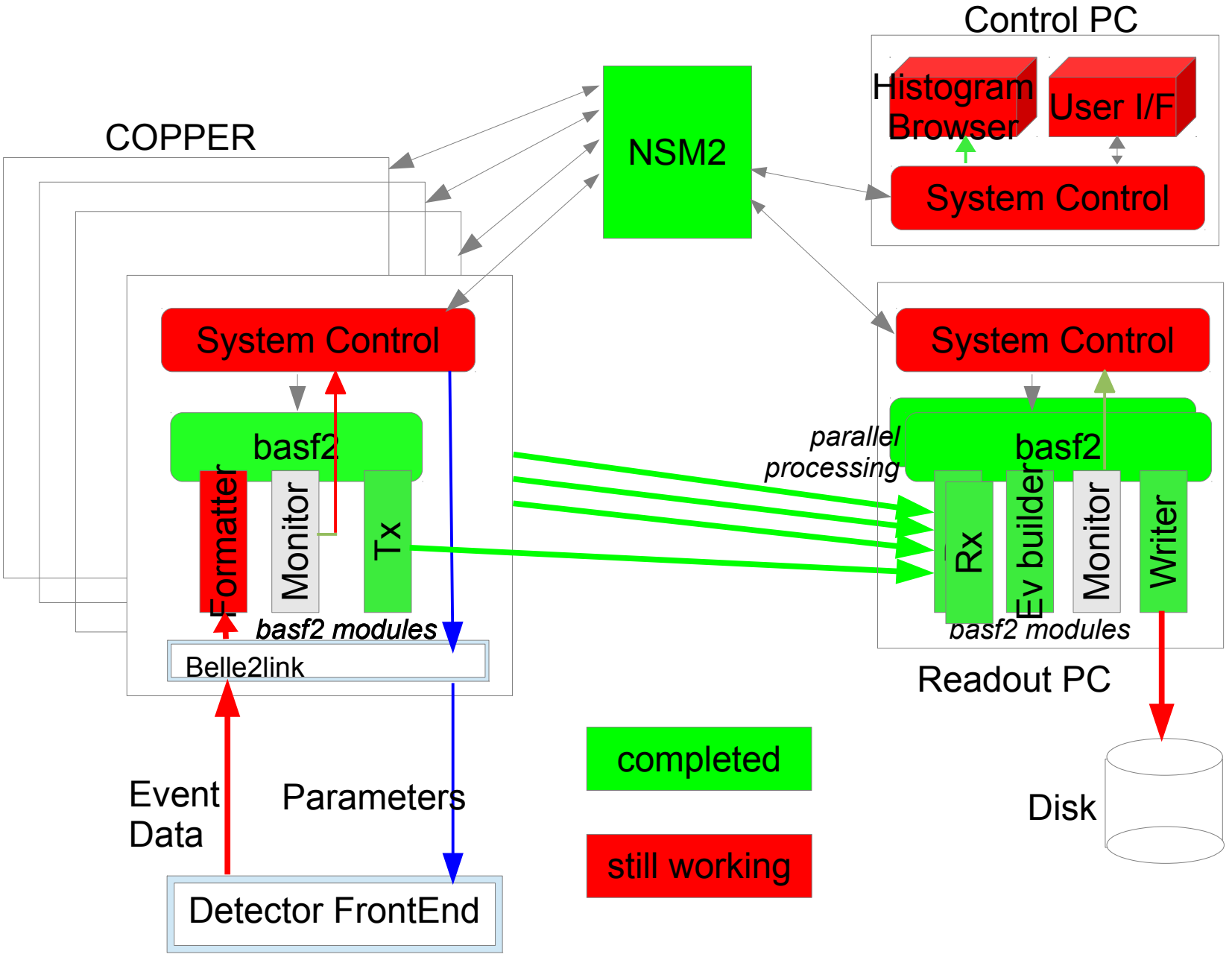

PXD
FE dig
PXD readout box (ATCA)Onsen
mini exp. reco
DATCON
Readout PC 2
portable RAID?
SVD
FE dig
tx
R/O PC
~4 layers in 1 octant?
COPPERs
mini HLT unit (current HLT test bench)
extended POCKET DAQ
original PocketDAQ
Telescope data
NSM2
N
N
Producer
Data Sender
EUDAQ
NSM2 gateway
EUDAQ command
Hardware Polling
Cmd Receiver
VXD slow control
NSM2 gateway
Telescope
Hardware

Network Topology



2. Prospect for PocketDAQ

- Remaining works : mostly software



- Got new man power !
  Yamada-san (KEK) : Data Flow
  Kon'no-san (TMU) : Slow control, DQM

- Target date of POCKET DAQ completion
  * POCKET DAQ is supposed to be used in CDC beam test with their new (final) R/O cards scheduled in Sep.
  * All the system is supposed to work by the time.

- Remaining issues:
  * HLT
  * 2nd level event building at Readout PC 2
  * Migration of EUDAQ

4. HLT

- Development of HLT framework is basically completed (data flow) and its performance is being tested.

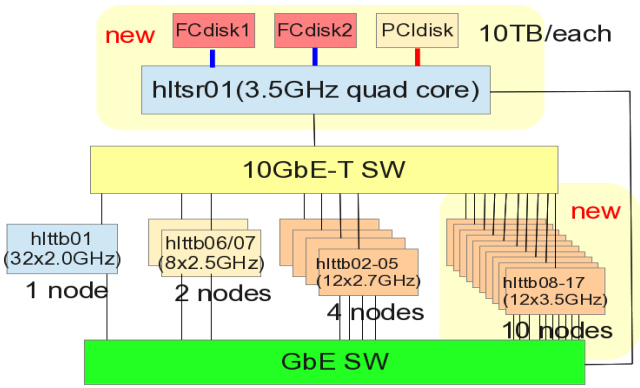
- Remaining work : slow control: interface to NSM2
  -> will be implemented targeting the telescope test

- How about the status of SVD-only tracking+RoI generation software?
  -> When can we test the prototype software?
  -> In test bench, it is possible to generate simulated raw data of SVD on COPPER CPU which really simulates track hits.
    -> tracking software can be tested on dry-run test bench.

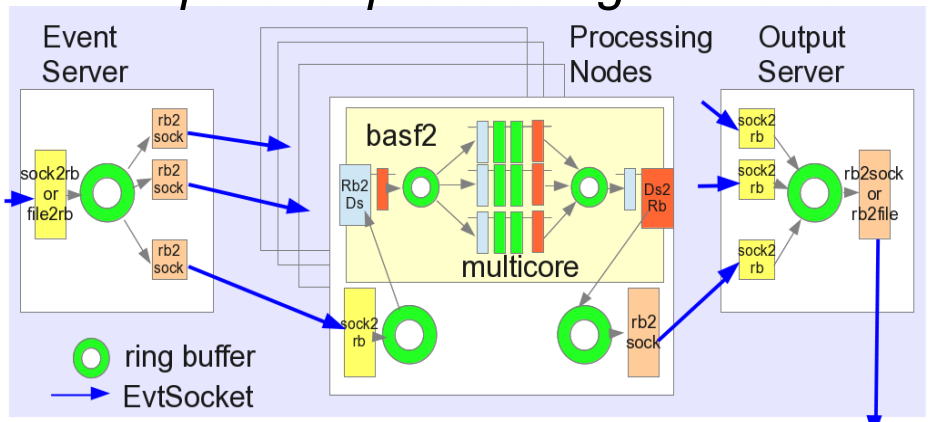
HLT status : 2 HLT prototype frameworks by S.Lee(Korea) [baseline] and by R.Itoh(KEK) [backup]

[Backup framework by Itoh]

New HLT test bench

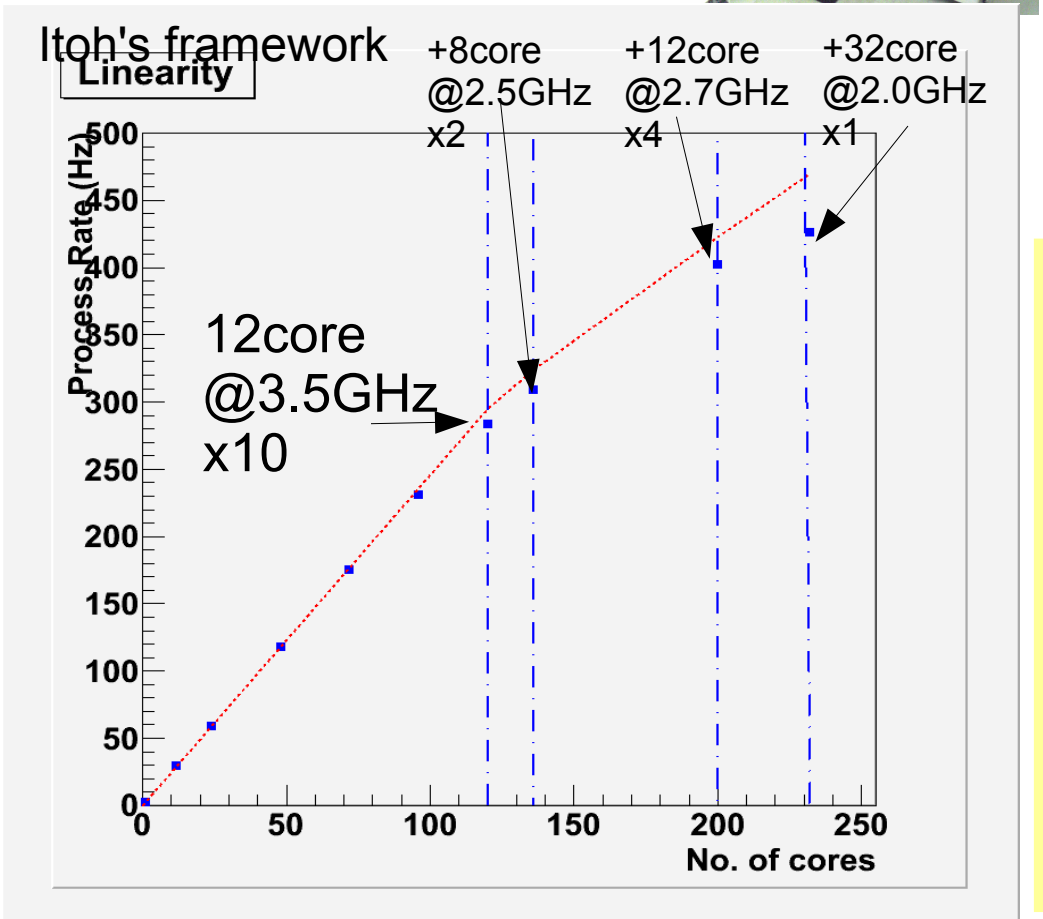


HLT parallel processing framework



Benchmark : Belle2 reco. (tracking only)
input:500kB/ev, output:700kB/ev

Expected linear performance increase



* Linearity is kept for >200 cores.

* Some deterioration observed for a higher number of cores

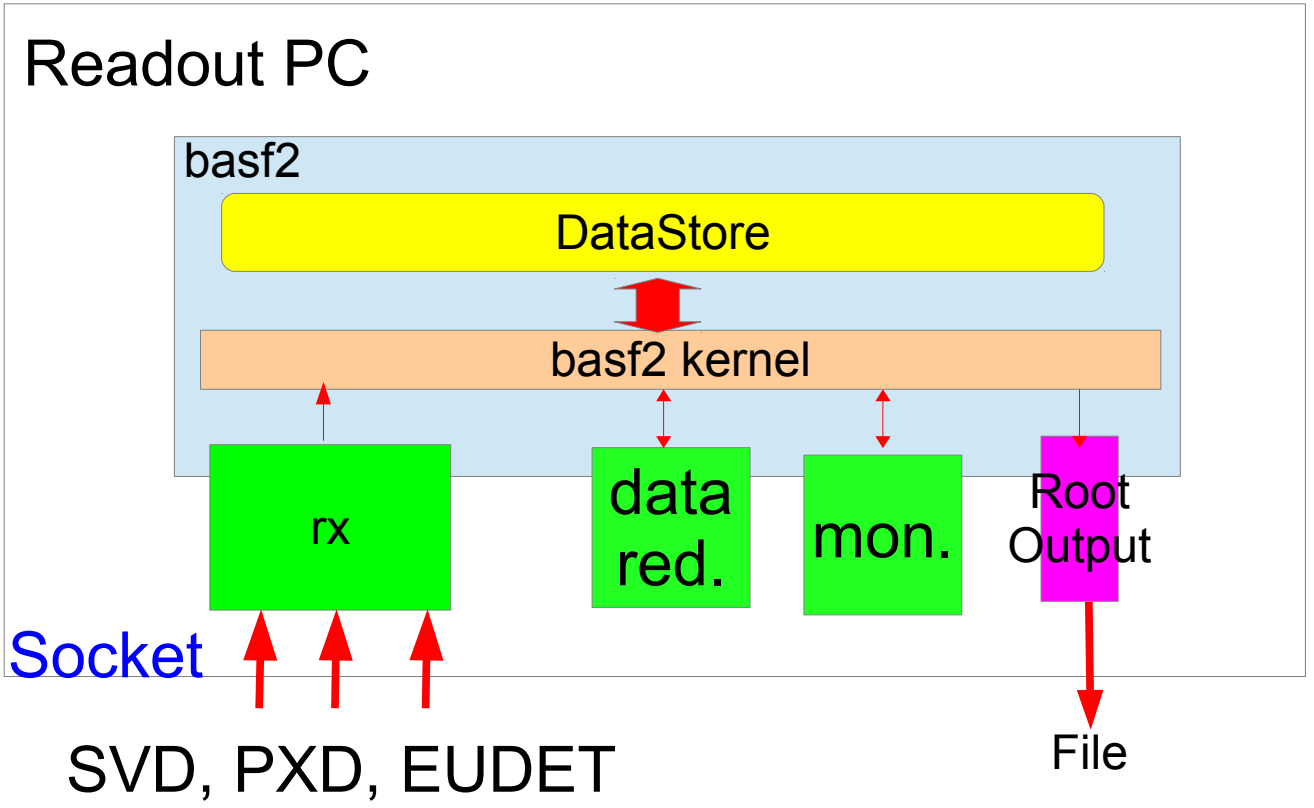
* I/O bandwidth is reaching at maximum.
(Total input/output rate is already reaching at >600MB/sec (=200MB/s:in + 400MB/sec:out) which is close to 10GbE max. BW).
-> Further study with new framework

2nd level event building

- Basically implemented by recycling the event building framework used in Readout PC 1 (Pocket DAQ)

- Treatment of disordered event sequence should be tested.

- Development using dry-run test bench at KEK by summer.



EUDET(EUDAQ) migration

- Software package is available through web.

- Nakao-san already installed the package and he told me that “test producre” is included in the package, which can generate some events.

- I will try to write a “receiver” module for basf2 to get the data over socket and encapsulate it in ROOT object.
  -> in a month or so.