

Summary on discussion in May 23 for J-PARC contribution

Hiroyuki Sako

ASRC/JAEA

24 May 2016

Main objectives (personal view)



- ▶ How we can contribute to O² in the next 5 years (2016 - 2020) before Run-3 starts?
 - Coherence
 - How we contribute strongly and efficiently
 - New collaboration related to the future projects in Japan
 - ALICE, GSI-FAIR, J-PARC

Current activities on operation/ upgrade (1)



CNS-Tokyo:

- GEM-TPC
 - Building X-ray and test systems for the full evaluation (GEM-SAMPA-CRU-GPU)
 - Learning GPU and FairMQ for TPC online tracking / distortion correction / vertexing
- TPC-RCU2
 - embedding Linux, bootstrap applications, remote firmware upgrade, detector control system

Univ. of Tsukuba:

- EMCal/DCal (L1 jet/gamma FW development, monitoring, calibration)
- FoCal upgrade
- ALICE Grid Tire 2 center in Tsukuba (under construction)

Current activities on operation/ upgrade (2)



Hiroshima U.:

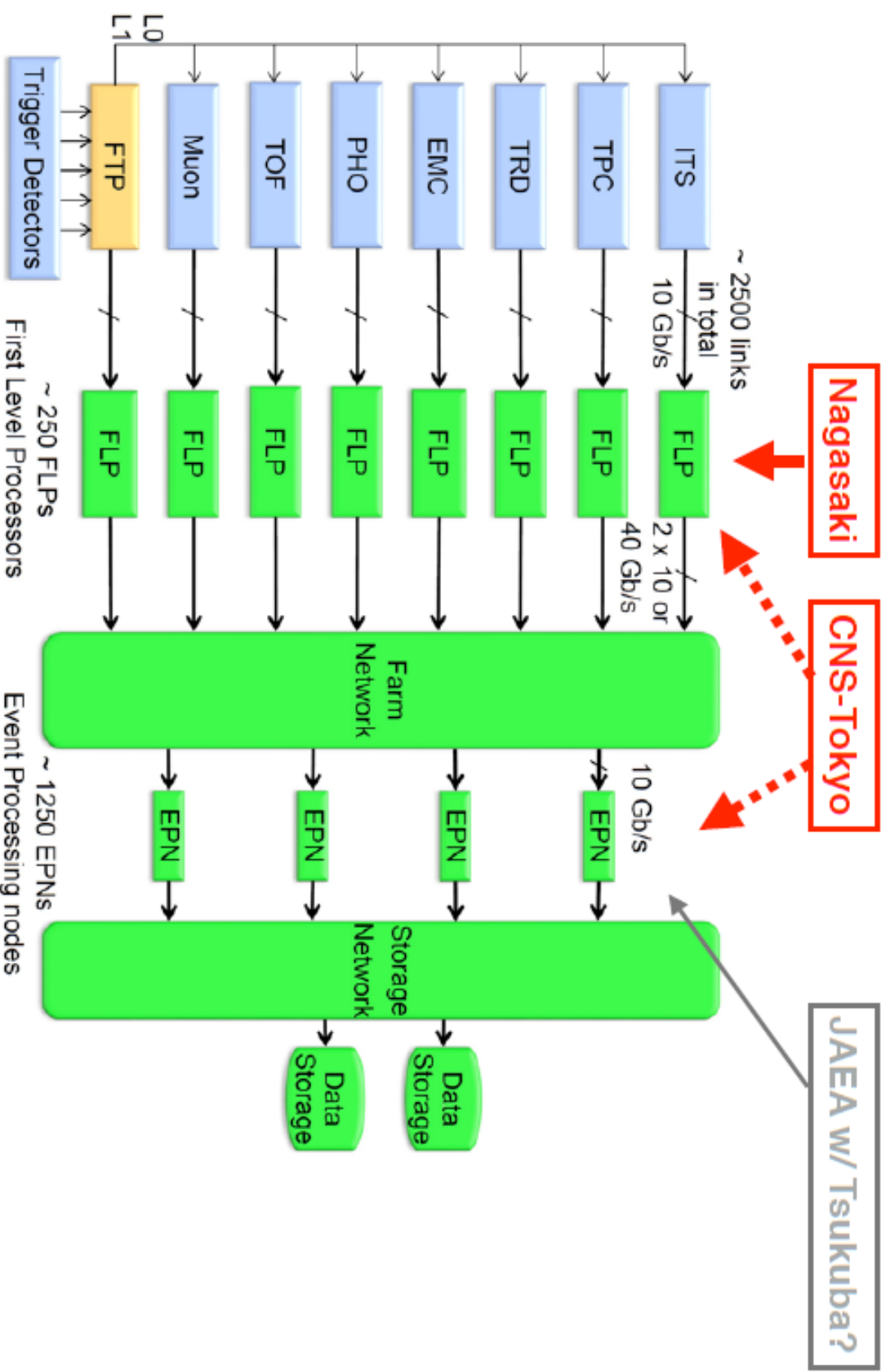
- PHOS (operation and calibration)
- ALICE Grid Tire 2 center in Hiroshima
- Muon Forward Tracker (MFT) upgrade (DCS, ALPIDE chip characterization)
- (FoCal, integration part)

Nagasaki Institute of Applied Science (NISA):

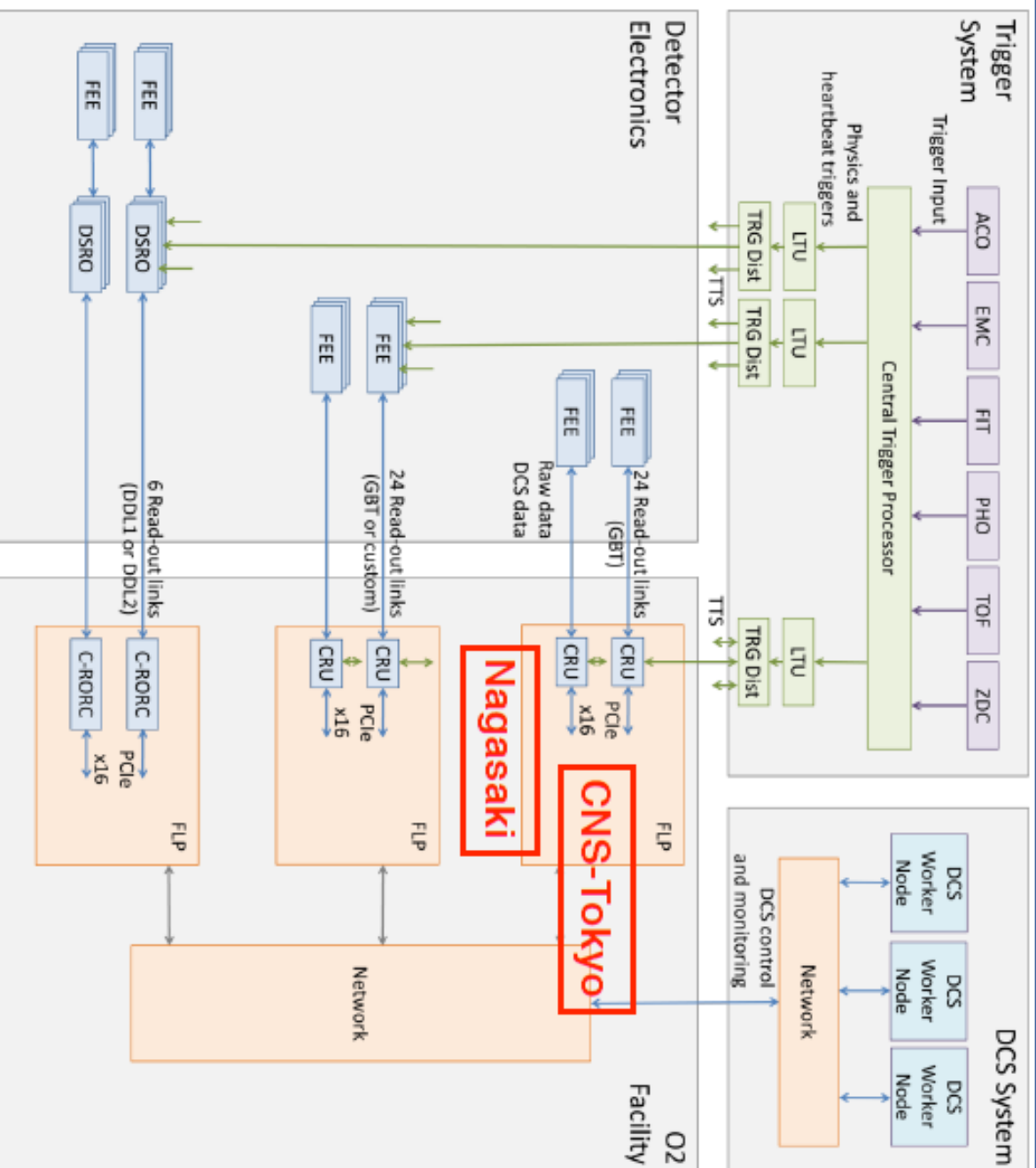
- TPC-CRU R&D (general coordinator)
- (FoCal, readout part)



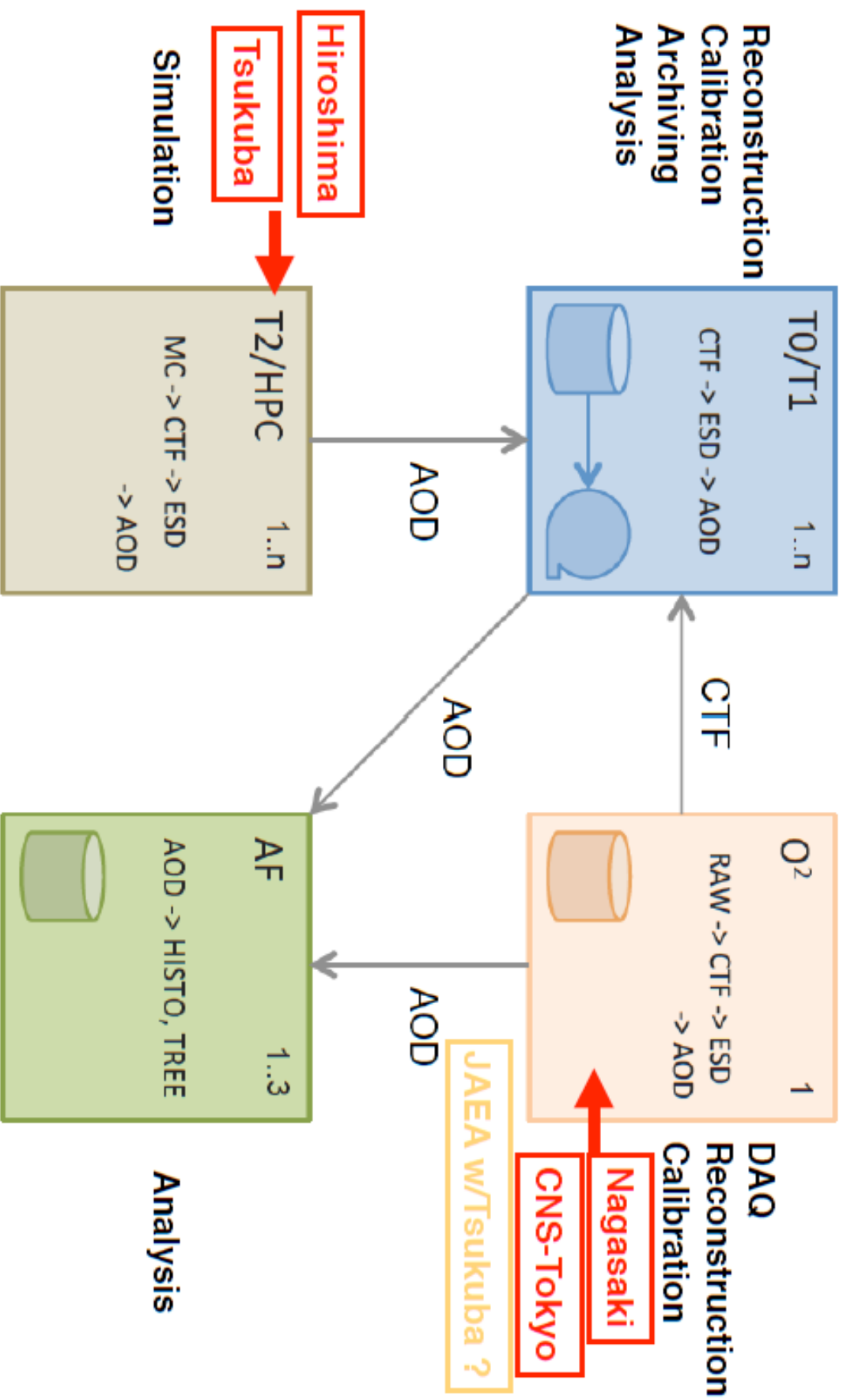
The ALICE O² Hardware Architecture



Detector read-out; O² interfaces



Roles of Tiers in Run-3



Ongoing and possible contributions to O²



CNS-Tokyo:

- Online calibration or tracking by GPU
- Distribution middleware (FairMQ, nanomsg, etc)

Univ. of Tsukuba:

- ALICE T1re 2 center in Tsukuba w/ SINET-5
- Possible contribution to data compression part (EPN) in O² with JAEA (one master student)
- possibility to use HPC in Tsukuba U. CC?

Hiroshima Univ.:

- ALICE T1re 2 center in Hiroshima w/ SINET-5

Nagasaki Institute of Applied Science (NISA):

- CRU in O²

Time scale

ALICE Run2 2015-2018

Long shutdown 2019-2020

ALICE Run 3 2021-2023

E16: Physics run starts in the end of 2018

E50 may start in 2021

J-PARC-HI 2024 or later

Good timing scale between ALICE and J-PARC

We recognize again importance of O2 system for J-PARC E50 and J-PARC-HI.

Man Power (most serious issue)

- A master student at Univ of Tsukuba may work for ALICE under supervision of Sako and Chujo.
- If we succeed to hire a new PD in JAEA starting in Apr 2017, he/she can contribute to O2 (online tracking). He/she should stay at CERN for several months to learn O2 in the beginning.
- Ma-san may contribute for a fraction of his working time.
- Gunji-san will visit soon CERN and get information on O2 online tracking and discuss how we can contribute to that.
- CNS U-tokyo and J-PARC may possibly collaborate for online tracking of TPC.
- Coherent works from ALICE-J and J-PARC are important! (Chujo)

Possible contribution for O2

- FPGA programming for online clustering in CRU
 - Technical harder
- GPU and CPU programming for online tracking in EPN
- Future AF
 - If J-PARC could construct an Analysis Facility and provides it for ALICE, J-PARC could use computer resources in ALICE. We should consider this possibility.

What else are we interested in?

- We should have experiences in O2 works for E50 and J-PARC-HI applications
- We consider to adopt related ALICE technologies to J-PARC
 - CRU, EPN
 - SAMPA
 - Design of DAQ and O2 system

Participation of J-PARC as ALICE associate member

Procedure

- MOU is not necessary to join ALICE as an associate member, but a LOI is enough.
- In the LOI, JAEA represents the group but other institution members should be included there.
- To join ALICE as an associate member, we have to attend July ALICE meeting. If we miss this chance, we have to wait until December 2016.
 - It should be decided today.
- How to proceed after joining ALICE?

LOI draft

Organization

Hiroyuki Sako(S), Susumu Sato(S), Hitoshi Sugimura(PD) (Advanced Science Research Center, JAEA)
Hiroyuki Noumi(S), Kotaro Shirotori(S), Ryotaro Honda(PD), Tomonori Takahashi(PD) (Osaka U.)
Kyoichiro Ozawa(S), Yoichi Igarashi(S) (J-PARC/KEK)
Yue Ma (S) (RIKEN)
(S:Staff member, PD:Postdoctral researcher)

Representative/Contact

Hiroyuki Sako (ASRC/JAEA)

Expected collaborative works

Software development for O2; for example, online clustering and tracking software. These works should be done as an associate collaboration of ALICE.

Terms

5 years starting in 2016, with possible 5-year extension until 2021?

Goals

We aim to apply O2 and DAQ technologies including the collaborative works in this LOI to the fast data acquisition systems for experiments with hadron beams at J-PARC (i.e. E16 and E50) and a future heavy-ion experiment at J-PARC.

Tentative schedule in 2016

Summer 2016: Agreement for collaboration?,

Fall-winter 2016: Start of real works?

Question

- ALICE is a collider experiment with a constant crossing frequency, while J-PARC is fixed target experiment with random collision timing. Can ALICE scheme be directly applied to J-PARC?

Backup