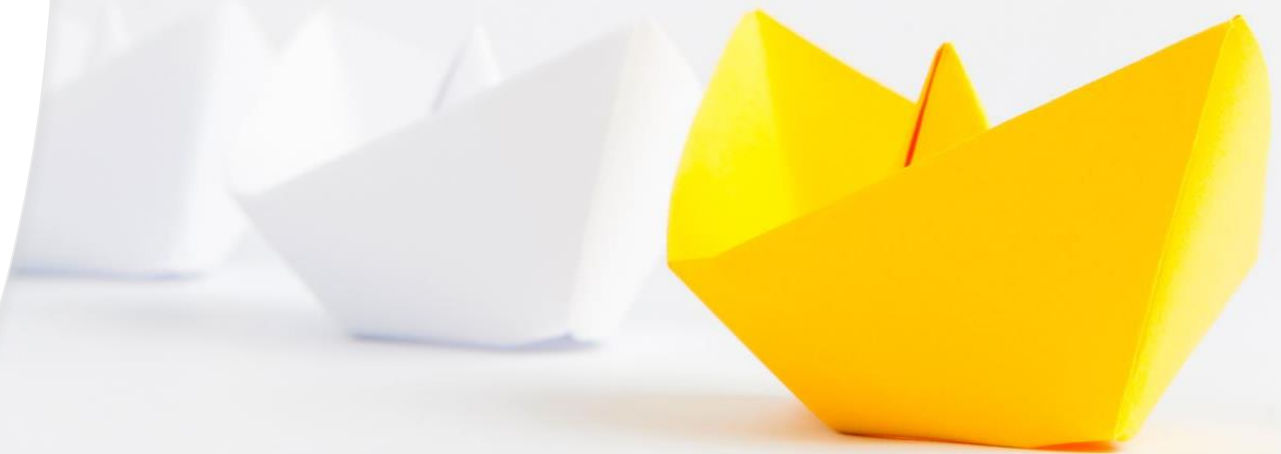# Short-term DAQ/SC development plan to support detector prototypes
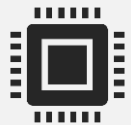
G. Lehmann Miotto CERN

Introduction

Focus on the short term plans up to the VD coldbox test

The VD ProtoDUNE II run is seen in the long-term plan context, since we would like to use the quasi-final DAQ and SC interfaces and components for it

Slow Control

Continuity with NP04/NP02

DAQ

Introduction of the new SW design,

Support for legacy electronics as needed,

Possibly ad-hoc solutions (e.g. timing)

Slow Control

Work kept to absolute minimum necessary

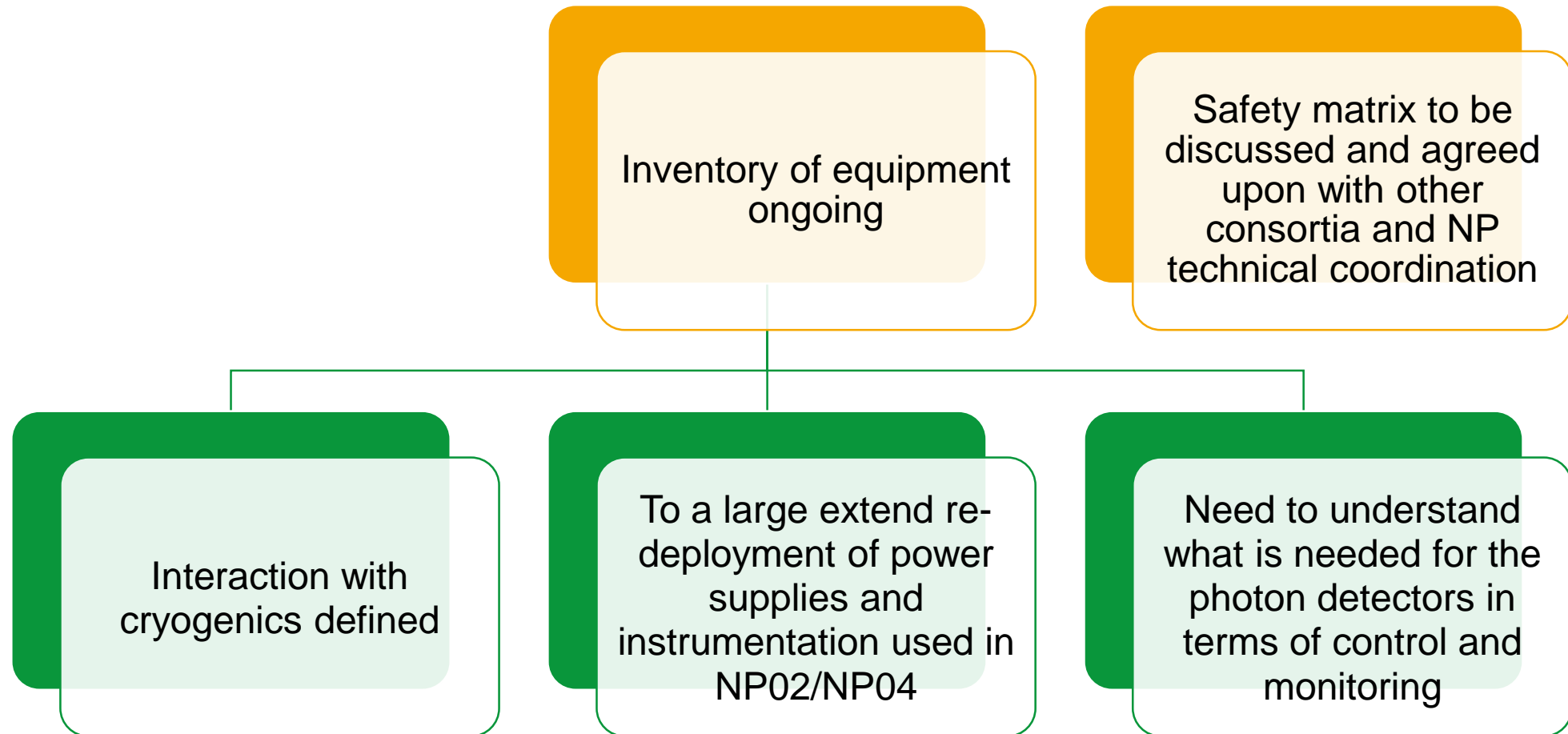- De facto very few people working part time on it

Relying on infrastructure designed and setup for NP02/NP04

- Same WinCC OA server, different project
- Data archiving to oracle
- Control and monitoring in control rooms and via cerntsice for experts
- Monitoring over web (if we find someone to work on this)

Coldbox on detector ground

- Transformer and impedence monitor from NP02
- SC racks installed close to the coldbox on an insulating support

Slow Control

Inventory of equipment ongoing

Safety matrix to be discussed and agreed upon with other consortia and NP technical coordination

Interaction with cryogenics defined

To a large extend re-deployment of power supplies and instrumentation used in NP02/NP04

Need to understand what is needed for the photon detectors in terms of control and monitoring

DAQ

- Development organised around release cycles
  - Dunedaq-v2.0.0 *ThanksGiving* (26 Nov 2020)
    - Basic application framework: queues, modules, logging, commands reception & execution
  - Dunedaq-v2.2.0 *MinidaqArising* (23 Jan 2021)
    - Single DAQ application implementing readout, trigger, event builder, data writer modules
  - Dunedaq-v2.4.0 *SleeplessNights* (22 Mar 2021)
    - Distributed DAQ applications supporting data flow functionality; FELIX support; first implementation of simple run control and operational monitoring
  - Dunedaq-v2.6.0 *ItsVaccinated* (4 June 2021)
    - Introduction of trigger logic, timing application and timestamping of external hardware signals; support for readout of WIB1, WIB2 and DAPHNE

DAQ Today
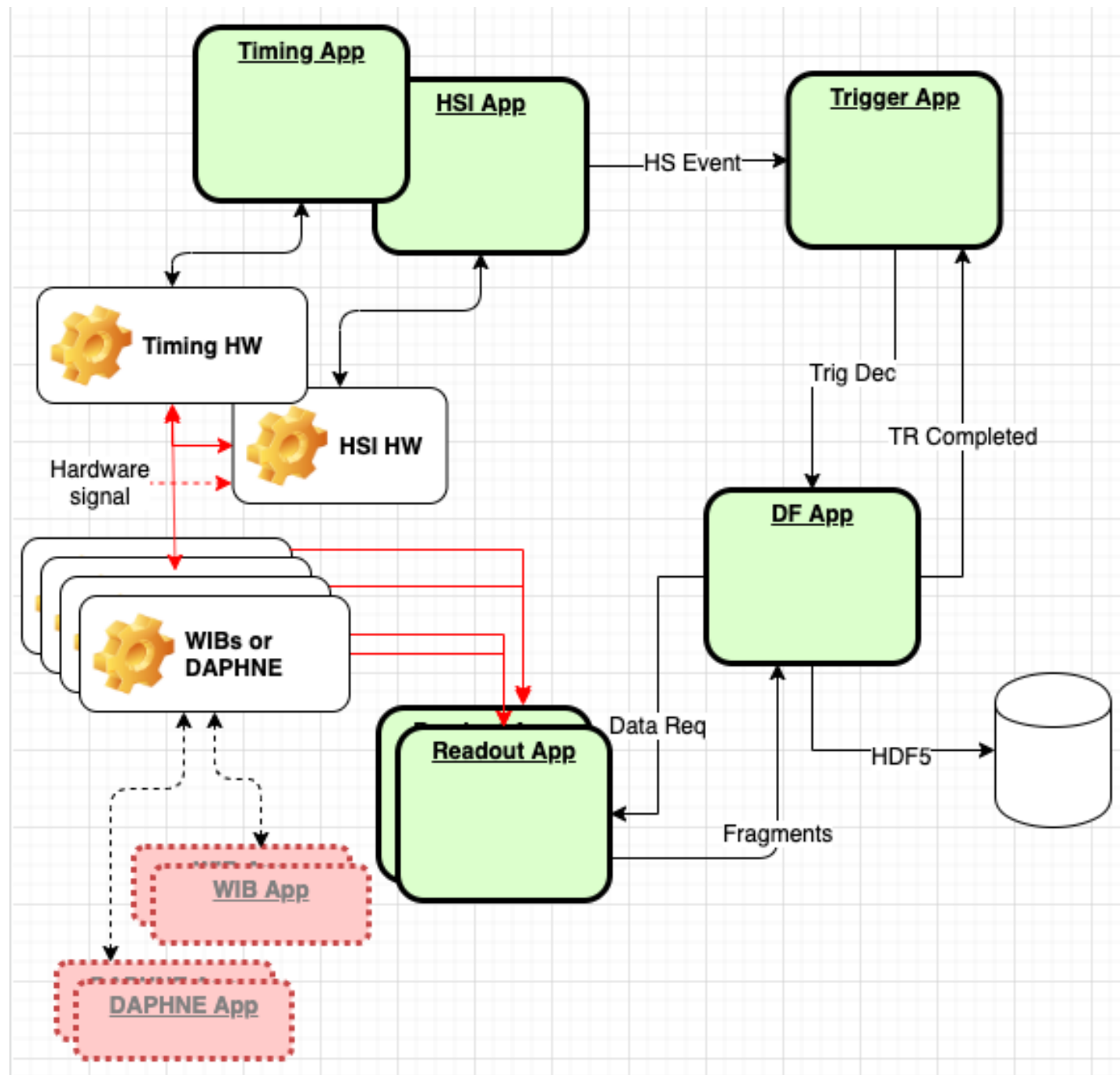
Dunedaq-v2.8.0

- Trigger primitives based data selection;
- Trigger primitives storage;
- First implementation of readout interface for ND;
- Data quality monitoring prototype.
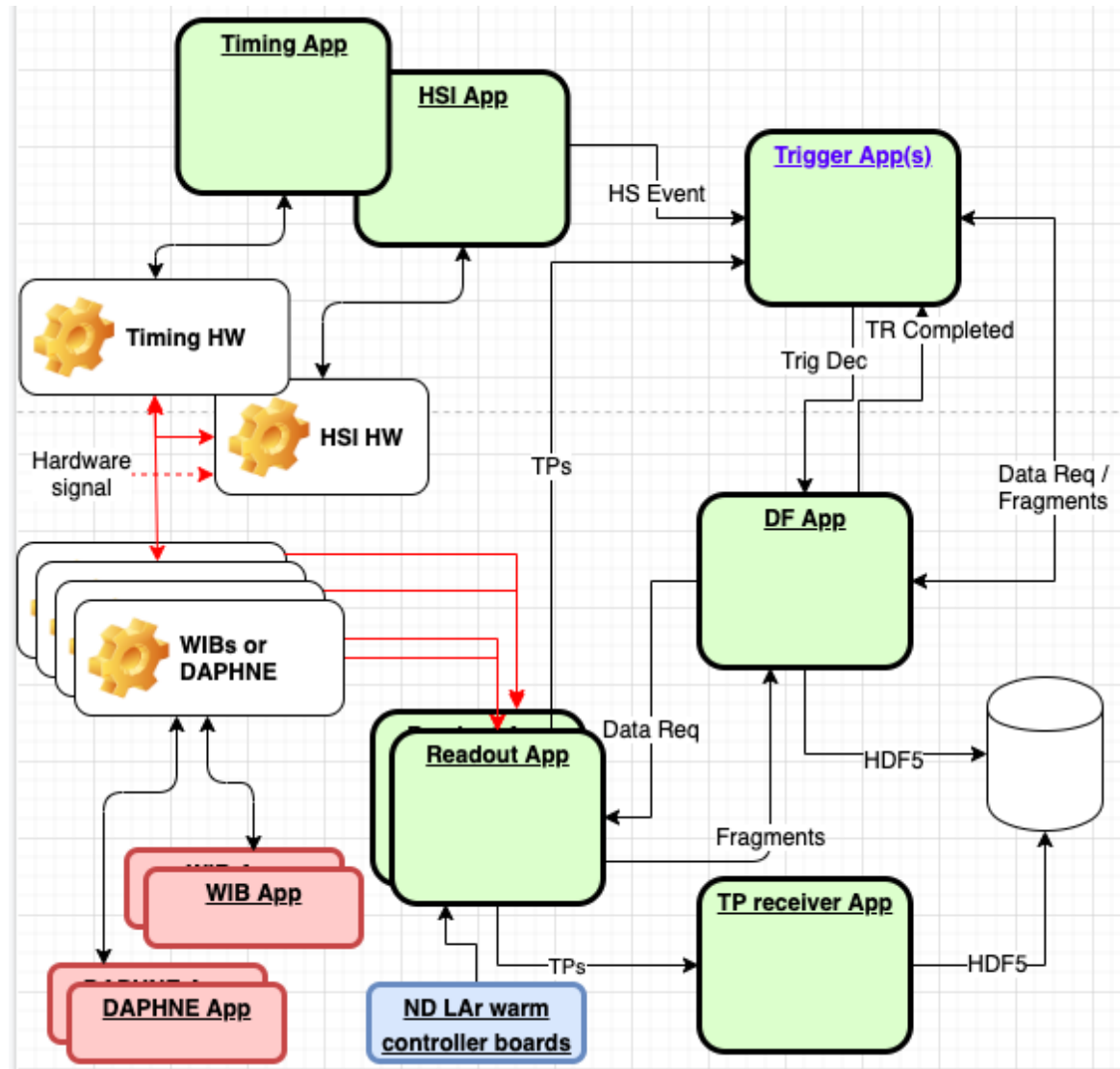
Supporting VD specific activities

- In order to support the VD developments there are two areas that require immediate work:
  - Ethernet based readout for the top electronics
  - Check of the compatibility of the two existing timing distribution systems and establishment of the mechanism for having a unique sample counter in all front-end systems, used by the DAQ to identify the data

Support for 40G Ethernet FE

- As a first implementation, usable for the coldbox, data will be received over 40/100G NICs
  - Use of standard NW stack or DPDK
  - No hit finding
  - Getting familiar with data formats, initialisation sequences, etc
- The longer term goal of implementing a system symmetric to the FELIX readout will be described later

Dunedaq-v2.10.0

- Multi-host event building;
- Support of ethernet readout for VD top electronics;
- Extended control, configuration, monitoring.
- What will the VD PDS electronics interface look like?
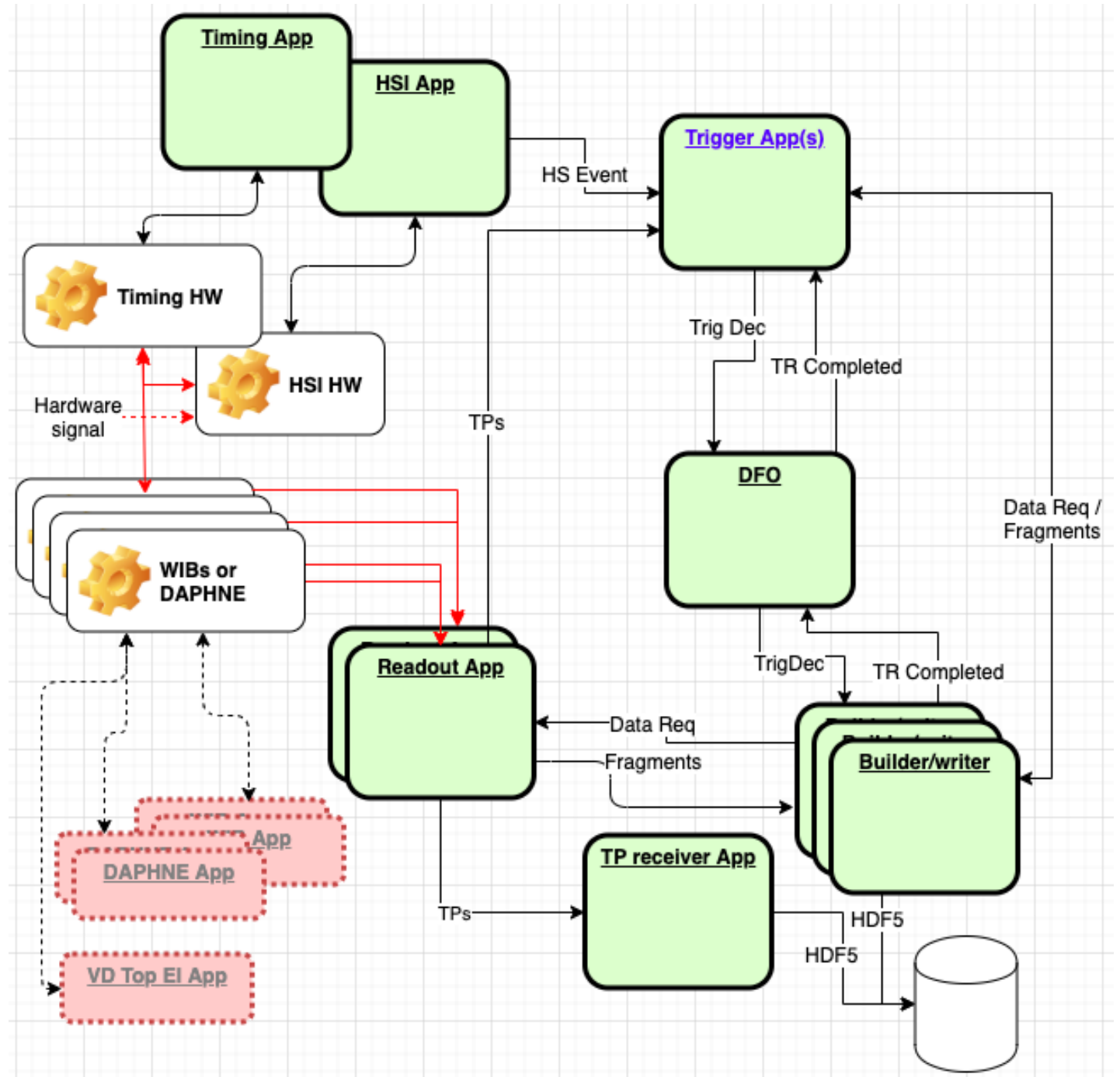
Timing compatibility – Test 0

- The experts consider that the two timing distribution systems can inter-operate without problems (more details in next talk)

- A first test setup will be prepared to start validating the relative stablity of the two systems and measure the differences in the timestamps produced by the two systems