The Ethernet readout of the DUNE DAQ system

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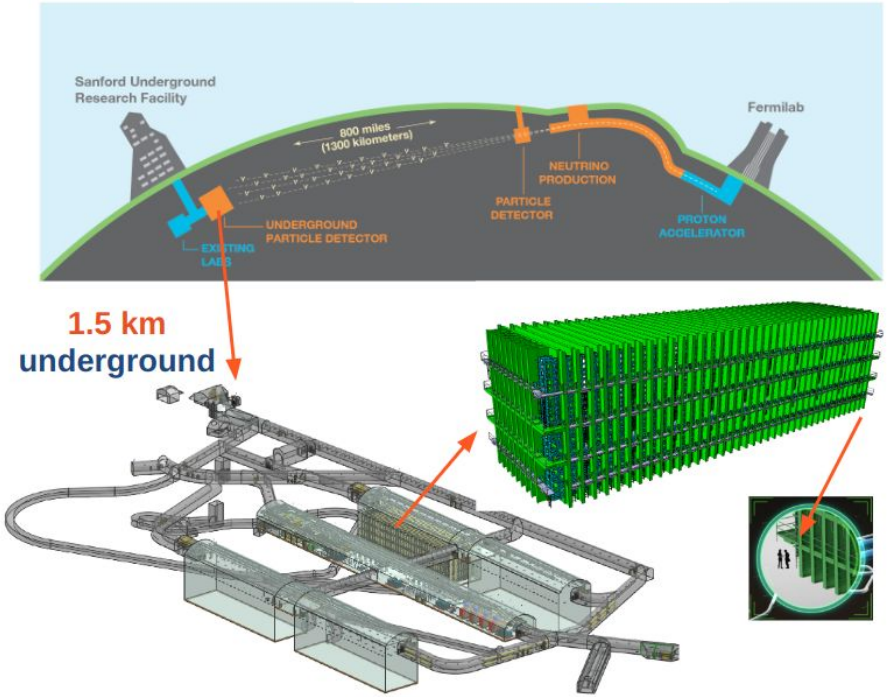

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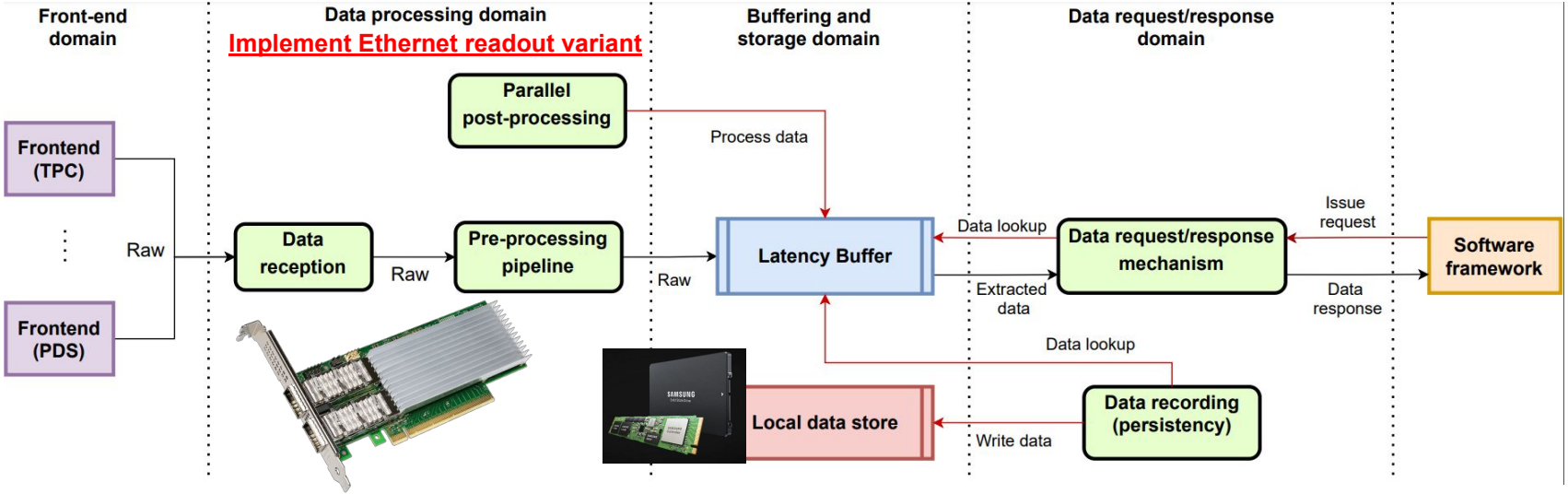
For more info and discussion, please visit the poster #147

Ethernet readout system



Front-End to Readout:

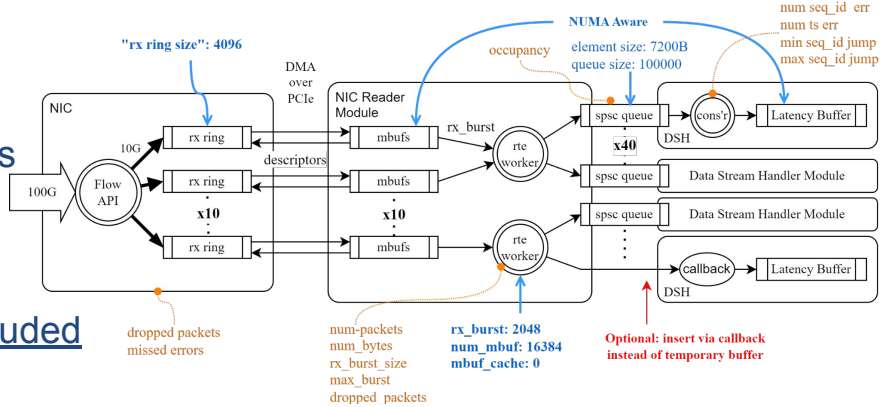
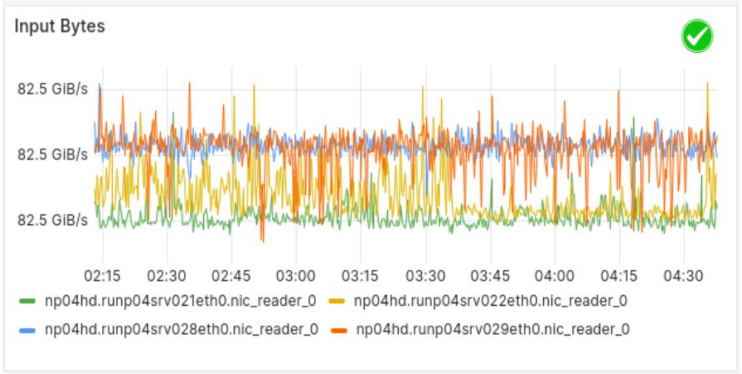
- Detector electronics transmits data over 10 Gbps links
- Those are aggregated into 100 Gbps links via switches
- 100Gbps links are fed to Readout Units with COTS NICs
- Total throughput (4 DUNE Far Detectors): **~30 Tbps**

Readout requirements:

- Process every frame for hit finding and produce Trigger Primitives for Trigger system
- Buffer data in DRAM for ~10 seconds
- Persist data on NVMe up to 100 seconds

Implementation and performance

- **High throughput software for multi 100Gbps JUMBO UDP Ethernet readout with COTS hardware**
- **Based on DPDK** and use-case specific optimizations

- **Extensive performance evaluation**
  - Wide range of hardware and resource topologies

- **Readout with all features in operations**
  - DUNE prototypes at CERN and ICEBERG
  - No data loss, trigger primitives, SNB buffers included