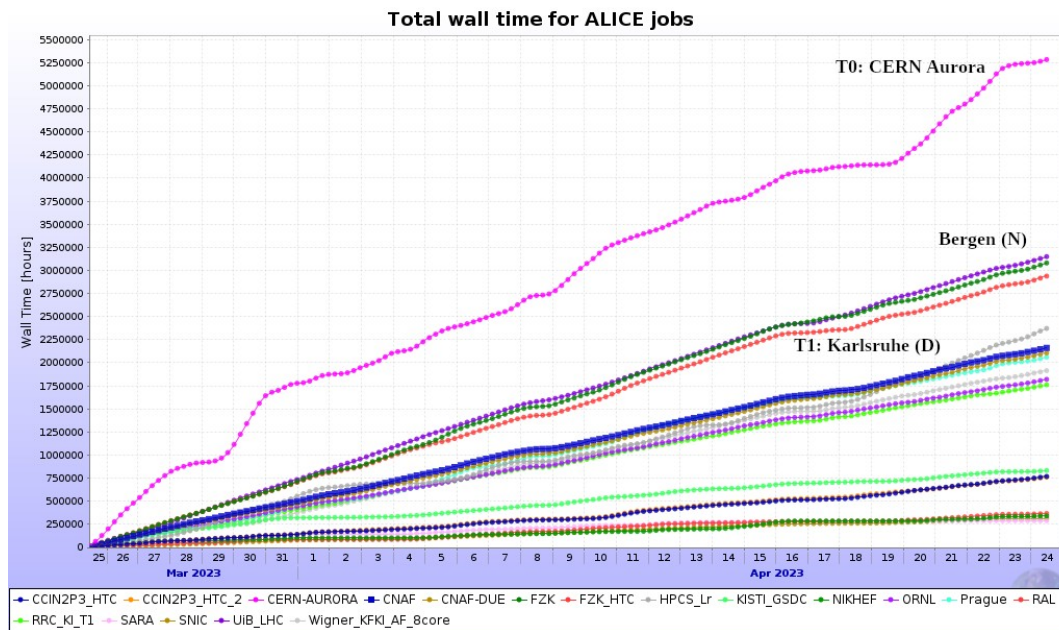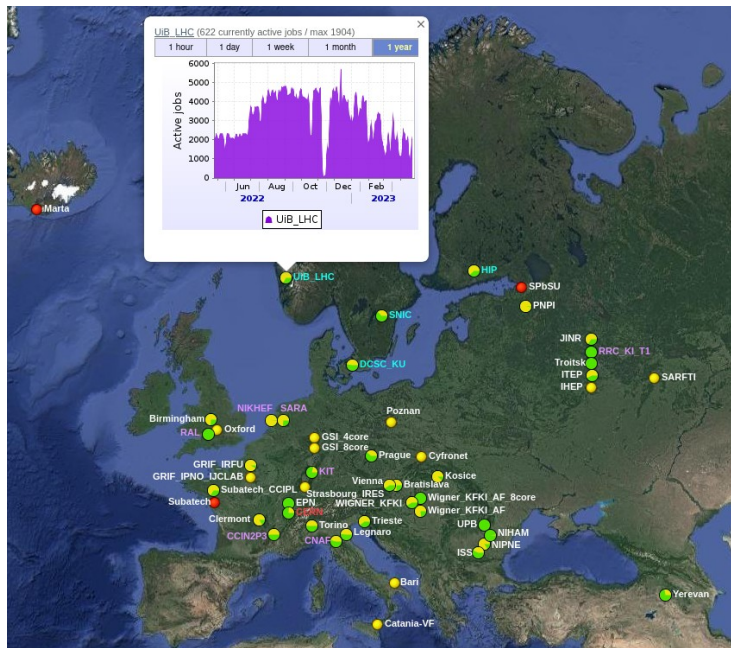# Computing and software

Run 1&2
High-Level Trigger (HLT)
Analysis framework
Tier-1 Grid center

Run 3&4
Grid middleware (jAlien)
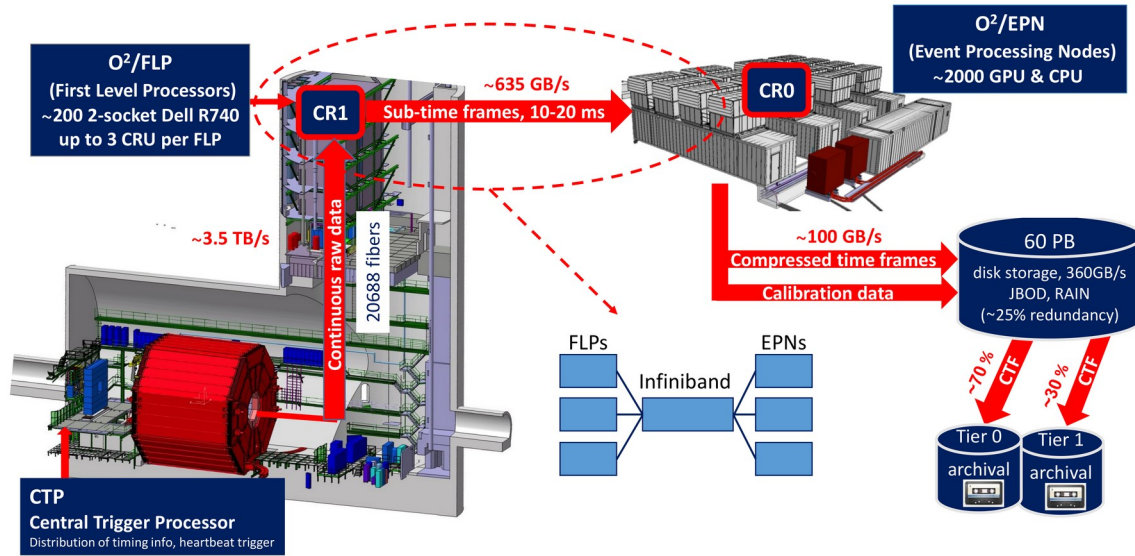Online and Offline software upgrade (O^2)
- Framework core
- Analysis framework
Tier-1 Grid center

Computing

- Grid computing: Nordic Tier-1 center (NeIC/NDGF)
  - ALICE Norway resources located in Bergen
  - New hardware installed in 2019 & 2022 (both CPU and storage)
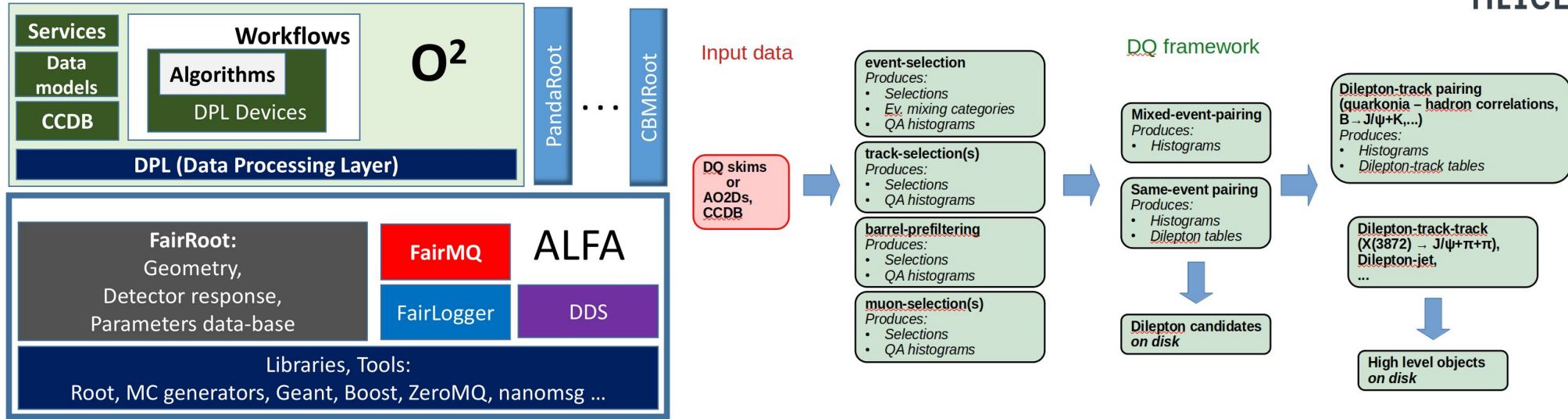 - 3.7% of ALICE CPU, 2.7% of hard disks and ~5% of tape

Software upgrade (O^2)

Challenge (driven by ALICE central barrel):

- Pb-Pb: 100x larger integrated luminosity

- pp: a few 1000x larger integrated luminosity

- Increase in data and CPU requirements not matched by budgets

Software upgrade (ALICE O^2)

- Combining online and offline systems

- Uses highly optimized flat data structures based on *Apache Arrow*

- Novel approach to abstraction of parallelization, multi-experiment (ALICE, FAIR)

- Declarative approach to reconstruction and analysis software

Foreseen software and computing activities

- Continue providing our pledges to the ALICE grid

- Consolidation of the O2 analysis framework

  - Analysis workflow optimization (CPU vs GPU usage)

- Development of new analysis projects

- Software implementation of the FoCal detector in O2

  - Simulation

  - Reconstruction