Engaging Industry for Innovation in the LHC run3-4 R&D program: CERN openlab

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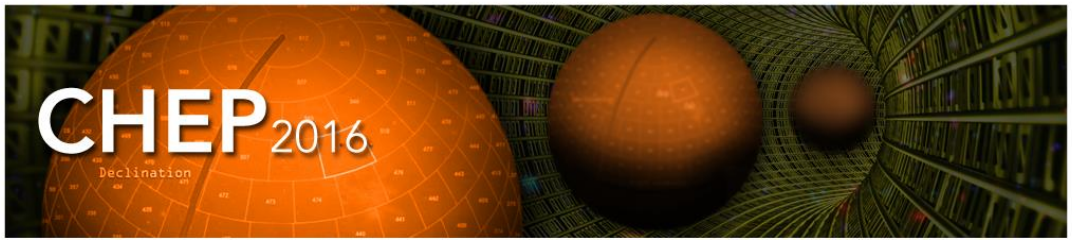

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CERN openlab

What is CERN openlab

- **CERN openlab has been created to support the computing and data management goals set by the LHC**
  - 15 years of innovative projects between CERN and leading IT companies
- **In its phase V, CERN openlab is working to solve some of the key technical challenges facing the LHC in Run3 and Run4**
  - Mutual benefit for industry and research communities
- **Ever-increasing interest in CERN openlab**
  - well established mechanism of partnership between industry and research communities
  - a path to common developments for future challenges
  - engaged with WLCG and HSF for the Community White Paper
- Research Areas include **Data Acquisition** and **Filtering, Networks** and **Connectivity, Data Storage Architectures, Compute Management and Provisioning, Compute Platforms and Code Modernization, Data Analytics**

CERN openlab projects

- Code Modernization with intel for GeantV, Fair, BioDynamo, HTCondor and ROOT IO
- The **High Throughput Computing Collaboration** investigates the use of intel technologies in trigger and data acquisition (TDAQ) systems
  - Investigate benefits of Xeon/FPGA, Omni-Path interconnect, Xeon Phi (KNL)
- Evaluate throughput using low latency and low power IDT **RapidIO** interconnect
- More predictable use of networking through reservation of bandwidth and advanced techniques using the BROCADE **Flow Optimizer**
- Storage Technology R&D on object disks, on **kinetic** SEAGATE
- Compute Management and Provisioning, on cloud federation and use of containers in OpenStack with rackspace the open cloud company
- **Data Analytics and Machine Learning** as emerging technology. Setting up projects with intel and other leading industry partners