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Beyond HEP: Photon and accelerator science computing infrastructure at DESY

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DESY is one of the largest accelerator laboratories in Europe, developing and operating state of the art accelerators, used to perform fundamental science in the areas of high-energy physics photon science and accelerator development.

While for decades high energy physics has been the most prominent user of the DESY compute, storage and network infrastructure, various scientific areas as science with photons and accelerator development have caught up and are now dominating the demands on the DESY infrastructure resources, with significant consequences for the IT resource provisioning. In this contribution, we will present an overview of the computational, storage and network resources covering the various physics communities on site.

Ranging from HTC batch-like offline processing in the Grid and the interactive user analyses resources in the National Analysis Factory for the HEP community, to the computing needs of accelerator development or of photon sciences such as PETRA III or the European XFEL. Since DESY co-hosts these experiments and their data taking, their requirements include fast low-latency online processing for data taking and calibration as well as offline processing, thus HPC workloads, that are run on the dedicated `Maxwell` HPC cluster.

As all communities face in the coming years significant challenges due to changing environments and increasing data rates, we will discuss how this will reflect in necessary changes to the computing and storage infrastructures.

We will present DESY compute cloud and container orchestration plans as a possible basis for infrastructure and platform services. We will show examples of Jupyter for small scale interactive analysis, as well as its integration into large scale resources such as batch systems or Spark clusters.

To overcome the fragmentation of the various resources for all scientific communities at DESY, we explore how to integrate them into a seamless user experience in an `Interdisciplinary Data and Analysis Facility`

Consider for promotion

Yes

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