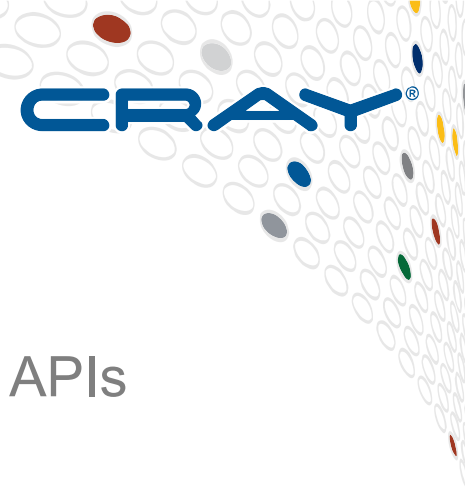# Cray's HBP-PCP project

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Project Overview

- **Objectives**
  - Evaluate non-volatile memories, storage class memory and their access APIs
  - Study non-standard workloads and their execution / software support

- **Next-gen use-cases**
  - In-situ visualisation + neurosimulation
  - In-transit visualisation
  - Machine learning + simulation

- **Pilot System "JULIA" : installed in Juelich**
  - Variety of compute nodes (KNL, data-nodes, viz nodes)
  - Intel Omnipath 100Gbit/s network
  - Memory / storage system : SSD-backed Ceph, incorporating new memories
  - Data-intensive software stack
  - Define abstractions and/or software tools to assist with memory usage and transit

Anticipated technology suggested for inclusion in an EsD project

- *Tiers of varied memory and storage*
- *Object store*
- *Memory abstraction layer*

- *All are immature, but highly relevant to Exascale*

How should this technology be used?

- *Do not burden the user more than already!*
- *Software abstraction is necessary*

Are there any pre-or co-requisite items?

- *Desirable : A simple non-posix open API for IO*
- *non-volatile memories are not yet in general release*

Any extra work/interaction?

- *Large amounts of specific technical integration*
- *Need inter-connected projects exploring various memories / APIs*
- *Questions remain*
  - *performance implications*
  - *the precise requirements for and constraints on middleware development*
  - *relevance of open frameworks such as openStack,*
  - *implications on resource managers.*

What information / actions are needed to best prepare for EsD projects?

- *Clear definition of some driving EsD use-cases*
  - *including the data-intensive and mixed workloads.*

- *Understanding the data roadmap of target applications (how data sizes will grow over time)*

- *Clear definition of next-generation "usage models"*