

Current and Future High Performance Computing Capabilities at the Idaho National Laboratory

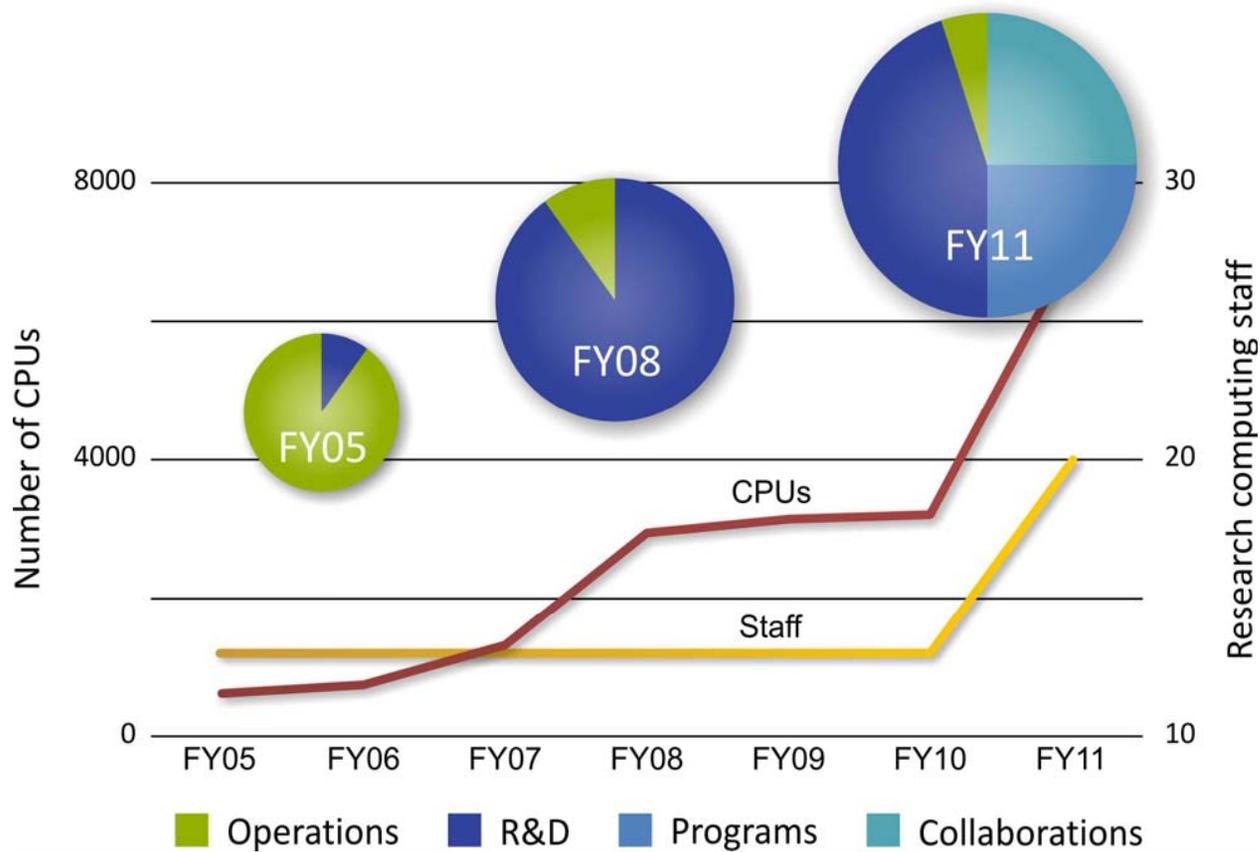
October 2010

www.inl.gov



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Evolution of Resources and Usage Profiles

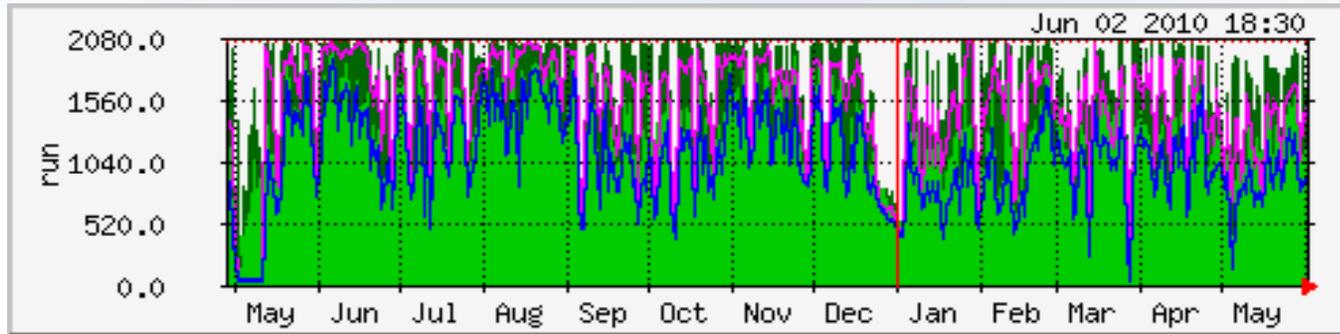


HPC Systems

- Icestorm
- SGI Altix 8200

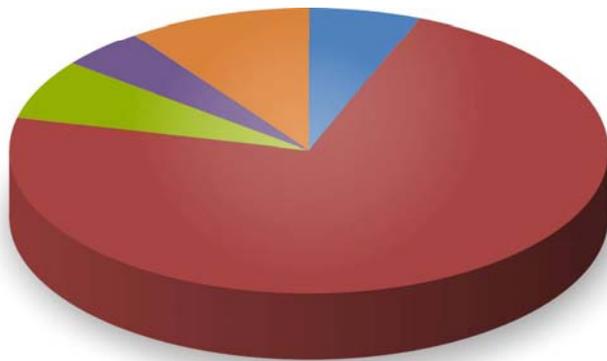


HPC Utilization

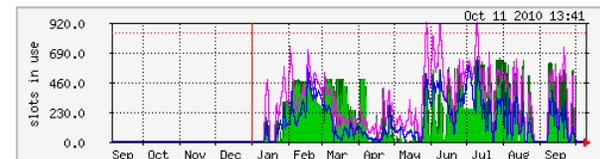


Icestorm 5/2009-5/2010 2048 cores

May 2010 Utilization



- Energy and Environment S&T
- Nuclear S&T
- National and Homeland Security S&T
- CAMS/CAES
- Applied Engineering
- Offsite Collaboration

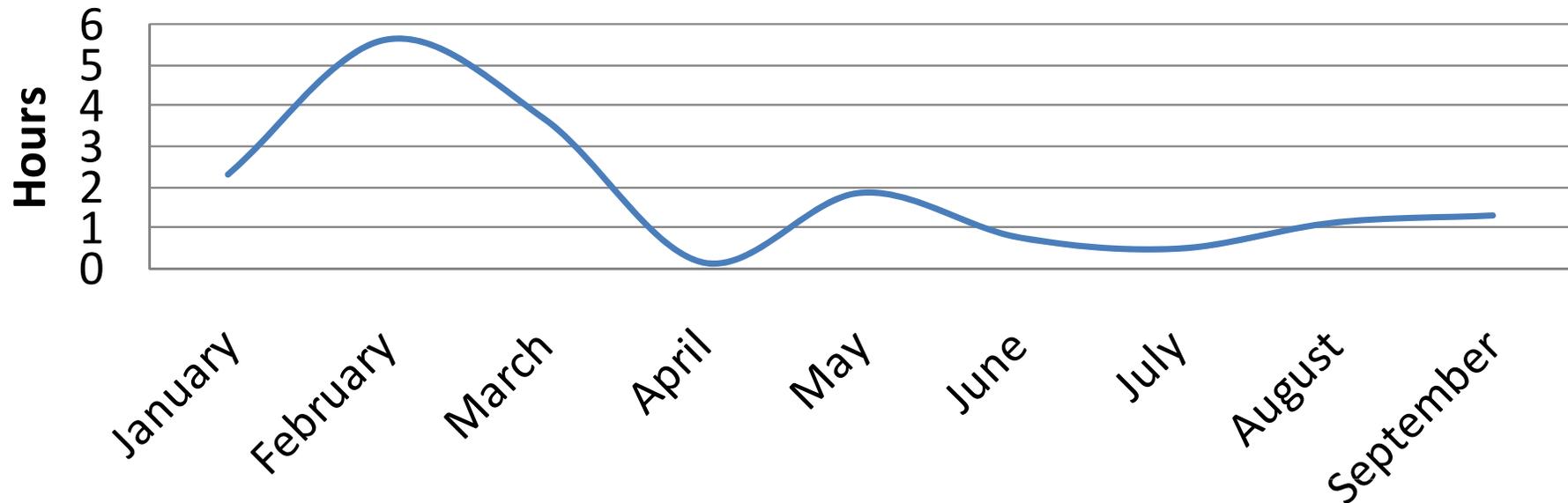


Helios 10/2009-10/2010

Software Stack

- External access via RSA token and ssh login
- Modules configured for
 - Intel/PGI compilers
 - mvapich, mvapich2, openmpi
 - petsc, paraview, visit, ensight
 - libmesh
 - Totalview
 - Commercial applications
- Wiki available
 - Queue status
 - Help pages

2010 Icestorm Average Queue Wait Time



- Typical jobs size 8-200 cores
- 40-60 active users

New Capacity Cluster

- 120TF Peak
- 10k-12k cores
- General purpose HPC capacity computing
- 10% dedicated for NEAMS ~9M cpu hours
- Expected availability Spring 2011

HPC Storage

- Panasas
 - 73TB scratch, 5x10Gbit connections
- Network Appliance
 - 134TB SATA/SAS – home, tools, and projects
 - 224TB SATA – near store mirroring of tools, projects, and home directories
- Icestorm
 - 70TB DDN/LSI

Additional Facilities

- Powerwalls
- Tile walls
- New HPC data center
- Immersive Visualization environments

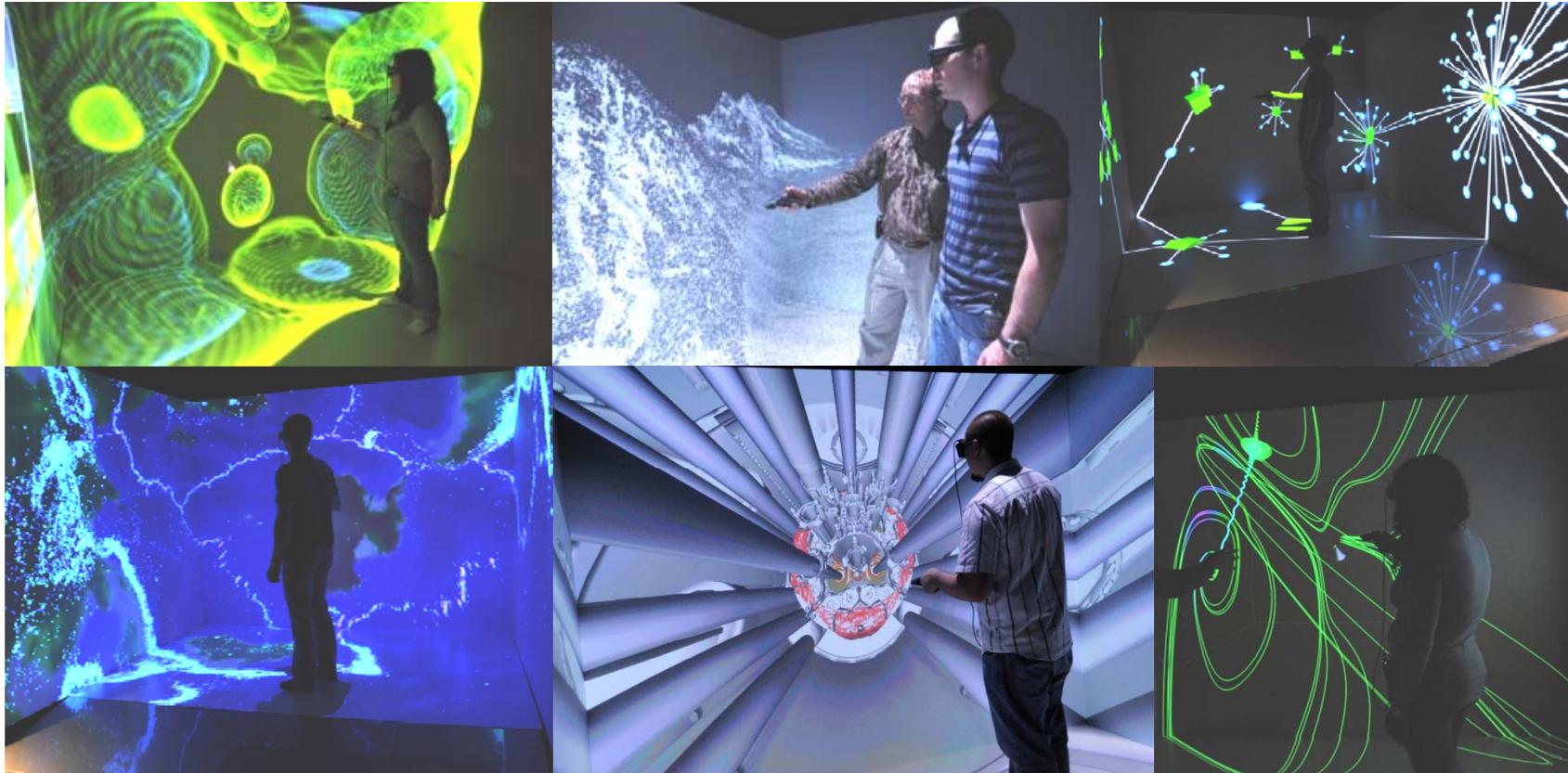
Flex CAVE



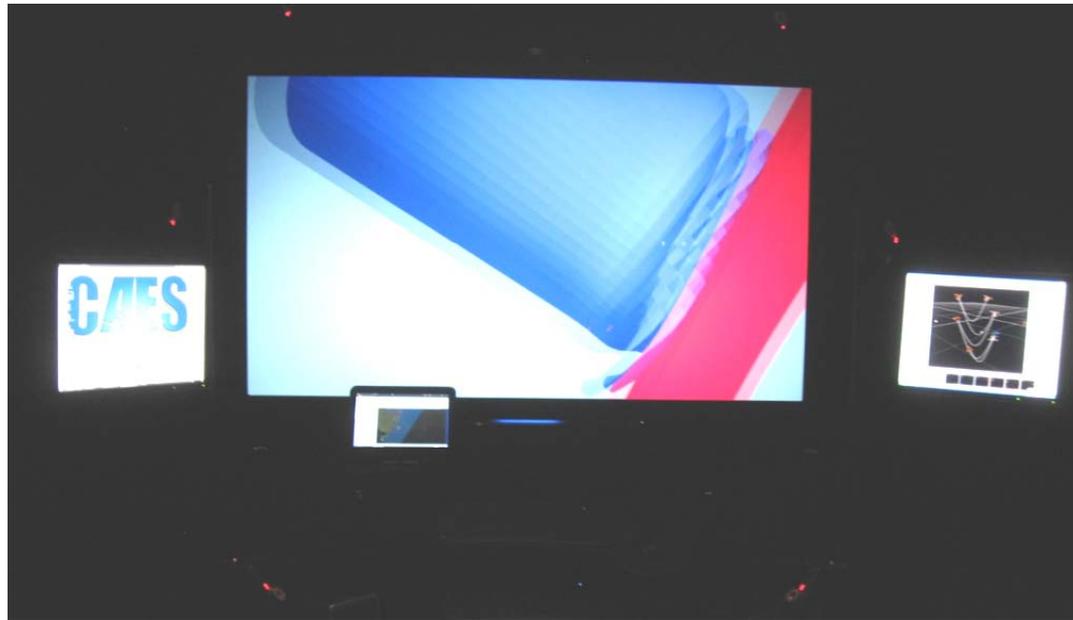


- Mini-CAVEs (approx \$25k each)
 - Large 3D DLP TV, optical head/wand tracking
- Democratization of immersive environments

Advanced Visualization Applications

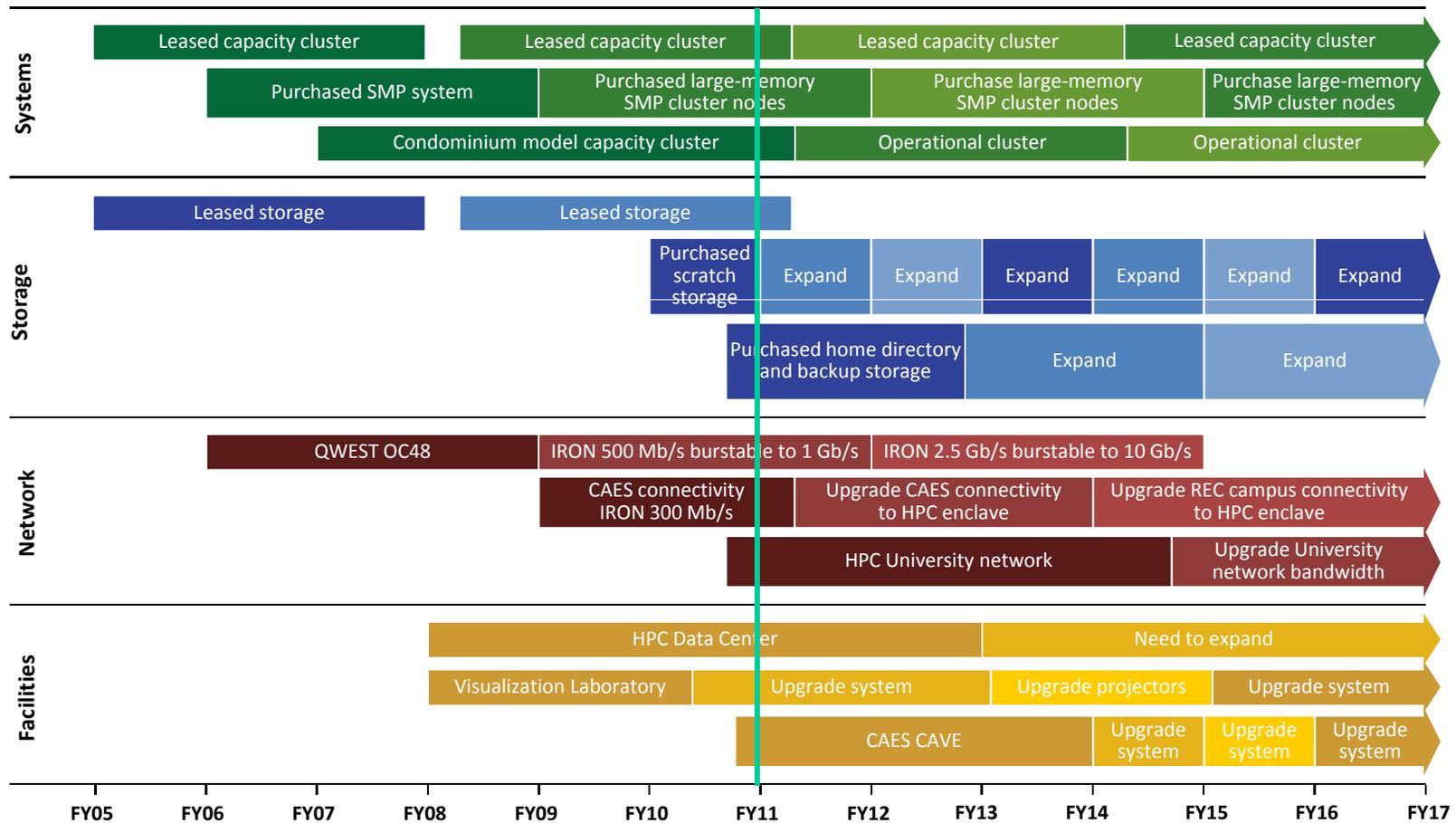


Community Universal Scientific Visualization Tool



- Recently partnered with Kitware to add immersive visualization features to Paraview

Roadmap



Summary

- Significant advanced visualization resources
- High Performance Computing systems, storage, and network resources available
- Available capacity for medium size jobs
- Tier 3 resources as a bridge to LCF
- Growing and improving resources