The OLCF ACE TestBed

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Advanced Computing Testbed (ACE)

Centralized sandboxed area - deploying heterogeneous computing and data resources and facilitating the evaluation of diverse workloads across a broad spectrum of system architectures

Current Resources

- Arm testbed (Wombat)
  - ❑ A64FX, Ampere Altra + A100 GPU, GH-200
- Integrated Research Infrastructure (IRI) Testbed (Defiant)
  - ❑ AMD EPYC 7662 + MI-100 GPUs
- Graphcore   - "BowPod16" configuration (16 IPUs)
- Holly: Single x86_64 server with 8 Nvidia H100 GPUs *(DGX-adjacent)*
- Storage: Lustre (disk + flash), VastData (flash) & DAOS (flash)

Upcoming Attractions

- Quantum Brillinance
  - ❑ 6 qubits of room-temperature quantum computers.
  - ❑ *Expected Q1 2025*

- Defiant Replacement:
  - ❑ x86_64 CPU-only nodes(20), 2x8 H200 Nodes (16 GPUs total).
  - ❑ *Expected Q2 2025*

- NextSilicon dataflow testbed (cloud based)
  - ❑ *Expected Q2 2025*

- RISC-V testbed (Inspire Semiconductor)
  - ❑ *Expected "soon"*

What we are currently exploring

- Near term / existing hardware/software/architecture evaluations
    - ❑ Arm , NextSilicon, RISC-V, GH200, DPUs
    - ❑ *Energy Efficiency*
- Workflows
    - ❑ Mostly, but not exclusively IRI oriented
    - ❑ Data Streaming
    - ❑ Facilities API
- Development platform for foundational technologies
    - AI training research (Holly)
- *"Leadership computing friendly"* multitenancy
- ***Your Big Idea goes here***

Access via standard OLCF Project application

Recent Highlights

Wael Elwasif, William Godoy, Nick Hagerty, J. Austin Harris, Oscar Hernandez, Balint Joo, Paul Kent, Damien Lebrun-Grandie, Elijah Maccarthy, Veronica Melesse Vergara, Bronson Messer, Ross Miller, Sarp Oral, Sergei Bastrakov, Michael Bussmann, Alexander Debus, Klaus Steiniger, Jan Stephan, Rene Widera, Spencer Bryngelson, Henry Le Berre, Anand Radhakrishnan, Jeffrey Young, Sunita Chandrasekaran, Florina Ciorba, Osman Simsek, Kate Clark, Filippo Spiga, Jeff Hammond, Stone John, David Hardy, Sebastian Keller, Jean-Guillaume Piccinali, and Christian Trott. 2023*. Application Experiences on a GPU-Accelerated Arm-based HPC Testbed.* In Proceedings of the HPC Asia 2023 Workshops (HPCAsia '23 Workshops). Association for Computing Machinery, New York, NY, USA, 35–49. https://doi.org/10.1145/3581576.3581621