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Cloud-Based Supercomputing: Jetstream2 and ACCESS

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Jetstream2

AI For Everyone

- Jetstream2 is designed to be user-friendly for researchers who have limited experience with high performance computing (HPC) or cloud computing.
- NSF funded. We serve academic communities with no access to such resources
- It provides a uniquely flexible environment for researchers looking to take advantage of the latest cloud-native approaches.
- Also available for Education - use it for courses!

What's Special About Cloud Computing?

- Create your own 'virtual machine' (VM)
- Full sudo (admin) access. Use your VM how you want.
  - Install the software you need.
- On-demand resources. No sharing or queue times.
  - Keep your jobs running as long as you want.
- Interactive computing environment
  - With graphical desktop
- Full internet access with Persistent IPs

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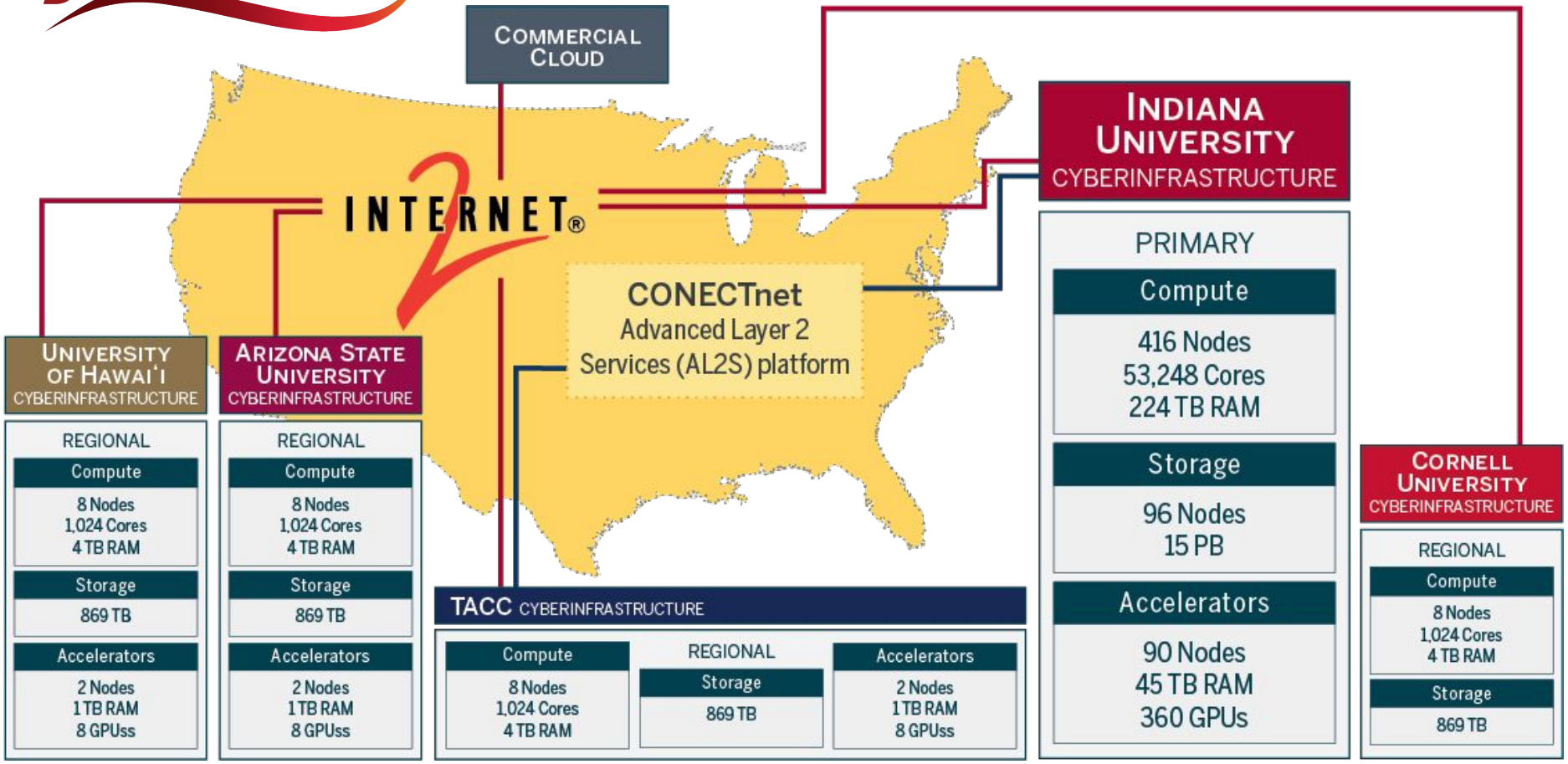
COMMERCIAL CLOUD
INTERNET2®
CONECTnet
Advanced Layer 2
Services (AL2S) platform
INDIANA UNIVERSITY
CYBERINFRASTRUCTURE
PRIMARY
Compute
416 Nodes
53,248 Cores
224 TB RAM
Storage
96 Nodes
15 PB
Accelerators
90 Nodes
45 TB RAM
360 GPUs
UNIVERSITY OF HAWAI'I
CYBERINFRASTRUCTURE
REGIONAL
Compute
8 Nodes
1,024 Cores
4 TB RAM
Storage
869 TB
Accelerators
2 Nodes
1 TB RAM
8 GPUss
ARIZONA STATE UNIVERSITY
CYBERINFRASTRUCTURE
REGIONAL
Compute
8 Nodes
1,024 Cores
4 TB RAM
Storage
869 TB
Accelerators
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8 GPUss
CORNELL UNIVERSITY
CYBERINFRASTRUCTURE
REGIONAL
Compute
8 Nodes
1,024 Cores
4 TB RAM
Storage
869 TB

Jetstream2 VM Sizes

- Three different resources:
  - CPU
    - Up to 64 cores, 250 GB RAM
  - Large Memory
    - Up to 128 cores, 1000 GB RAM
  - GPU
    - Up to 32 CPU cores, 125 GB RAM, and a full NVIDIA 40GB Ampere A100 GPU
  - Storage
    - Default: 1 TB
    - More on Request

View the full list:
https://docs.jetstream-cloud.org/general/vmsizes/

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Use Cases

- On-demand access to powerful computer for data analysis.
  - Useful for teaching a course in which students have this need.
- Write, debug, and execute code with interactive GUI applications
  - Matlab, R Studio, JupyterLab.
  - Use a GPU if needed.
- Host a file server or database. Receive, store, and serve data to colleagues.
- Host a website. Either static or dynamic to share your applications
  - JupyterHub, Posit Connect/Shiny App
- Science Gateways & Web-apps

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Accessing Jetstream2

Go To https://jetstream2.exosphere.app/

But wait! Before you can use Jetstream2 you must first have an ACCESS ID and be on an active Jetstream2 allocation!

What is Access?

Provides Access to National Advanced Computing Resources

https://access-ci.org/

The NSF's ACCESS (Advanced Cyberinfrastructure Coordination Ecosystem: Services & Support) program builds upon the successes of the 11-year XSEDE project, while also expanding the ecosystem with capabilities for new modes of research and further democratizing participation.

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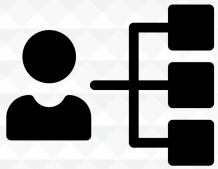
Allocation Process

CREATE ACCOUNT



SELECT OPPORTUNITY

REQUEST ALLOCATION

RECEIVE CREDITS

EXCHANGE CREDITS

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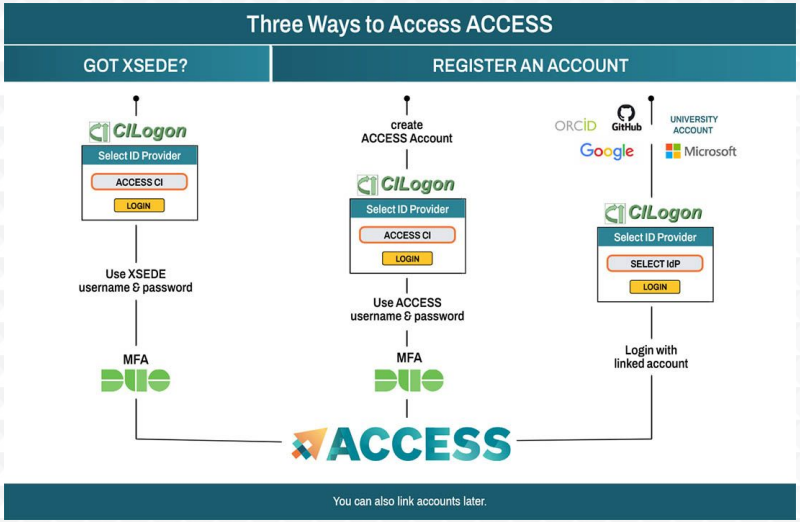
Getting an ACCESS ID

In order to Apply for an allocation OR be able to login to any resources an Access ID is required.

Go To https://identity.access-ci.org/new-user



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ACCESS | Advancing Innovation

Getting Your Own Allocation

ACCESS | Advancing Innovation

https://access-ci.org/

Applying for an allocation is like applying for a small grant that provides computational resources.

The first level of application “Explore ACCESS” is a single form and only takes a few minutes. Allocations are usually approved in a few days.
~$40,000 worth of cloud resources for a few minutes of effort.

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Allocation Tiers

Explore	Discover	Accelerate	Maximize
400,000 credits	1,500,000 credits	3,000,000 credits	N/A
CV and Brief Summary	CV & 1-page proposal	3-page proposal & panel review	10 page proposal & panel review
Grad student projects Small labs Benchmarking Small classes	Modest resource needs Mid-sized projects Campus Champions Large classes	Mid-scale resource needs Multi-grant collaborative projects Science Gateways with growing communities	Large-scale projects in need of massive amounts of computational resources

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What Resources are Available?

EXCHANGE CREDITS

- Indiana Jetstream2
- Indiana Jetstream2 GPU
- Indiana Jetstream2 Large Memory
- Indiana Jetstream2 Storage

Indiana University (IU)
Jetstream2

Johns Hopkins University (JHU)
Rockfish

National Center for Supercomputing Applications (NCSA)
Delta

Open Science Grid (OSG)

Open Storage Network (OSN)

Pittsburgh Supercomputing Center (PSC)
Bridges-2

Purdue
Anvil

San Diego Supercomputer Center (SDSC)
Expanse

Stony Brook University
Ookami

Texas Advanced Computing Center (TACC)
Stampede2
Ranch

Texas A&M University (TAMU)
FASTER

University of Delaware
DARWIN

University of Kentucky
KyRIC

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Demo

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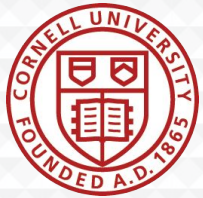
Jetstream2 partners



Jetstream2

http://jetstream-cloud.org/
National Science Foundation
Award #ACI-2005506

Documentation and Support

Jetstream2 Website

https://jetstream-cloud.org/index.html

Documentation:

https://docs.jetstream-cloud.org/

Jetstream2 Login (Exosphere)

https://jetstream2.exosphere.app/

Reach out to Jetstream2 support at

help@jetstream-cloud.org

Or directly to Research Cloud Services:

rcsadm@iu.edu

My email:

djhavert@iu.edu

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