

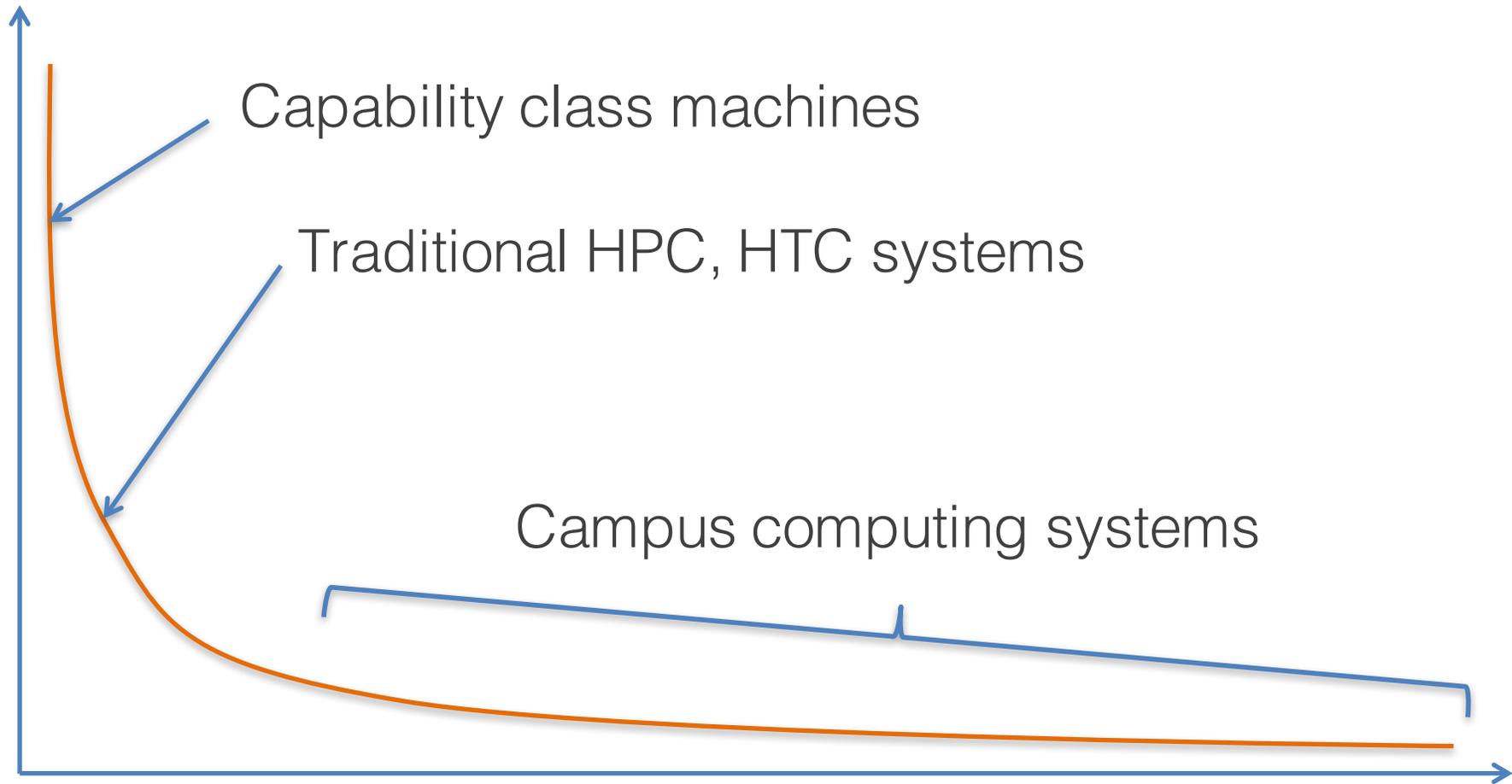
The logo features the word "Jetstream" in a bold, italicized, red sans-serif font. A light blue swoosh underline starts under the 'J' and extends across the rest of the word. Below the main text, the tagline "A national science & engineering cloud" is written in a smaller, white, sans-serif font.

# Jetstream

A national science & engineering cloud

funded by the National Science Foundation  
Award #ACI-1445604

# “Long tail” of the NSF XD Ecosystem

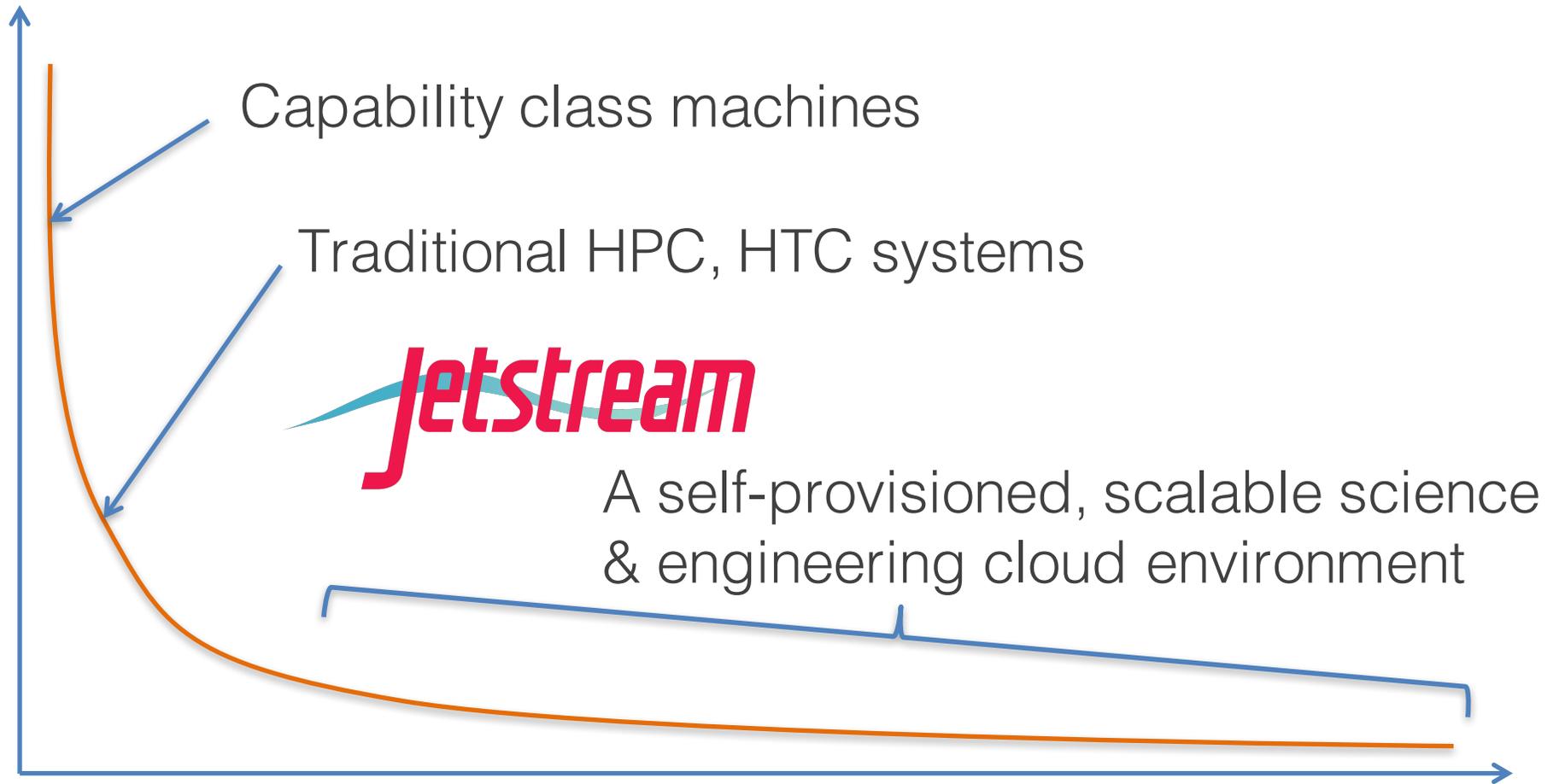


Award #1445604



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# “Long tail” of the NSF XD Ecosystem



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# Jetstream characteristics

- First cloud for science and engineering research across all areas of activity supported by the NSF
- Interactive computing and data analysis resources “on demand”
- Focus on ease-of-use, broad accessibility
- VM library, custom VMs, or “private computing system”
- Reproducibility: Store, publish via IU Scholarworks (DOI)



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# Science domains

- **Biology:** iPlant and Galaxy VMs, enabling access to and use of new analytical codes in various modalities
- **Earth Science:** VMs capable of requesting NSIDC data and running common routines to enable more effective research and better analyses of data
- **Field Station Research:** VM-based data collection and analysis tools to support data sharing and collaboration



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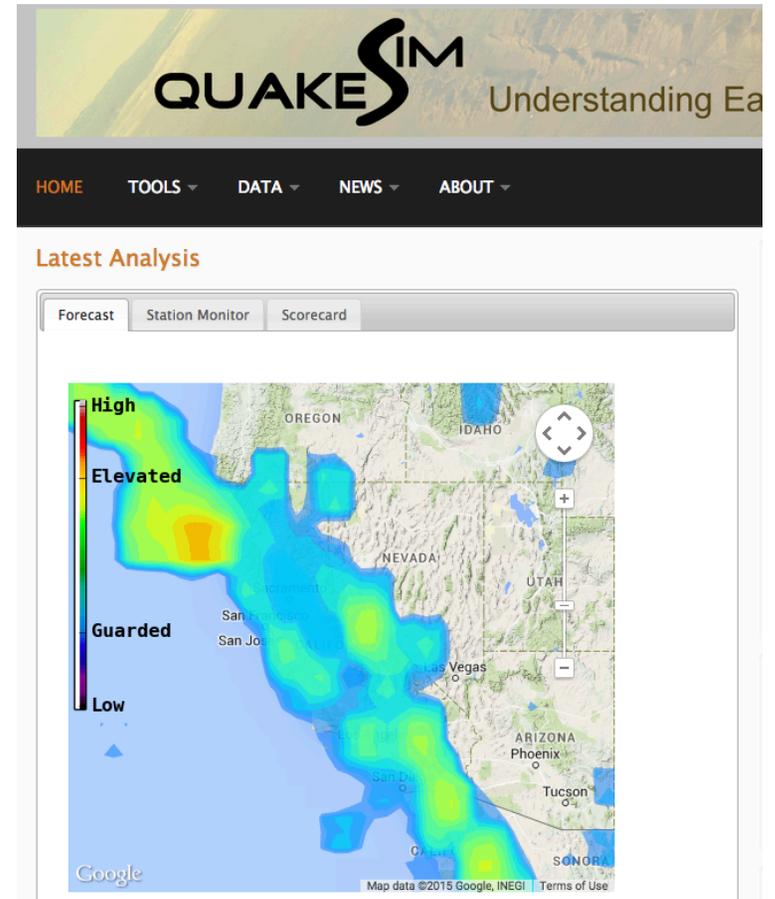
# Science domains

- **GIS:** Deliver the CyberGIS toolkit and provide access to ArcGIS in a VM using IU's existing site license
- **Network Science:** Build VMs with CShell tool builders to deliver network analysis tools interactively
- **Social Sciences:** Create VMs that allow selection of data from the Odum Institute in a way that retains provenance and version information
- **Whatever *you* do**, probably ...unless you run large scale MPI codes!



# Types of applications supported

- Interactive, VM-based work
- Persistent science gateways
- Hadoop at modest scale

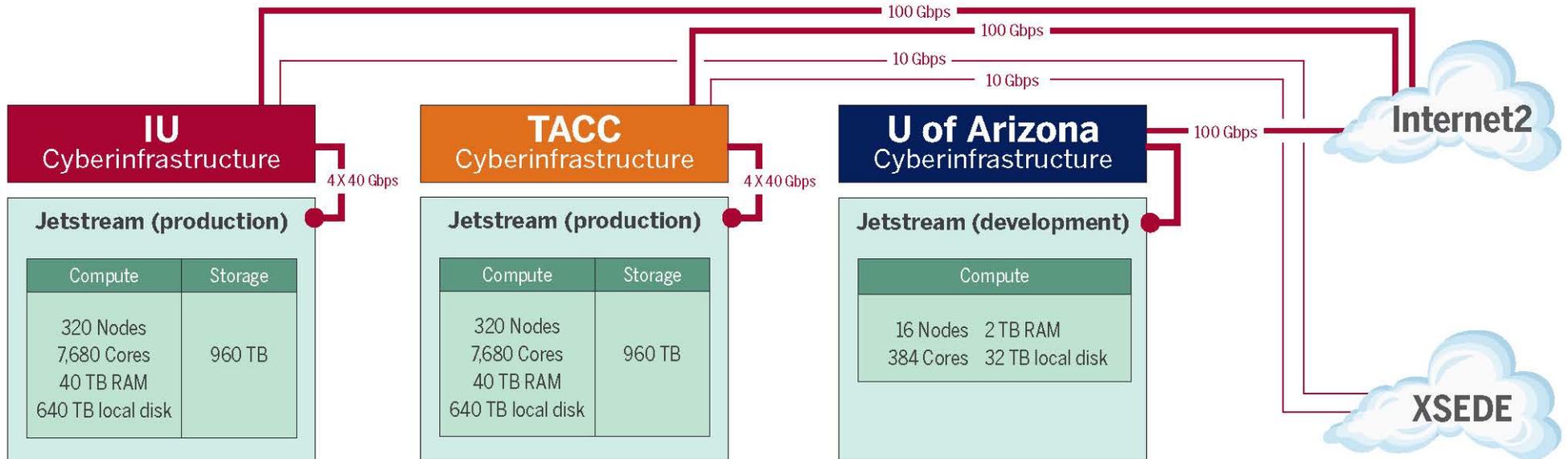


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# Jetstream System Overview



- Geographically distributed cloud; 0.5 PetaFLOPS
- Globus for large scale file transfer, authentication

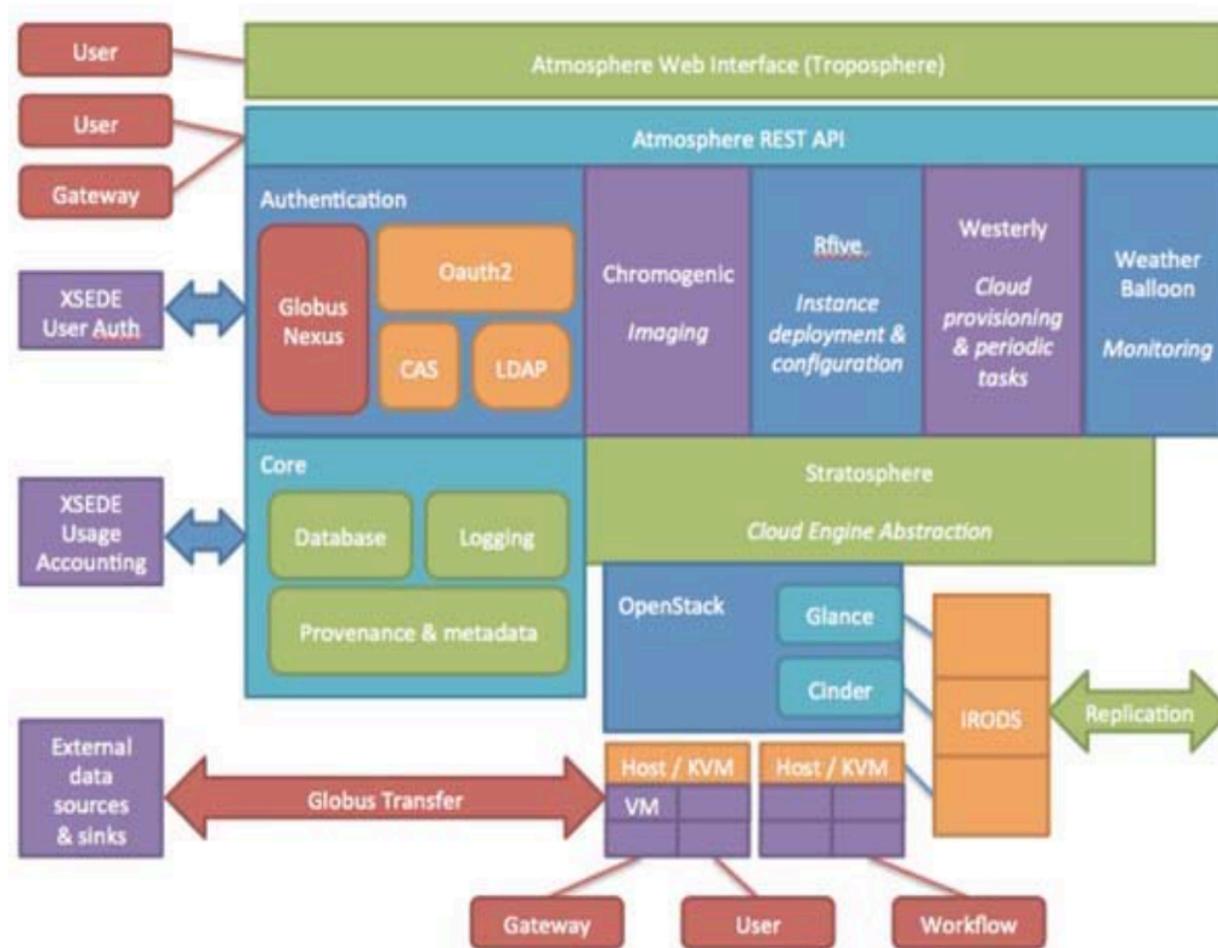


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# Software Stack: Metal to Atmosphere

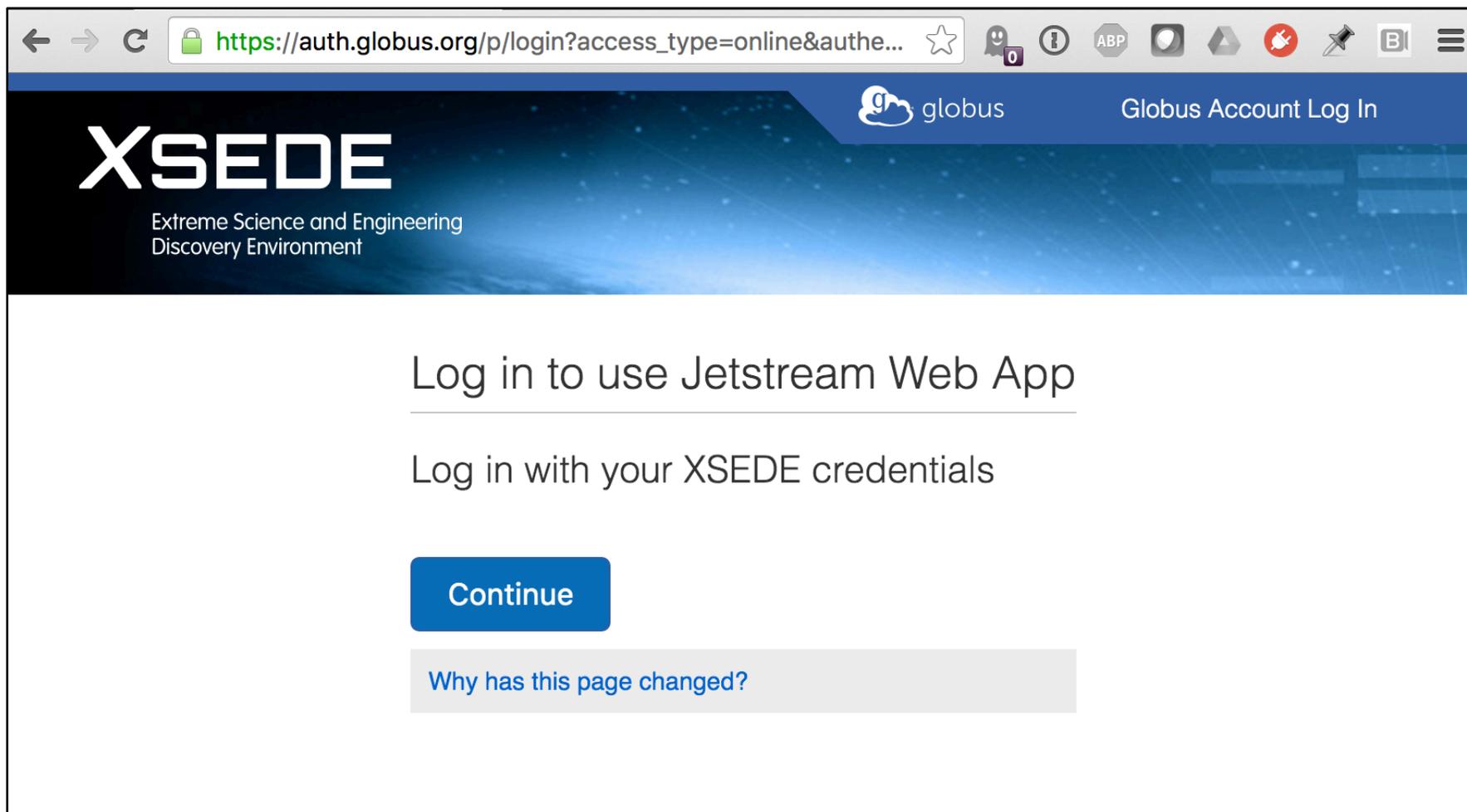


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# Login using Globus Auth



The screenshot shows a web browser window with the URL [https://auth.globus.org/p/login?access\\_type=online&authe...](https://auth.globus.org/p/login?access_type=online&authe...). The page features the XSEDE logo (Extreme Science and Engineering Discovery Environment) and a blue header with the Globus logo and "Globus Account Log In" text. The main content area contains the text "Log in to use Jetstream Web App" and "Log in with your XSEDE credentials", followed by a blue "Continue" button and a link "Why has this page changed?".



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Dashboard

Images

Favorites

My Images

Projects

Cloud Providers

Quotas

Settings

# Search Images

Search by App Images, Tag, OS, and more

Popular Searches: [R](#) [Bisque](#) [NGS](#) [Community: Astrophysics](#)

Quick Sort:  Popularity  Recency  Rating

[Advanced Search Options](#)

Quick Filter:

View as:

## Popular Images from All Communities



**Math Kernel Library**

[blas](#) [fft](#) [fortran](#) [lapack](#)

Community: Mathematics

👍 52 🗨️ 0 💬 7



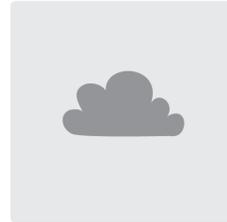
**RNASeq Analysis Tools**

[bowtie2](#) [blast](#) [blat](#) [edgeR](#)

[R](#) [rnaseq](#) [tophat2](#)

Community: Biology

👍 30 🗨️ 2 💬 4



**Atmospheric Dispersion Modeling**

[aermod](#) [aermet](#) [aermap](#)

Community: Atmospheric Sciences

👍 20 🗨️ 0 💬 0



**MrBayes with TreeMix**

[bayesian inference](#) [mrbayes](#)

[treemix](#)

Community: Phylogenetics

👍 25 🗨️ 1 💬 10







# VM Instance Sizes

Instance Type	vCPUs	RAM	Storage	Instances/Node
Tiny	1	2	20	46
Small	2	4	40	23
Medium	6	16	130	7
Large	10	30	230	4
X-Large	22	60	460	2
XX-Large	44	120	920	1

Node config: 2 Intel 2680 v3 “Haswell.” 2.5 GHz base frequency. Floating point intensive operations utilizing the AVX instruction set run at 2.1 GHz.



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# Planned Globus transfer use on Jetstream

- Globus Connect Personal in VM images
  - Being integrate with Atmosphere image management
- Globus Connect Server on object storage
  - Ceph RADOSGW



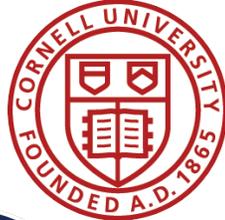
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# Jetstream Partner Organizations

Initial construction  
(funded partners)



Planned funded partners (O&M phase)

Unfunded partners



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