

The logo for Jetstream 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 logo, the text "A national science & engineering cloud" is written in a white, sans-serif font.

Jetstream

A national science & engineering cloud

Prepared for the HPC User Forum

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What is Jetstream?

- NSF's first cloud for science and engineering research across all areas of activity supported by the NSF
- A user-friendly cloud environment designed to give researchers access to self-provisioned interactive computing and data analysis resources
- Globus for data movement and authorization
- User-selectable library of virtual machines that researchers can customize
- A geographically distributed environment; leveraging Internet2 and XSEDE resources



Who will use Jetstream?



- For the researcher needing a handful of cores TODAY rather than thousands next week.
- Software creators and researchers needing to create their own customized virtual machines
- As a backend supporting science gateways



What's in a name? Cloud? Really?

- Name
 - Jet streams lie at the border of two different air masses
 - The Jetstream system stands at the border of two groups
- Yep, it's really a cloud, or at least a cloud environment.
- Software layers:
 - Atmosphere interface
 - OpenStack
 - KVM
 - CentOS Linux



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Atmospheric Dispersion Modeling

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MrBayes with TreeMix


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


[treemix](#)

Community: Phylogenetics

 25  1  10

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Science Domains and Users

- Biology
- Earth Science/Polar Science
- Field Station Research
- Geographical Information Systems
- Network Science
- Observational Astronomy
- Social Sciences
- Jetstream will be particularly focused on researchers working in the “long tail” of science with born digital data
- Enabling analysis of field-collected empirical data on the impact and effects of global climate change will be one of the specific foci
- Whatever *you* do, *maybe*.



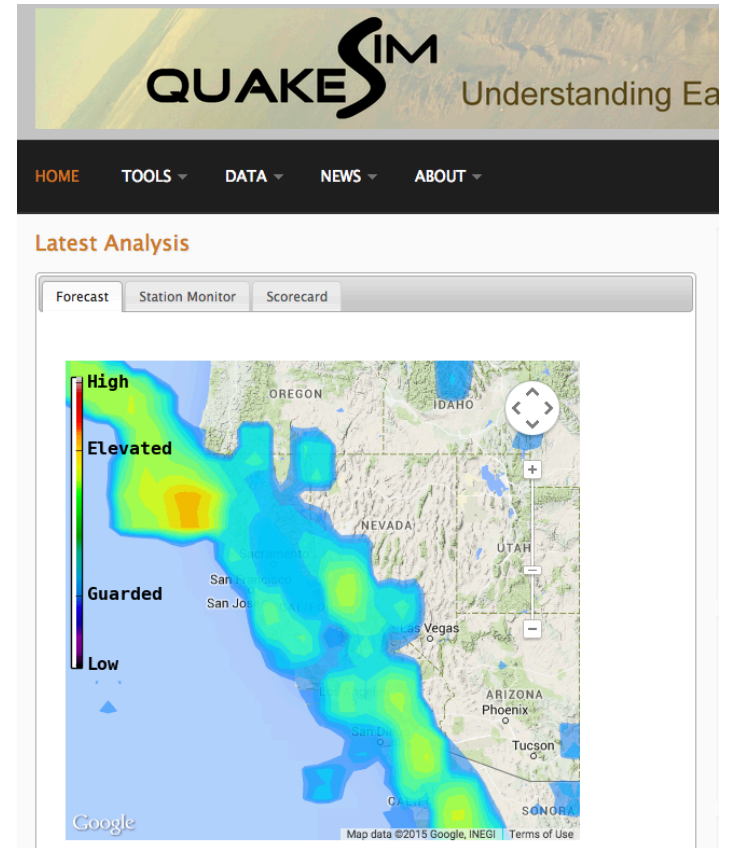
21st century workforce development

- Jetstream will include virtual Linux desktops and applications specifically aimed to enable research and research education at small colleges and universities including HBCUs (Historically Black Colleges and Universities), MSIs (Minority Serving Institutions), Tribal colleges, and higher-Ed institutions in EPSCoR States
- Jetstream will also support deployment of user-friendly Science Gateways



Types of applications supported

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





IU
Cyberinfrastructure

Jetstream (production)

Compute	Storage
320 Nodes 7,680 Cores 40 TB RAM 640 TB local disk	960 TB

TACC
Cyberinfrastructure

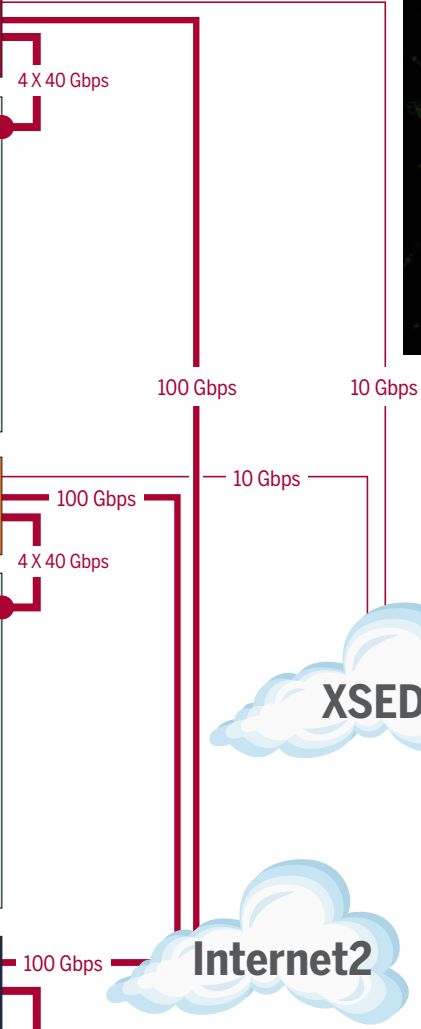
Jetstream (production)

Compute	Storage
320 Nodes 7,680 Cores 40 TB RAM 640 TB local disk	960 TB

U of Arizona
Cyberinfrastructure

Jetstream (development)

Compute
16 Nodes 2 TB RAM 384 Cores 32 TB local disk



Jetstream System Diagram

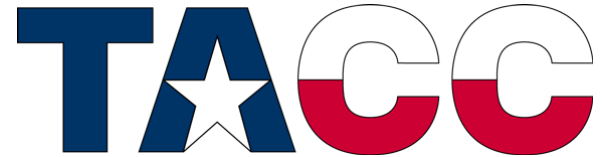
Jetstream Deployment Partner Organizations



- Initial construction (funded partners):

- University of Texas Austin (TACC)
- University of Chicago (Argonne National Lab)
- University of Arizona
- Johns Hopkins University

INDIANA UNIVERSITY



- Planned funded partners for M&O phase:

- University of Texas at San Antonio (Open Cloud Lab)
- Penn State University
- Cornell University



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Jetstream Application & Outreach Collaborators

- Cornell University – Ms. Susan Mehringer, Lead. Cornell® Virtual Workshops about Jetstream and applications running on jetstream.
- University of Arkansas at Pine Bluff – Dr. Jesse Walker, lead. cybersecurity education, Minority Serving Education outreach
- University of Hawaii – Dr. Gwen Jacobs, lead. EPSCoR early adopter/user. Jacobs will chair Science Advisory Board
- National Snow and Ice Data Center (NSIDC) – Dr. Ron Weaver, lead. Data retrieval from NSIDC, application integration with ice sheet analysis applications
- University of North Carolina, Odum Center – Dr. Thomas Carsey , lead. Data retrieval from Dataverse Network
- National Center for Genome Analysis at Indiana University – providing genome analysis software. Includes TACC, PSC, and SDSC as partners

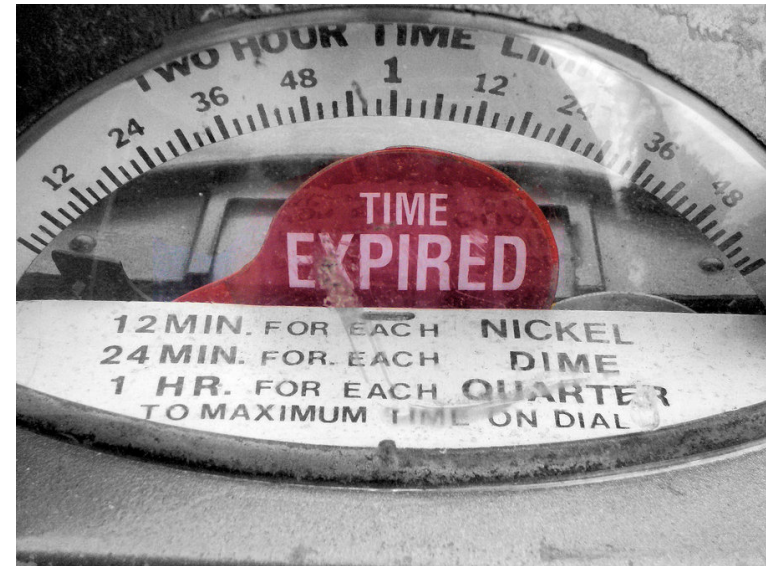


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Timeline



- Test gear this quarter
- Production gear in mid-summer
- Friendly user mode prior to SC
- Production operation status by January 2016



Attributions

- NSF & Jetstream Partners
- Flickr user uxerrors
- Membership Expired, Respond Today! by [Judith E. Bell](#)
- Jet Stream - Wikipedia
- Aggressive ring-tailed lemurs by Burnet Rose
- Maria Morris, Arturo Contreras, Vince Cannon – IU
- Time Expired by DayofGlory
- R Graffiti by [David Goehring](#)

