Jetstream: A new national research and education cloud

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Award #ACI-1445604

What is Jetstream?

- First production cloud for science and engineering research across all areas of activity supported by the NSF
- Interactive computing and data analysis resources "on demand"
- Part of the NSF eXtreme Digital (XD) program - an advanced, nationally distributed, open cyberinfrastructure comprised of various computational and scientific resources connected by high-bandwidth networks, integrated by coordinated policies and operations

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http://jetstream-cloud.org/

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What is Jetstream?

- Focus on ease-of-use, broad accessibility
- Reproducibility: Store, publish via IU Scholarworks (DOI)
- Will support persistent gateways (iPlant, Galaxy, generic "SciGAP" build-a-gateway image)
- The primary goal set by IU and its partners in implementing Jetstream is to create a resource that expands the users of XD program resources beyond the current community of users.
- VM library, custom VMs, or "private computing system"

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Not just another XD resource (Why Jetstream?)

- National Science Foundation (NSF) estimates that 299,000 researchers, educators, and learners received direct support during the year ending September 2013, yet merely 1.5% completed a computation, data analysis, or visualization task on XD program resources and less than 3% had an account on the XSEDE portal.
- Jetstream, through its scale and flexibility, will dramatically enhance the diversity and size of the US researcher community benefiting from XD resources by focusing on lowering the barriers to scientific computing.

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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
- Doing Hadoop at a modest scale

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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
- GIS: Deliver the CyberGIS toolkit and provide access to ArcGIS in a VM using IU's existing site license
- Network Science: Build VMs with CIShell 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 or HTC workloads!

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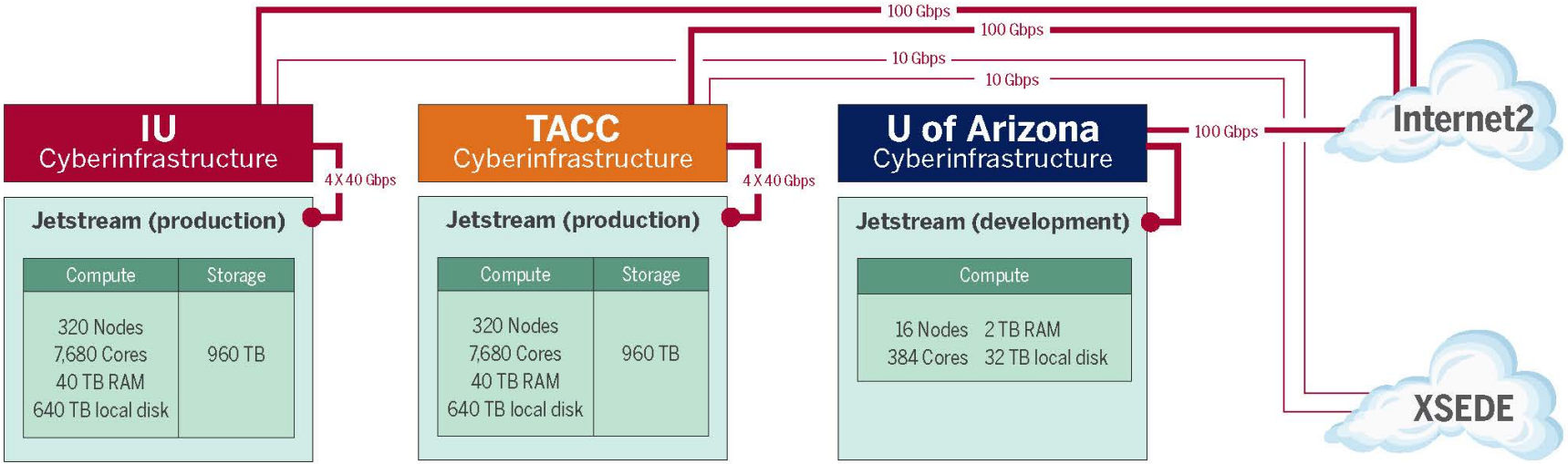
Jetstream System Overview



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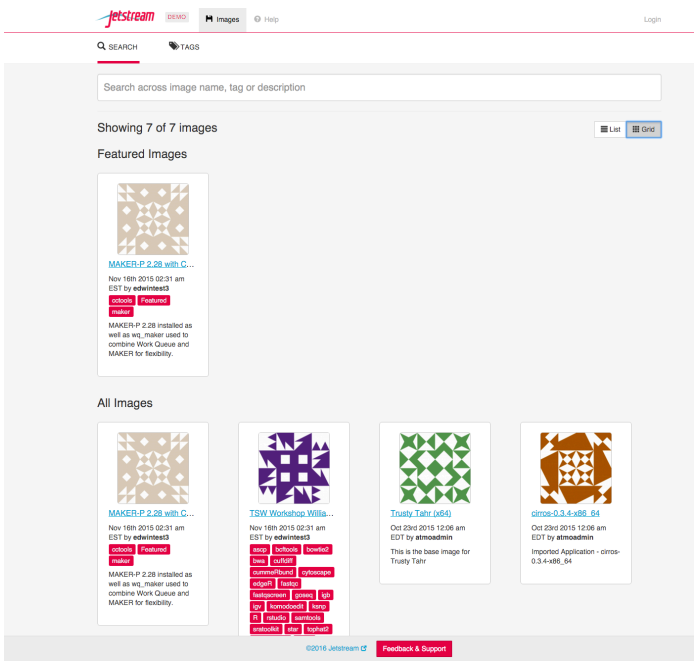
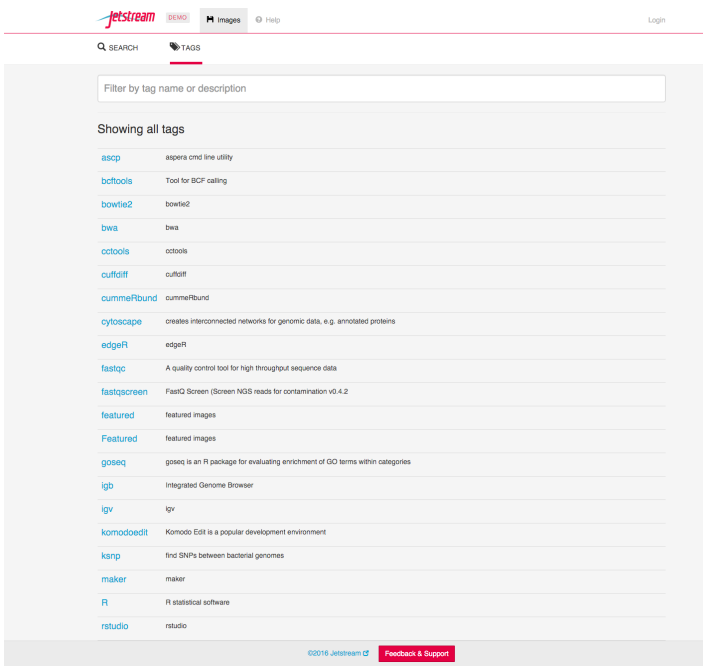
The Jetstream Interface





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Jetstream Timeline…what comes next?

- Test system has completed acceptance testing at IU
- Program Execution Plan has passed peer review and been conveyed by DACI (Division of Advanced Cyberinfrastructure) to DGA (Division of Grants and Awards) for modification of award instrument
- SOW with vendor (Dell) has been executed
- Production system has arrived and is under construction!
- Friendly user mode by SC15
- ***Early operations mode Jan – Mar 2016, targeted start date of January 20, 2016***

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How can I use Jetstream?

- An XSEDE User Portal (XUP) account is required. They are free! Get one at https://portal.xsede.org
- Read the Allocations Overview - https://portal.xsede.org/allocations-overview
- Write a successful allocation request – start with a Startup or Education request - https://portal.xsede.org/successful-requests

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Where can I get help or learn more?

- Production:
  - User guides: https://portal.xsede.org/user-guides
  - XSEDE KB: https://portal.xsede.org/knowledge-base
  - Email: help@xsede.org
  - Campus Champions: https://www.xsede.org/campus-champions
  - Training Videos / Virtual Workshops (TBD)

- Early use:
  - http://jetstream-cloud.org/
  - Early use: jethelp@iu.edu

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Jetstream Partner Organizations

Initial construction (funded partners)

Indiana University

The University of Texas at Austin

TACC

The University of Arizona

The University of Chicago

globus

Johns Hopkins University

Management & Operations partners

The University of Texas at San Antonio

Penn State

Cornell University Founded A.D. 1865

Application / community lead partners

University of Hawai'i

University of Arkansas at Pine Bluff

NSIDC National Snow and Ice Data Center

UNC The Odum Institute

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Questions?

Project website: http://jetstream-cloud.org/
Project email: jethelp@iu.edu Direct email: jeremy@iu.edu

License Terms

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