A national science & engineering cloud

Jetstream - A self-provisioned, scalable science and engineering cloud environment

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Jetstream

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Jetstream Cloud Services

Logout User

- 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: Community...

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

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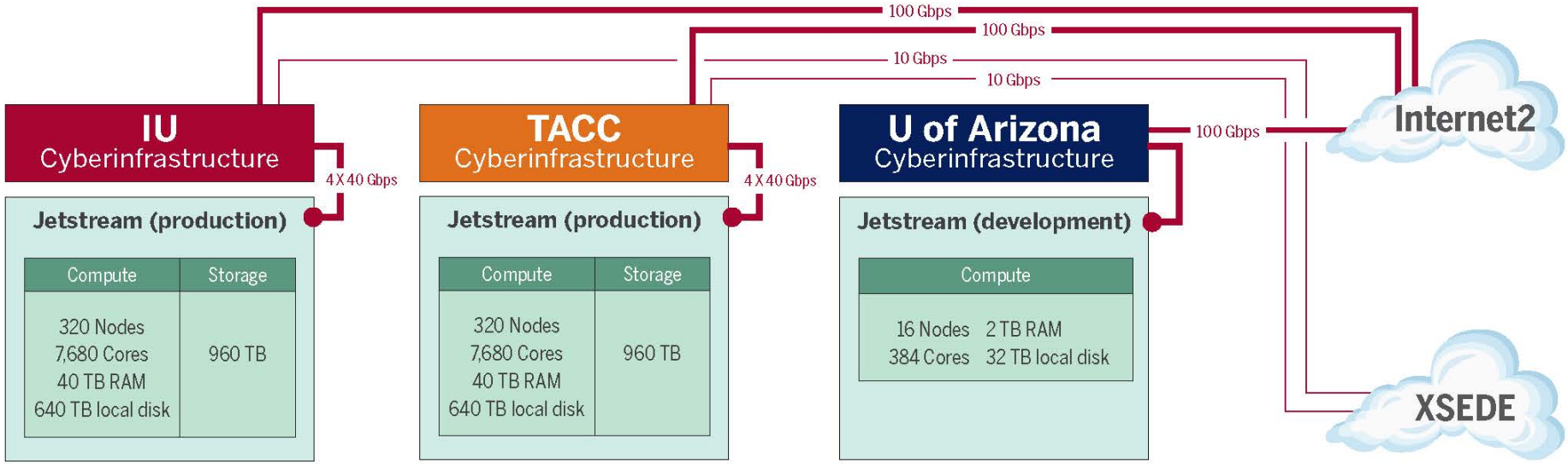
Jetstream characteristics

- First production cloud for science and engineering research across all areas of NSF-supported activity
- Interactive computing and data analysis resources “on demand”
- Focus on ease-of-use, broad accessibility
- VM library, custom VMs, or “private computing system”
  - Not every cloud computing service one might be able to buy from AWS
- Reproducibility: Store, publish via IUScholarWorks (DOI)
- Will support persistent gateways (iPlant, Galaxy, generic “SciGAP” build-a-gateway image)

Jetstream System Overview



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

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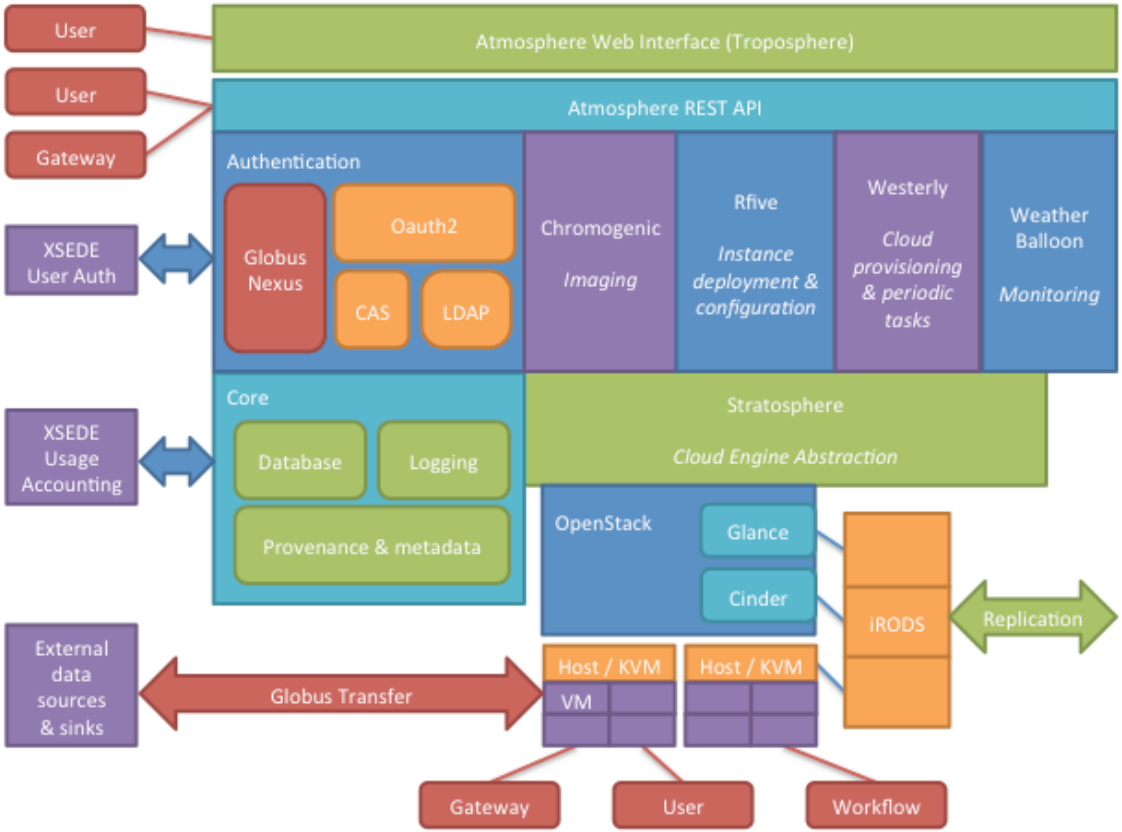
Software Stack: Metal to Atmosphere



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Use cases drawn from 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!

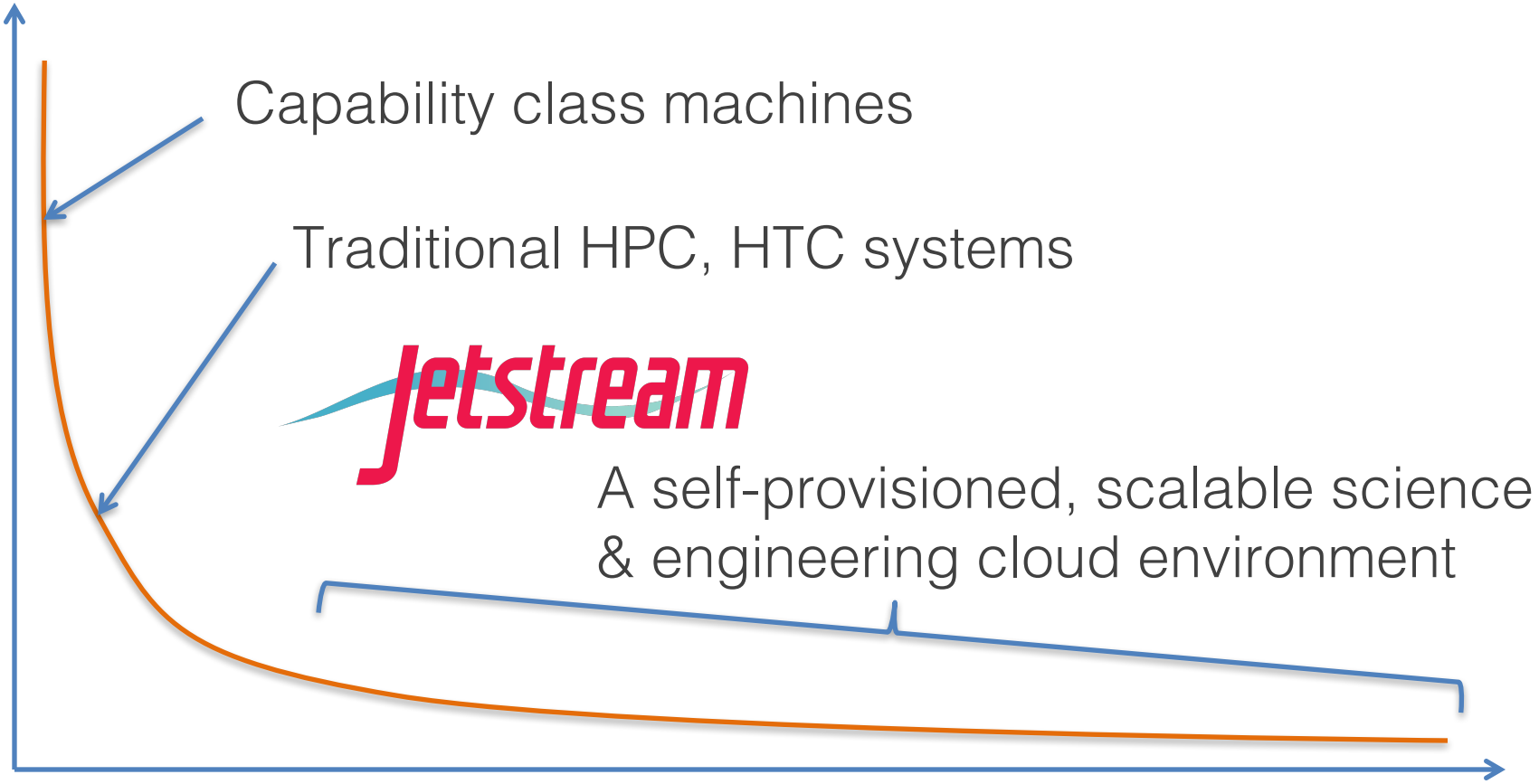
Needs based on mode of use

- Campus bridging. An old XSEDE use case: the ability to initiate an interactive computing session, detach with it running, and re-attach and continue working. Jetstream VM image featuring a user-friendly virtual Linux desktop running on Jetstream with screen images delivered to tablet devices on cellular connections or to older PCs on slow networks.
- Enable use of proprietary software.
- Facilitate reproducible data analyses.
- Enhance ease of science gateway deployment. Provide a gateway builder's toolkit, including VMs with commonly used workflow engines installed and ready to configure, XSEDE tools, and a platform for persistently hosting web services.
- Visualization and analysis. Many researchers would like to interactively use visualization.

21st-century workforce development

- Specialized virtual Linux desktops and applications to enable research and research education at small colleges and universities
- HBCUs (Historically Black Colleges and Universities)
- MSIs (Minority Serving Institutions)
- Tribal colleges
- Higher-ed institutions in EPSCoR States

“Long tail” of the NSF XD Ecosystem



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Challenges in implementation

- Well, it's an FOAK
- Allocations
- Appropriate use
- Scope of user community
  - Depending on existing community structures and XSEDE

Newest news

- Done
  - Test system in 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 been ordered
- Planned
  - Friendly user mode by SC15
  - Early operations mode Jan – Mar 2016

Jetstream Partner Organizations

Initial construction (funded partners)

Management & Operations partners

Application / community lead partners

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