Jetstream2 in the lightning
Accelerating Science and Engineering on Demand

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What is Jetstream2 and why does it exist?

- Significant evolution of the Jetstream
- Under 10% NSF investment -> support for 24% of institutions, 23% of active PIs, and 32% of users*
- Jetstream has provided 6x more SUs than any other XSEDE resource for Education
- Emphasis on ease-of-use, broad accessibility, *AI for Everyone*
- Will provide on-demand interactive computing and persistent services for science gateways
- Enables *configurable* environments; *programmable cyberinfrastructure*

*Based on XDMoD data at Workload Analysis Report: http://arxiv.org/abs/1801.04306
What worked?

- Allowing API access and full control (root privileges)
- “Indefinite workflows” – allowing instances to run continuously – providing PIs renew their allocations
- Development of trial allocations

What didn’t work?

- Forcing small allocations into the research allocation process
- Lack of multi-year allocations
- Lack of shared data set storage
Jetstream2 Capabilities

Enhancing IaaS model of Jetstream:
• Improved orchestration support
• Elastic “push button” virtual clusters
• Federated JupyterHubs

Commitment to >99% uptime
• Critical for science gateway hosting
• Hybrid-cloud support

Revamped User Interface
• Unified instance management
• Multi-instance launch

• >57K cores of next-gen AMD EPYC processors
• >360 NVIDIA A100 GPUs will provide vGPUs via NVIDIA’s MIG feature
• >18PB of storage (NVMe and disk hybrid)
• 100GbE Mellanox network
Conceptual Jetstream2 Architecture
Platform Overview

- Atmosphere
- XSEDE Accounting
- OpenStack
- Ceph
- Jetstream2 Core System
- OpenStack
- Horizon
- OpenStack CLI
- Authentication Service
- XSEDE Accounting
- 3rd Party Clients
- Science Gateways
Timeline

- Jetstream now in 5th year of operations
- Jetstream extension granted by the NSF through November 2021
- Jetstream2
  - Early operations planned for August 2021
  - Production operations by October 2021
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Jetstream2 partners

http://jetstream-cloud.org/
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