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The transition to two – Jetstream to Jetstream2

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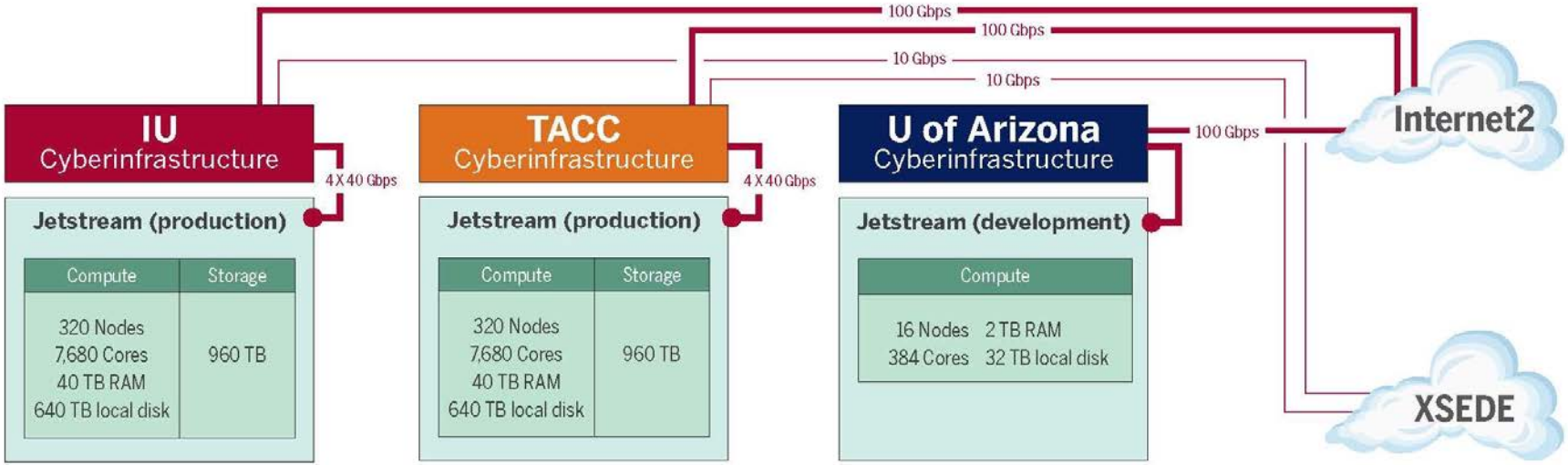
Jetstream & Jetstream2 Primary Investigator

Prepared for SC20 – November 2020 – Too much Virtual

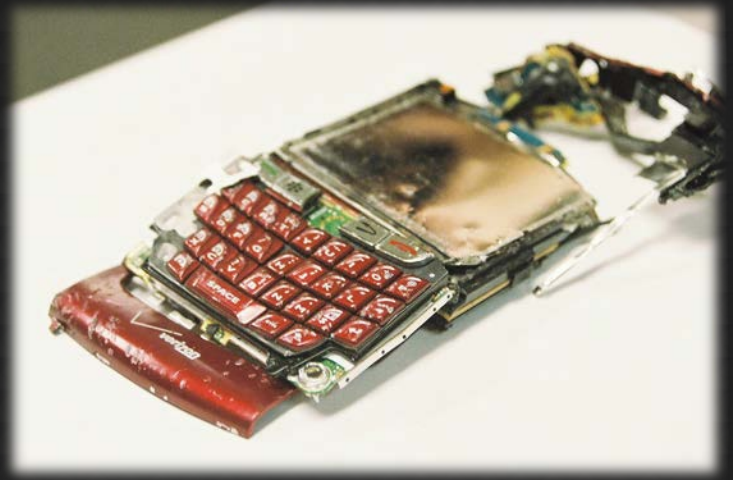
Jetstream2

Jetstream [1] System Overview



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



Flickr user MattHurst – Broken Blackberry

What didn’t work?

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

jetstream

What is Jetstream2 and why does it exist?

- Significant evolution of the Jetstream cloud resource
- 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

Jetstream2

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

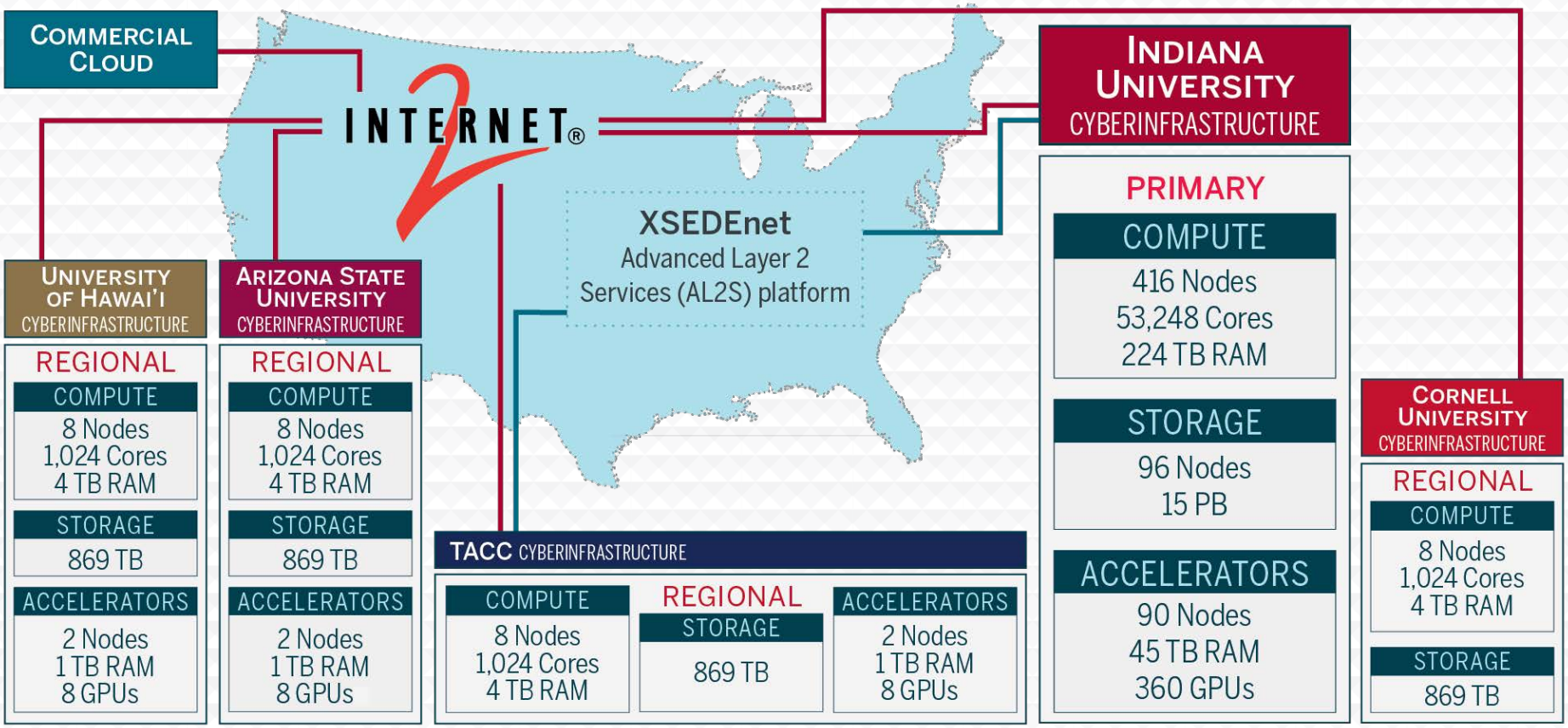
Revamped User Interface

- Unified instance management
- Multi-instance launch

Feb 12, 2019 – Jet stream region called "Jet N6"
NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill

- >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

Jetstream2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INTERNET2®
XSEDEnet
Advanced Layer 2 Services (AL2S) platform
INDIANA UNIVERSITY CYBERINFRASTRUCTURE
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COMPUTE
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53,248 Cores
224 TB RAM
STORAGE
96 Nodes
15 PB
ACCELERATORS
90 Nodes
45 TB RAM
360 GPUs
UNIVERSITY OF HAWAI'I CYBERINFRASTRUCTURE
REGIONAL
COMPUTE
8 Nodes
1,024 Cores
4 TB RAM
STORAGE
869 TB
ACCELERATORS
2 Nodes
1 TB RAM
8 GPUs
ARIZONA STATE UNIVERSITY CYBERINFRASTRUCTURE
REGIONAL
COMPUTE
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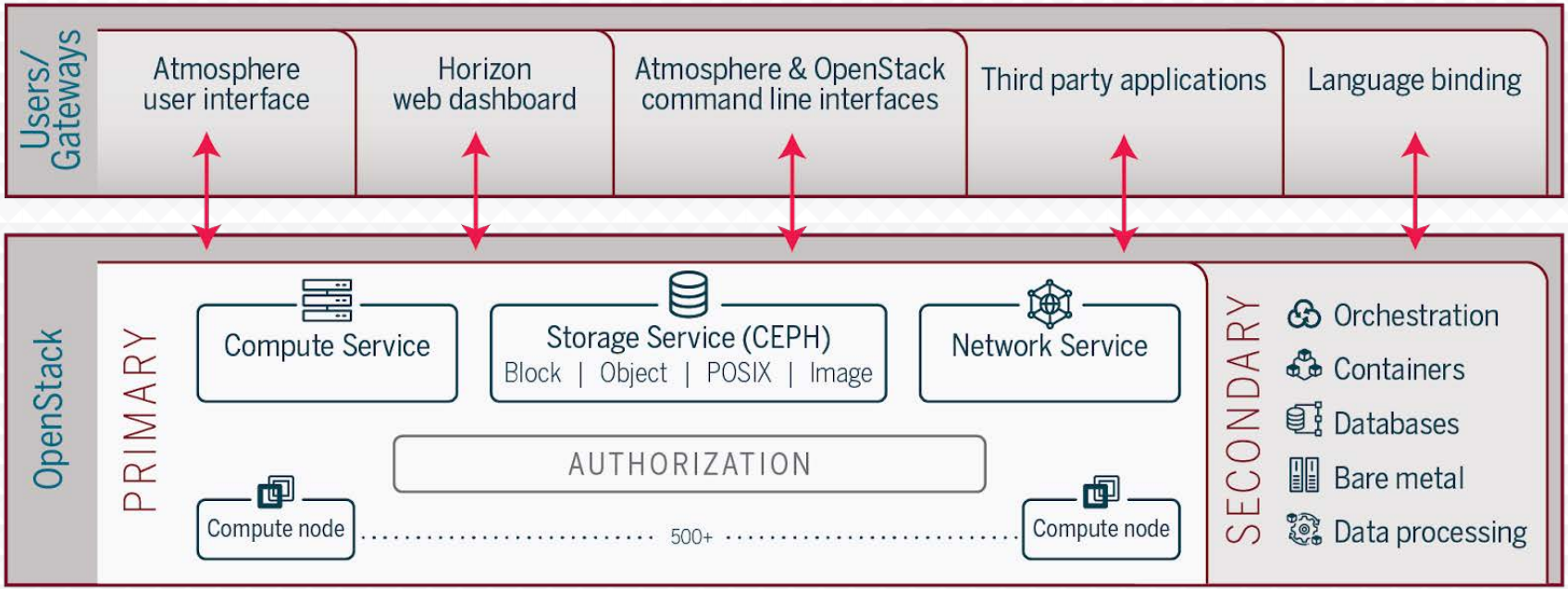
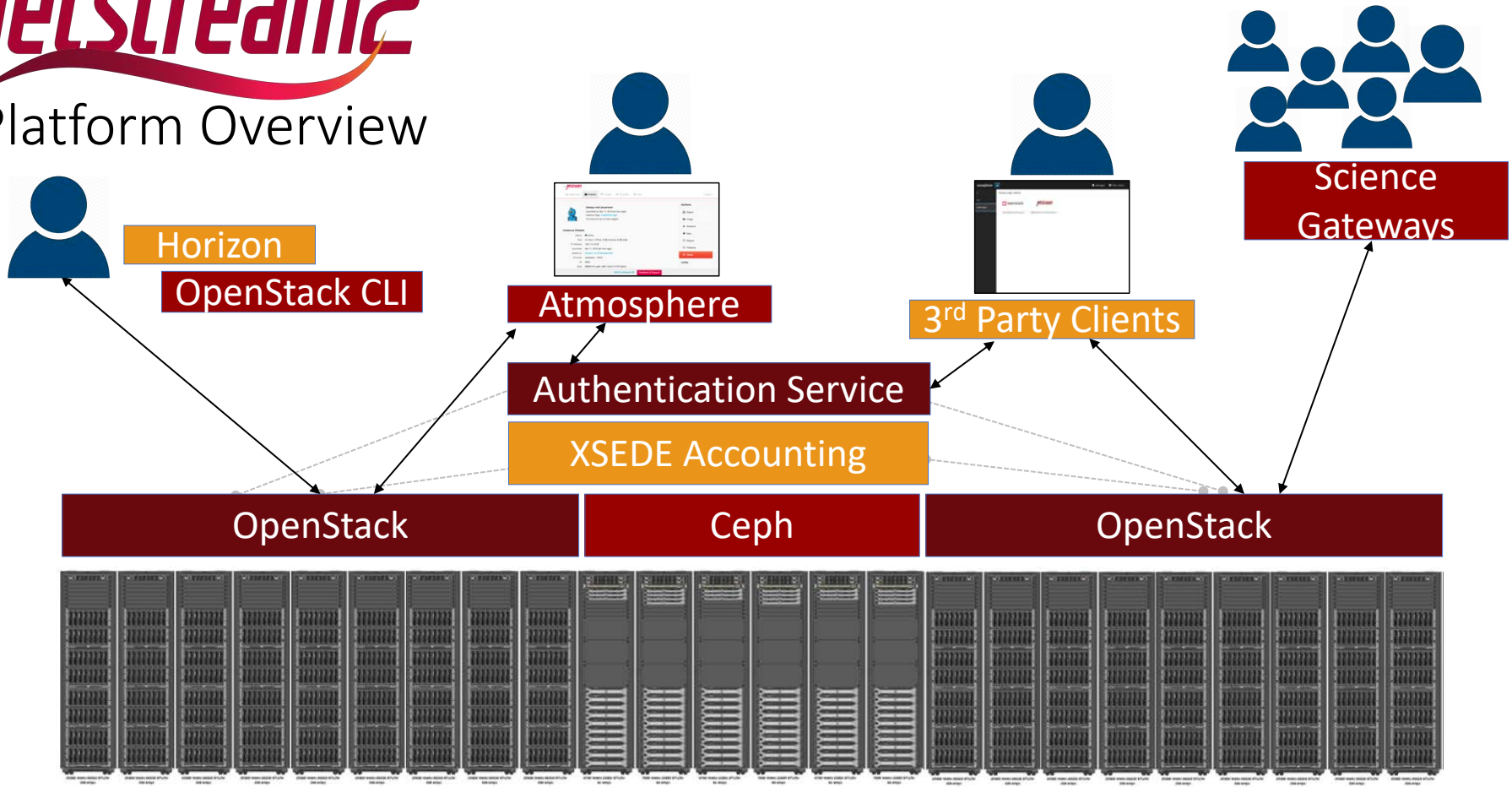
Conceptual Jetstream2 Architecture



Jetstream2

Jetstream2

Platform Overview



Jetstream2 Core System

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

Flickr user Oiluj Samall Zeid - Lejos de Yulín

Jetstream2

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Acknowledgements

NSF Awards 1053575 & 1548562 (XSEDE), 1445604 (Jetstream) and 2005506 (Jetstream2)

This document was developed with support from the National Science Foundation. Any opinions, findings, conclusions, or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the NSF.

Special thanks to contributors, Jetstream, and Jetstream2 partners

- Jeremy Fischer, J. Michael Lowe, Therese Miller, Maria Morris, Winona Snapp-Childs, and George Turner

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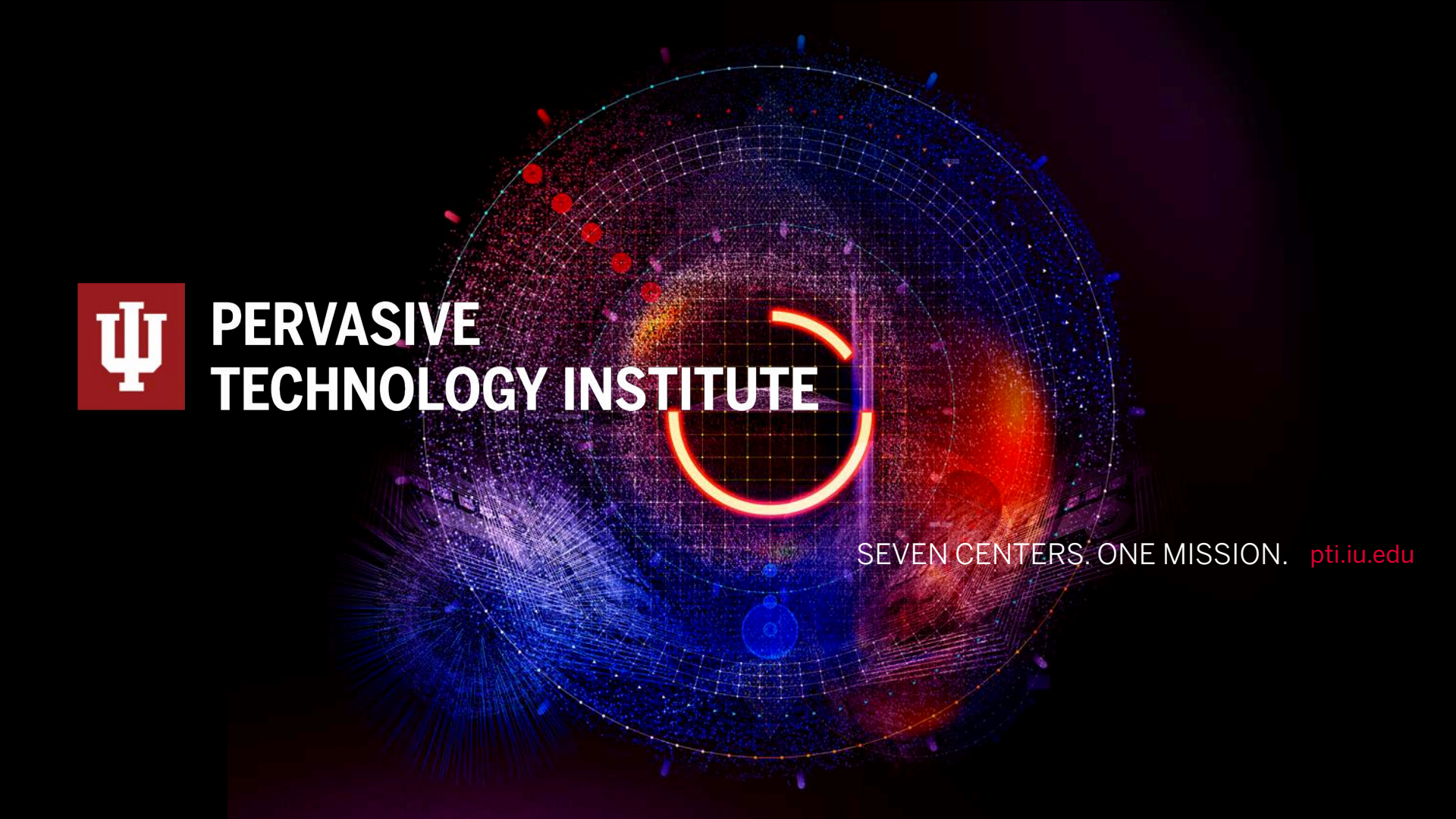
http://jetstream-cloud.org/
National Science Foundation
Award #ACI-2005506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