

XSEDE for Computational Research Resource Update and Campus Champions

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XSEDE

Extreme Science and Engineering
Discovery Environment



New XSEDE Resources

An Update



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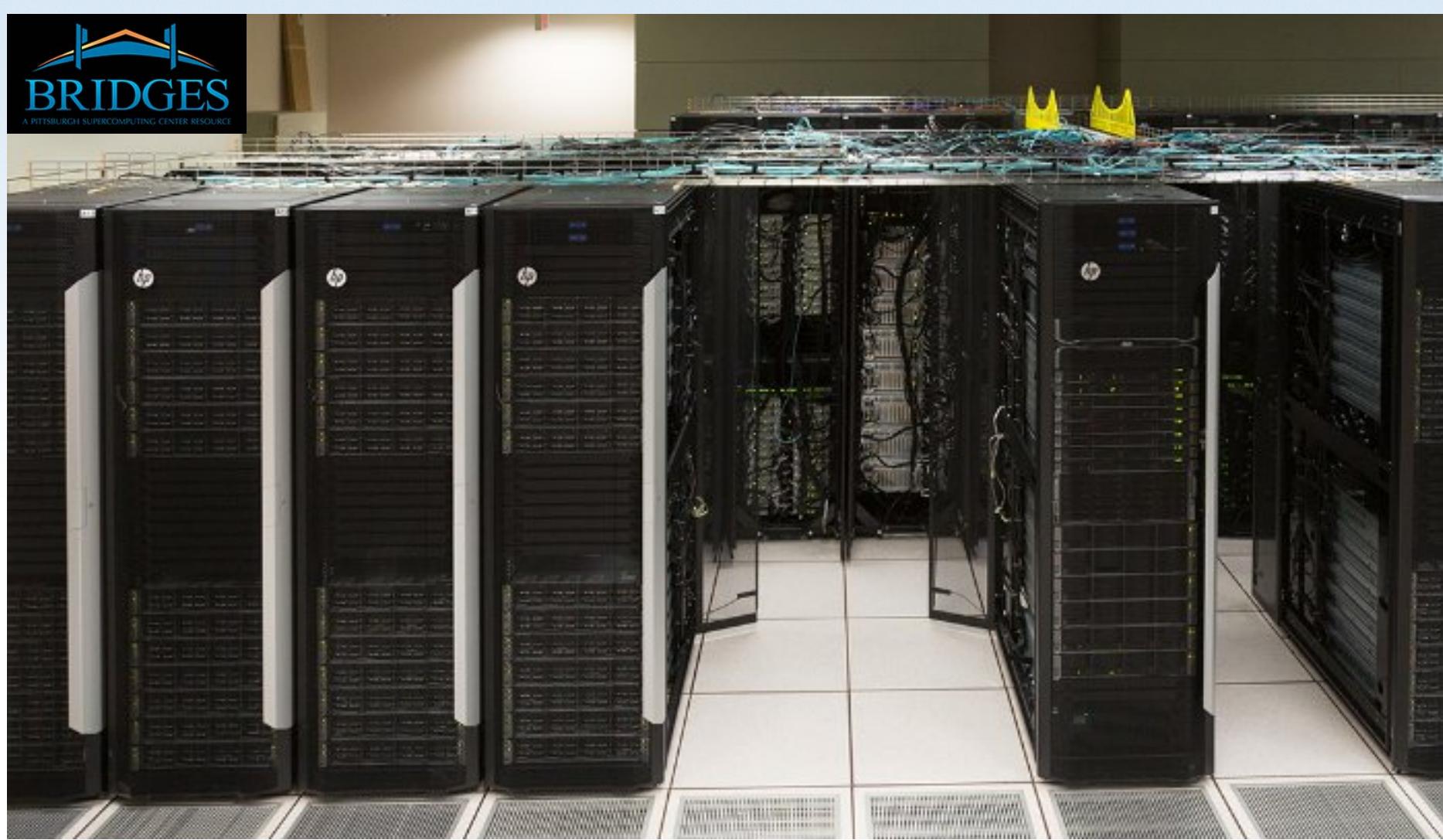
Bridges at PSC

Bridges is made up of three types of HPE machines:

- Four Integrity Superdome X servers, which are scale-up products that let users lock data once into their 12 terabytes of shared memory and then conduct analytics
- 42 HPE ProLiant DL580 servers, each of which has 3 terabytes of shared memory and provides virtualization and remote visualization.
- 800 HPE Apollo 2000 nodes, each with 128 gigabytes of shared memory apiece, servicing capacity workloads.



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20 Storage Building Blocks, implementing the parallel *Pylon* filesystem (~10PB) using PSC's SLASH2 filesystem

4 MDS nodes

2 front-end nodes

2 boot nodes

8 management nodes

6 "core" Intel® OPA edge switches:
fully interconnected,
2 links per switch

Intel® OPA cables

800 HPE Apollo 2000 (128GB) compute nodes

4 HPE Integrity Superdome X (12TB) compute nodes

42 HPE ProLiant DL580 (3TB) compute nodes

12 HPE ProLiant DL380 database nodes

6 HPE ProLiant DL360 web server nodes

20 "leaf" Intel® OPA edge switches

32 RSM nodes with NVIDIA next-generation GPUs

16 RSM nodes with NVIDIA K80 GPUs

Purpose-built Intel® Omni-Path topology for data-intensive HPC

<http://psc.edu/bridges>

Comet at SDSC

Comet is evolution of past successes:

- Standard compute nodes consist of Intel Xeon E5-2680v3 processors, 128 GB DDR4 DRAM (64 GB per socket), and 320 GB of SSD local scratch memory.
- The GPU nodes contain four NVIDIA GPUs each.
- The large memory nodes contain 1.5 TB of DRAM and four Haswell processors each.
- The network topology is 56 Gbps FDR InfiniBand with rack-level full bisection bandwidth and 4:1 oversubscription cross-rack bandwidth.
- Comet has 7 petabytes of 200 GB/second performance storage and 6 petabytes of 100 GB/second durable storage.
- It also has dedicated gateway hosting nodes and a Virtual Machine repository.



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SDSC

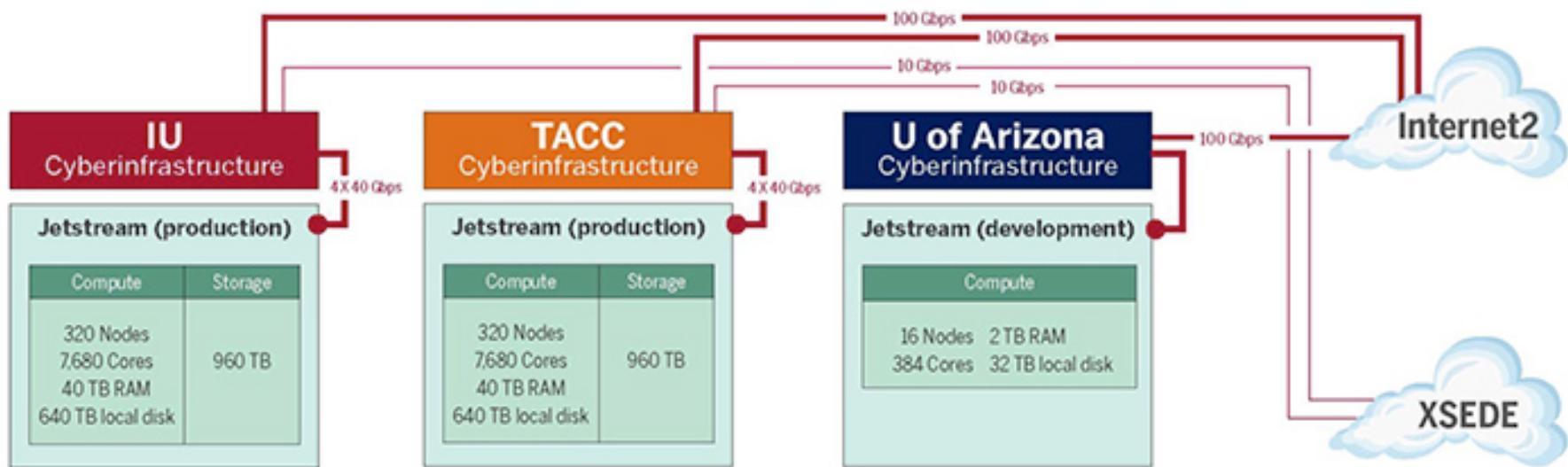
Jetstream at IU/TACC

Jetstream can be used in several different virtual machine (VM) sizes which are charged in service units (SUs) based on how much of the total system resource is used. The table below outlines the VM sizes created for Jetstream.

VM SIZE	VCPUS	RAM (GB)	LOCAL STORAGE (GB)	SU COST PER HOUR
Tiny	1	2	8	1
Small	2	4	20	2
Medium	6	16	60	6
Large	10	30	120	10
XLarge	22	60	240	22
XX Large	44	120	480	44



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https://use.jetstream-cloud.org/application

Apps Add to Wish List Gmail - TeraGrid Log Add to Wish List Linux Mint Community Forums Blog Other bookmarks

Jetstream Dashboard Projects Images Providers Help jpummil

Getting Started

 Launch New Instance

Browse Atmosphere's list of available images and select one to launch a new instance.

 Browse Help Resources

View a video tutorial, read the how-to guides, or email the Atmosphere support team.

 Change Your Settings

Modify your account settings, view your resource quota, or request more resources.

Resources in Use *Need more?*

Percent of Allocation Used

Legend: Jetstream - Indiana University (Blue), Jetstream - TACC (Green)

Resource Type	Allocation (%)	Provider
CPU	4.55%	Jetstream - Indiana University
Memory	4.44%	Jetstream - Indiana University
Allocation	7.2%	Jetstream - Indiana University

1 Instances

suspended



0 Volumes

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Dashboard Projects

Images

Providers

Help

jpummil

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[Ubuntu 14.04.3 Development GUI](#)

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CentOS development Featured



[Centos 7 \(7.2\) Development](#)

Jul 22nd 2016 10:19 am CDT by [jfischer](#)

CentOS development Featured



Based on Centos 7 Cloud 1601 Image, Development tools added, Patched up to date as of 6/29/16.

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https://use.jetstream-cloud.org/application/images/37

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SEARCH

Centos 7

Name: Centos 7

Created: 7/21/2016 by jfiscus

Description: Basic of 6

Tags: Centos

Versions:

1.5 7/17/2016 Advanced Options Cancel Launch Instance

v 1.5 patched up to date as of 6/22/16 added python modules to python pip getalpm

Available on:

- Jetstream - TACC - 3de3b7ea-6d1d-43b5-9d43-e428f1b5dbc6
- Jetstream - Indiana University - 3de3b7ea-6d1d-43b5-9d43-e428f1b5dbc6
- Jetstream - TACC - 217a24b4-2338-4802-8221-fff3bf3fc260
- Jetstream - Indiana University - 217a24b4-2338-4802-8221-fff3bf3fc260

1.4

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Launch an Instance / Basic Options

Basic Info

Instance Name: Centos 7 (7.2) Development

Created: 7/21/2016

Created by: jfiscus

Description: Basic of 6

Tags: Centos

Resources

Provider: Jetstream - Indiana University

Instance Size: m1.tiny (CPU: 1, Mem: 2GB)

Resources Instance will Use

You have used 7% of 3960 AU's from this provider

a total 7 of 132 allotted CPUs

a total 18 of 360 allotted GBs of Memory

+ Add to Project

Launch



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XStream at Stanford

XStream hardware specs:

- Each of the 65 nodes has 8 NVIDIA K80 cards or 16 NVIDIA Kepler GPUs, interconnected through PCI-Express PLX-based switches. Each GPU has 12 GB of GDDR5 memory.
- Compute nodes also feature 2 Intel Ivy-Bridge 10-core CPUs, 256 GB of DRAM and 450 GB of local SSD storage.
- The system features 1.4 PB of Lustre storage (22 GB/s aggregate).



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P16

P15

P14

P13

P12

CRAY
CS-STORM

CRAY
CS-STORM

CRAY
CS-STORM

CRAY
CS-STORM

CRAY
CS-STORM

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Champion Program



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History of the Champions

- Planning began in Fall of 2007
- 1st Champion selected in May 2008
- December 2009 --Champion Leadership Team formed
- August 2011 – 100th institution joined
- May 2012 – Champion Fellows Program begun
- June 2013 – 200th Champion joined



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History of Champions – cont'd

- July 2013
 - Student Champion Program introduced
 - Domain Champion Program initiated
- January 2015 – Regional Champion Program initiated
- August 2015 – 200th institution joined
- August 2016 – 220 institutions, 284 champions
- Covers EVERY state and EVERY EPSCoR jurisdiction except Guam





Extreme Science and Engineering
Discovery Environment

Campus Champion Institutions

- ★ Standard – 119
- ★ EPSCoR States – 73
- ★ Minority Serving Institutions – 15
- ★ EPSCoR States and Minority Serving Institutions – 10

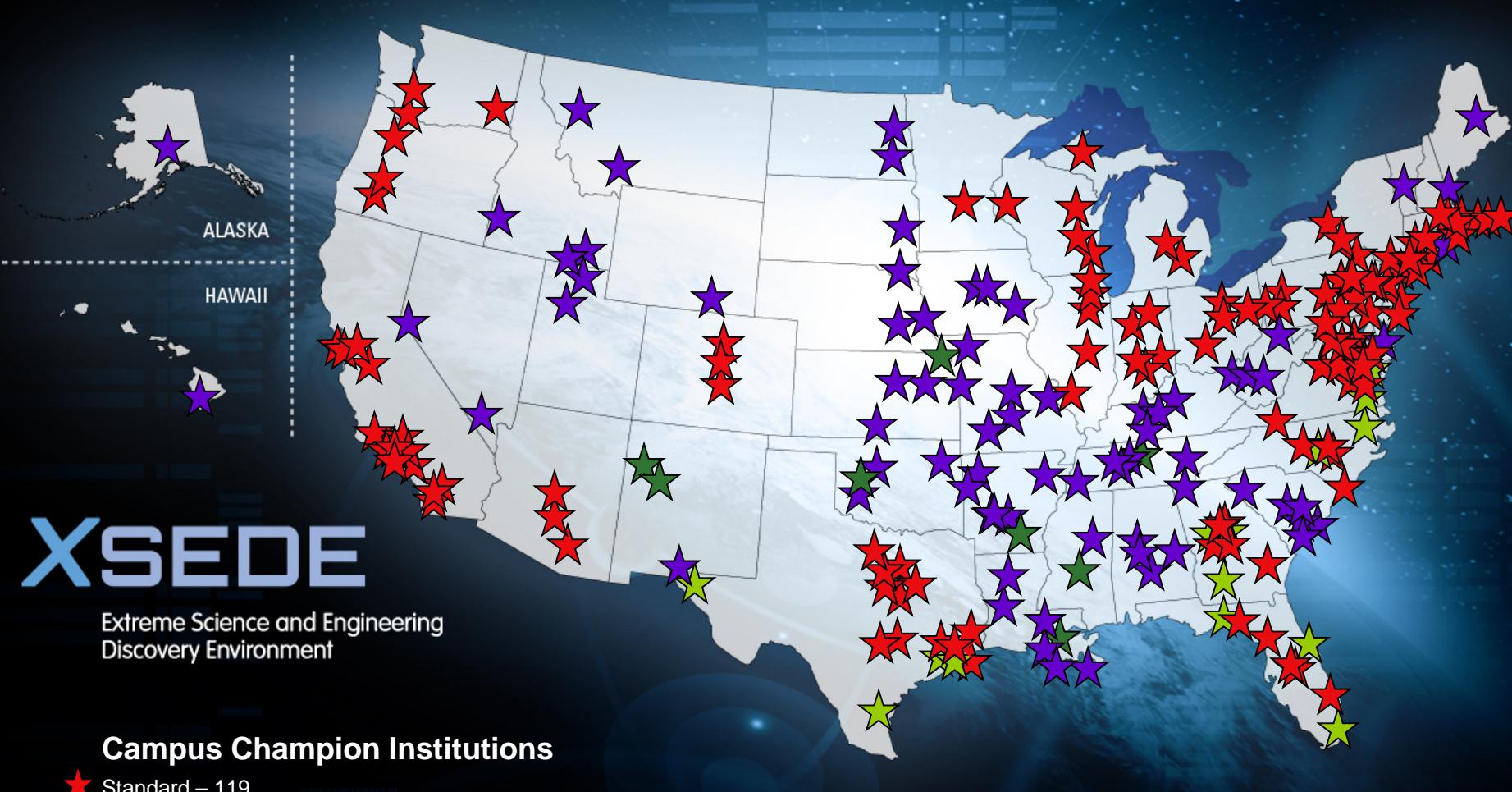
Total Campus Champion Institutions – 217

Revised June 29, 2016



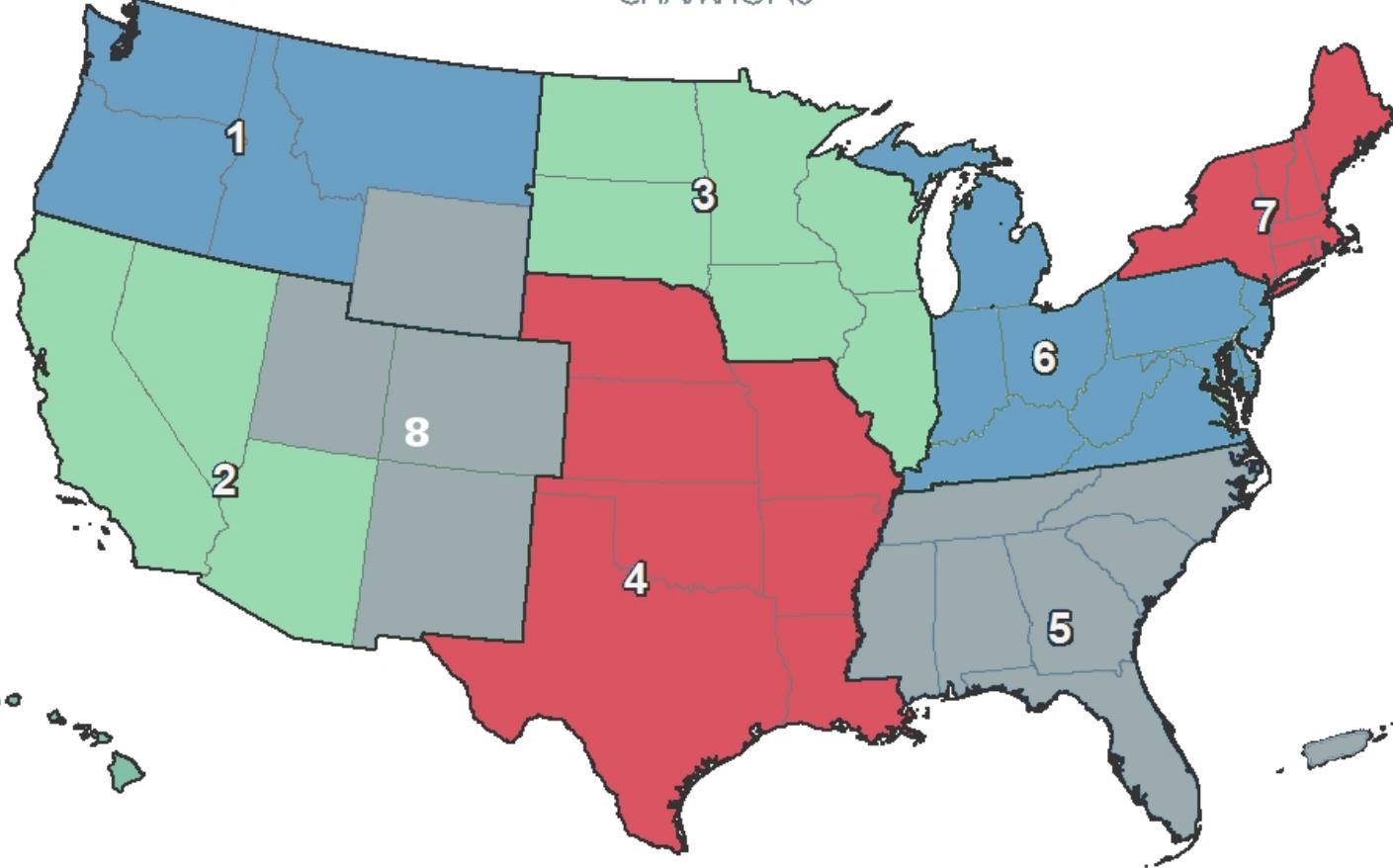
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PUERTO RICO ★
VIRGIN ISLANDS ★





XSEDE Regional Designations



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Who are the champions?

- HPC Directors
- System Administrators
- User Support specialists
- Faculty evangelists
- Central IT staff
- Non-academic organization staff, e.g. USGS, USDA-ARS, KINBER, Idaho National Lab
- Plus friends of the family



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What do champions do?

- Facilitate computing- and data-intensive research and education;
- Help their local researchers and educators to find and use the advanced digital services that best meet their needs;
- Share CI challenges and solutions.
(at all levels: workgroup, institutional, regional, national, and international)



Goals

- Increase scalable, sustainable institutional uptake of advanced digital services from providers at all levels
- Foster a broader, deeper, more agile, more sustainable and more diverse nationwide cyberinfrastructure ecosystem;
- Cultivate inter-institutional interchange of resources, expertise and support;
- Sustain this community beyond XSEDE

.



Champion Program Areas

- Campus Champions
- Regional Champions
- Student Champions
- Domain Champions
- Champion Fellow Program



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Champion Initiatives -- 2016

- Scalability & Sustainability Planning
- Deeper Champion Engagement and Support Planning
- Determine impact metrics
- Develop and Extend Collaboration Activities



Campus Engagement Mission Statement

The Campus Engagement program promotes and facilitates the effective participation of a diverse national community of campuses in the application of advanced digital resources and services to accelerate scientific discovery and scholarly achievement.



Questions?

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