

# What is campus bridging and what can it do for me?

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Indiana University / XSEDE Campus Bridging

# XSEDE

Extreme Science and Engineering  
Discovery Environment



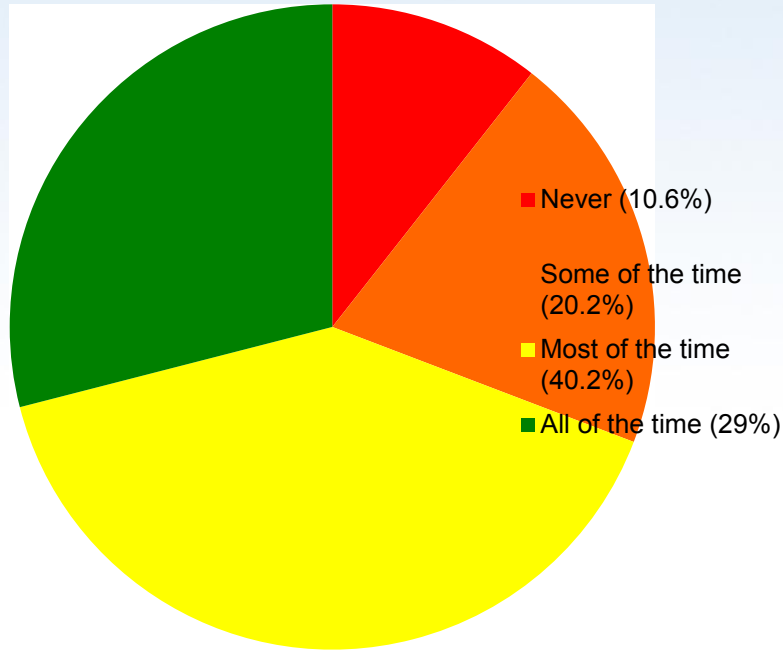
# The beginnings of Campus Bridging as a concept....

- The goal of campus bridging is to enable virtual proximity:
  - the seamlessly integrated use among a scientist or engineer's personal cyberinfrastructure; cyberinfrastructure on the scientist's campus; cyberinfrastructure at other campuses; and cyberinfrastructure at the regional, national, and international levels; as if they were proximate to the scientist.
  - When working within the context of a Virtual Organization (VO), the goal of campus bridging is to make the 'virtual' aspect of the organization irrelevant (or helpful) to the work of the VO.

NSF ACCI Task Force Report, 2011, available via  
<http://pti.iu.edu/campusbridging>



# (In)adequacy of Research CI



Key observations from ACCI Campus Bridging Task Force (paraphrased):

- Aggregate US cyberinfrastructure inadequate to meet needs
- Existing CI not optimally utilized
- Many of the challenges have to do with the existing state of software, security, and policy
- Some reasonable choices well executed now are better than perfect solutions implemented later

From: NSF Advisory Committee for Cyberinfrastructure Task Force on Campus Bridging. Final Report. March 2011. [http://www.nsf.gov/od/oci/taskforces/TaskForceReport\\_CampusBridging.pdf](http://www.nsf.gov/od/oci/taskforces/TaskForceReport_CampusBridging.pdf).



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# XSEDE campus bridging vision & strategy

- *Promote better and easier use, via XSEDE and campus bridging tools, of the nation's aggregate CI resources*
  - Campus Bridging is more a mindset that guides choices than software or hardware
  - Campus Bridging could be thought of as a very technical and broad approach to usability
  - Work with the various groups in XSEDE (such as Campus Champions and User Support) to achieve the goals set in campus bridging area
  - To be conscientiously targeted at Data, HPC, and HTC – probably in that order
  - Strategy: conscientiously make a small number of reasoned choices, pursue them with diligence, and reap economies of scale (if things go right) or clear learning experiences (otherwise)



# What Campus Bridging can do for users

- Tools to simplify data management
  - Global Federated File System – data access between users of a common grid
  - Globus Online – simplified data transfers between users/systems
- Software packages, best practices documentation that make a campus system easier to use in OSG or XSEDE context
  - OSG: Virtual Data Toolkit integrating to a Condor Flock
  - XSEDE: Rocks Rolls for setting up machines similar to XSEDE resources
- Unified documentation and Training Services
  - Training and documentation that applies to campus, regional, and national resources



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# What's required at campus sites?

- Need to participate in collaborative research – data sharing, running jobs on multiple systems, training on how to use XSEDE systems
- Willingness to make use of best practices guidance and documentation
- Not necessarily cookie-cutter systems – standards-capable systems, able to use OSG Virtual Data Toolkit or other packaging standards



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# Economies of scale in training and usability from more consistency in cluster configurations

**Roughly 4 out of 5 systems administrators agree...\***



\* not intended to be a factual statement

- In reality, the four cluster admins depicted here being in agreement are all right.
- Experienced cluster admins all learned how to use what they learn when the tools were still developing, so the tool each sysadmin knows the best is the tool that lets that sysadmin do their work the best
- The only way to develop consistency is to provide installers that will make their work easier
- The XSEDE architecture group is developing installers for file management tools
- XSEDE campus bridging is developing Rocks Rolls cluster build setups (and documentation)

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# Economies of scale in training and outreach

- Consistency in system setups – local becoming more like XSEDE – should also lead to economies of scale in training
- Materials and trainer expertise will be more easily transportable and extensible
- The campus bridging group plans to work very closely with the campus champions



Image from TeraGridEOT: Education, Outreach, and Training 2010. <https://www.teragrid.org/web/news/news#2010scihigh>



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# Campus Bridging GFFS pilot program

- Texas A&M – use of GFFS with Brazos Cluster
- Kansas – data transfer within Great Plains Network and with Indiana University
- CUNY – spanning campus to XSEDE resources
- Univ of Miami – data sharing within campus and across WAN
- Pilot projects are currently working with XSEDE Operations to prepare Genesis II Infrastructure for beta usage



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# Five year goals

- At the end of 5 years, have implemented and socialized a community vision of an integrated national cyberinfrastructure with XSEDE as a critical component – but just a component
- Working with XSEDE and the community as a whole, implement the technology required to support as many of the use cases described here as possible



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