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Globus in the Campus Bridging Context

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XSEDE

Extreme Science and Engineering
Discovery Environment



What is XSEDE?

- eXtreme Science and Engineering Discovery Environment
- Successor to TeraGrid
- NSF Grant
- Network of top-tier scientific computing resources nationwide
- The institution that supports the network



What is XSEDE? 2

- Through a simple allocation process, researchers can apply for and receive compute resources on top-tier cyberinfrastructure with which to run scientific experiments
- Work often involves extensive use of “Big Data” – so these researchers are moving a lot of data back and forth

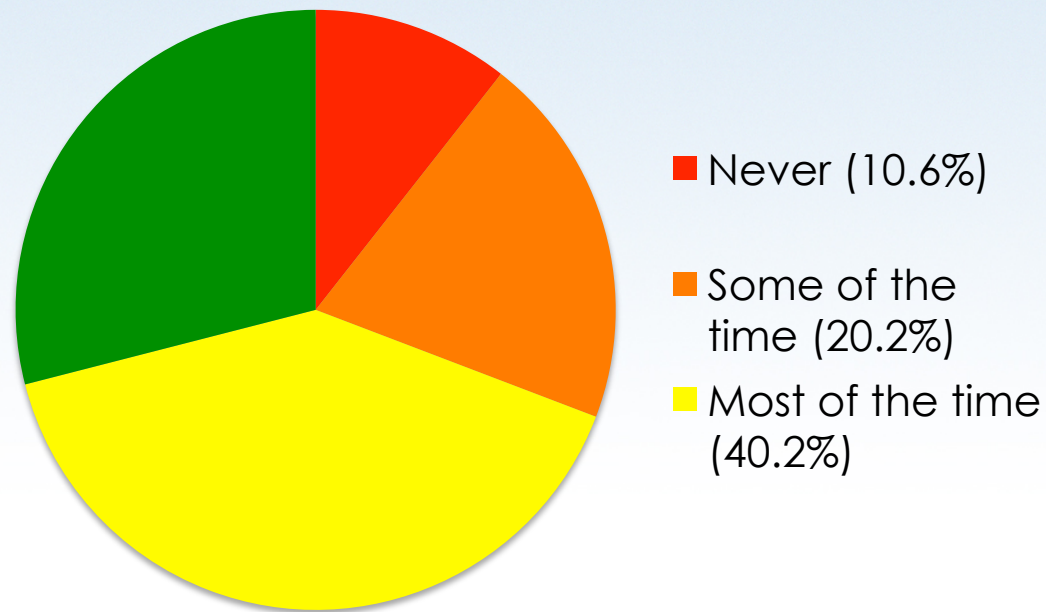


What is Campus Bridging?

- “Bridging” the gap between local researcher cyberinfrastructure, campus CI, and national CI resources
 - Hardware
 - Software
 - Support
 - Outreach



Adequacy of research CI



Responses to asking if researchers had sufficient access to cyberinfrastructure resources – survey sent to 5,000 researchers selected randomly from 34,623 researchers funded by NSF as Principal Investigators 2005-2009; results based on 1,028 responses

Stewart, C.A., D.S. Katz, D.L. Hart, D. Lantrip, D.S. McCaulay and R.L. Moore. Technical Report: Survey of cyberinfrastructure needs and interests of NSF-funded principal investigators. 2011. hdl.handle.net/2022/9917



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More on Campus Bridging

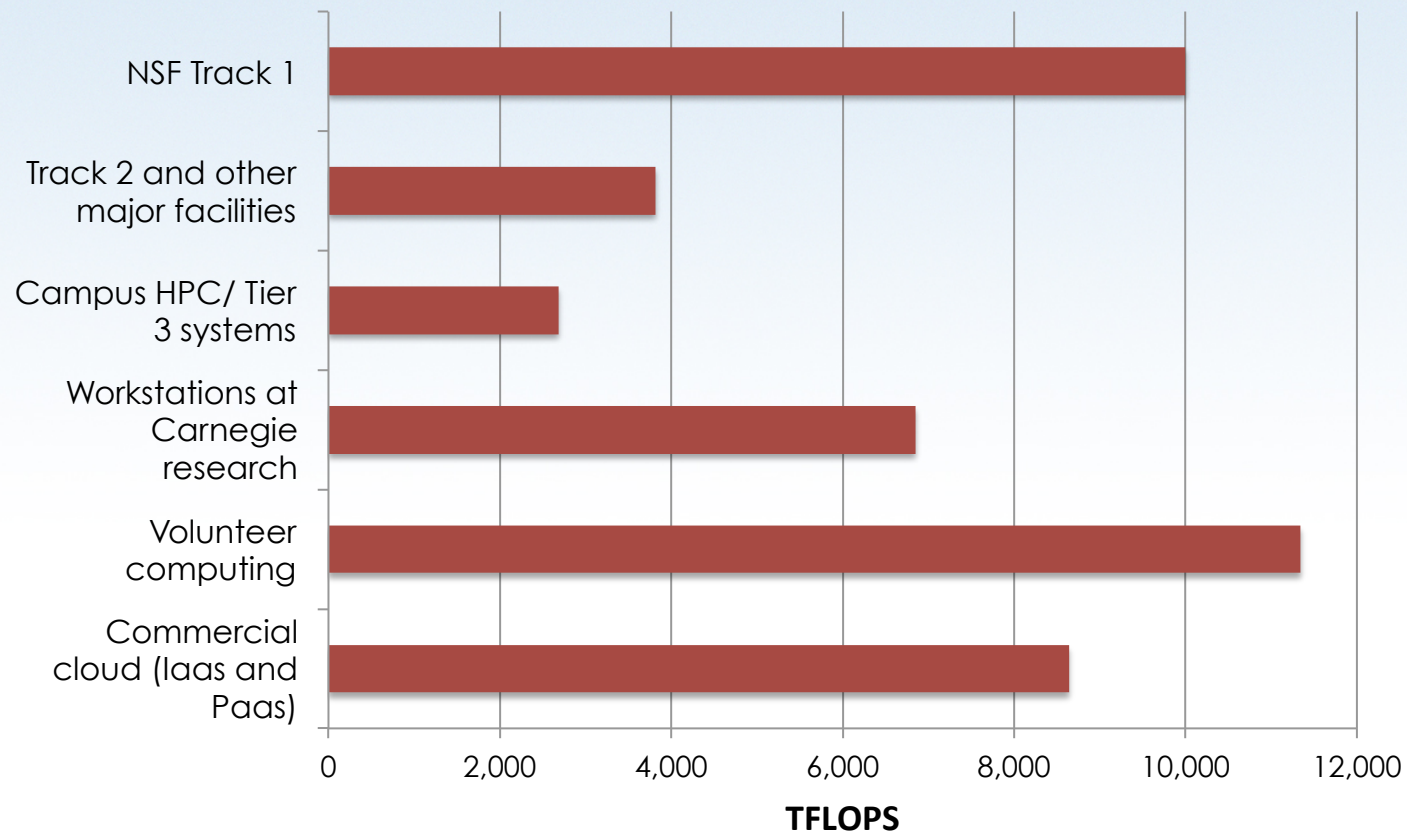
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- The goal of campus bridging is virtual proximity ...
- The biggest problems:
 - Not enough CI resources available to most researchers
 - When you go from your campus to the national cyberinfrastructure it can feel like you are falling off a cliff! That's why you need bridging....
- Campus bridging is a major priority within XSEDE



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Some CI resources available to science and engineering researchers in US (March 2011)⁷



Based on: Welch, V.; Sheppard, R.; Lingwall, M.J.; Stewart, C. A. 2011. Current structure and past history of US cyberinfrastructure (data set and figures). hdl.handle.net/2022/13136



XSEDE Campus Bridging

- Even for those researchers with enough computing time, there has traditionally been little support once the allocation process is complete
 - XSEDE has prioritized training and documentation, as well as a number of initiatives designed to make the transition appear seamless to the user:



Campus Bridging services today

- UNICORE – Grid system developed in Europe, supported and continually evolving, adopted by XSEDE for optional deployment on level 1 and 2 Service Providers. Nearly universal.
- Cluster Rocks Rolls and YUM Repo
- Globus Online – File transfer utility, approved for use on XSEDE resources. Globus Connect Multiuser also through engineering process.
- Genesis II – global file system and job submission service under evaluation & development



Globus in the Campus Bridging Context

- Screenshot courtesy of http://genome.jgi.doe.gov/pages/portal_apps.jsf

The screenshot displays the Globus online web interface. At the top, the 'globus online' logo is on the left, and navigation links for 'Manage Data', 'Groups', 'Support', and 'jdoe' are on the right. Below the navigation bar, there are links for 'start transfer', 'view transfer activity', 'manage endpoints', and 'dashboard'. A 'Get Globus Connect' button is also present with the text 'Turn your computer into an endpoint.'

The main area is titled 'Transfer Files'. It features two side-by-side panels for selecting source and destination endpoints. The left panel has an 'Endpoint' field set to 'jgi#portal' and a 'Path' field set to '/-/By_Proposal_Name/AAcidic_Mine_Environ'. The right panel has an 'Endpoint' field set to 'nersc#dtn' and a 'Path' field set to '/-/data/'. Both panels have 'Go' buttons.

Below the endpoint selection, there are two file lists. The left list shows a directory structure with folders named 'Acidic_Mine_Environmental_sample__Acid_mine_drainage_[Acimindrainage]', 'Acidic_Mine_Environmental_sample__Community_UBA_Waterfall_[ComUBA]', 'Acidic_Mine_Environmental_sample__Iron_Mountain_AMD_Site_1_[IroMouAM]', 'Acidic_Mine_Environmental_sample__Iron_Mountain_AMD_Site_2_[IroMouAM]', 'Acidic_Mine_Environmental_sample__Ultra_back_A_BS_[UltrabackABS]', 'Acidic_Mine_Environmental_sample__Ultra_back_A_UBA_[UltrabackAUBA]', and 'Acidic_Mine_Environmental_sample__Ultra_back_C_level_1_20_m_back_[UltrabackClevel120mback]'. The right list shows a single folder named 'Acidic_Mine'.

At the bottom of the interface, there is a 'Label This Transfer' section with a text input field and a 'more options' link. Below the input field, it says 'This will be displayed in your transfer activity.'

Globus with at least one XSEDE Endpoint

- 136 million files transferred to a XSEDE endpoint
- 121 million files transferred from a XSEDE endpoint
- 1,351 TBs transferred to a XSEDE endpoint
- 1,328 TBs transferred from a XSEDE endpoint
- 373 distinct Globus Transfer XSEDE users



Summary


- Campus bridging aims to create virtual proximity between researchers and resources
- Streamlining and easing the analysis part of research
- Ways we are working to bridge research computing:
 - Basic XSEDE-compatible software stack
 - Full-time dedicated support and consulting
 - Globus Online
 - GenesisII



For more information...

- <https://www.xsede.org/campus-bridging>
 - <http://cb-repo.iu.xsede.org/xsederrepo/>
 - <https://www.xsede.org/globus-online>
 - <http://genesis2.virginia.edu>
 - campusbridging@xsede.org
 - +1 (812) 318-2872 (M-F, 9a-5p Eastern)
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- Any questions?





Our reach will forever
exceed our grasp, but,
in stretching our horizon,
we forever improve our world.

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