

Cyberinfrastructure Resource Integration

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XSEDE

Extreme Science and Engineering
Discovery Environment



Supported by OAC 15-48562.

The Extreme Science and Engineering Discovery Environment - XSEDE

- FREE access to high-performance resources at national supercomputing centers
 - Lots of research resources applications available, but the environment is complex
- Training on how to use resources, programming, and more
- Consulting on applications
- Help with integrating technology on campuses ←my team's role
- Getting started doc: <https://portal.xsede.org/documentation-overview>



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CRI activities

Help grow the aggregate CI from campuses, collaborations, to XSEDE

- Toolkits for better CI integration
 - OpenHPC installation
 - Virtual Cluster Toolkit
 - OpenStack base architecture
 - Application Container Template Library
- Consulting and training
 - bringing best practices from XSEDE to campus and regional collaborations
- Service Provider Coordination

...and we help with Letters of Support for NSF MRI's, CC, and other proposals!*



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CRI Toolkit overview

- XSEDE-Compatible Basic Cluster (XCBC) - simplifying HPC Cluster deployment
 - OpenHPC-based, WareWulf management tool, Slurm scheduler
 - Ansible scripts to aid deployment
 - Includes scripts to aid installation of OpenOnDemand user interface and Open XDMoD metrics
- Virtual Cluster toolkit - run a traditional HPC cluster (based on XCBC above) on an OpenStack cloud.
 - Currently running on Jetstream Research Cloud and Cornell Red Cloud
- OpenStack Base Architecture - research cloud implementation best practices
- Container Template - best practices for lightweight, reproducible research applications



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Where can you get this stuff?

- Cluster Stack: https://github.com/XSEDE/CRI_XCBC
- Virtual Cluster: https://github.com/XSEDE/CRI_Jetstream_Cluster
- Container Templates: <https://github.com/XSEDE/container-template-lib>



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Consulting on campus infrastructure

- Site visits
 - If a campus wants help setting up a campus cluster, our field engineers work to help get things set up
 - Hardware should be present or close - we also provide letters of support for funding proposals
 - Typically a few meetings to set scope and goals, then identify a good time for the build and implementation
 - Pre-pandemic: in-person/on-site, about a week; Currently: Series of zoom meetings with screen share
- Engagements - consulting on campus practices
 - Single call or series of calls with the team that cover:
 - Architecture
 - Implementation
 - Policy



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CRI Engagements

- Infrastructure Deployments
 - Marshall U, West Virginia U, Southern Illinois U, University of Texas El Paso, Clarkson, University of Central Oklahoma, George Mason, University of Cincinnati, Doane University, Bentley University
- Engagements on Policy and Implementations
 - Arizona State University, Brown University, Oral Roberts University
- Goals:
 - Provide best practices from many sites to be implemented locally
 - Collect policy and implementation reflections from broader community
 - Solicit needs for toolkits from implementers



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CRI Outcomes

- Toolkits and documentation
- Over 1TF of aggregate computing capacity supporting thousands of users
- Helped with overall architectural planning, purchase, and acquisition of large systems
- Multiple MRIs supported with a few winners



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How to get access to our services?

- Email help@xsede.org and mention CRI, please cc me at rich.knepper@cornell.edu
- See our online info:
 - <https://www.xsede.org/ecosystem/xcri-mission>
 - <https://github.com/XSEDE>
 - <https://xcri-docs.readthedocs.io>



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