

# XSEDE

Extreme Science and Engineering  
Discovery Environment

DATA SAMPLE PART 01  
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## What is XSEDE?

### A new era of advanced digital services

The Extreme Science and Engineering Discovery Environment (XSEDE) is the most advanced, powerful, and robust collection of integrated digital resources and services in the world. It is a single virtual system that scientists can use to interactively share computing resources, data, and expertise.

Scientists, engineers, social scientists, and humanities experts around the world—many of them at colleges and universities—use advanced digital resources and services every day. Supercomputers, collections of data, and new tools are critical to the success of those researchers, who use them to make us all healthier, safer, and better off.

XSEDE integrates these resources and services, makes them easier to use, and helps more people use them.

The five-year, \$121 million project is supported by the National Science Foundation. It replaces and expands on the National Science Foundation TeraGrid project. More than 10,000 scientists used the TeraGrid to complete thousands of research projects, at no cost to the scientists. XSEDE continues that same sort of work—only in more detail, generating more knowledge, and improving our world in an even broader range of fields.

XSEDE supports 16 supercomputers and high-end visualization and data analysis resources. XSEDE's integrated, comprehensive suite of advanced digital services will connect with other high-end facilities and campus-based resources, serving as the foundation for a national computing ecosystem. Common authentication and security mechanisms, global namespace and filesystems, remote job submission and monitoring, and file transfer services are examples of XSEDE's advanced digital services. XSEDE's architecture, based on a judicious use of standards, allows open development for future digital services and enhancements.

XSEDE is led by the University of Illinois's National Center for Supercomputing Applications. The partnership includes: Center for Advanced Computing - Cornell University, Indiana University, Jülich Supercomputing Centre, National Center for Atmospheric Research, National Center for Supercomputing Applications - University of Illinois at Urbana-Champaign, National Institute for Computational Sciences - University of Tennessee Knoxville/Oak Ridge National Laboratory, Ohio Supercomputer Center - The Ohio State University, Pittsburgh Supercomputing Center - Carnegie Mellon University/University of Pittsburgh, Purdue University, Rice University, San Diego Supercomputer Center - University of California San Diego, Shodor Education Foundation, Southeastern Universities Research Association, Texas Advanced Computing Center - The University of Texas at Austin, University of California Berkeley, University of Chicago, and the University of Virginia.

- **Find out more about XSEDE:**  
<https://www.xsede.org>
- **Find out how to get time on XSEDE computing resources:**  
<https://www.xsede.org/allocations>
- **Learn more about Extended Collaborative Support Services:**  
<https://www.xsede.org/ecss>
- **Send general questions to:** [info@xsede.org](mailto:info@xsede.org)



The Extreme Science and Engineering Discovery Environment (XSEDE) is supported by the National Science Foundation.

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The XSEDE project also provides the expertise to ensure that researchers can make the most of the supercomputers and tools such as:

- Extended collaborative support that includes assigning experts from XSEDE partner sites to work closely with users over long periods of time, as well as working with entire research communities to extend their capabilities.
- An advanced distributed systems architecture, rooted in user requirements and hardened by systems engineering, that allows for individualized user experiences, consistent and enduring software interfaces, improved data management, and ways for campus resources to be transparently integrated into the overall XSEDE infrastructure.
- The XSEDE user portal, a web interface that allows users to monitor and access XSEDE resources, manage jobs on those resources, report issues, and analyze and visualize results.
- Coordinated allocations of NSF's high-end resources and digital services.
- A powerful and extensible network, in which each XSEDE service provider is connected to a Chicago-based hub at 10 gigabits per second and has a second 10 gigabits-per second connection to another national research and education network.
- Specialized community-provided services that serve a particular function and allow for rapid innovation and experimentation.
- Advanced cybersecurity to ensure that XSEDE resources and services are easily accessible to users but protected against attack.
- Training, education, and outreach that expand participation in XSEDE-based projects, curriculum development, and more traditional training opportunities.

- Advanced support for novel and innovative projects.
- A fellowship program that brings Campus Champions to work closely with extended collaborative support staff at XSEDE service providers.
- The Technology Insertion Service, which allows researchers to recommend technologies for inclusion in the XSEDE infrastructure and enables the XSEDE team to evaluate those technologies and incorporate them where appropriate.

### About Campus Champions

XSEDE supports the Campus Champions program, which includes volunteers from more than 100 institutions who provide information about high-performance and high-throughput computing and other XSEDE digital services, opportunities, and resources. Champions provide their campuses with direct access to XSEDE and input to its staff, as well as startup resource allocations for use by campus researchers and assistance in using those resources. Champions serve the scientific community on their own campuses, as well as providing regional and national assistance. They also provide valuable feedback, helping XSEDE leaders understand the impact of resources and challenges at participating campuses.

To gain additional experience with XSEDE, Champions may apply to the Campus Champions Fellows Program, which offers expanded professional development opportunities. Fellows help connect the broader scientific community with the cyberinfrastructure expertise that is inherent in high-end application support staff. Each Fellow is paired with a member of XSEDE's Extended Collaborative Support Services team for up to one year, during which the Fellows gain greater knowledge of and exposure to XSEDE and how the data, tools, and resources are and can be used.

**Find out how to become a Campus Champion at your institution:**  
<https://www.xsede.org/campus-champions>.