

Engagement & Training

XSEDE Campus Program: HPC specialists within NUIT connect campus researchers with the Extreme Science and Engineering Discovery Environment (XSEDE), a nationwide research environment supported by the National Science Foundation, in the use of national facilities to enable science that cannot be performed locally.

School for Computational Science and Engineering (VSCSE): Graduate students, post-docs, and young professionals from all disciplines gain skills in the use of computing resources to advance their research through specialized training offered by VSCSE. vscse.org/about.html

Research Computing Education and Training: Learning opportunities on topics including building and maintaining data on Quest, data storage opportunities on Vault, parallel programming techniques, and leveraging national resources such as XSEDE and the Great Lakes consortium for Petascale Computing (GLCPC), are available in person by request and online for on-demand viewing.

The Northwestern University Library: To address the growing institutional need for research data management planning and research support, Northwestern University Library and NUIT have partnered on the development of new research computing consulting space located at Mudd Library in addition to offering joint consultation services.

Consultation

Research Grant & Proposal Consultation: One-on-one consultation for defining requirements for research computing, authoring of proposals for technical specifications for research grants, and system design and implementation, as necessary, all in support of University research initiatives.

Visualization Consultation: Discover how advanced visualizations can deliver more engaging and impactful perspectives on data through advanced visualization technologies in research, academic classrooms, creative activity, and educational and community outreach.

Northwestern University is a **comprehensive research institution** providing **world-class resources** in support of the **diverse campus research environments**.

Northwestern University Information Technology (NUIT) supports the development of **research-enabling infrastructure** where undergraduate, graduate, and faculty **researchers** can:

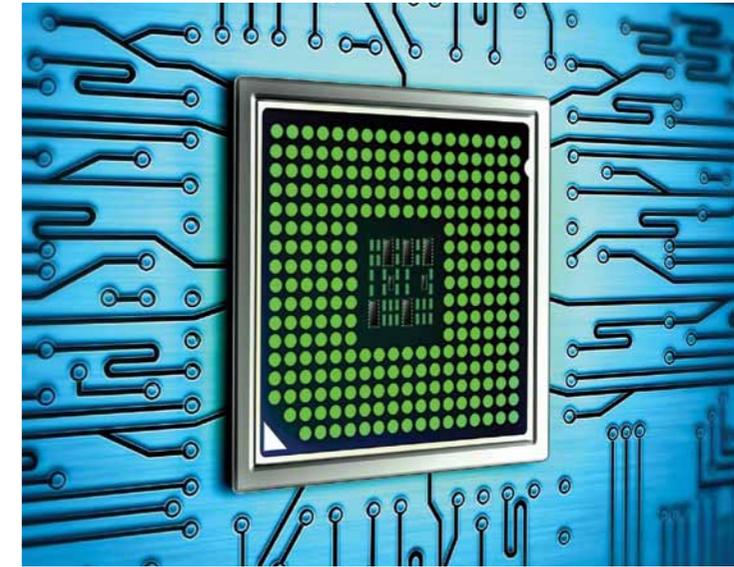
- ◆ **Discover** solutions to demanding science and engineering problems
- ◆ **Integrate** research and learning through advanced visualizations
- ◆ **Connect** to local, national, and international research centers, and to each other
- ◆ **Engage** in global research initiatives and collaborations



it.northwestern.edu/research

Advanced Research Computing at Northwestern University

2014–2015



Northwestern University
Information Technology
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Northwestern University Information Technology
1800 Sherman Avenue
Evanston, IL 60201

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Computational Services

The University fosters its competitive edge among peer institutions by providing campus researchers with access to high performance computing (HPC) resources and services for conducting computationally intense research.

The Quest Cluster: Northwestern provides campus researchers with the resources and services for conducting advanced computational projects on the University's large-scale shared high performance computing system, Quest.

Built to accommodate a wide variety of codes with great economy, Quest is used for projects that require computationally or memory-intensive tasks, such as intense numerical calculations or dealing with large datasets, which cannot be performed on a normal desktop.

Access to Quest: Applications are accepted quarterly for review by a faculty-based application committee. Additionally, resources are available for purchase through the Full Access program.

Social Sciences Computing Cluster (SSCC): This high performance computing environment is customized for social sciences research activities offering an advanced computational capability and a suite of statistical software applications.

Research Data Services

A secure and reliable research data storage environment, called Vault, provides researchers with alternative platforms for the storage of critical data.

Vault Collaborative Research Data Storage:

Using this centrally-provided web-based tool, Northwestern researchers can upload, store, and share large research related documents with colleagues via a web link or URL. Web publishing is supported via a web content folder. The initial 50GB of storage is provided at no cost. Additional storage is available on a cost per 100GB increment basis.

Vault Supplementary Research Data Storage:

Directly connected to the Quest cluster and select research instrumentation, this additional storage platform facilitates data analysis pipelines, workflow, and meets the need for persistent storage of large-scale results from Quest computations. Un-replicated storage is available on a cost per 500GB increment basis.

Vault HPC Research Data Storage: Additional storage connected to the Quest cluster through an InfiniBand fabric enables high-speed access to read and write data for research projects that require additional amounts of highly connected storage. Storage is available on a cost per 500GB increment basis.

Visualization Services

NUIT visualization specialists serve University researchers across all disciplines in the production of highly informative visual representations of their real, simulated, or conceptual research data.

- **Production Animation** is used to visualize temporal sequences of research data and as a means to illustrate and communicate ideas or concepts to students and the public.
- **Interactive** offers researchers the ability to walk through and interact with their data in real time.
- **Illustration** includes sketches, technical drawings, and infographics that play an important explanatory role in academic textbooks, grant proposals, research publications, and more.

Research Data Center Facilities

As part of the University's Data Center facilities, dedicated space is available for researchers to house computational equipment necessary to carry out research grant projects on campus. Equipped with efficient energy solutions for sustainability, these secure and reliable facilities provide for the computation and data storage necessary to support high performance computing needs.

Virtual Hosting Services: Researchers can request virtual servers for a new project or application, a new service, new portions of an existing environment, or for a hosting-only platform as a cost-saving alternative to hosting or managing physical servers.

HIPAA Readiness: Northwestern has instituted policies, procedures, and installed security enhancements to satisfy the Health Insurance Portability and Accountability Act of 1996 (HIPAA) compliance requirements for hosting information and processing within University data centers.

Research Networks

The University network provides researchers with access to regional, national, and international research resources and collaborators through connectivity to the Metropolitan Research and Education Network (MREN), the International Center for Advanced Internet Research (iCAIR), Internet2, and the CIC OmniPoP.

Science, Technology, and Research Transit Access (StarLight): University researchers have access to StarLight, one of the world's largest optical network exchanges for national and international research and education networks. Hosted at Northwestern by iCAIR, the facility offers an advanced optical infrastructure and proving ground for network services optimized for high-performance applications. startup.net/starlight/

Gigabit Ethernet: The Northwestern shared commodity IP network supports the most recent products from major vendors. Network connectivity to the Internet can be provisioned at 100 Mbps, 1 Gbps, or 10 Gbps.

Research Networks: With support from the National Science Foundation, Northwestern will begin deployment of an initial dedicated research network in 2014. In addition, this funding will enable the University to provide an aggregated 100 Gbps intercampus backbone for research data transfers.



New Location:
Research Computing Services
Mudd Library, 3rd Floor
Evanston Campus

it.northwestern.edu/research

The University's centrally-provided computational cluster provides campus researchers with the resources to conduct computationally intense research.



This image shows an interactive 3D protein crystal structure viewing software running on the University's 52 megapixel 3D display wall located in the Center for Advanced Molecular Imaging (CAMI).