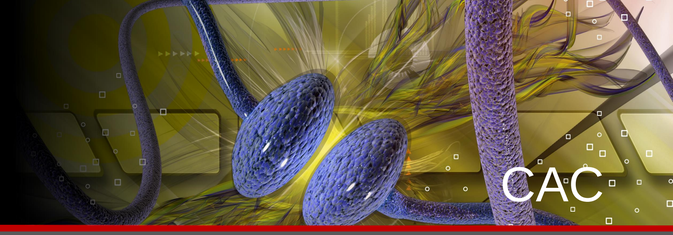
Cornell University Center for Advanced Computing



Research Computing l Consulting l Training & Education

www.cac.cornell.edu

Accelerate Discovery

Do you need to achieve your research goals faster and more efficiently?

Research Computing & Consulting

CAC provides Cornell faculty and staff with research computing and consulting services that accelerate discovery and broaden impact. Our PhD scientists, computational, and data analysis experts offer a wide range of services from HPC cluster maintenance and storage to database design, programming, and visualization. Our goal is to help you get your results faster and broaden your engagement with research colleagues, citizen scientists, the public and your supporters.

The Cornell faculty who use CAC resources have over $100 million in sponsored program research awards from NSF, NIH, USDA, DOE, NASA, and other funding agencies.

Innovation Leader

Historic center firsts include: first of 5 US supercomputing centers, first IBM SP supercomputer deployment, first Dell supercomputer deployment, largest Web server in the world deployed at the US Olympics, and IDC HPC Innovation Excellence Award for breakthrough research in hepatitis C. Center successes resulted in a NYS grant which drove the construction of Frank H.T. Rhodes Hall.

Today, we continue to innovate with new federated cloud technologies, eCornell courses, and cloud images and containers that make Cornell researchers more productive and enable portability across clouds, from Red Cloud to AWS, Azure, and Google Cloud.

Cloud Platforms

red cloud

- Instances with up to 28 cores and 240GB RAM
- Instances featuring up to 4 NVIDIA Telsa V100 GPUs
- Persistent disk storage volumes backed by Ceph storage with >1 petabytes raw capacity
- CPU/cores not oversubscribed
- Exploratory accounts available

ARISTOTLE CLOUD FEDERATION

- $7.1M NSF-funded federated cloud: Cornell (PI), University at Buffalo, UC Santa Barbara
- New federated allocations, accounting, cloud metrics
- OpenStack software platform
- Use cases include Cornell's Jim Cordes, Angela Douglas, Sara Pryor, and Patrick Reed

Core Services

Service	Capability
High Performance Computing	Design/Maintain Clusters & Storage
Red Cloud	Cornell's OpenStack Cloud
Cloud-Ready Research Applications	Build Images, Containerize Apps
Research Databases	Design, Optimize, Host, Manage
Programming & Code Improvement	Proficient in Many Languages
Web Sites/Science Gateways	Design/Host User Interfaces and HPC and Database Backends
Cornell Virtual Workshops	Design/Develop Online Training & Outreach Workshops (Any Subject)

Process

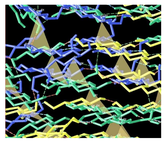
Analyze

CAC professionals work closely with Cornell faculty and research staff to analyze project requirements.

Plan

Faculty or research staff select levels of computing, storage, and/or hourly consulting services desired.

Deliver



Services delivered. CAC consulting in regular contact with PI or research team. Accounting available online.

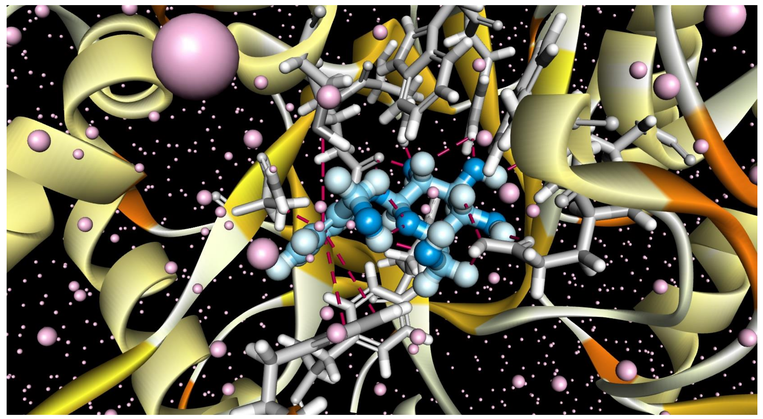
Maintain

Quality, turnkey maintenance available for HPC clusters, storage systems, web sites, and databases.

Rates

- Professional computing and consulting services are fee-based. A Cornell account is required for charge back.
- No fees required for initial requirements meeting; access to high-speed networks from CAC-supported services; and, up to 20 hours consulting to architect an HPC cluster or storage system to be housed in our Rhodes Hall machine room and maintained by our staff.
- Researchers who wish to try out Red Cloud may request a free exploratory account.
- Industry, and other colleges and universities, non-profits, and public agencies may access CAC services or partner with us through our Partner Program. Red Cloud subscriptions are available to external entities on demand.

Sample Project



CAC created a Red Cloud image with BIOVIA Discovery Studio; resolved license, installation, and security issues; and, created job submission scripts and scaling tests for a Cornell BEE professor. Simulations and data analyses were performed on Red Cloud and a national supercomputer. Result: first fully-computational approach to evaluate how different environmental conditions disrupt the activity of carbon-cycling extracellular enzymes.

National Awards

Awards	Role
Aristotle Cloud Federation	Federated Cloud, Portal & Tools
Frontera	Develop Frontera Virtual Workshops
NANOGrav PFC	Cyberinfrastructure Design, Software Design, Data Management
Physics at the Information Frontier	Optimize Parallel Code for Analysis of CERN Detector Data
Jetstream	Jetstream Virtual Workshops
XSEDE 2	Workforce Development Training Lead, Cornell Virtual Workshops
XSEDE 2	Community Infrastructure Lead, Software/Scripts and Repository

Contact

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