Center for Advanced Computing
Partner Program

Computing solutions for industry, education, and government
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Cornell CAC
We enable your success

www.cac.cornell.edu
Welcome to Cornell

More than 80 organizations from business and industry, education, and government have partnered with the Cornell University Center for Advanced Computing (CAC) to solve their most vexing software, data, and computational problems.

Partner Program members leverage our skills and technological prowess to meet their user and market demands faster and more efficiently. Member benefits are customized to provide just the services you need.

Services available include system architecture design, cloud migration, building cloud images and containerizing applications, database and workflow design, data analysis and visualization, code modernization, tuning codes for performance, programming, IT strategy and best practices discussions, and training.

About CAC

David Lifka leads the CAC and also serves as Cornell’s Vice President for Information Technologies and CIO. He’s an HPC industry veteran who’s led over $32 million in business, industry, and federal R&D projects.

CAC’s PhD research scientists, computational scientists, system analysts, programmers, database system developers, and cloud engineers are leaders in their own right. They take pride in staying ahead of the technology curve while implementing new ideas with speed and efficiency.
Technology Leadership

CAC has a history of computational firsts. We deployed the first IBM SP supercomputer, the first Dell TOP500 HPC cluster, the first federated cloud funded by the NSF in collaboration with researchers such as the College of Engineering’s Pat Reed (left), and the first large-scale MATLAB cluster that achieved a 175x faster computation of a CDC Hepatitis C model (right).

Today, we’re helping researchers and Partner Program members with digital transformations and new technology adoption—creating real-time analytic and visualization platforms, performing social network analyses, architecting HPC and cloud systems, implementing parallel simulations, containerizing applications, designing data and machine learning workflows, and more.

Partner Program Memberships

Multiple Partner Program membership levels are available—from entry-level memberships for start-ups and small businesses to affiliate and supporting levels for larger organizations.

Members can access any of our services up to the number of consulting and/or computing hours allotted in their benefits package.

General consulting services provided by CAC staff do not constitute intellectual property.

“We’re exploring data sets faster than ever thanks to CAC’s database, workflow, and portal designers.”

Shami Chatterjee
Research Scientist
Featured Service: Red Cloud

One of the more popular services we offer is Red Cloud, an on-premise research cloud. Users can request instances with up to 28 cores and 224GB RAM. Persistent disk storage volumes are backed by Ceph storage and offer >1 petabyte raw capacity. Linux and Windows Server operating systems are supported. Unlike many cloud platforms, CPU cores and RAM are not oversubscribed—an Intel processor core is behind each core on the virtual server for fast and consistent performance. Users can manage their cloud service using a Web console, command line clients, or any development library supporting the OpenStack API. Nvidia GPUs are available.

“CAC services help our members meet their R&D and market demands faster and more efficiently.”

Paul Redfern
Partner Program Director

After discussing your needs, we’ll propose an appropriate membership level for you. Besides accessing our services, members may gift technologies to speed up product testing or market acceptance. Members may also sponsor student research and Cornell events. Partnering with us to pursue federal grants is another possibility.
Services

CLOUD MIGRATION
We’ll build ready-to-use cloud images and containerize apps for efficiency and deployment across multiple clouds.

Docker, Singularity & Nix
Portability to Clouds or HPC
Cloud-based Web Applications

PROGRAMMING & AI
We program and fine tune codes in C/C++, C#, Java, MATLAB, MPI, OpenMP, Perl, Python, R, etc. and can help you get started with AI.

Code Modernization & Parallelization
Performance Analysis/Debugging
Code & Cache Usage Optimization

CLOUD ACCESS
Red Cloud is an on-premise cloud that provides root access to virtual servers and storage on-demand and dedicated CPU cores.

Up to 28 Cores & 224GB RAM
NVIDIA GPUs
Ceph Storage

DATABASE DESIGN
We design and maintain data pipelines and databases such as SQL, and operate database servers with robust performance.

Database Server Capacity Planning
Database & Workflow Design
Data Analysis & Visualization

HPC/SERVER DESIGN
CAC’s systems staff will architect, house, and maintain a dedicated HPC system or servers so you can focus on your organization’s goals.

Server & Network Maintenance
Software Updates
Avoid Capital Expenditures

PORTAL DESIGN
We design and build portals with high performance capabilities such as custom tools, databases, and large-scale storage systems.

Portal Design and Implementation
Portal Hosting & Maintenance
Portal Optimization

DATA STORAGE
CAC offers GBs to petabytes storage services with fast, no fee transfers in and out.

Dedicated Storage
Globus Online Data Transfer
Archival Storage

IT/HPC STRATEGY & TRAINING
We produce custom online training on any subject and will educate your workforce online or in person.

Cornell Virtual Workshops
Webinars/Seminars
Strategy & Best Practices Sessions
Projects

While most Partner Program members have a specific project in mind, others join the program to support Cornell, a community of scholars engaged in deep and broad research and teaching tomorrow’s thought leaders to think otherwise.

Sample Projects

• **Corning** – IT/HPC staff received training on database architectures and Corning R&D collaborated with a CAC computational physicist to improve simulations and better understand glass imperfections.

• **Boeing** – asked CAC to compare the parallel performance of aircraft subsystem simulations on a desktop and cloud platform and provide advice on how the simulations could be further parallelized for additional speed-up.

• **US EPA** – was interested in understanding how vulnerable our nation’s water distribution systems are to contamination by terrorists. CAC designed and installed a high-performance computing system for the National Homeland Security Research Center which reduced threat scenario run times from hours to minutes.

• **Supercomputing Wales** – needed best-in-class training for their users, so they turned to CAC’s training leadership to meet their needs. CAC is also training Frontera supercomputer and Jetstream 2 cloud users from around the world.

• **Johns Hopkins University** – joined the Partner Program to access our software development expertise and accelerate the enhancement of their Public Access Submission System. PASS allows researchers to comply with the access policies of their funders and institutions via a single, unified website.
Join the many organizations who’ve partnered with CAC:

Air Products
Amazon Web Services
Animusic
Bettis Lab
Boeing
Capital One
Campbell & Co.
Columbia University
Corning
Dell
Emhart Glass
ENSCO
Equitable
Farther Farms
Ford
GE
Gen Re
HVB Bank
IBM
Infosys
Intel
Intl. Olympics
Johns Hopkins
KLA-Tencor
Manning & Napier
Mercedes-Benz
Merck
Microsoft
MITRE
Nextiva
Northrup Grumman
Nvidia
Pfizer
SAIC
SQLStream
Stratus
Supercomputing Wales
TTC Technologies
Unisys
USDA
US EPA
Xerox

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