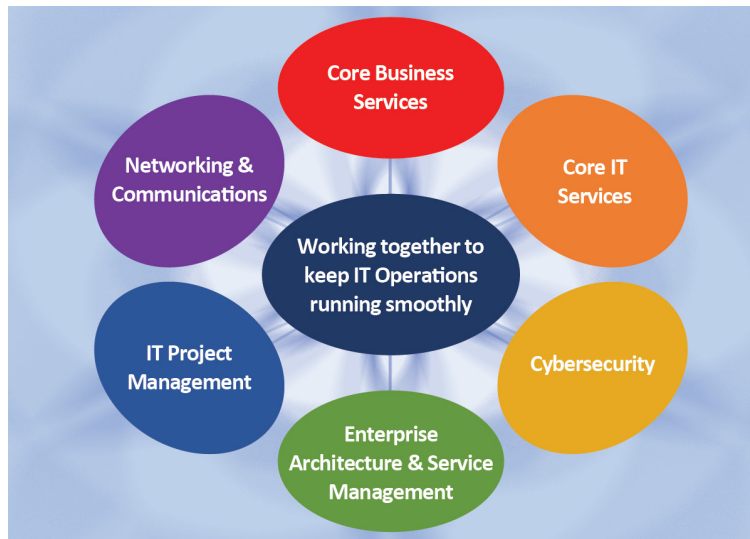# Core computing: Supporting science

Fermilab's Core Computing Division delivers timely, innovative computing solutions and services that enable Fermilab to achieve its mission, efficiently execute the lab's business and provide a modern user experience. Our vision is to provide secure and reliable access to information and services, any time, any place, on any device, in full collaboration with our scientific community.

Core Business Services · **Networking & Communications** · **Core IT Services** · **IT Project Management** · **Cybersecurity** · **Enterprise Architecture & Service Management** · *Working together to keep IT Operations running smoothly*

Core Business Services

Providing modern information systems, services and business process solutions

Our services include financial, human resource, environment, health and safety, cybersecurity and facilities applications; engineering; a library, publications and records management; and content management systems.

In a typical year, we:
· Serve hundreds of business and scientific colleagues
· Implement 500+ enhancements to cloud and on-premise business systems
· Provide 118,000 downloads of scientific journals, books and engineering standards

Core IT Services

Delivering user devices and the servers and system backup services that support our applications

We provide Windows, Mac and Linux support; physical and virtual server hosting and operating system support; central website hosting; database hosting for business and scientific services; system backup and restoration; centrally managed desktop, laptop and mobile devices; central authentication systems; and Service Desk and managed IT services.

A sample of the items we manage:
· 5.5 petabytes of storage deployed for SAN, NAS and virtual machines
· 670+ virtual machines (total host capacity: 1.09 THz CPU and 5.5 TB RAM)
· 75+ managed database instances

Cybersecurity

Working in a three-way partnership with lab employees and management to protect our cyber systems.

We operate a variety of cyber defenses, draft policies, develop security plans and work diligently to maintain accreditation and authority to operate our computer systems. We also perform research activities.

On an average day:
· 900,000+ network polls are performed to verify devices on the Fermilab network
· 60,000 intrusion detection events are triggered
· 8,000 malicious URLs are blocked

Data centers, such as the one shown above at the Feynman Computing Center, are critical to the lab's scientific mission. Our experiments and business areas depend on them to provide reliable computing systems.

Enterprise Architecture & Service Management

Overseeing the business system architecture and providing quality services to the lab's business and scientific communities.
We oversee process management, communication, ISO20000 certification and enterprise architecture/design.

In a typical year, we:
- Oversee processes responsible for resolving 13,000 incidents, 25,000 requests and 1,300 requests for change
- Provide over 400 change-related communications
- Review and maintain 460 services

IT Project Management

Helping IT project teams in achieving project objectives and delivering outcomes within an agreed-upon triple constraint (scope, budget and schedule).
We use hard and soft skills to manage projects ranging from short-term, low-cost projects to multi-year, multi-million dollar projects with wide-ranging and significant impact to Fermilab and the U.S. high-energy physics program.

Our team of five:
- Oversees 18-20 enterprise-level projects per year
- Has managed projects totaling nearly $40 million over the past 10 years.
- Has vast experience in 15 types of industries

Networking and Communications

Providing all network, telecommunications and audio/visual services.
We support the resources necessary for all lab users to share information across Fermilab's 6,800-acre campus, between Fermilab and our far detectors in South Dakota and Minnesota, and to our international research institutions and partners.

More than 130 employees across the IT arm work to provide high-quality service to Fermilab's scientific and business communities

Some of the items we oversee:
- 100 petabytes of data moved across the network per day
- 15+ million minutes of audio conferencing servicing 44 countries each year
- 4,700 phone lines and 300+ cellular devices

Expert staff from multiple disciplines — cybersecurity, networking and communication, business and IT services and applications, project management, and service management — work together to find innovative IT solutions for the laboratory.

The Feynman Computing Center houses two data centers as well as office space for about 150 employees.

🔷 **Fermilab**   🔶 **U.S. DEPARTMENT OF ENERGY**