The Research Computing division of UNC-Chapel Hill provides expert scientific and information technology consultants and cyberinfrastructure to the scholarly and research community of the university. The consultation staff includes nine scientists and scholars who have experience across a wide range of disciplinary communities from the physical sciences to the life sciences, from the computational sciences to clinical research, from social/behavioral sciences to the humanities. Cyberinfrastructure includes two large computational clusters. One cluster is designed specifically for high-performance computing needs with more than 11000 conventional cores where each node has 512-GB memory (8052 at 2.4GHz, 2000 Skylake core) and 1440 Knights Landing cores, parallel scratch filesystem, and low-latency interconnect fabric (Infiniband EDR). The second cluster is designed specifically for high-throughput and data-intensive processing needs: it contains more than 6000 cores (each node minimum of 256-GB memory), including five (5) large 3-TB memory nodes, thirty (30) Skylake nodes each with 750-GB memory, and nodes for “Big Data” workloads, accessing 3-PB of shared high performance storage. Cyberinfrastructure administration and consultation is available at no cost to researchers. The division’s aim is to ensure that research efforts have a stable, consistent, available, and expert, resource for all phases of the research lifecycle.

Researchers are finding it increasingly common that granting agencies require servers that host their data be in compliance with various federal guidelines. The most common request is for a server which is Health Insurance Portability and Accountability Act (HIPAA) compliant, and the most recent is for servers that are in compliance with the Federal Information Security Management (FISMA) Act. UNC’s IT Research Computing has carefully designed servers which are fully HIPAA and FISMA compliant and have all the accompanying documentation needed to fulfill the requirements for compliance.

Storage for research data accessed on the above systems includes more than 5 petabytes of disk, comprising locally attached disks; network-attached shared scratch space; and network-attached shared file systems. Supported file systems include Lustre, Isilon OneFS, GPFS and NFS. An archival mass storage system, with a current capacity of more than 700 TB, is also available. Infrastructure components are housed in an 11,000 square foot data center with more than 2 megawatts of power 800 tons of cooling available. The data center is staffed and monitored 7x24x365. Computing services in Research Computing are largely based on an underlying common campus architecture that includes Kerberos authentication, role-based authorization and shared, centrally installed and managed software applications when practical. More than two hundred software packages and utilities are offered for use on the central systems. By relying on ITS to maintain the hardware, security environment and software builds of computing systems, researchers are free to devote their time to science and research rather than to system administration.

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