**[Research Computing](http://rc.fas.harvard.edu/)**

**URL:** <http://rc.fas.harvard.edu/>

**Director for Research Computing:** Scott Yockel

**Description:**

*Square Footage:* ~3,200 square foot office space 2nd floor; 9,600 square foot of data center space.

*Facility Location:* 38 Oxford Street

Research Computing (RC) is was established in 2007 as part of the Faculty of Arts & Sciences (FAS) Division of Science, and also provides services for The John A. Paulson School of Engineering and Applied Sciences, Harvard T.H. Chang School of Public Health, Harvard Business School, and Graduate School of Education. The mission of RC is to design, build and support advanced research computing to solve the most challenging problems at an internationally renowned university. RC staff maintains expertise in constantly changing computing technologies while “speaking the language” of the FAS researchers, allowing staff to help them use computing more effectively.

**Services:**

* **High Performance Computing (HPC):** RC provides a large-scale computing environment called Cannon, which is an HPC cluster that supports the core of scientific modeling and simulation for thousands of Harvard researchers. Odyssey contains 92,000 computing cores with 4GB/core of memory on average, and over 1000 GPU accelerator cards. The cluster is interconnected by a low latency 100Gb/s InfiniBand fabric to handle large-scale parallel processing as well as connect to high-performance storage. Each user has 100 GB of home directory space, and access to 3 PB of shared high-performance scratch space.
* **Research Storage:** RC maintains over 50 PB of storage spread out over four tiers, which is available for purchase those the Storage Service Center: (Tier 0) Lustre parallel filesystems that are designed for high-performance large-scale IO; (Tier 1) enterprise class storage with flash tiering, snapshots and off-site disaster recovery copy; (Tier 2) Ceph object storage with encryption at rest; (Tier 3) tape cold storage.
* **Hosted Machines:** In addition to the HPC cluster, RC also provisions and manages a tiered model of virtual machines for researchers.  These machines serve as web-portals, database access points, and development boxes. Additionally, RC maintains numerous workstations that are connected to instruments in the Core Facilities and some specific Labs.
* **Software:** In addition to storage and compute facilities, RC manages and provisions thousands of different scientific software tools and programs. RC also provides common compilers and libraries to assist users in building their own software codes. A license manager service is maintained for software requiring license checkout at run-time. Other services to the community include the distribution of individual use software packages and a Citrix instance that allows for remote display and execution of various commercial software packages**.**
* **Consulting:** With the advancements in computing and storage platforms, algorithms and workflows used to process data must be updated to leverage these new technologies. RC provides consulting to enable researchers to process data more efficiently and reduce the time needed to draw scientific conclusions. Sometimes a single visit to office hours can accomplish this; for more complex issues a multi-visit engagement may be necessary. There are varying levels of engagement available. RC will work with researchers to determine which model fits their needs best.