**Research Services / Research Advanced Computing Services (RACS)**

**Last updated: January 24, 2022**

**High Performance Computing Cluster**

The UO’s HPC cluster, Talapas, is comprised of approximately 9,500 cores, 90 TB memory, 94 GPUs, and over 2 PB storage. Talapas is a heterogeneous cluster that includes compute nodes with Intel and AMD processors, Nvidia GPUs, large memory nodes, and large local scratch nodes. Connectivity throughout the cluster is over 100 Gb/sec EDR InfiniBand with an IBM Spectrum Scale (GPFS) file system mounted across the cluster. Numerous programming languages, compilers, and mathematical and scientific libraries are available cluster wide, including over 225 discipline-specific application packages and a large array of Python packages including machine learning specific packages such as TensorFlow, Keras, and PyTorch. Researchers can access Talapas through a command line interface or an easy-to-use web-based interface. The Slurm workload manager handles cluster resource management and job scheduling.

Talapas is suitable for high-performance computing in a wide range of disciplines, including but not limited to bioengineering, computer science, data science, economics, education, genomics, linguistics, neuro-engineering, physics, the physical sciences, and psychology. It is also currently used to support teaching and student learning in degree programs across campus, including Bioinformatics, Biology, Business, Chemistry, Computer Science, Genomics, Earth Science, and Physics. Since its inception in 2018, Talapas has supported over 1,400 researchers across 35 departments and labs and has run over 90 million hours of computation.

Talapas takes its name from the Chinook word for coyote, who was an educator and keeper of knowledge. The RACS team consulted with the Confederated Tribes of the Grand Ronde to choose this name, following a Northwest convention of using American Indian languages when naming supercomputers.

**Research Computing Storage**

Talapas provides over 2 Petabytes of IBM’s Elastic Storage System running Spectrum Scale parallel file system with access to local SSD scratch disk space for I/O intensive workloads. By default, each account on Talapas is configured with an individual home directory and project space. Snapshots are available (for home and project space), enabling a researcher to conveniently retrieve accidentally lost files. Additionally, access to external storage via UO Cloud, Google Drive, and Dropbox is available for backup/archive.

**Large Data Transfer**

Transferring data to and from Talapas is a common requirement in research computing and can be especially time-consuming when working with large datasets. The UO subscribes to Globus, which enables researchers fast, secure, and reliable data transfers between your desktop/laptop and Talapas, and access to data stored on a variety of national research clusters. Talapas provides a dedicated Globus data transfer node connected via 100Gb/sec Ethernet to facilitate large data transfers.

**Research Computing Network**

The UO runs high-performance networks across campus and connects with our statewide network (Link Oregon), and the world.

The campus core utilizes 100-Gigabit Ethernet with multiple 100-Gigabit links to Link Oregon. The UO is a member of Internet2, which operates a national network (400 GB/s) in support of U.S. research and education. The University is one of five founding members of Link Oregon, which operates a new facilities-based, resilient optical network (200+ Gb/s) across the state. Link Oregon connects to Internet2 (100 Gbps) and to our peer network in California, CENIC (100 Gbps). To support the University as well public and non-profit members in the lower Willamette Valley, Link Oregon maintains two redundant nodes in Eugene. Link Oregon also connects to high-speed Internet exchange points in Eugene (WIX), Portland (NWAX), and Seattle (SIX) for optimized regional performance.

**Additional Research Support and Consultation**

**Research Advanced Computing Services:** [Research Advanced Computing Services](https://hpcf.uoregon.edu/) **(**RACS), a department within Information Services, architects and manages high-performance computing systems, provides communication and outreach activities, and delivers individual consultation, support, and training in the following areas to enable researchers to maximize their productivity in research and teaching.

* Use of HPC and system-specific resources
* Managing allocation and purchases of computing and storage resources
* Programming tools and packages
* Computational techniques
* Program parallelization
* License and installation support for Research Computing specific software
* Sensitive and restricted data to ensure compliance and adherence to data security policies (coming soon!)