**Facilities, Equipment and Other Resources**

**II. UCI SHARED FACILITIES**

**UCI Research CyberInfrastructure Center (RCIC)**

RCIC maintains campus infrastructure for high-performance and high-throughput computing, research data storage and analysis, and scientific software tool integration. Computing and data infrastructure is operated in a shared financial model where campus researchers are given no-cost access to a baseline level of computing and highly-reliable storage, but can also purchase additional capacity and capability using grant or other funds. In addition, no-charge computation with modest local storage is available to a wider range of the campus community. RCIC has eight full-time professionals, whom are cross trained in the infrastructure and researcher support. The following resources are available through RCIC:

*HPC3:* This new cluster replaces the soon-to-be retired HPC condo cluster (9200 cores (248 nodes) across 23 distinct processors). The high-performance computational community cluster (HPC3­) will absorb compatible HPC nodes (~1600 cores/29 nodes) and adds new Skylake/Cascade Lake (4300 cores/108 nodes) for an initial sizing of 5900 cores/137 nodes. All nodes are interconnected at 10GbE and 56Gbps/100Gpbs Infiniband. The new systems support condo (node purchase), core-hour purchase (similar to commercial cloud), granted-cycle, and unaccounted (free queue) access. UCI provides continual investment in hardware and plans to add another 2000 cores for general in 2021. Like HPC, it open to all researchers at UCI. Purchased nodes have the number of CPU and GPU (if any) hours that they deliver in a year credit to a project account. Jobs can then run anywhere on the cluster using these credits.

*Campus Research Storage Pool (CRSP):* CRSP It is an Enterprise-grade system, with up to 1 Petabyte (PB) of usable capacity (2.8PB raw before replication/RAID overhead), with 7x24 support. All data written to CRSP is immediately replicated for two-copy data protection. Asynchronously, data is replicated to a third offsite facility for disaster recovery. CRSP is accessible through three low-level protocols (SFTP, HTTPS and NFS). The first two enable direct access to CRSP from in-lab equipment or laptop. Faculty are granted 1TB of no-cost storage on CRSP, can enable others (usually centered on their research group) to read and write their space, and can purchase additional capacity at the cost of media. The current configuration of CRSP can support 4 PB.

*Cluster Storage*. In addition to CRSP, the RCIC deploys scalable parallel file system storage based on BeeGFS. Multiple Petabyte systems exist and are intended for long-term “scratch” storage. Four different parallel files systems provide about 3.2PB of usable capacity. While data is protected against multiple disk failures, all data in these file systems are single copy. Users can choose directories for “selective backup” to replicate data to another storage system. Replication runs daily.