



Research Computing & Cyberinfrastructure (RC2)

ANNUAL REPORT - FY 2022

RC2 OVERVIEW

In 2021, Research Computing and Cyberinfrastructure was named. It's naming was an initial step in a larger vision to establish our research computing presence at the campus, state, and national level and expand this burgeoning program through campus engagement and feedback.

Despite a global pandemic, we sought to build connections in an increasingly siloed remote-only environment. We saw the need to define our program as part of Colorado State University's mission-focused Division of IT, a program which benefits from close collaboration with CSU Libraries and the Office of the Vice President of Research (OVRP). With that in mind, we pushed forward with the launch of the [Research Computing and Cyberinfrastructure website](#). We also saw a need for a campaign to structure the incorporation of feedback throughout a service initiation or review, therefore establishing the [REDEFINE initiative](#).

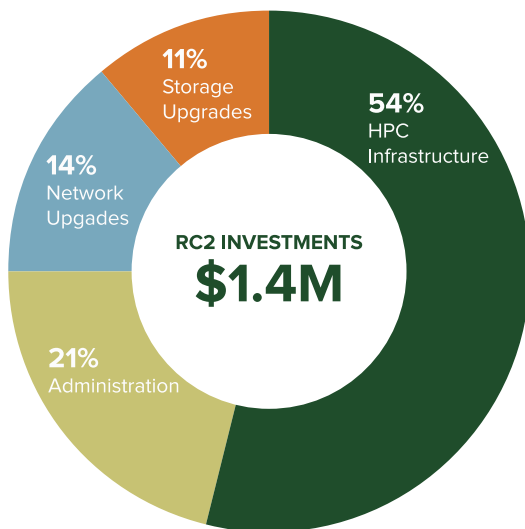
Throughout these steps, our goals for our unit have been simple:

- Build and promote a culture of an engaged and knowledgeable cyberinfrastructure community.
- Work alongside the research community and college IT groups to develop shared practices and shared resources to further CSU's mission.

We have only succeeded in this by working together. Our reception from the campus community continues to inspire and motivate our work. We work to enhance research technology collaborations across campus by working on several initiatives in the priority areas of Service, Support, and Training. As with anything new, this will not be without setbacks or resource constraints, but always honoring core intentions to gain feedback through transparent processes and open lines of communication.

We aspire to further expand this critical component of our land-grant mission and bring about valuable contributions to CSU, Colorado, and beyond.

RC2 BY THE NUMBERS



RC2 RESEARCH PROJECT SUPPORT

37 = **\$26.45**
PROJECTS **MILLION**

Since participating in this CU, CSU, and RMACC shared services system, CSU now supports 37 funded projects at CSU in NSF areas, totaling \$26.45 million.

Read more about [the past, present and future of high-performance computing at CSU](#).

RESEARCH PRESENTATION ATTENDANCE



CAPACITY & USAGE

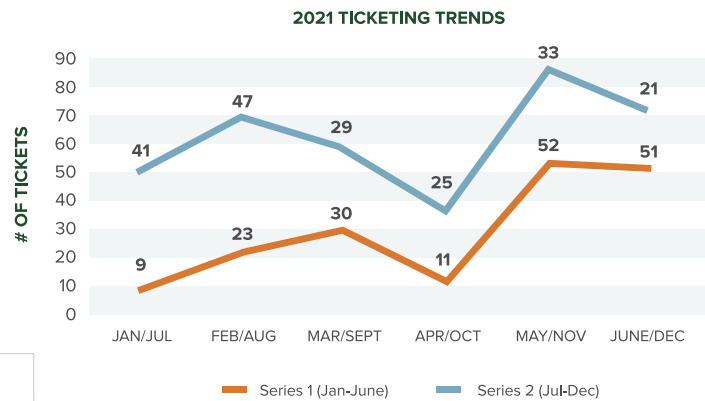
100GB VSWITCH

530TB RSTOR USAGE
BY 12 COLLEGES/UNITS
BY 352 USERS

RC2 BY THE NUMBERS (cont)

TICKETING

Our team works through two ticketing systems to coordinate support of our catalog of services. One ticketing system, used in conjunction with CU Boulder provides support to classroom instruction, research computing, and academic scholarship utilizing the Summit high-performance computing System (HPC).



\$400K CAMPUS CYBER INFRASTRUCTURE AWARD

This CSU-led project is a collaboration for the acquisition of High-Performance Computing (HPC) cyberinfrastructure (CI) on behalf of Colorado State University (CSU) and CU Boulder

Read the full [Award Abstract](#)

LAUNCH OF WEBSITE

235
UNIQUE PAGE
VIEWS IN
6 MONTHS

We identified an urgent need to create an authoritative source of service information for our researchers. Within 6 months of its launch, our website was able to provide our community with over 235 unique page views. Our design process exemplified a service-oriented site to allow users to come in, get answers to scenarios or services, and move forward with a solution.

RMACC SYSADMINS MEETUP 2021

CSU hosted technical experts from Rocky Mountain Advanced Computing Consortium (RMACC) member institutions for a meetup to discuss the technologies that serve move research forward.

INSPIRATIONAL PROPOSALS

2
GROUP
PROPOSALS

RC2 was excited to participate in two group proposals. One proposing the creation of a research integrity working group and another to promote incentivizing infrastructure replacement cycles to improve CSU's greenhouse gas (GHG) footprint. Participation with entities across campus displays an enthusiasm in intentional holistic solutions for the betterment of CSU.

CSU GRANTS

We have support cyberinfrastructure (CI) plans, coordination of College and Central IT resources and integration with CSU Libraries data management support to provide more thorough support than the past. We actively engaged with the NSF CC* award and continue to work with large and small projects across the Pueblo and Fort Collins campuses.

SERVICES PROVIDED

TRAININGS

Nov 8- 12 Lunch & Learn Series

Focusing on graduate student feedback, we provided a weeklong 5-part Research Computing and Cyberinfrastructure (RC2) November Lunch and Learn Series. This introduced Summit as a computing resource and reviewed advanced package management and proposal collaboration techniques.

8 Professional Development Institutes

We were able to engage with over 170 individuals in topics in research computing, research computing workflows, and data security. This reviewed not only what systems could be used, but also how to use them.

Leading Edge Accelerated Development (LEAD)

The LEAD program provided asynchronous training to our in-person, hybrid, and remote campus partners, providing 80+ hours of training in Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), and other technologies.

National Cyber Security Awareness Month (NCSAM)

RC2 collaborated with Office of the VP of Research (OVPR), Cybersecurity and Privacy, and CSU Libraries to highlight biocybersecurity, data security, and good security practices for our colleagues on campus.

SERVICES PROVIDED (cont)

COMPUTATION

The Summit HPC System

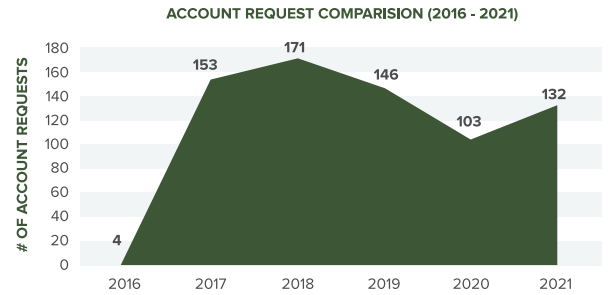
The Summit HP System was established under NSF MRI Award #1532235 to both Colorado State University and CU Boulder in 2017, which contains 380 Intel Xeon E5- 2680 v3 @2.50GHz (2 CPUs/node, 24 cores/node). CSU is allocated 22.5% of all CPU time.

CSU PUBLICATIONS ATTRIBUTED TO SUMMIT

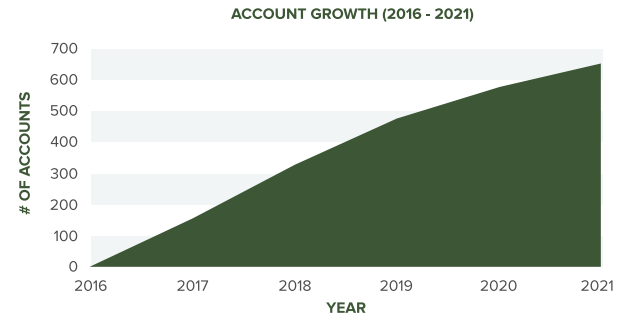
There were approximately 68 publications related to the Summit system last year alone.

Alpine

Alpine is a heterogeneous supercomputing cluster based primarily on the AMD EPYC “Milan” CPUs with; HDR InfiniBand; and 25 Gb Ethernet. Alpine is jointly funded by the University of Colorado Boulder, the University of Colorado Anschutz, Colorado State University, and the National Science Foundation (award 2201538).



*Note: The Cyberinfrastructure Facilitator position was vacant from 2019 to mid-2021.



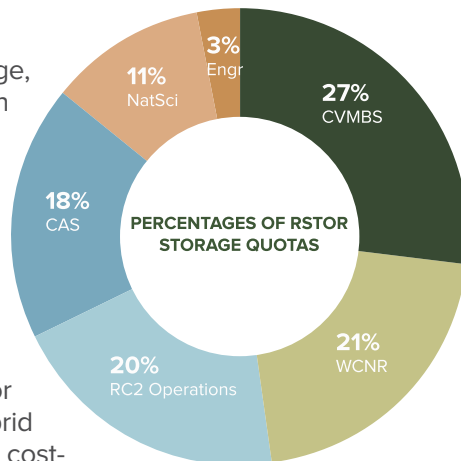
NETWORK

CSU operates a fully redundant, self-healing 10 Gbps core backbone network. The core devices (firewalls, border routers, and core switches) are in the process of being upgraded from 10 Gbps to 100 Gbps. Through proposal collaborations our team was able to gain funding to upgrade our ResearchLAN (ResearchDMZ) from 10 Gbps to 100Gbps, providing a high bandwidth network to support data transfer and collaboration.

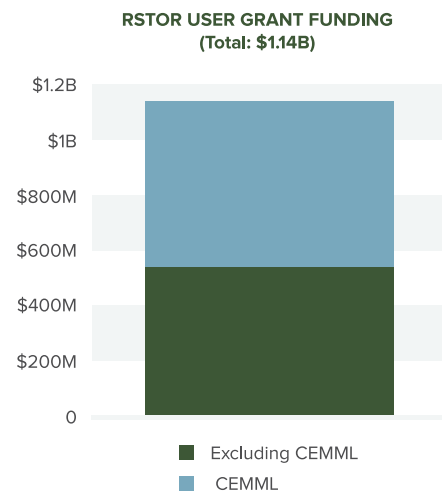
STORAGE

RStor

Short for Research Data Storage, RStor, provided by the Division of IT, is a scale out network-attached storage platform by Dell EMC, called Isilon. It features massive scalability and is currently just over 680 terabytes in size. RStor solves the problem of access to high-volume, scalable storage of unstructured data for research needs. Through a hybrid central funding model, it is cost-effective for storage of large volumes of research data. For data protection, the RStor system creates daily read-only point-in-time copies (snapshots) of files for 30 days. In addition, a nightly disaster recovery (DR) backup is taken of the entire system to different locations on campus.



To determine return on investment for the RStor data storage service, we have taken account of all users with file share access and totaled their grant funding.



For More Information

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