



## Success Story

Software Defined Storage

# University of Maine System

Ambitious research projects based on High-Performance Computing (HPC) at the University of Maine System required the storage of enormous volumes of data, and the organization’s existing storage infrastructure was struggling to keep up with demand. By migrating to SUSE Enterprise Storage, the university can scale its storage architecture without disruption, while reducing administration overhead – allowing its IT staff to focus on supporting researchers and developing new capabilities.



### Overview

The University of Maine System includes seven universities across the state as well as the University of Maine System School of Law. It teaches 40,000 students, and supports thousands of Mainers and Maine-based businesses with university research and development, business development, Cooperative Extension programs, community and cultural events, and a wide range of other activities.

### Challenge

The University of Maine System has supported a number of research programs across multiple disciplines with a High-Performance Computing (HPC) landscape since 2012. Each new year brings larger research projects with corresponding increases in data storage demands. For example, one ongoing project, which generates high-resolution ocean models to map climate change, requires half a petabyte of data by itself. Another, employing deep learning to help detect tumors, requires a single directory with over two million files. In some cases, individual files from research teams weigh in at 20TB.

The university’s storage architecture was beginning to buckle under the strain of these diverse and demanding data workloads. The existing storage systems were difficult to scale up, and with tight budgets the university could not afford to rip-and-replace the entire infrastructure.

Steve Cousins, Supercomputer Engineer for the University of Maine System, said: “We wanted a way to gradually grow storage capacity, while using our existing hardware for as long as possible – and without disruption every time we added new capacity.”

**“Our experience with SUSE has been exceptionally good. The SUSE team helped us define the configuration we needed to meet present and future demands, and stood by us through our extended testing periods.”**

**STEVE COUSINS**  
Supercomputer Engineer  
University of Maine System



### University of Maine System at a glance:

*University of Maine System encompasses seven public universities in the state. It runs a number of research projects involving High-Performance Computing aimed at driving advances in areas such as Climate Change, Ocean and Atmospheric Sciences, Chemistry, Engineering, Forestry, Bioinformatics, Medicine and many others.*

#### ■ Industry and Location

Education, Maine, United States

#### ■ Product and Services

SUSE Enterprise Storage

#### ■ Results

- + Accelerated file access for deep learning by a factor of ten
- + Decreased time spent on storage administration
- + Enabled scalability to add new storage capacity and nodes without disruption

**“SUSE Enterprise Storage has already brought clear improvements to our deep learning projects, one of which requires two million files in a single directory. Putting these files into SUSE Enterprise Storage has increased performance more than ten times compared with the previous storage solution.”**

**STEVE COUSINS**

*Supercomputer Engineer  
University of Maine System.*

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## Solution

The University of Maine System wanted to find a more scalable, sustainable and easy-to-manage approach to storage, so that it could grow capacity in line with budgets and demand, while reducing administration time and effort.

The university determined that CephFS, an open-source software-defined storage solution, would offer the best performance and value for its requirements. However, it was clear that setting up and managing the software would require considerable knowledge and new skills. To minimize the overhead on its small storage team, the university looked for a pre-packaged, vendor-supported implementation.

Steve Cousins said: “I wanted to keep storage administration as simple as possible, with full expert support if something goes wrong. I also wanted it to be simple to hand over, so that another team member can handle administration without having to understand my homegrown scripts.”

The University of Maine System opted to deploy [SUSE Enterprise Storage](#), an intelligent software-defined storage solution powered by Ceph technology and backed by built-in management tools and

comprehensive support. The current implementation includes one master node, three monitor nodes and two metadata servers, uses CephFS as the access protocol, and employs both InfiniBand and 10Gb/s Ethernet networking.

“Our experience with SUSE has been exceptionally good,” said Steve Cousins. “The SUSE team was really good to work with. They helped us define the configuration we needed to meet present and future demands, and stood by us through our extended testing periods. The team has also passed on new skills, including erasure coding in the openATTIC interface, so that we can achieve the best possible value out of the solution.”

## Results

After a period of rigorous testing – ongoing in the case of the proposed disaster recovery site – the University of Maine System is now migrating data from its former storage landscape to SUSE Enterprise Storage.

Steve Cousins said: “SUSE Enterprise Storage has already brought clear improvements to our deep learning projects, one of which requires two million files in a single directory. Putting these files into SUSE Enterprise Storage has increased

performance more than ten times compared with the previous storage solution.”

Adopting SUSE Enterprise Storage will allow the university to retire some of its older hardware, which is reaching end-of-life, and gradually add new capacity.

“With SUSE Enterprise Storage, we will be able to easily and non-disruptively add new capacity to existing nodes, or deploy entire new nodes,” said Steve Cousins. “We can also duplicate stored data to our second data center for disaster recovery, safeguarding vital research data.”

With SUSE Enterprise Storage providing resilient, high-performance storage of data on common off-the-shelf hardware, the University of Maine System has a solution that matches its research ambitions without incurring unsustainable costs.

“Thanks to the stability and ease of management of the SUSE solution, we have significantly reduced the time we spend managing live and archived data,” said Steve Cousins. “This keeps our internal team free to focus on driving new value for the university and its life-changing research projects.”