



Minnesota Supercomputing Institute Unlocks Cost Savings and Scalability with SoftIron's HyperDrive®

HyperDrive maximizes Ceph's best functionality while minimizing its complexity



The Minnesota Supercomputing Institute is a resource of the University of Minnesota, whose mission is to provide research computing to faculty, students and greater Minnesota.

Minnesota Supercomputing Institute (MSI) is a world-class facility that provides computing infrastructure and expertise to foster innovation through advanced computing technologies, scientific computing services, and more. The University of Minnesota's researchers rely on MSI's infrastructure to conduct a wide variety of fascinating research including contributing to the worldwide global genomics project, creating sustainable energy initiatives, and monitoring global agriculture and environmental changes.

Existing Infrastructure Hampers Service Delivery

However, MSI's legacy infrastructure was hampering the Institute's goals to service its internal customers with scalable, easy-to-deploy, high-performance data solutions so it started the search for a more cost-effective, scalable storage solution.

One of MSI's requirements was that any new solution had to utilize Ceph; the leading open-source, distributed, scale-out platform that underpins enterprise level software-defined storage (SDS). A number of years ago MSI began exploring Ceph as the MSI team believed it held great promise in more effectively delivering compute storage. However, whilst Ceph is undoubtedly powerful, it is also incredibly complex, requiring specialist technicians to deploy and manage the software. As a result, its adoption within the University had been limited to the supercomputing group.

The Challenges and Complexities of Ceph

"We started exploring Ceph as a more efficient way to deliver storage to our researchers," explains Jeffrey McDonald, Ph.D., Associate Director for Operations at the Institute. "We found it had some great advantages, such as supporting multiple storage formats like block, object, and file storage, but it was also very challenging to use. There's almost no training available for Ceph, and it is completely command line-driven so we were spending a great deal of time learning how it worked. Ceph's complexity was a considerable obstacle for us in choosing to deploy it more widely."

Making Ceph Easier to Use

After carefully evaluating multiple vendors, MSI chose enterprise-storage startup SoftIron, pioneers of dedicated Ceph appliances that are purpose-built for SDS. SoftIron designed its HyperDrive storage appliance to take advantage of Ceph's core strengths; flexibility and scalability, while minimizing its complexities with an intuitive management interface that radically simplifies the deployment and management of Ceph software and storage hardware.

"Ceph has some amazing benefits," says Jeff. "We felt it had great potential to go far beyond what we were doing in high-performance computing, but it was difficult to harness those capabilities without specially trained IT personnel. SoftIron's HyperDrive appliance is enabling us to go much further with Ceph than we would have on our own."

Implementing HyperDrive was also more cost-effective compared to upgrading their existing system. "It would be very expensive to upgrade our legacy system because our only real option was a fork-lift upgrade," explains Jeff. "However, SoftIron demonstrated that they could meet, and exceed, our current cost per terabyte, and because of backward compatibility with Ceph, we could grow our existing Ceph estate and easily migrate data off our legacy systems."

Flexible, Scalable Storage

Universities typically face a unique challenge in the fact that they often don't know how much storage their researchers will need, and so struggle to plan or budget for it. Therefore, dynamic, flexible storage is important, but that wasn't possible with MSI's legacy system.

HyperDrive, by contrast, is a software-defined storage solution with distributed scale-out storage. As more components are added, it scales horizontally and performance increases. It is a dynamic solution that can flex to accommodate a university's constantly shifting requirements. The result is that MSI can use HyperDrive to be a truly centralized, unified storage solution.

High Performance, Optimized Storage

HyperDrive's purpose-built hardware is specifically optimized for storage, which gives it a huge performance advantage over traditional storage solutions. "HyperDrive was designed from the ground up to do storage extremely well," explains Phil Straw, Chief Technical Officer at SoftIron. "We designed HyperDrive's hardware to exploit Ceph's best functionality and to shield users from its complexity. It's also extremely fast, which is critical in a data-intensive, high computing environment like MSI's."

Reduced Environmental Footprint and Higher Density Storage

HyperDrive drove other advantages for MSI including minimizing environmental impact through reduced power consumption because it uses far less power compared to MSI's legacy system. "In general, HyperDrive uses 100 watts, and we were previously using around 600-800 watts," explains Jeff. "HyperDrive's reduced power consumption translates to less impact on the environment." HyperDrive also has a 1U footprint, which means it is far smaller than legacy storage devices. It occupies less rack space than traditional systems, such as Dell Compellant, which translates to a 50% density gain. That's the equivalent of gaining back three times more storage space.

HyperDrive Takes Ceph Further

In summary, MSI is embracing HyperDrive and Ceph. "We now have a dynamic, centralized solution that is optimized for storage and is far more cost-effective than our previous legacy solution," says Jeff. "It also capitalizes on Ceph's functionality while minimizing its complexity."

Learn More

To learn more about how SoftIron's HyperDrive Ceph appliance is redefining software-defined storage for higher education and research facilities, visit softiron.com





SoftIron® makes the world's finest solutions for the data center. The company's HyperDrive® software-defined storage portfolio is built on Ceph and runs at wire speed, while HyperCast™ delivers the best density and value for real-time video streaming. SoftIron unlocks greater business value for enterprises by delivering great products without software and hardware lock-in.

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