CUSTOMER CASE STUDY

MASSACHUSETTS OPEN CLOUD SUPPORTS BIG DATA ANALYSIS WITH RED HAT

Massachusetts Open Cloud (MOC)—a nonprofit initiative of universities, government organizations, and businesses—needed reliable, cost-effective storage to support its public and private clouds built on Red Hat OpenStack Platform. With help from Red Hat Technical Account Management and Red Hat Training, MOC deployed Red Hat Ceph Storage as the storage foundation for innovative research and big data analytics.

SOFTWARE AND SERVICES

Red Hat® Ceph Storage

Red Hat OpenStack® Platform

Red Hat Technical Account Management

Red Hat Training

Red Hat Consulting

HARDWARE

Fujitsu Storage ETERNUS CD10000 with 123TB storage

48 x Cisco UCS C220 rack servers

10 x Lenovo servers with 500TB storage

16 x Dell PowerEdge M620 blades with 108TB storage

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PIYANAI SAOWARATTITADA
DIRECTOR OF ENGINEERING, MASSACHUSETTS OPEN CLOUD

EDUCATION I.T.

30 EMPLOYEES SUPPORTING **100** RESEARCHERS, STUDENTS, AND INDUSTRY COLLABORATORS

BENEFITS

- Deployed a reliable, scalable, and high-performance storage platform to support research innovation and collaboration
- Gained access to expert knowledge and guidance for easier deployment, troubleshooting, and management with Red Hat Technical Account Management and Red Hat Training
- Reduced IT costs by deploying a cost-effective open source platform on industry-standard hardware

ESTABLISHING A RESOURCE FOR COLLABORATIVE RESEARCH

To better understand and serve their customers and constituents, organizations including businesses, governments, and nonprofits seek to analyze and gain insight from rapidly growing volumes of data. To achieve this goal, several private and public institutions in Massachusetts formed the Massachusetts Open Cloud (MOC). Funded by the Commonwealth of Massachusetts, this initiative's mission is to develop a common, cloud-based infrastructure that provides researchers and businesses with the tools to develop and share cloud technologies and run big data applications.

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MOC needed to create an inexpensive, efficient, and highly scalable public cloud utility to offer these capabilities. However, public clouds are typically built, controlled, and operated by a single provider in a closed environment, limiting flexibility. To create a resource that would help users to conduct innovative research and take advantage of the latest technology from local providers, MOC sought an open source public cloud storage solution. Using an open source solution would let the initiative use industry-standard servers and scale as needed to cost-effectively support growth.

In addition, MOC wanted technical support for advanced storage technologies to help the initiative's small IT team run and manage the new solution.

DEPLOYING HIGH-PERFORMANCE, OPEN SOURCE STORAGE

MOC leaders chose OpenStack as its infrastructure foundation due to its cost-effectiveness and support from a large community of contributors. After deciding to use OpenStack, MOC's DevOps team quickly chose to deploy Red Hat OpenStack Platform, a solution from one of the project's core industry partners. Finally, after evaluating and discussing storage options with Red Hat Consulting, MOC deployed Red Hat Ceph Storage.

"We knew a public cloud built on open source technology would let many entities operate the cloud together, offer innovative new services, and even build on top of each other's services," said Orran Krieger, lead of MOC. "But to support our vision, we also needed open source storage. Ceph is by far the most accepted high-performance storage solution for OpenStack and the best match for our goals."

To build its cloud infrastructure, MOC accepted hardware donations from participating technology vendors. A Red Hat Technical Account Manager (TAM) then reviewed the available hardware and recommended strategies for optimal use.

With Red Hat's assistance, three staff built and deployed MOC's Ceph environment. The initiative now runs three storage clusters on Red Hat Ceph Storage, including:

- A production environment with 123TB and 90 users.
- A research and experimental cluster with 500TB and 15 users.
- A new, internal third cluster for testing with 108TB and 5 users.

CREATING A SOLID FOUNDATION FOR RESEARCH INNOVATION

GREATER SCALABILITY AND RELIABILITY

With Red Hat Ceph Storage, MOC can expand its storage network to meet researchers' growing needs for developing innovative, data-intensive applications and performing detailed analysis. For example, upcoming projects—such an analysis of Twitter data to identify security threats—are expected to double the number of system users from 180 current regular users, resulting in greater storage demand.

"Red Hat Ceph Storage provides a solid, scalable platform for big data applications, letting our researchers focus on analytics and innovation instead of data collection and storage," said Piyanai Saowarattitada, director of engineering at MOC. "We're confident that Ceph can scale to meet our storage needs, no matter how large. Even with data-heavy applications like Hadoop and MapReduce, Red Hat Ceph Storage delivers everything you expect from a performance-focused storage platform."

Red Hat Ceph Storage also provides rapid recovery from issues and high reliability for critical research project data.

"In the early days of the initiative, a batch of bad storage disks caused several servers to crash, but Red Hat Ceph Storage quickly reconstructed itself when we experienced a failure," said Krieger. "Everything else can succeed, but if your storage is unreliable, you're in big trouble. In dealing with all of the challenges we've encountered, Red Hat Ceph Storage has been incredibly reliable."

ACCESS TO EXPERT TRAINING AND SUPPORT

To ensure a successful deployment, MOC not only engaged Red Hat Consulting and a Red Hat Technical Account Manager but also took advantage of Red Hat Training to learn more about the new solution.

"Red Hat has been our core partner and has been incredibly responsive to our needs from the beginning. The Red Hat Ceph Storage team is excellent, and our Red Hat consultant proactively assessed our needs and presented a performance-based strategy before deployment," said Saowarattitada. "That support really sped up the implementation. Then he went further, teaching us how to measure and tune our performance to make adjustments to the equipment in the future."

During training, MOC's DevOps teams learned how to operate Red Hat Ceph Storage, and two OpenStack engineers were trained to diagnose and fix potential performance issues. This guidance helps MOC use Red Hat Ceph Storage more efficiently, including using intuitive management features to easily administer and support its three storage clusters. One infrastructure expert who was new to Red Hat Ceph Storage learned everything he needed to deploy MOC's second storage environment without assistance.

"We greatly appreciate the comprehensive storage training and deployment support," said Saowarattitada. "The trainer let us ask questions, try out commands in the lab environment, and learn to solve problems. Our engineers said it was one of the best classes they'd ever taken. The deep knowledge of Red Hat's experts and their understanding of our needs helped pave the way for our success."

REDUCED STORAGE COSTS

By running Red Hat Ceph Storage on industry-standard hardware, MOC reduced its overall technology expenses while increasing reliability.

"Ceph was far more cost-effective than high-end storage technology that we considered," said Krieger.

PARTNERING FOR FUTURE GROWTH

With its powerful infrastructure, MOC is emerging as a leading research partner. The initiative is discussing development of a 20PB production storage cluster with the Massachusetts Green High Performance Computing Center.

"By giving us the tools to build reliable storage that supports large data sets, Red Hat has helped us entice leading researchers to collaborate with us," said Saowarattitada. "We needed a cost-effective, reliable, and scalable storage solution to accommodate the large amounts of data our researchers work with. We found it with Red Hat Ceph Storage."

MOC is also collaborating on new projects with Red Hat. The initiative plans to double the size of its production storage cluster. In addition, MOC has deployed Red Hat OpenShift Container Platform to explore developing, hosting, and scaling cloud applications and how containers could simplify its storage resources for researchers.

"It's easy to see Red Hat Ceph Storage as an evolving platform that will support continuing innovation at MOC," said Krieger.

ABOUT MASSACHUSETTS OPEN CLOUD

The MOC initiative is a consortium of private and public institutions that includes Boston University, Harvard University, Massachusetts Institute of Technology, Northeastern University, and University of Massachusetts. MOC is dedicated to the creation of publicly available cloud computing resources that will support innovative approaches to big data. By developing a shared infrastructure, MOC hopes to empower researchers and companies to explore, develop, and release cloud-based big data technology.

ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

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