

Ghent University accelerates research with Supercomputing-as-a-Service



Software

Red Hat® OpenStack®
Platform

Red Hat Ceph® Storage

Partner

Dell

High-performance computing (HPC) offers opportunities to help research facilities collect, share, and process data faster. Ghent University is in charge of developing the cloud component for the Vlaams Supercomputer Centrum (VSC), as part of a Supercomputing-as-a-Service offering to Flemish researchers. Using Red Hat technology to create a modular, developer-friendly environment, supported by massively scalable data storage, VSC now lets researchers store, share, and explore data on demand to support innovative breakthroughs in academic and industrial scientific challenges. A foundation of supported enterprise software helps Ghent University optimize hardware resource use and simplify environment maintenance.



Education

15,000 employees

47,000 students

Benefits

- ▶ Accelerated innovative research with new data platform
- ▶ Optimized hardware and compute resource use
- ▶ Simplified environment maintenance with supported enterprise solution

“Using Red Hat’s cloud and storage technology, we have now created a simple portal with easy access to a library of services, open to projects from industry to academia.”

Stijn De Weirdt
Technical Coordinator of HPC,
Ghent University

“Research teams just want simple access to resources, without having to worry about the technology back end. With Red Hat’s long-term roadmap for their OpenStack and Ceph solutions, we have a stable, supported platform with long-term life-cycle management.”

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Technical Coordinator of HPC,
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Accelerating scientific breakthroughs with high performance computing

High-performance computing (HPC) helps higher education institutions, research organizations, and other groups explore some of the world’s toughest scientific challenges with rapid insight and sustainable resource use.

Ghent University is in charge of developing the cloud component for the Vlaams Supercomputer Centrum (VSC), as part of a Supercomputing-as-a-Service offering for researchers in Belgium’s Flemish region. The goal of this project is to help researchers store, share, and review [data](#) on demand with a catalog-based as-a-Service approach to accessing supercomputing capabilities.

“To ensure researchers have the power and freedom to do their best work, VSC needs to deliver on-demand resources through a cloud-like approach, with project-based access for academic, public sector, or industry users,” said Stijn De Weirdt, Technical Coordinator of HPC, Ghent University.

Simplifying resource access with Supercomputing-as-a-Service platform

After a pilot with a community version of the software, Ghent University decided to use Red Hat OpenStack Platform as the cloud platform foundation of VSC. The university has successfully used other Red Hat software to support various projects, including running its video learning platform on Red Hat OpenShift® and experience with Red Hat Enterprise Linux for SAP Solutions.

“We started with the community OpenStack solution, but once we had created a working prototype for the VSC, we recognized that we needed enterprise support to manage the platform in production,” said De Weirdt. “We didn’t want just upfront consultancy work but someone to support us every step of the way. Some of the alternative vendors we considered lacked a clear vision, but Red Hat’s commitment, roadmap, and level of support were clear.”

Red Hat OpenStack Platform abstracts industry-standard hardware infrastructure and organizes it into cloud-like architecture for more agile, efficient IT operations and easier management across traditional and cloud-native applications. The university worked with a Red Hat Cloud Success Architect to set up their production cloud environment to run on Red Hat OpenStack Platform.

Ghent University also adopted Red Hat Ceph Storage, a distributed [object storage](#) platform, to provide massively scalable storage for data analytics and artificial intelligence and machine learning (AI/ML). Tightly integrated with Red Hat OpenStack Platform, Red Hat Ceph Storage can scale to support petabytes of data.

“Using Red Hat’s cloud and storage technology, we have now created a simple science portal with easy access to a library of services, open to projects from industry to academia,” said De Weirdt.

Accelerating and simplifying data processing for faster research insight

Created consistent, cost-effective research foundation

VSC now provides stable, massively scalable infrastructure to help Flemish institutions pursue innovative scientific research without requiring significant financial or time investment for setting up and maintaining hardware.

“The main advantage for researchers compared to our other HPC infrastructure is that Red Hat OpenStack Platform is flexible,” said De Weirdt. “Researchers can use more or less whatever resources they want, as opposed to more restricted use with large clusters. We can provide HPC on demand to complement the more traditional HPC resources.”

Optimized compute and storage resource use

While VSC provides greater speed and scale, its compute power and storage are not unlimited. Together, Red Hat OpenStack Platform and Red Hat Ceph Storage help Ghent University ensure VSC users can access the resources they need, like file share storage, when they need them.

During the test phase, on average, five virtual machines (VMs) were created per project. Those VMs were active for an average of 5,500 hours per month, about 75% of the potential use time—meaning researchers were able to make the most of the available resources to complete their work efficiently.

Simplified platform maintenance

Without the resources needed to maintain a critical deployment of community software, Ghent University was eager to work with supported enterprise technology, backed by Red Hat’s expertise.

While using Red Hat OpenStack Platform across a broad spectrum of functions, from storage to security and authentication, VSC has completed several updates to its IT infrastructure with no negative impact to performance or availability for users.

“Research teams just want simple access to resources, without having to worry about the technology back end,” said De Weirdt. “With Red Hat’s long-term roadmap for their OpenStack and Ceph solutions, we have a stable, supported platform with long-term life-cycle management, so it’s easy for our core team to test new features and then put them into production, as well as make maintenance updates.”

Attracting new talent and funding

After the successful launch of the VSC cloud, Ghent University plans to promote the capabilities of the platform and the high-profile research it supports to attract new projects—and in turn, attract new funding to support new, innovative research.

The university plans to migrate its on-premise HPC clusters from CentOS to Red Hat Enterprise Linux. It is also exploring new features and capabilities that could help enhance the HPC platform in the future, such as improving backup and monitoring functions.

“VSC is a key way to promote the importance of scientific and technical computing and its value to society,” said De Weirdt. “There are other HPC projects in Europe, but our goal is to be the best in Belgium. Running our science portals on a flexible, scalable platform using Red Hat OpenStack Platform for years to come gives us the right tools to achieve that goal.”

About Ghent University

Ghent University is a global top 100 university and one of the major universities in Belgium. Its 11 faculties offer more than 200 courses and conduct in-depth research within a wide range of scientific domains. It has more than 47,000 students and 15,000 staff. Ghent University Global Campus is also the first European university in Songdo, South Korea. <https://www.ugent.be/>






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About Red Hat

Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. [A trusted adviser to the Fortune 500](#), Red Hat provides [award-winning](#) support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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