CoreSite

HEAD OF THE CLASS
CORESITE'S SOLUTION

Elite research university cut costs by 33% while empowering the next generation of researchers with colocation and dedicated cloud connectivity.

HIGHER EDUCATION CASE STUDY **AT A GLANCE**

CHALLENGE

- Sustainably providing adequate power and cooling to a supercomputer

- Empowering researchers with robust data tools and more collaboration

- Reducing real estate and operating costs

SOLUTION

- The research university is using CoreSite colocation and cloud connectivity solutions to consolidate infrastructure operations into a cost-effective, energy-efficient and well-connected data center to reduce operating costs while enhancing the data collection, processing and transportation capabilities of research teams spanning a wide range of important subjects.

RESULTS

- Eliminated up to 95% of supercomputer heat at 33% lower cost with liquid-based cooling

- Gained on-demand access to essential storage and compute capacity with a private direct connection to Google Cloud Platform

- Accelerated data transfer and knowledge sharing among research collaborators

- Relocated from high-priced urban data centers which significantly reduced real estate expense

A POWER **STRUGGLE**
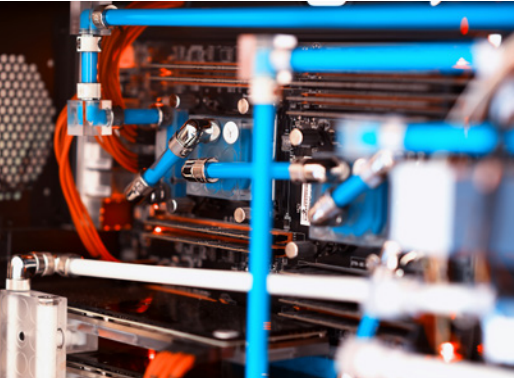
Conventional cooling systems in the university's previous data center were inefficient and costly, as the combined power and cooling costs for the 700kW machine could reach as high as $.30 per kilowatt hour and total hundreds of thousands of dollars annually.

CHALLENGE

Building scalable infrastructure for a new generation of researchers

Higher education has often conjured images of stodgy classrooms and libraries with tomes of reference books on walls and racks as far as the eye could see. But today's colleges and universities aren't the paper-based learning environments of yesteryear. Instead, they're at the forefront of the digital revolution, leading the adoption — and in some cases, the creation — of new technologies and education tools.

For one elite East Coast university, the digital transformation of higher education has helped enhance its longstanding commitment to research. The university is renowned for its research programs aimed simultaneously at discovering new knowledge and at preparing students in disciplines ranging from mathematical and neural sciences to philosophy, art history and sociology to succeed in the modern economy.

But research is a data-intensive endeavor, and data-driven pursuits require both adequate computing power to collect and analyze that information as well as sufficient bandwidth for moving that information from one group of researchers to another. As the university's research programs expanded, so did its need for scalable computing and a lot more storage, which became increasingly difficult to access through its existing, high-priced data centers.

Super-sized costs from a super-sized computer

As a leading research institution, the university enjoys partnerships with industry leaders, technology manufacturers and a host of government and non-profit organizations. One of those relationships resulted in acquiring one of the fastest supercomputers on the planet. The machine is capable of processing four petaflops per second — ideal for powering complicated studies on potentially life-altering subjects like the genomics of rice to solve world hunger and a range of topics related to the COVID-19 global pandemic.

It also weighs more than 22,000 pounds and features hundreds of power-hungry GPUs that combine to produce an extraordinary amount of heat. Conventional cooling systems in the university's previous data center were inefficient and costly. The combined power and cooling costs for the 700kW machine could reach as high as $.30 per kilowatt-hour per server and total hundreds of thousands of dollars annually, compared with the approximate $.12/kWh it costs to power and cool a typical server.

Worse, the university had been using a general-purpose network carrier that couldn't provide a connection that was fast enough to move large data sets among teams and locations. As a result, departments had to store data locally in their dedicated machine rooms and pre-plan data transfers to accommodate slower network speeds. Even moving to the cloud to leverage on-demand storage and compute would be hindered by inadequate connectivity and the fact that running all the university's applications in the cloud would cost roughly twice as much as running them on-premises in the data center.

SOLUTION

Mix and match for optimal performance

The university's analysis pointed toward a hybrid infrastructure to balance its operational demands with the realities of

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its budget limitations. After consideration, the university chose to relocate its core computing infrastructure to a nearby CoreSite data center because of the data center's innovative and cost-effective cooling systems, scalable and configurable storage arrays, and variety of connectivity options to cloud and network services partners.

Unlike conventional data center cooling systems, this CoreSite facility supports water-based cooling that requires far less energy to maintain while eliminating up to 95% of the heat the supercomputer produces. At the same time, CoreSite's support for high-density, easily configurable racks and cage deployments enable the university to add storage or compute servers as needed without requiring additional floor space or power investments.

In addition to infrastructure built to support a world-class supercomputer, the university is also taking advantage of CoreSite's on-ramps to leading public cloud platforms via secure, high-performance interconnection services that enable the university to connect directly with Google Cloud Platform as part of a low-latency dedicated research network at 400GB/s speeds.

Research teams and departments across the university can now easily tap into more storage and compute on demand for additional capacity in support of resource-intensive modeling and analytics applications and reliably share their findings with colleagues and collaborators over a lightning-fast network with eight-9s availability.

CUSTOMER EXPERIENCE AND BENEFITS

In it for the long haul

University technology leaders say that partnering with CoreSite instead of over half a dozen competing options has proven to be a tremendous boost to their research efforts and their bottom line.

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The added flexibility of direct, scalable cloud connectivity strikes a critical balance between providing research teams with the tools and capabilities they need for greater collaboration and the university's responsibility to spend its resources wisely.

With CoreSite, the university has found a partner laser-focused on providing the infrastructure solutions for supporting its current and future research programs. In the future, university technology leaders plan to migrate additional machine rooms to the CoreSite data center, further reducing its real estate obligations while increasing the IT resources their researchers need to continue world-changing work.

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