Academic Research | China

Supporting groundbreaking biology research

Centre for Evolutionary & Organismal Biology at Zhejiang University

Working with Lenovo and NVIDIA, the University of Zhejiang deployed a high-performance computing (HPC) cluster, featuring ThinkSystem servers accelerated with NVIDIA® A10 Tensor Core GPUs, that helps scientists make progress on pioneering research projects.

Lenovo

NVIDIA.

1 Customer background

Who is the Centre for Evolutionary & Organismal Biology at ZJU?

The Centre for Evolutionary & Organismal Biology at Zhejiang University (ZJU) focuses on genomics. Through multidisciplinary research, the team aims to understand the origin of species as well as the processes and laws of biological traits and their impact on diseases; analyze the genetic regulation mechanism of traits from an evolutionary perspective; and fully reveal the essential laws of evolution.

Zhejiang University
Centre For Evolutionary & Organismal Biology

2 The challenge

To support its research into biological trends, the Centre harnesses many specialized software applications, including IQ-Tree, BUSCO, and BRAKER for mapping genetic code structures. These cutting-edge tools enable research scientists and students to integrate, analyze, and visualize vast data sets, and in turn, require a hugely powerful IT infrastructure to run efficiently.

He Yunqiu, Secretary at the Centre for Evolutionary & Organismal Biology at ZJU, explains: “To perform complex scientific analysis, our researchers rely on rapid access to information. Currently, we manage around 10 PB of data, but that figure is growing quickly. To keep research projects running smoothly, we looked to upgrade our compute and storage environment.”

“Previously, we experienced performance bottlenecks with our IT infrastructure. It was taking longer and longer for our users to access data, reducing productivity and holding up progress on research. It was time to invest in more reliable, high-performance servers, storage, and network resources.”

He Yunqiu

Secretary, Centre for Evolutionary & Organismal Biology, Zhejiang University

3 The solution

Driving scientific breakthroughs with a new HPC cluster

To support its pioneering research work, the Centre engaged Lenovo to deploy a new HPC environment. Working closely with Lenovo's HPC experts, the Centre planned, designed, and implemented a new architecture that provides the performance, bandwidth, and capacity needed to run the most demanding research and analytics tools.

Hardware

Lenovo ThinkSystem SR630 V3
Lenovo ThinkSystem SR650 V3
Lenovo ThinkSystem SR675 V3 accelerated with NVIDIA® A10 Tensor Core GPUs
Lenovo ThinkSystem SR850 V3
Lenovo Distributed Storage Solution for IBM Spectrum Scale

Software

3d-dna
BRAKER
BUSCO
IBM Spectrum Scale
IQ-Tree
RepeatMasker

3 The solution

The full solution includes 56 parallel computing Lenovo ThinkSystem SR630 V3 servers, four large-memory Lenovo ThinkSystem SR850 V3 systems, and one Lenovo ThinkSystem SR675 server acccelerated with high-performance NVIDIA® A10 Tensor Core GPUs to support artificial intelligence (AI) workloads.

Furthermore, the Centre selected integrated Lenovo Distributed Storage Solution for IBM Spectrum Scale (DSS-G), which provides around 15 PB of capacity for seamless management of growing data volumes.

“One of the best elements of the Lenovo solution is the DSS-G storage platform. The built-in redundancy helps to safeguard data availability, while the data synchronization times are extremely impressive. Plus, we have the flexibility to scale the environment vertically or horizontally.”

He Yunqiu

Secretary, Centre for Evolutionary & Organismal Biology, Zhejiang University

4 The results

Accelerating research

With Lenovo, the Centre has eliminated performance bottlenecks and built a more powerful, resilient, and scalable HPC environment to support research into evolutionary science. Users at the Centre can now retrieve data much faster while receiving lower response times when running specialized analytics applications, helping them to accelerate work on substantial research projects.

The new infrastructure has also proved exceptionally reliable, as He Yunqiu notes: “We have run the Lenovo HPC environment for thousands of hours without incident and achieved 99.999% data availability. That’s an excellent result and boosts productivity among researchers and students.”

- 99.999% data availability for users
- 1000s of operational hours without incident
- Supports groundbreaking biological research

“The Lenovo HPC environment has been ideal for supporting our research. The Lenovo servers and NVIDIA GPUs provide the performance needed for AI and sophisticated analytics workloads, while the storage offers ample capacity for current projects and headroom for future expansion.”

He Yunqiu

Secretary, Centre for Evolutionary & Organismal Biology, Zhejiang University

Why Lenovo?

In part, the Centre's decision reflected Lenovo's proven expertise in the design and delivery of HPC solutions. Beyond this, the Centre also recognized the exceptional performance and reliability of the Lenovo DSS-G system, which would help to reduce network overheads and improve the user experience.

During testing, the DSS-G solution offered excellent bandwidth of around 30 GB/s, while the Centre was impressed with the GPU Direct Storage (GDS) function, which enabled a seamless connection between the storage and NVIDIA GPUs, improving overall efficiency.

How can universities drive pioneering research?

Zhejiang University deployed a new HPC cluster based on Lenovo ThinkSystem servers and NVIDIA GPUs to support sophisticated analytics tools.

Explore Lenovo HPC Solutions