

Academic Research | China

# Powering up research capabilities

Wuhan University of Technology

To give researchers access to world-class high-performance computing resources, Wuhan University of Technology partnered with Lenovo to design and deploy a powerful water-cooled supercomputer.



Lenovo

# 1

## Customer background

# Who is Wuhan University of Technology?

Wuhan University of Technology (WUT) was formed in 2000 from the merger of Wuhan University of Technology, Wuhan Transportation University, and Wuhan Automotive Polytechnic University. Originating as the Hubei Institution of Technology in 1898, WUT has over 120 years of experience as a leading higher education provider in China. Today, more than 37,000 undergraduate and 23,000 doctoral and master's students study at WUT each year.



武汉理工大学

## 2 The challenge

Under the guidance of the Ministry of Education, WUT focuses on producing highly skilled professionals and world-class research, paving the way for the development of China's construction, transportation, and automotive industries.

High-performance computing (HPC) is key to modern research—from atomic physics to zoology and everything in between, academics rely on supercomputers to process huge data sets and perform complex calculations.

Although some departments at WUT already utilized HPC for their research, these resources were not available across the whole university. To support cutting-edge research everywhere, WUT set out to build a central HPC platform.

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“As **leaders in engineering and transport research**, we partner with over 160 enterprises in China to support the development of these industries. Our goal was to build a **central HPC platform** that would meet these demands.”

CaiJun Chen

**Director of the Network Information Center, Wuhan University of Technology**

# 3 The solution

## Custom cluster design

Working with Lenovo HPC Services, WUT designed a water-cooled supercomputer based on 150 Lenovo ThinkSystem SD650 V2 servers and Lenovo Neptune® Liquid Cooling technology. The cluster also includes seven GPU-rich Lenovo ThinkSystem SR670 V2 servers for AI workloads, and a Lenovo ThinkSystem SR860 V2 management node.

On the storage side, WUT opted for a Lenovo Distributed Storage Solution for IBM Storage Scale (DSS-G) solution that offers up to 3.3 PB of potential capacity.

### Hardware

- Lenovo ThinkSystem SD650 V2
- Lenovo ThinkSystem SR670 V2
- Lenovo ThinkSystem SR860 V2
- Lenovo Neptune® Liquid Cooling
- Lenovo Distributed Storage Solution for IBM Storage Scale (DSS-G)

### Services

- Lenovo EveryScale
- Lenovo HPC Services – Cluster Design, Configuration, and Installation
- Lenovo Data Center Design Services

# 3 The solution

## Plug-and-play HPC

WUT engaged Lenovo HPC Services to support the design, configuration, and installation of the cluster. The HPC Services team also helped to redesign the university's data center, laying the groundwork for the Lenovo Neptune<sup>®</sup> Liquid Cooling installation.

Using the Lenovo EveryScale “Best Recipe” framework, the Lenovo engineers configured the Lenovo ThinkSystem and OEM components to work together seamlessly as a fully integrated solution.

WUT's custom Lenovo EveryScale HPC solution came racked and ready, significantly reducing the complexity of the deployment process for the university. With support from the Lenovo HPC Services team, WUT was able to get the new supercomputer up and running fast.

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“We wanted to invest in a **future-proof platform**. With a **total peak performance of 1 PFLOP** and **energy-efficient Lenovo Neptune<sup>®</sup> liquid cooling technology**, our new Lenovo HPC cluster will support research for many years to come.”

CaiJun Chen

**Director of the Network Information Center, Wuhan University of Technology**



# 4 The results

With the Lenovo supercomputer now operational, researchers from across WUT have access to powerful HPC resources to further their work. “We support users from almost every department at the university—from engineering to biology to transportation planning and management,” confirms CaiJun Chen, Director of the Network Information Center at WUT.



1 PFLOP peak performance;  
3.3 PB storage capacity



High energy efficiency,  
low total cost of ownership



Supports innovative research  
across the university



# 4 The results

As well as widening access to HPC, WUT has dramatically boosted the computational power available to researchers. The Lenovo HPC cluster offers a total peak performance of 1 PFLOP, as well as 48GBps of multi-stream read bandwidth and 23 GBps of multi-stream write bandwidth to meet high-speed read and write requirements.

With access to cutting-edge HPC resources, WUT academics can advance their research and ensure that the university continues to be a leader in developing pioneering solutions in key industries.

# 4 The results

## Densely packed power

While researchers benefit from the high computational power, WUT enjoys a low total cost of ownership.

“The Lenovo ThinkSystem SD650 V2 servers offer very high performance in an extremely dense package, so the entire cluster takes up just three racks,” explains CaiJun Chen. “A solution of comparable power from a competitor would usually take up more than 15 racks.”

With a small data center footprint and Lenovo Neptune<sup>®</sup> Liquid Cooling technology removing heat from the servers, WUT benefits from maximum performance and energy efficiency—and lower energy and cooling costs. Lenovo Neptune<sup>®</sup> liquid cooling reduces data center power consumption by up to 40%<sup>1</sup> and delivers 100% heat removal for more sustainable supercomputing. What’s more, the university has the rack space to scale the HPC cluster in line with its research needs.

<sup>1</sup> Based on Lenovo internal testing against similar air-cooled systems in a typical data center.

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“Our new cluster is a powerful demonstration of **Lenovo’s HPC expertise**. From design to configuration to installation, Lenovo demonstrated **unwavering commitment** to providing a solution that would **supercharge our research**.”

CaiJun Chen

**Director of the Network Information Center, Wuhan University of Technology**

# Why Lenovo?

For WUT, Lenovo stood out as a HPC leader and innovator—for years, Lenovo has been the number-one provider of supercomputers on the TOP500 list of supercomputers.

Lenovo's experience in deploying HPC solutions for other higher education providers in China assured WUT that Lenovo was the right partner. "The professionalism, technical know-how, and commitment of the Lenovo HPC Services team sealed the deal," confirms CaiJun Chen.

# How can universities harness HPC for research?

Working with Lenovo, Wuhan University of Technology designed and deployed a powerful HPC platform, opening the door to research innovation.

[Explore Lenovo HPC Solutions](#)