

# Leibniz Supercomputing Centre

Leibniz Supercomputing Centre wanted to provide the scientific community with an easy-to-manage, reliable and efficient high-performance computing platform. To meet these needs, it has implemented SuperMUC, the world's fastest x86-based super-computer and Europe's fastest HPC system.

SUSE® Linux Enterprise Server provides the stable foundation needed to ensure best performance and optimum energy efficiency.

## Overview

Leibniz Supercomputing Centre is the central computing centre for Munich's universities and other academic institutions. The centre provides high-performance computing capacities to the scientific community across Europe. Its latest addition, SuperMUC, is the fastest supercomputer in Europe.

## Challenge

As part of the Gauss Centre for Super-computing (GCS), which operates the most powerful high-performance com-

puting infrastructure in Europe, Leibniz Supercomputing Centre offers super-computer resources to a large scientific community.

The institution wanted to provide researchers across Europe with a reliable and powerful high-performance computing platform, which would enable users to make faster progress in their complex research projects.

To reduce the environmental impact of high-performance computing, the institution aimed at improving the energy efficiency of its operations with the latest technology available on the market. Leibniz Supercomputing Centre also sought to leverage established automation solutions to maximise the efficiency and manageability of the new supercomputing platform.

## Solution

Working with SUSE and IBM, and drawing on its own extensive experience in high-performance computing, Leibniz Supercomputing Centre implemented SuperMUC, Europe's fastest supercomputer, with approximately 9,400 general purpose computing nodes and a peak performance of three Petaflop/s. The system comprises more than 155,000 Intel Xeon processor cores and more than 300 TB main memory, and is connected to disk storage systems with a total capacity of 11.5 PB.

**“We have relied on SUSE Linux Enterprise Server in high-performance computing for approximately 15 years, and have always been very satisfied with the operating system. Specific features such as its early support of the Andrew File System distinguished SUSE Linux Enterprise Server from the competition.”**

HERBERT HUBER

Division Head of Super Computing  
Leibniz Supercomputing Centre

## Success Story

Enterprise Linux Servers



### Leibniz Supercomputing Centre at a glance:

European high-performance computing centre and IT service provider for Munich's universities

#### ■ Industry and Location

Research, Germany

#### ■ Product and Services

SUSE Linux Enterprise Server  
SUSE Linux Enterprise Desktop

#### ■ Results

- + Overall performance has been boosted by a factor of 50, making SuperMUC the fastest supercomputer in Europe and the fourth fastest worldwide when it went into production.
- + Simplifies system configuration with leading automation tools such as AutoYaST.
- + Improves energy efficiency with advanced power saving features, providing 20 times more performance per watt than the previous environment
- + Enables smooth migration from Itanium 2 to x86 processor architecture

**“The SUSE team is close at hand, should we require support or guidance, as their headquarters are located nearby. We have received highly competent support from SUSE over the years, and look forward to collaborating with them as we continue to make advances in high-performance computing.”**

**HERBERT HUBER**

*Division Head of Super Computing  
Leibniz Supercomputing Centre*

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Leibniz Supercomputing Centre chose to run its high-performance computing system SuperMUC with SUSE Linux Enterprise Server, leveraging SUSE's proven expertise and leading automation tools such as AutoYaST, which allows systems to be installed without manual intervention.

“We have relied on SUSE Linux Enterprise Server in high-performance computing for approximately 15 years, and have always been very satisfied with the operating system,” said Herbert Huber, Division Head of Super Computing at Leibniz Supercomputing Centre. “Specific features such as its early support of the Andrew File System distinguished SUSE Linux Enterprise Server from the competition. Today it is an established and highly successful platform at Leibniz Supercomputing Centre.”

The institute deployed innovative warm-water cooling technology, and has taken advantage of frequency scaling and other power saving features of SUSE Linux Enterprise Server to increase energy efficiency.

Following the installation of SuperMUC, Leibniz Supercomputing Centre acts as a European Centre for Supercomputing within PRACE, the Partnership for Advanced Computing in Europe. PRACE is a non-profit research and development association, supporting scientists across Europe with a powerful supercomputing infrastructure. The association focuses on research to lower energy consumption and the environmental impact of computing systems.

## Results

By selecting SUSE Linux Enterprise Server for its new SuperMUC system, Leibniz

Supercomputing Centre was able to complete an easy and smooth migration from its previous Itanium 2 infrastructure to the new x86 processor architecture.

The institution has considerably simplified configuration and automation of the SuperMUC system, using the automation capabilities of the AutoYaST tool that is integrated with SUSE Linux Enterprise Server.

An innovative cooling system and advanced power saving features have substantially improved the energy efficiency of the new supercomputer. SuperMUC delivers approximately 20 times more performance per watt than its predecessor.

The supercomputer has also boosted overall performance by a factor of 60, enabling researchers to perform more complex calculations and gain completely new insights. The supercomputer is being used to drive new insight into a range of areas, with high-performance computing becoming increasingly important in life sciences and medical research in particular.

“We have already registered 170 projects on the migration system and are looking forward to making Europe's fastest supercomputer available to the scientific community,” said Herbert Huber. “The SUSE team is close at hand, should we require support or guidance, as their headquarters are located nearby. We have received highly competent support from SUSE over the years, and look forward to collaborating with them as we continue to make advances in high-performance computing.”



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Contact your local SUSE Solutions Provider,  
or call SUSE at:

France  
+33 1 55 62 50 00

Germany  
+49 211 56 31 0

Italy  
+39 (0) 2 99 06 02 01

Netherlands  
+31(0)172 50 55 55

Poland  
+48 22 537 5000

Russia  
+7 495 514 1155

Spain  
+34 91 640 25 00

Sweden  
+46 (0)8 752 25 00

Switzerland  
+41 43 456 23 00

South Africa  
+27 11 322 8300

United Kingdom  
+44 1344 724 000

SUSE  
Maxfeldstrasse 5  
90409 Nuremberg  
Germany