The 10 fastest supercomputers in the world in 2026.

Today we'll be talking about supercomputers, listing the top 10 fastest supercomputers currently in the world.

The top 10 most powerful supercomputers in the world have just been announced, with five located in the United States, two in China, and the rest in Japan, Finland, and Italy. This list is taken from the Top500 supercomputer ranking.

The Top 500 supercomputer project is announced twice a year, either online or at the International Supercomputing Conference and the ACM/IEEE Supercomputing Conference in late May or early June and in November.

This project has been carried out by renowned experts such as Jack Dongarra of the University of Tennessee; Knoxville, Erich Strohmaier and Horst Simon of the US Center for Scientific Computing Research; Hans Meuer of the University of Mannheim. and has been held annually since 1993.

What is a supercomputer?

Supercomputers are high-performance computers (HPCs) with computing capabilities far exceeding what you might imagine. They work diligently in universities, laboratories, and other major, critical facilities around the world.

Supercomputers play a vital role in the field of computational science and are used for a wide range of complex computational tasks across many fields, including quantum mechanics, weather forecasting, climate research, oil and gas exploration, molecular modeling (calculating the structures and properties of chemical compounds, biological macromolecules, polymers, and crystals), and physical simulations (such as simulating the early moments of the universe, the aerodynamics of aircraft and spacecraft, the explosion of nuclear weapons, and nuclear fusion). Throughout their history, supercomputers have proven crucial in the field of cryptographic analysis.

What measures the speed of a supercomputer?

The speed of a supercomputer is measured in FLOPS (floating-point operations per second) rather than MIPS (million instructions per second). As of 2015, some supercomputers could perform up to 10 quadrillion FLOPS, measured in P (eta) FLOPS. The majority of supercomputers today run Linux-based operating systems.

The speed of the supercomputers on this list is also measured in petaflops, one petaflop is equivalent to 10^15 (10 quadrillion) calculations per second, so you can multiply it slowly.

1. The world's largest virtual universe was created by a Chinese supercomputer.

The world's top 10 supercomputers.

1. Frontier, United States

Frontier was built in 2022 by the American multinational information technology company Hewlett Packard Enterprise, in collaboration with its subsidiary Cray. It is the world's first exascale supercomputer, meaning it can perform at least 10^18 calculations per second.

Frontier has a total of 8,730,112 cores and achieved 1.1 EFLOPS (or exaflops) in Linpack benchmark tests. It is based on the latest HPE Cray EX235a architecture and uses a combination of 3rd generation 64-core 2GHz 7A53s CPUs and AMD MI250X GPUs.

Frontier is also the world's most efficient supercomputer, with an energy efficiency rating of 52.23 gigaflops/watt. Each of its 74 computing cabinets weighs approximately 3.63 tons, and the entire system cost a total of $600 million.

2. Fugaku, Japan

Speed: 442,010 petaflops, peak performance 537,212 petaflops

Built by Fujitsu, Fugaku is installed at the RIKEN Computer Science Center (R-CCS) in Kobe, Japan. With additional hardware, the system achieved a new world record with a result of 442 petaflops on the HPL, more than three times faster than the second-ranked system on the list.

RIKEN's director, Satoshi Matsuoka, stated that 'it's finally possible to use the entire machine instead of just a small part of it'.

Since the June competition, his team has been able to refine the code for maximum performance. Matsuoka said, "I don't think we can improve much more."

3. Aurora

This is one of the youngest supercomputers on the list, and it has the potential to become one of the most powerful in the future.

The Aurora supercomputer has a power output of 585 petaFLOPS (0.59 exaFLOPS) and is located at Argonne National Laboratory in Illinois, USA (ALCF). It is the second exascale supercomputer ever built.

Aurora is the result of a collaboration between Intel and HPE, first becoming operational in June 2023. This supercomputer integrates scientific tools and analytics, performing modeling, simulation, and running artificial intelligence (AI).

According to ALCF representatives, Aurora has the potential to reach a computing power of 2 exaFLOPS, double that of Frontier. Its power can create accurate models in a wide range of fields, including climate prediction, materials science, energy storage, and fusion.

The focus for Aurora is nuclear fusion.

4. Eagle

Instead of being located in a laboratory, Eagle is part of a data center system that operates Microsoft's Azure cloud server service, allowing anyone to access it through the Microsoft Azure cloud platform.

The Eagle supercomputer has a power output of 561 petaFLOPS (0.56 exaFLOPS) and first became operational in August 2023.

Microsoft's supercomputer is equipped with an Intel Xeon Platinum 8480C CPU with 48 cores based on the Sapphire Rapids architecture, an Nvidia H100 GPU based on the Hopper architecture, and an Nvidia Infiniband NDR data bridge, totaling 1.1 million processing cores.

5. LUMI, Finland

LUMI (Large Unified Modern Infrastructure), built by HPE in 2022 and located in Finland, has become the fastest supercomputer in Europe. LUMI has a total of 1,110,144 cores and achieves a speed of 151.9 PFLOPS.

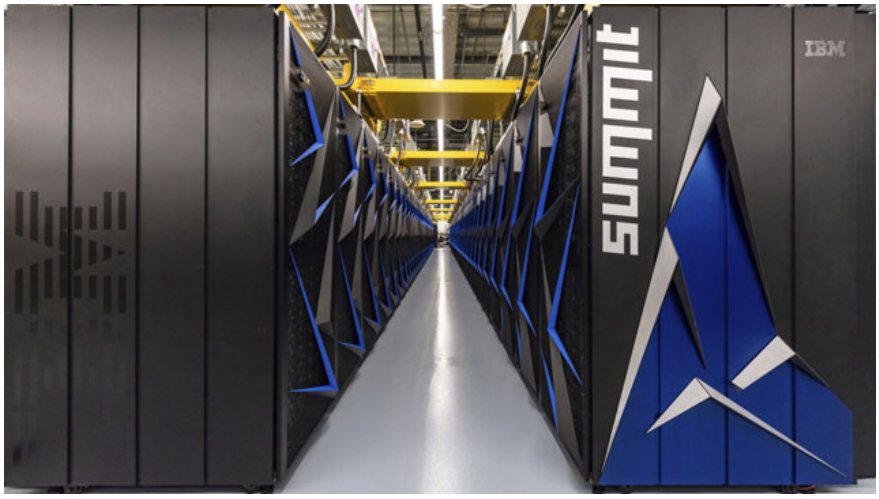
LUMI runs on the same processor as Frontier and has an energy efficiency rating of 51.63 gigaflops/watt, making it the second most efficient supercomputer in the world.

6. Leonardo (Italy)

The Leonardo supercomputer uses Intel's Xeon Platinum 8358 32C chip along with Nvidia's A100 and HDR100 processors, achieving a computing power of 238.7 petaflops. Located in Bologna, the supercomputer has been operational since November 2022. The construction cost of the Italian supercomputer was $240 million. Intel and Nvidia are responsible for the software that runs the machine.

7. Summit, United States

Speed: 148,600 petaflops, peak performance 200,795 petaflops



Based at Oak Ridge National Laboratory (ORNL) in Tennessee, Summit was built by IBM and is the fastest system in the US. Launched in 2018, it boasts a performance of 148.8 petaflops, with 2,282,544 IBM Power9 cores and 2,090,880 Nvidia Volta GV100 cores, and has 4,356 nodes, each containing two 22-core Power9 CPUs and six NVIDIA Tesla V100 GPUs.

Recently, two teams working on Summit won the prestigious Gordon Bell Award for outstanding achievements in the field of high-performance computing, often referred to as the 'Nobel Prize of supercomputing'.

8. Sierra, United States

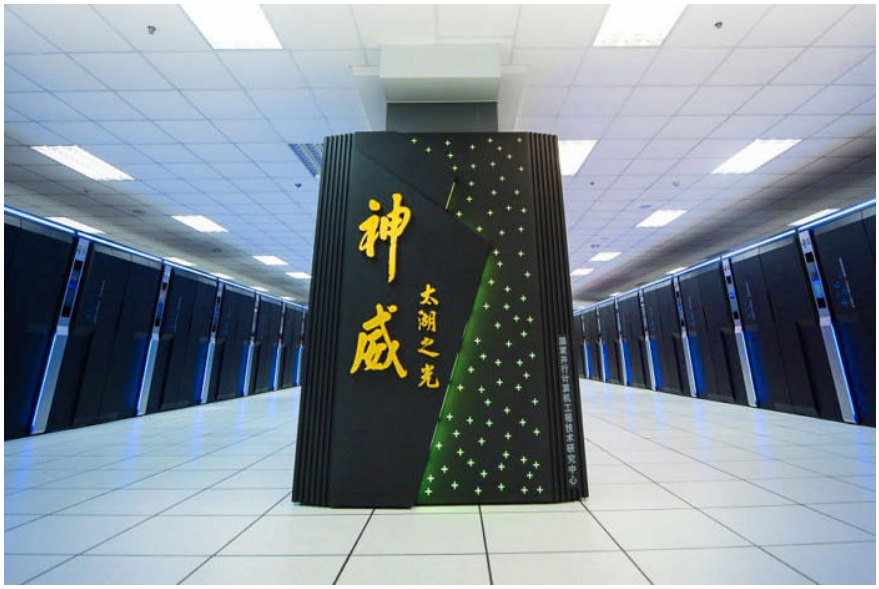
Speed: 94,640 petaflops, peak performance 125,712 petaflops

A system at Lawrence Livermore National Laboratory (LLNL) in California, Sierra, has an HPL of 94.6 petaflops. With each of the 4320 nodes equipped with 2 Power9 CPUs and 4 NVIDIA Tesla V100 GPUs, it has a similar architecture to Summit's.

Sierra also ranked 15th on the Green500 list of the world's most energy-efficient supercomputers.

9. Sunway TaihuLight, China

Speed: 93,015 petaflops, peak performance 125,436 petaflops.



Located at China's National Supercomputing Center in Wuxi, Sunway TaihuLight previously held the number one spot for two years (2016 and 2017). However, its ranking has declined since then. It was ranked third last

year and has dropped to fourth this year.

Developed by China's National Research Center for Parallel Computing Technology & Engineering (NRCPC), the Sunway TaihuLight achieved 93 petaflops on the HPL benchmark. It is powered exclusively by the Sunway SW26010 processor.

10. Perlmutter, United States

Speed: 64.6 Pflop/s, peak performance 89,795 petaflops.

This is the only new supercomputer on this year's top 10 list. Perlmutter is based on the HPE Cray Shasta platform, using both AMD EPYC nodes and 1536 accelerated Nvidia A100 nodes.