

# FRONTIER DETHRONES FUGAKU AS THE WORLD'S FASTEST SUPERCOMPUTER

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The Frontier supercomputer. | Photo Credit: Special Arrangement

In 2020, [Fugaku, a supercomputer jointly developed by RIKEN and Fujitsu Ltd.](#), topped the supercomputer benchmarking index. Two years later, the Japanese machine was dethroned by another built in the West.

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Frontier, a supercomputer built using Hewlett Packard Enterprise (HPE) architecture and equipped with Advanced Micro Devices (AMD) processors, [outperformed Fugaku](#) to become the world's fastest supercomputer, according to the Top500 list of world's most powerful supercomputers.

The supercomputer, built for the U.S. Department of Energy's Oak Ridge National Laboratory (ORNL), has reached Linmark benchmark score of 1.1 exaflops, making it the world's first supercomputer to break the exascale speed barrier. Fugaku, installed at the RIKEN Center for Computational Science in Kobe, Japan, has a Linmark benchmark score of 442 petaflops (1 exaflop is equivalent to 1,000 petaflops).

"Frontier is a first-of-its-kind system that was envisioned by technologists, scientists and researchers to unleash a new level of capability to deliver open science, AI (artificial intelligence) and other breakthroughs, that will benefit humanity," Justin Hotard, EVP and GM, HPC & AI, at HPE, said in a statement.

The supercomputer will be able to help with modelling and simulating complex scientific research, across biological, physical and chemical sciences. It can be used to develop AI models that are 4.5X faster and 8X larger, allowing to train more data that can increase predictability and speed time-to-discovery, according to HPE.

Frontier has 8,730,112 total cores and is built on the latest HPE Cray EX235a architecture and powered with AMD EPYC 64C 2GHz processors. Fugaku, now the second-most powerful supercomputer, has 7,630,848 cores.

The top two systems are followed by a new LUMI system, installed at the EuroHPC centre at CSC in Finland (151.9 petaflops); Summit, an IBM-built system at ORNL in Tennessee, U.S. (148.8 petaflops); and Sierra, a system at the Lawrence Livermore National Laboratory in the U.S. (94.6 petaflops), as per the 59th edition of the Top500 list.

Frontier is also ranked number one as the world's most energy-efficient supercomputer, on the Green500 list, which measures supercomputing energy use and efficiency, with 52.23 gigaflops performance per watt, making it 32% more energy-efficient compared to the previous number one system, according to HPE.

The most powerful supercomputer in the world is expected to reach even higher levels of speed with a theoretical peak performance of 2 exaflops.

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