Supercomputers - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

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Report description:

The Supercomputers Market size is estimated at USD 12.10 billion in 2024, and is expected to reach USD 12.15 billion by 2029, growing at a CAGR of 0.09% during the forecast period (2024-2029).

The increasing use of cloud technology is one of the significant supercomputer market trends. With the growing workload, supercomputing centers are adopting the cloud, and the cloud is running parallel applications as they do not require particular architecture.

Key Highlights
-A modern supercomputer's architecture is majorly configured with parallel processing, meaning it splits the problems into pieces while working on several pieces simultaneously. Exascale computing is a significant trend that has enabled worldwide investment in computing systems. Exascale can provide at least one exaFLOPS (a quintillion) calculation per second.
-Supercomputers substantially contribute to the scientific progress of a country and national security. Supercomputing centers are increasingly using cloud services to handle workloads and security. Cloud service executes parallel programs that do not require a highly specialized infrastructure. However, more sophisticated apps are expected to be run on the cloud in the coming years. For instance, Cray, a supercomputer manufacturer located in the U.S., partnered with Microsoft to deploy its devices and storage systems to the Azure Cloud platform. By using Microsoft Azure, customers can run their most strategic workload in Microsoft Azure's cloud service.
-The increase in market suppliers is driven by the desire to stay competitive and provide the most advanced technologies with higher processing power. In February 2022, A powerful supercomputer named Param Pravega with a supercomputing capability of 3.3 petaflops was introduced by the Indian government. It was installed at the Indian Institute of Science in Bangalore as part of the Made in India initiative.

-Increased investments in the R&D of supercomputers by significant companies are contributing to the market's revenue growth. For instance, Aurora, a supercomputer built by Intel in the Chicago suburbs with the U.S. Department of Energy's Argonne National Laboratory for artificial intelligence research, will be twice as fast as anticipated. According to Intel, the computer can process two quintillion calculations per second. Expanding federal organization activities in developing countries is also expected to fuel market revenue growth.
-The high installation cost and ample space are significant barriers to expanding market revenue. Supercomputers are ten times more expensive than regular computers and have a hefty maintenance cost. A specialist team must be appointed to oversee and manage a supercomputer, and a specific application is employed that can detect issues as well as general machine usage. Its drawbacks are its size, maintenance, power consumption, and heat release, in addition to its high price.
-Due to COVID-19, there has been an exponential spike in need for data centers, AI, and ML among businesses, including those in the public and private sectors of government and education. This growth is positively impacting the demand for supercomputers. It is anticipated that this growth will continue through the end of 2022, spreading the influence and significance of supercomputers across a range of end-user industries. IBM, in association with the U.S. Department of Energy and the White House Office of Science and Technology Policy, launched the COVID-19 high-performance consortium with 16 systems that have more than 330 petaflops of processing power, 775,000 CPU cores, 34,000 GPUs, and counting in better understanding COVID-19, its treatments, and potential cures.

Supercomputers Market Trends

Increasing Demand for Higher Processing Power to Drive the Market Growth

- Enterprises with vast amounts of data to manage and process are looking to analyze this data to aid decision-making. It is also desired by end users to maintain a competitive advantage. Thus, highly data-driven organizations are witnessing significant improvements in decision-making than those who rely less on data. This increasing demand for higher processing power for managing data and decision-making is driving the supercomputers market.
- The market is further driven by many vendors' emphasis on more processing power for various end-user sectors. For instance, IIT Gandhinagar introduced Param Ananta in May 2022, which had additional space for research projects in multiple disciplines, including machine learning, data science, computational fluid dynamics, bioengineering, and more.
- The BFSI industry is partnering with many vendors for automation implementation and spending on research projects, fueling the supercomputer market's expansion. For instance, in January 2022, the Ministry of Innovation and Technology (ITM) and OTP Bank collaborated to build the first module of an AI supercomputer. The module was built in a unique Hungarian language model and will be able to manage phone banking operations in their region.
- Additionally, the first partition of "EXA1," a supercomputer built using Atos' BullSequana XH2000 architecture and featuring increased processing power for military and defense applications, was announced in November 2021 Atos and the CEA's Military Applications Division (CEA/DAM). It is the most extensive supercomputing system based on installed general-purpose CPUs, with 12,960 AMD processors. It uses 4.96 MW of power and has a computational capacity of 23.2 petaflops.
- The US Department of Defense is funding research in the military and defense fields. Significant work on supercomputers has also been performed, especially in support of a shared urgent operational requirement from the US Transportation Command. The project looks at ways to dramatically reduce the risk associated with airlifting COVID-19 passengers while utilizing the air force for aircrews and medical personnel.
- Governments worldwide recognize that supercomputers are necessary for achieving economic security and competitiveness for their respective countries. They are using supercomputers to develop state-of-the-art electronic warfare equipment and defense systems.

Asia-Pacific to Register a Significant Growth Rate

Asia-Pacific has been rapidly growing in terms of technology. Countries like China and Japan are majorly responsible for the region's rapid growth of supercomputing systems.

- Countries like China have well-developed supercomputing landscapes, with significant investments compared to other countries. According to Top500.org, as of June 2022, around 173 of the world's 500 most powerful supercomputers were located in China, three times more than its nearest competitor, the United States, accounting for an additional 128 supercomputers.
- According to Xinhua news agency, researchers from China claimed to have built a quantum computer prototype capable of detecting up to 76 photons through Gaussian boson sampling. Chinese researchers compete against major US corporations, including Google, Amazon, and Microsoft Corporation, for a lead in the technology. Additionally, Xi Jinping's government claimed it is building a USD 10 billion National Laboratory for Quantum Information Sciences as part of a big push in the field.
- Emerging nations like India play a significant role in the growth of the Asia-Pacific market. The National Supercomputing Mission in the country was introduced to raise USD 730 million in investment by 2023 to build a supercomputing grid, which will comprise 73 high-performance computing facilities. According to the Department of Science and Technology (DST), India was set to experience a boost in supercomputing capacities by launching four new supercomputers deployed in 2022 till date. Once deployed, the total number of supercomputers would grow to 19.
- Japan is another major contributor to the Asia-Pacific supercomputer market, with around 33 of the world's 500 most powerful supercomputers, including the K computer. Japan's flagship program 2020 aimed to invest more than USD 1 billion to develop more efficient systems than the K computer in the country. In August 2022, Japan's Fugaku supercomputer was launched to discover new drugs and predict severe weather forecasts.
- According to the report from French-Korean Conference, South Korea plans to build one of the five fastest exascale supercomputers by 2030, potentially with local chips. Such processing capabilities trends further encourage supercomputing growth in the Asia-Pacific region.

Supercomputers Industry Overview

The supercomputers market is consolidated due to a few significant players holding a greater market share. Some key players include HPE, Atos SE, Dell Inc., FUJITSU Corporation, IBM Corporation, Lenovo Inc., and NEC Technologies India Private Limited.

- January 2022 - Meta, formerly known as Facebook, is building a massive new supercomputer in the world intending to advance into a new generation of AI known as the AI Research SuperCluster (RSC) to power up real-time interactions, such as the impressive feat of helping large groups of people, each speaking a different language, seamlessly collaborate on a research project or play an AR game together.
- November 2021 - Atos SE partnered with NVIDIA to advance healthcare and climate research computing with Exascale Super Computing under Excellence AI Lab (EXAIL). The project aims to bring scientists and researchers together to help advance European computing technologies, education, and research. The partnership also includes researchers running new AI and deep learning models on Europe's fastest supercomputer at the Julich Supercomputing Center.
- November 2021 - Hewlett Packard Enterprise announced that it is building one of Europe's most powerful supercomputers to be installed and operated at CINES (National Computing Center for Higher Education), one of the three high-performance computing (HPC) centers in France. The new supercomputer was procured by GENCI, a French national agency that invests and provides HPC resources to support France's academic and industrial research communities.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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