High-Performance Computing (Hpc) Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 120 pages | Mordor Intelligence

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Report description:

The high-performance computing market is expected to register a CAGR of 6.5% over the forecast period. Increasing adoption of HPC in the cloud and the emerging need to process an enormous amount of data efficiently and quickly are driving the market growth.

Key Highlights
Factors such as the increasing investments in the Industrial Internet of Things (IIoT), Artificial Intelligence (AI), and engineering, which demand Electronic Design Automation (EDA), are likely to drive the market over the forecast period. The market has been augmented by the continued investment from hardware providers to develop solutions that support these capabilities.
Countries like United States, Germany, United Kingdom, Japan, and China, among others, have acknowledged the significance of such technologies as an essential driver for economic growth. These countries are potential markets for HPC solutions, which support these initiatives while preserving cost and performance efficiencies.
Moreover, without the appropriate tools and cutting-edge technology, it becomes practically difficult to handle the growing need for short product development cycles (PLCs) and the requirement to maintain quality in real-time. High-performance Computing (HPC) systems with Computer-aided Engineering (CAE) software for high-fidelity modeling simulation are becoming more widely used in various sectors, including discrete manufacturing, robotics in healthcare, and the automotive industry.
Physical simulation, optimization, and Machine Learning (ML) in varied industrial applications, including financial modeling and life science simulation, are some examples where HPC plays a critical role in solving complex problems within time. In the automotive industry, EVs, autonomous vehicles, and connected vehicles are continuously taking development challenges to enter the market and require edge computing capabilities to be incorporated in these solutions driving the software market.
The demand for HPC saw significant growth, especially in bioscience, as HPC was used to develop a vaccine and tackle the effects of the COVID-19 pandemic. Data consumption and cloud demand have skyrocketed since the pandemic, owing to enterprises

moving toward remote working and shifting their workloads onto the cloud.

High Performance Computing Market Trends

On Premise is Expected to Witness Significant Growth

The on-premise model holds a significant market share, owing to its ability to tap into the total capacity of HPC systems without facing any bottlenecks due to connectivity issues.
Incorporating on-premise systems in significant research, analytics, and modeling applications is increasing, and real-time data access is paramount. Moreover, the growing complexity of operations and increasing capability of these systems are adding to this trend, as it bolsters the output and input capacity of HPC systems.
The security of private data is another primary driver for this model. Businesses and government organizations, especially in defense, are using this method to prevent attacks on their database. The physical presence requirement significantly adds to the security and integrity of the system, application, and data.
Moreover, incorporating these systems in the defense sector is expected to grow due to the rising threat of cybersecurity and the emergence of advanced technologies such as facial recognition and global security databases.
Although cloud-based solutions are becoming one of the most viable options for various applications as they provide the storage and computation needs for users at a relatively low cost, the area still needs to include appropriate security measures to protect the data and applications for cloud users.

North America is Expected to Hold Major Share

The North American region is recognized for its early adoption of cutting-edge technologies. This happened because of the rapid technical development in the United States and Canada. Utilizing HPC systems is encouraged by the development of new technologies and the need for security. The expansion affects both types of big data. Throughout the duration of the projection, North America will retain its leadership in the global HPC market. The national government spending on R&D activities is one of the key factors fueling the demand.
The industry has significant companies, including NVIDIA, HPE, IBM, Microsoft, and AMD, and as a result, the need for high-performance computing in the area is anticipated to develop significantly. To maintain the position of the United States as the supercomputer industry leader, the White House budget for the fiscal year 2021 included a proposal to invest more than USD 475 million in exascale computing. The investment intends to increase application performance five times over the American Oak Ridge Leadership Computing Facility Summit system.
In April 2021, with integrated IP solutions geared for HPC/AI, networking, and storage solutions, OpenFive, a provider of configurable, silicon-focused solutions with different IPs, reported the successful tape out of a high-performance SoC on TSMC's N5 process. With the help of OpenFive's cutting-edge 2.5D packaging technologies and HBM/D2D interface IP, designers can now make Systems-on-Chip (SoCs) that fit greater computing power into compact form factors for HPC and AI applications.
To increase their geographic reach and coverage, the market's vendors have forged new alliances with other businesses. For instance, to reach more potential clients and help them scale up using its Intelligence Processing Unit (IPU) solutions, Graphcore expanded its partner program. To broaden its regional reach, the company added several partners in the North American region to its global partner program, including Applied Data Systems and Images et Technologie, among others.
Though manufacturers have significantly improved leveraging HPC systems for innovation, the penetration of HPCs in North America's small and medium enterprise manufacturing base has come much more slowly and periodically. Many SMEs constitute various users who adopted HPC in the region.

High Performance Computing Market Competitor Analysis

High-performance Computing (HPC) Market is highly fragmented. The presence of major players, such as Hewlett Packard Enterprise, Advanced Micro Devices Inc., Sugon Information Industry Co. Ltd, NEC Corporation, and Fujistu Ltd, have considerable influence on the overall market. High-performance computing vendors increasingly focus on delivering enhanced solutions that cater to various requirements.

In May 2022, Hewlett Packard Enterprise announced an expansion to build its first European factory for HPC and AI systems to accelerate customer delivery and strengthen the region's supplier ecosystem. A new site will manufacture and ship HPE Apollo systems and the HPE Cray EX supercomputers.

Additional Benefits:

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

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