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Data Center Graphical Processing Unit (GPU) Market Forecasts to 2034 – Global Analysis By Deployment Model (Cloud and On-premises), Function (Inference and Training), End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Data Center Graphical Processing Unit (GPU) Market is accounted for $35.4 billion in 2026 and is expected to reach $351.0 billion by 2034 growing at a CAGR of 33.2% during the forecast period. Data Center Graphical Processing Units (GPUs) are specialized processors designed to accelerate graphics rendering and parallel processing tasks within data center environments. Their parallel processing capabilities enable simultaneous execution of multiple tasks, enhancing computational efficiency. In data centres, GPUs are used to accelerate tasks such as artificial intelligence (AI), machine learning (ML), high-performance computing (HPC), data analytics, and scientific simulations.

Market Dynamics:

Driver:

Rising adoption of data center GPUs in enterprises

Enterprises are increasingly leveraging GPUs to enhance their computational capabilities for tasks like data analytics, artificial intelligence, and machine learning. GPUs, with their parallel processing prowess, accelerate complex computations, enabling quicker insights and decision-making. The need for GPU-equipped data centres is increasing as companies embrace data-driven operations. Furthermore, these GPUs not only improve performance in traditional graphics processing but also empower enterprises to address the growing demands of advanced computing workloads. Thus, it will propel market growth.

Restraint:

High initial costs

The acquisition and implementation expenses associated with GPU technology, including the GPUs themselves and supporting infrastructure like cooling systems, present a considerable financial barrier for organizations. This initial investment can deter some businesses, particularly smaller enterprises, from embracing GPU solutions, impacting the overall adoption rate. Despite the long-term benefits of computational performance, the substantial upfront expenditures may hinder widespread integration of GPUs in data centres, limiting the market's growth.

Opportunity:

Demand for high-performance computing

GPUs provide improved performance by effectively managing the parallel workloads that are characteristic of HPC operations due to their parallel processing capabilities. The need for GPU-accelerated solutions in data centres is rising as various sectors rely on intricate and data-intensive simulations. Moreover, GPUs are essential for increasing computational power and accelerating research outcomes in data analysis, scientific research, and engineering, where there is a growing need to meet emerging needs. Thereby, it will enhance market expansion.

Threat:

Data security concerns

As GPUs play a pivotal role in processing sensitive and confidential data in data centres, any security breach or vulnerability in GPU architectures could compromise data integrity and confidentiality. Instances of data breaches could lead to a loss of trust among organisations, deterring them from adopting or expanding GPU usage. The evolving landscape of cybersecurity threats necessitates robust measures to safeguard data processed by GPUs, and any perceived weaknesses in security may impact the market's growth.

Covid-19 Impact

High-performance computing and GPU-accelerated apps were in more demand due to the rapid uptake of digital transformation and remote work practices. GPU demands have increased for jobs like data analytics, content creation, and medical simulations in industries like research, healthcare, and entertainment. The pandemic brought attention to the crucial significance of strong data centre infrastructure and encouraged investments in GPU technology to meet changing processing demands, even though there were some supply chain disruptions worldwide and fluctuations in particular industries.

The cloud segment is expected to be the largest during the forecast period

The cloud segment is estimated to hold the largest share. Cloud providers leverage GPUs to enhance the performance of virtualized environments, catering to diverse workloads such as graphics rendering, artificial intelligence, and high-performance computing. This segment allows businesses to access GPU-accelerated resources on a scalable and on-demand basis, facilitating cost-effective and efficient processing of computationally intensive tasks. Moreover, it reflects the growing trend of offloading complex computational workloads to virtualized GPU resources, offering flexibility and scalability for a wide range of applications and industries.

The government segment is expected to have the highest CAGR during the forecast period

The government segment is anticipated to have lucrative growth during the forecast period. Governments leverage GPUs for applications such as scientific research, defence simulations, and data analytics. GPUs enable these entities to process vast amounts of data efficiently, supporting initiatives ranging from national security to public services. Furthermore, it underscores the critical role of GPUs in enhancing computational capabilities for tasks essential to governance, research, and strategic decision-making. The adoption of GPUs in government data centres reflects a commitment to leveraging advanced technologies for improved efficiency and performance in public sector operations.

Region with largest share:

Asia Pacific commanded the largest market share during the extrapolated period owing to a rise in e-commerce, technological infrastructure advancements, and growing data-driven initiatives. Countries like China, Japan, and India are at the forefront, investing heavily in GPU technology for scientific research, gaming, and cloud services. Furthermore, the rise of cloud computing services is significant in the Asia Pacific, with major cloud providers expanding their data center capabilities. The region's focus on industrial innovation and automation further drives the demand for GPUs in data centres.

Region with highest CAGR:

North America is expected to witness profitable growth over the projection period. The region is a key player in AI, machine learning, and high-performance computing applications, leading to a high demand for GPUs in data centres. Major tech hubs in the United States, including Silicon Valley, contribute to innovation, research, and development. The gaming industry's prominence fuels the demand for GPUs, while cloud computing providers continue to invest in GPU-centric infrastructure. With a strong focus on digital transformation, North America remains a significant influencer in shaping the global landscape of the data centre GPU market.

Key players in the market

Some of the key players in the Data Center Graphical Processing Unit (GPU) Market include Advanced Micro Devices Inc, Google Inc., Advantech Co. Ltd., IBM Corporation, Huawei Technologies Co. Ltd., Intel Corporation, Imagination Technologies, NVIDIA Corporation, Samsung Electronics Co.Ltd., Qualcomm Technologies, Inc., Micron Technology, Inc., Microsoft Corporation, Graphcore, Arm Limited, Gigabyte Technology Co. Ltd., Apple Inc., Zotac and Micro Devices Inc.

Key Developments:

In October 2023, Nvidia and Foxconn joined forces to create data center modules designed for AI-driven factories, utilizing Nvidia's Grace Hopper chips. Through the collaboration, Hon Hai Technology Group (Foxconn) aims to integrate Nvidia's technology to establish innovative data centres.

In October 2023, IBM introduced the new IBM Storage Scale System 6000, a cloud-scale global data platform designed to meet today's data intensive and AI workload demands, and the latest offering in the IBM Storage for Data and AI portfolio

In May 2023, IBM Announces Launch of IBM Hybrid Cloud Mesh to Help Enterprises Regain Control of their Multicloud Infrastructure. Driven by “Application-Centric

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Connectivity", IBM Hybrid Cloud Mesh is engineered to automate the process, management and observability of application connectivity in and between public and private clouds to help modern enterprises operate their infrastructure across hybrid multicloud and heterogeneous environments.

Deployment Models Covered:

- Cloud
- On-premises

Functions Covered:

- Inference
- Training

End Users Covered:

- Enterprises
- Cloud Service Providers
- Government

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe

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- Germany
- UK
- Italy
- France
- Spain
- Rest of Europe

Asia Pacific

- Japan
- China
- India
- Australia
- New Zealand
- South Korea
- Rest of Asia Pacific

South America

- Argentina
- Brazil
- Chile
- Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:
- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

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Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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