Lingaya's Lalita Devi Institute of Management & Science

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Department of Computer Application

NEWS LETTER

October
2024

Latest Supercomputer of India

Vikas Kumar Kushwaha
BCA 3rd Year

I am writing to share my interest in and knowledge of the PARAM Rudra supercomputers, an essential part of India's computing infrastructure. The launch of three PARAM Rudra supercomputers on Thursday (September 26, 2024) by Prime Minister Narendra Modi marks a significant milestone in India's technological advancement. PARAM Rudra, a high-performance computing system developed by the Centre for Development of Advanced Computing (C-DAC) under the National Supercomputing Mission, is one of the fastest supercomputers in India, designed to handle large-scale data processing and advanced research applications. With a peak performance of petaflops, PARAM Rudra is capable of solving complex problems in fields such as scientific research, weather forecasting, artificial intelligence, and machine learning.

The architecture of PARAM Rudra is based on a scalable and energy-efficient design, which makes it suitable for both academic and industrial purposes. It supports a wide range of applications, from engineering simulations to climate modeling, making it a valuable tool for researchers and scientists across different disciplines. One of the key features that sets PARAM Rudra apart is its ability to process massive amounts of data in a very short time. This feature allows researchers to run detailed simulations and analyze large datasets, leading to faster discoveries and innovations. It also helps in improving accuracy in areas like drug discovery, space exploration, and material science.

In conclusion, PARAM Rudra represents a significant step forward for India in the field of supercomputing. It plays a critical role in advancing research and technology, providing the audience with valuable information and insights into India's technological advancements.

Latest Supercomputer of World

Ankush Rawat
BCA 3rd Year

Frontier is the World's top Supercomputer, released in June 2024. It was built by HPE for the Oak Ridge National Laboratory (ORNL) in the United States. Frontier is the first Supercomputer to break the exascale speed barrier and can perform as many calculations in a second as 100,000 laptops.

The Supercomputer, named Frontier by Oak Ridge National Laboratory (ORNL), has set new records in computing power. It has surpassed all previous machines by reaching the exascale level, meaning it can perform over one quintillion (a billion billion) calculations per second. This incredible speed is a significant milestone for solving highly complex problems like scientific research, climate modeling, and artificial intelligence.

Frontier's hardware is designed with advanced processors, such as the AMD EPYC and AMD Radeon Instinct GPUs, which allow it to handle

large amounts of data efficiently. This Supercomputer also uses cutting-edge technology to consume less energy while maintaining high performance, making it more environmentally friendly than previous models. This powerful machine will significantly boost research across various fields, enabling scientists to run more detailed simulations, develop new medicines, and make important discoveries in physics, biology, and beyond. Its role in advancing artificial intelligence, in particular, will be crucial for developing more intelligent algorithms and technologies.

In conclusion, the latest Supercomputer of 2024 represents a giant leap in our ability to solve complex problems. It opens up endless possibilities for the future of science and technology. I am excited to see how this will shape our World.

AMD Vs. Intel Processors

Ajay Kumar Gupta
BCA 2nd Year

In 2024, the latest processors from Intel and AMD are pushing boundaries in speed, power efficiency, and AI capabilities. AMD's new Ryzen 9000 series, built on the "Zen 5" architecture, offers substantial improvements over its predecessor, boasting a 16% improvement in instructions per cycle (IPC). This generation includes high-performance models like the Ryzen 9 9950X, which leads in performance for creative and productivity tasks and delivers up to 20% faster speeds in AI-based tasks compared to Intel's top Raptor Lake Refresh processors. The Ryzen 9000 series also achieves higher energy efficiency, with TDPs reduced by around 30-40% across various models, making it ideal for power-sensitive applications.

Intel's Core 14th Gen processors, introduced at CES 2024, bring a mix of performance and efficiency cores. The flagship Core i9-14900HX, designed for high-performance laptops, reaches a turbo frequency of up to 5.8 GHz and improves multitasking by over 50% compared to its predecessors. Intel's U-series in this generation, aimed at mainstream users, offers balanced performance for thin-and-light laptops, with up to 5.4 GHz speeds and Thunderbolt 4 support, enhancing connectivity options. However, Intel's desktop options are awaiting a major upgrade with the upcoming Arrow Lake processors, which may shift the balance in competition with AMD.

Both brands are focusing on AI capabilities, with AMD's Ryzen AI 300 Series processors providing robust neural processing power for AI-driven applications, a feature particularly beneficial in Windows Copilot+ environments. Intel's current models also support AI workloads, yet AMD currently holds a slight edge in AI-dedicated hardware.

Conclusion: AMD's Ryzen 9000 series currently leads in energy efficiency and AI acceleration, while Intel's Core 14th Gen offers strong multitasking and laptop performance. Both companies are enhancing processing power and efficiency, setting a high bar for future processors and specialized tasks like gaming, professional applications, and AI.

RAM Technology

Shruti Pateriya
BCA 2nd Year

In 2024, RAM technology has evolved significantly, with DDR5 (Double Data Rate 5) and the emerging LPDDR5X (Low Power Double Data Rate 5X) setting new standards in computing speed and efficiency. The improvements in these technologies primarily target increased performance, energy efficiency, and support for high-speed data handling, which is essential for modern applications like AI processing, gaming, and high-performance computing.

DDR5: The New Standard

DDR5 is the most advanced mainstream RAM currently available. It doubles the bandwidth of DDR4, reaching speeds from 4,800 MHz to over 8,400 MHz. This increase in speed allows for faster data transfers, which significantly boosts performance, especially for tasks that require large amounts of data processing, such as 3D rendering, machine learning, and large-scale simulations.

DDR5 also supports increased capacity per module, with up to 64 GB on a single stick. This higher density is essential for data-intensive applications, allowing computers to handle more tasks simultaneously without slowing down. Another key feature of DDR5 is its improved power efficiency. Despite the increase in speed, DDR5 operates at a lower voltage than DDR4 (1.1V instead of 1.2V), which helps reduce power consumption and heat generation.

LPDDR5X: Low Power, High Performance

For mobile and portable devices, LPDDR5X is the latest advancement in RAM technology. It is designed to balance performance with low power consumption, which is crucial for devices like smartphones, tablets, and laptops. LPDDR5X improves upon LPDDR5 by increasing speeds to 8,533 MT/s while maintaining energy efficiency.

This makes it ideal for applications in AI, augmented reality, and 5G communications, where power efficiency and performance are critical.

Comparison with Other RAM Types

1. DDR4: Although DDR4 is still widely used, it is significantly slower and less efficient than DDR5. With speeds generally maxing out around 3,200 MHz and lower module capacities, DDR4 is gradually being phased out in high-performance devices.

2. GDDR6: Used mainly in graphics cards, GDDR6 is optimized for parallel data processing, which is essential in gaming and 3D graphics rendering. While fast, it has different uses compared to DDR5 and LPDDR5X, which are designed for general-purpose computing and mobile devices.

3. HBM2E: High Bandwidth Memory (HBM2E) is another advanced type used in specialized devices like high-performance graphics cards and data centers. It offers extremely high bandwidth but is more expensive and mainly used in high-end systems.

Conclusion: The latest RAM technologies, especially DDR5 and LPDDR5X, bring substantial improvements in speed, efficiency, and capacity, making them suitable for next-generation computing needs. As the demand for data processing continues to grow, these RAM types will become essential in meeting the needs of modern applications across various platforms.

ACTIVITIES

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01.10.2024	02.10.2024 **Gandhi Jayanti**	03.10.2024 **Navratri**	04.10.2024	05.10.2024
06.10.2024 **Drone Technology Seminar**	07.10.2024	08.10.2024	09.10.2024 **Personality Development Workshop**	10.10.2024	11.10.2024
12.10.2024 **Dusshera**	13.10.2024	14.10.2024	15.10.2024 **Student Day**	16.10.2024	17.10.2024
18.10.2024 **Zest Event**	19.10.2024 **Zest Event**	20.10.2024	21.10.2024	22.10.2024	23.10.2024
24.10.2024	25.10.2024	26.10.2024 **Diwali Carnival**	27.10.2024	28.10.2024 **Industrial Visit**	29.10.2024
30.10.2024	31.10.2024 **Diwali**				

Achievement

Congratulations to these three students of BCA for their best in industrial visit at Electbits and receive gifts from them.

Mr. Saurabh Kumar   Dr. Salim Jeved   Dr. Pranav Mishra

Newsletter Coordinator   HOD   Director LLDIMS