

Comparative Study on Different Types of Computers

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Computers

Computers are programmable machines that can perform a wide range of tasks by executing sequences of arithmetic or logical operations. They consist of hardware components, such as the central processing unit (CPU), memory (RAM), and storage devices (like SSDs or HDDs), along with software that provides instructions for processing data. Modern computers are electronic and digital, allowing them to handle complex calculations and data manipulations at high speeds.

Why are there different types of Computers?

based on their architecture, the speed at which commands or instructions are carried out, the peripherals they use, and the tasks for which they were designed.

- *Supercomputer*
- *Mainframe Computers*
- *Mini computers*
- *Servers*
- *Workstation*
- *Microcomputer*

Supercomputers



Summit supercomputer

Such computers have been used primarily for scientific and engineering work requiring exceedingly high-speed computations. Common applications for supercomputers include testing mathematical models for complex physical phenomena or designs, such as climate and weather, evolution of the cosmos, nuclear weapons and reactors, new chemical compounds (especially for pharmaceutical purposes), and cryptology

Mainframe Computers



FUJITSU Server GS21 2400

digital computer designed for high-speed data processing with heavy use of input/output units such as large-capacity disks and printers. Mainframes have been used for such applications as payroll computations, accounting, business transactions, information retrieval, airline seat reservations, and scientific and engineering computations. Mainframe systems, with remote “dumb” terminals, have been displaced in many applications by client-server architecture.

Mini Computers



Acer Nitro V15

computer that was smaller, less expensive, and less powerful than a mainframe or supercomputer but more expensive and more powerful than a personal computer. Minicomputers were used for scientific and engineering computations, business transaction processing, file handling, and database management.

Servers



HPE ProLiant DL380

a computer program or device that provides a service to another computer program and its user, also known as the client. In a data center, the physical computer that a server program runs on is also frequently referred to as a server. That machine might be a dedicated server or it might be used for other purposes.

Workstations



Dell Precision 7920

a high-performance computer system that is basically designed for a single user and has advanced graphics capabilities, large storage capacity, and a powerful central processing unit. A workstation is more capable than a personal computer (PC) but is less advanced than a server (which can manage a large network of peripheral PCs or workstations and handle immense data-processing and reporting tasks).

Micro Computers



Apple MacBook Air

an electronic device with a microprocessor as its central processing unit (CPU). *Microcomputer* was formerly a commonly used term for personal computers, particularly any of a class of small digital computers whose CPU is contained on a single integrated semiconductor chip. Thus, a microcomputer uses a single microprocessor for its CPU, which performs all logic and arithmetic operations. The system also contains a number of associated semiconductor chips that serve as the main memory for storing program instructions and data and as interfaces for exchanging data of this sort with peripheral devices (e.g., keyboard, video display, and printer) and auxiliary storage units

Types of Computers	Name/Brand	CPU	Memory	Processing Speed	Calculating Power	Working Principle	Energy Consumption	Field of Use
Supercomputer	Summit	IBM Power 9	600 GB	250 PB	13 WW	processes data at speeds measured in floating-point operations per second (FLOPS) to perform complex calculations and simulations	15 megawatts	research energy, artificial intelligence, human health, and other research areas
Mainframe Computers	FUJITSU Server GS21 2400	SPARC64 VII	64 GB	2.75 GHz	88 GFlops	provides the power to consolidate your business, information, and optimize your IT infrastructure	700 Watts	With green IT credentials is able to contribute to customer business growth and improved customer value.
Mini Computers	Acer nitro v15	Intel core i5	32 GB	2.10 GHz	75 W	combination of high-performance processors, efficient power management, and rapid data access via memory and storage, all designed to handle demanding tasks like gaming while maintaining energy efficiency	180 Watts	Its versatility allows it to cater to the needs of gamers, content creators, developers, students, and professionals across various fields.
Server	HPE ProLiant DL380	AMD EPYC	64GB to 1TB+ ECC RAM	2.0-3.5 GHz	100-300 GIPS	Centralized data processing and resource management for multiple users over a network	200W - 2kW	Data centers, web hosting, cloud services, enterprise IT
Workstations	Dell Precision 7920	AMD Ryzen Threadripper	16GB to 128GB+ RAM	3.0-4.5 GHz	50-300 GIPS	High-performance computer for specialized tasks such as 3D design, engineering, and research	200 - 600 W	Scientific research, CAD, 3D rendering, video editing
Micro Computers	Apple MacBook Air	AMD Ryzen	4GB to 16GB RAM	2.0-4.0 GHz	2.6 teraflops	General-purpose personal computer for	30 - 150W	Personal use, office work, light

						daily use, work, and entertainment		gaming, multimedia
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Conclusion:

Each type of computer has its own distinct roles and exhibits different capabilities that are used for specific purposes.

Micro computers are designed for individual use, typically having a single microprocessor. They have relatively low processing speeds and limited memory capacity that are suitable for tasks such as word processing and web browsing. However, mini computers support multiple processors, allowing them to handle more complex tasks and multiple users. Resulting in higher processing speeds and greater memory capacity, making it ideal for business applications.

While workstations are powerful single-user systems that provide high performance for demanding tasks such as graphic design or engineering applications. They combine fast processors with substantial memory facilitating intense problems. Servers, on the other hand, are used for managing resources and providing services to multiple users at once. They feature robust hardware configurations that allow for high processing speeds and extensive memory capacity.

When it comes to power consumption, micro computers are the most energy-efficient due to their simpler architecture. Mini computers consume more power but are still more efficient than workstations and servers, which tend to have higher power requirements due to their advanced capabilities.

In summary, micro computers are best suited for personal use, mini computers excel in multi-user business environments, workstations cater to professionals needing high performance, and servers manage resources across networks efficiently. Each type of computer plays a vital role in meeting the diverse needs of modern computing environments.

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