Assignment

Submitted by :-

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Operating Systeam

⟹ Introduction

The history of operating systeams is a testament to how technology evolves to meet the needs of users and machines. operating systeams have transitioned from simple setups to complex, disturbed systeams that support Modern computing requirements. This assignment explores the stages of operating systeam evolution, the benefits and challenges of each phase, and the structural components that define contemporary operating systeams.

⟹ Evolution of Operating Systeams

The evolution of operating systeam began with serial processing, where programs were executed one at a time. This systeam allocated all computer resources to a single program until its completion. Although this approach represented a significiant improvement over bare machines, it had notable drawbacks. Program peration was slow, requring extensive Manual intervention, and systeam resources were underulitzed, as there was no parallel task execution.

To address the inefficiencies of serial processing, batch processing systeams emerged. In this setup, Jobs with similar requirements were grouped together and executed sequentially. A resident monitor, a small program always present in memory, was introduced to sequence Jobs automatically, reducing idle CPU time. Batch processing proved beneficial for applications demanding long computation times without user interaction. However, it lacked real-time interactivity and had high turnaround times, making debugging a slow and challenging process.

With advancements in hardware and the need for efficient resource use, multiprogrammed systeams came into existense. These systeams enabled and simultaneous execution of multiple programs by a single processor. By keeping multiple Jobs in memory and switching between them, multiprogramming significiantly reduced CPU idle time. While this approach improved memory and processor utilization, it required advanced memory management and CPU scheduling, as well as mechanisms to ensure the proper mixing of CPU bound and I/O bound Jobs.

Finally Network operating Systeams facilated resource sharing among interconnected computers, unlike distributed systeams, where users remain unware of underlying systeams, networked Systeams made users explicitly aware of multiple machines and their locations. This distinction highlighted the differences

in user experience and systeam design between networked and distributed operating systeams.

The evolution also saw the rise of Multiprocessor Systeams, where multiple processors worked together, sharing memory and peripheral devices. Symmetric multiprocessing (SMP) allowed all processors to run identical copies of the operating systeam, promoting load sharing. Asymmetric multiprocessing, on the other hand, assaigned specific tasks to induvidual processors, with a master processor coordinating their activities.

⇒ Operating Systeam Structures

Modern operating systeams are defined by their intricate structures and the diverse functionalities they offer. Key components include process management, memory management, file management, I/O systeam management and secondary storage management.

Process Management :- Involves handling programs in execution, referred to as process. it includes creating deleting, and synchronizing processes, as well as providing mechanisms for communication and resolving deadlocks. Efficient process management ensures smooth multitasking and optimal use of systeam resources

Memory Management :- It is another critical aspect, as Memory serves as a temporary storage space for data and programs in execution. The operating system is responsible for tracking memory usage, Allocating and deallocating memory, and ensuring memory protection to prevent process from interfering with one another.

File Management :- Simplifies information storage by presenting a logical view of data, regardless of its physical storage medium. It involves organizing files into directories, supporting file operations, and mapping files onto secondary storage devices. Backup mechanisms are also implemented to ensure data safety.

I/O System Management : Abstracts the complexities of hardware devices, providing users with a shamless interface. This includes device drivers, buffering, caching and spooling, which enhance the performance and usability of I/O devices.

Lastly, Secondary Storage Management :- it addresses the limitations of Voltaile main memory by utilizing disks for permanent data storage. Disks serve as the primary medium for storing programs and data, ensuring they are available even after systeam shutdowns.

⟹ Conclusion

The evolution of operating systeams has been driven by the need for efficiency, user convenience and reliability. From serial processing to distributed systeams, each phase introduced groundbreaking innovations that addressed specific challenges. Modern operating systeams, with their robust structures and advanced capabilities, from the back bone of contemporary computing, supporting a wide range of applications and user needs. This Journey highlights the critical role of operating systeams in shaping the technological landscape.