Tugas 3
Sistem Operasi

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Soal

1. In a multiprogramming and time-sharing environment, several user share the system simultaneously. This situation can result in various security problems.
   a. What are two such problems?
   b. Can we ensure the same degree of security in a time-shared machine as in a dedicated machine? Explain your answer.
2. The issue of resource utilization shows up in different forms in different types of operating systems. List what resources must be managed carefully in the following settings:
   a. Mainframe or minicomputer systems
   b. Workstations connected to servers
   c. Mobile computer
3. Under what circumstances would a user be better off using a timesharing system than a PC or a single-user workstation?
4. Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantage of multiprocessor systems?
5. How do clustered systems differ from multiprocessor systems? What is required for two machines belonging to a cluster to cooperate to provide a highly available service?
6. Consider a computing cluster consisting of two nodes running a database. Describe two ways in which the cluster software can manage access to the data on the disk. Discuss the benefits and disadvantages of each.
7. How are network computers different from traditional personal computers? Describe some usage scenarios in which it is advantageous to use network computers.
8. What is the purpose of interrupts? How does an interrupt differ from a trap? Can traps be generated intentionally by a user program? If so, for what purpose?

Jawab

1.   In a multiprogramming and time-sharing environment, several user share the system simultaneously. This situation can result in various security problems.
   a. The first problem is no privacy between user and the second problem is device-control registers are not accessible to users, so the integrity of the various peripheral devices is protected.
   b. Yes. Because, if we can ensure that the operating system prevents any sharing of data between users or shares the computer, we can achieve the same level of security. But, we can never be sure that our software doesn't have bugs, so we can never be sure that we prevent all sharing of data and fairly allocate computer resources
2. Resources that must be managed carefully
   a. Information and the shared resources. And make sure that all available CPU time, memory, and I/O are used efficiently and that no individual user takes more than her fair share.
   b. Networking and servers, including file, compute, and print servers.
   c. Touch screen in the user interface.
3. A user is better off under three situations: when it's cheaper, faster, or easier. For example :
   - When the user is paying for management costs, and the costs are cheaper for a time-sharing system than for a single-user computer
   - When running a simulation or calculationg that takes too long to run on a single PC or workstation.
   - When a user is travelling and doesn't have laptop to carry around, they can connect remotely to a time-shared system and do their work.
4. Differences between Asymmetric and Symmetric
   a. Asymmetric Multiprocessing
      Each processor is assigned a specific task.
   b. Symmetric Multiprocessing
      Each processor performs all tasks
   c. Advantages of Multiprocessor System
      - Increased throughput
      - Economy of scale
      - Increased reliability
   d. Disadvantage of Multiprocessor Systems : Expensive price
5. The difference between clustered systems and multiprocessor systems is on clustered systems, multiple systems working together. The LAN Network is required for two machines belonging to a cluster to cooperate to provide a highly available service
6. Twoways :
   a. Asymmetric Clustering : has one machine in hot standby mode. The benefit of using this cluster is appropriate for providing redundancy. The disadvantages is doesn't utilize the processing power of both hosts
   b. Symmetric Clustering : has multiple nodes running applications, monitoring each other. The benefit using this cluster is database application can running on both host, but the disadvantages is must providing some form of distributed locking mechanism for files on the shared disk.
7. Network computers (or thin clients)—which are essentially terminals that understand web-based computing—are used in place of traditional workstations where more

security or easier maintenance is desired while the traditional personal computer is stand-alone general purpose machine.

8. Difference between Trap and Interrupt
   a. Interrupt
   - An interrupt is a hardware-generated change-of-flow withinthe system.
   - An interrupt handler is summoned to deal with the cause of the interrupt; control is then returned to the interrupted context andinstruction.
   - An interrupt canbe used to signal the completion of an I/Ot o obviate the need for devicepolling.
   b. Trap
   - A trap is a software-generated interrupt.
   - A trap can be used to call operating system routines or to catcharithmetic errors