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Subject: Operating System

Topic: Memory Management

QUESTIONS

1.) Among all memory management techniques …….. is simple to implement little operating system overhead.

A) Fixed partitioning

B) Simple Paging

C) Virtual memory paging

D) Simple segmentation

Ans: A) Fixed partitioning

Explanation:It simply requires putting a process into certain partition without focussing on the emergence of Internal and External Fragmentation.

2.) In the context operating systems, which of the following statements is/are correct with respect to paging?

A) Paging incurs memory overheads.

B) Paging helps solve the issue of external fragmentation.

C) Page size has no impact on internal fragmentation.

D) Multi-level paging is necessary to support pages of different sizes.

Ans: A and B are correct

Explanation:Pages are divided into fixed-size slots and hence no external fragmentation. But applications smaller than page size cause internal fragmentation.Page tables take extra pages in memory. Therefore incur an extra cost

3.) Consider the following statements:
S1: A small page size causes large page tables.

S2: Internal fragmentation is increased with small pages.
S3: I/O transfers are more efficient with large pages.
Which of the following is true?

A) S1 and S2 are true

B) S1 is true and S2 is false

C) S2 and S3 are true

D) S1 is true S3 is false

Ans: B) S1 is true and S2 is false

Explanation: S1: A small page size causes large page tables.

This statement is correct. Smaller page size means more pages required per process. It means large page tables are needed.

S2: internal fragmentation is increased with small pages.

Internal fragmentation means when process size is smaller than the available space. When pages are small, then available space becomes less and there will be less chances of internal fragmentation.

S3: I/O transfers are more efficient with large pages.

An I/O system is required to take an application I/O request and send it to the physical device. Transferring of I/O requests are more efficient with large pages. So, given statement is correct.

4.) Main memory in a computer system is ……. as a linear or one dimensional, address space, consisting of a sequence of bytes or words.

A) relocated

B) protected

C) shared

D) organized

Ans: D) organized

Explanation: Main memory is organized as linear or it can be a one-dimensional address space which consists of a sequence of bytes or words. Most of the programs can be organized into modules, some of those are unmodifiable and some of those contain data that can be modified.

5.)The address of a page table in memory is pointed by:

A) stack pointer

B) page table base register

C) page register

D) program counter

Ans: B) page table base register

Explanation: The address of a page table in memory is pointed by stack pointer page table base register page register program counter.

6.) Which of the following is/are the different memory management techniques.

i) Fixed partitioning ii) Dynamic paging iii) Simple paging iv) Simple segmentation

A) i, ii and iii only

B) ii, iii and iv only

C) i, iii and iv only

D) All i, ii, iii and iv

Ans:C) i, iii and iv only

Explanation: Dynamic Paging The paging operation can be dynamically performed using the DataManager. With the help of an external button click event, the required page records can be obtained and processed accordingly.

7.)Consider allocation of memory to a new process. Assume that none of the existing holes in the memory will exactly fit the process's memory requirement. Hence, a new hole of smaller size will be created if allocation is made in any of the existing holes. Which one of the following statements is TRUE?

A) The hole created by first fit is always larger than the hole created by next fit.

B) The hole created by worst fit is always larger than the hole created by first fit.

C) The hole created by best fit is never larger than the hole created by first fit.

D) The hole created by next fit is never larger than the hole created by best fit.

Ans: C) The hole created by best fit is never larger than the hole created by first fit.

Explanation: The best fit allocation strategy chooses the smallest available memory partition that can satisfy the memory requirement. It creates the smallest hole.

The first fit chooses the first available memory partition that can satisfy the requirement.

8.)Size of virtual memory depends on

A) Address line

B) Data Base

C) Disc Space

D) All the above

Ans: A) Address line

Explanation: Virtual memory is a feature of an operating system that enables a computer to be able to compensate for shortages of physical memory by transferring pages of data from random access memory to disk storage.

This process is done temporarily and is designed to work as a combination of RAM and space on the hard disk.

The size of virtual memory depends on the size of the address bus. Processor generates the memory address as per the size of virtual memory.

9.)Which one of the following statements is not correct regarding the usage of virtual memory?

A) To free user programs from the need to carry out storage allocation and to permit efficient sharing of the available memory space among different users

B) To make program independent of the configuration and capacity of the physical memory for their execution

C) To achieve higher CPU performance

D) To achieve the very low access time and cost per bit that is possible with a memory hierarchy

Ans: C) To achieve higher CPU performance

Explanation: Physical memory cannot store large programs. So virtual memory is used that provides a larger amount of space to the process. Some of the portions is stored in the disk storage.

It allows us to extend the use of physical memory by using hard disk space.

It allows us to have memory protection because each virtual address is translated into physical memory.

When the process requires a particular page, it demands the required page. The page in the storage device is accessed.

But storage device is much slower than RAM's, so it affects the performance, i.e. the performance is reduced. (Statement in Option C is incorrect)

10.)Techniques that automatically move program and data blocks into physical main memory when they are required for execution are called

A) Main memory techniques

B) Cache memory techniques

C) Virtual memory techniques

D) Associate memory techniques

Ans: C) Virtual memory techniques

Explanation: Virtual Memory is a space where large programs can store themselves in form of pages while their execution and only the required pages or portions of processes are loaded into the main memory.

This technique is useful as large virtual memory is provided for user programs when a very small physical memory is there.

Techniques that automatically move program and data blocks into the physical main memory when they are required for execution are called virtual-memory techniques.