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BSIT –301

Part I

1. If you are to add a new 10MB process in the memory, where could it possibly be added and why? (5 points)

- Because the variable partitioning strategy initially divides memory into a single continuous free block, virtual memory is utilized in this arrangement.

2. What could be the size of the free block just before it was partitioned by X? Rationalize your answer. (5 points)

- 2M+5M=7M free block before X is inserted.

3. Would you suggest the provisioning of virtual memory in this configuration? Why or why not? (5 points)

- The default values 64 GB of RAM for the management center virtual 300 and 32 GB of RAM for the majority of management center virtual instances—are not something we recommend changing. You can always increase the RAM and CPU count of a virtual appliance to improve performance, depending on your available resources.

4. Is it possible to add a new 7MB process using the first-fit placement algorithm without swapping out any process? Why or why not? (5 points)

- The answer is true because the first-fit placement procedure will find a free block big enough to do the job.

5. A new process is requesting a 3MB allocation. Illustrate the possible memory configuration using a horizontal segmented memory strip (like the diagram above), where a partition will be created for the new process under the following placement algorithms: best-fit and first-fit. Label your illustration clearly. (2 items x 5 points)

- Software, however, seems to be growing even more, as was already indicated. Processes can be switched or transferred if they no longer fit in the RAM that was given to them.

Part II

1. Explain the operation and management of the following virtual memory. Search for relevant studies and literatures that would support your answer. Properly cite your references. (10 points x 2 items)

• Linux Virtual Memory

- Linux supports virtual memory, a technique for boosting the effective amount of usable memory by using a disk in addition to RAM. The kernel will write the contents of an unoccupied memory block to the hard drive so that it can be used later.

• Windows Virtual Memory

- The operating system's virtual memory manager uses a process called paging to map the virtual address space to the physical address space and allow all processes to use the physical memory.

2. Then, answer the following items based on your research. (4 items x 5 points)

a. Between the operation and management of Linux and Windows virtual memory, which do you think is less complex and why? In Linux, Linked List data structures are utilized for memory management, whereas Tree data structures are used in Windows. Pages are only purchased with Windows' Cluster Demand Paging system when several copies of them are simultaneously needed. Linux has a mechanism called demand paging that stops pages from being loaded into RAM before they are needed. The Page Replacement Algorithm used by Windows is First In First Out (F.I.F.O.), whereas the Page Replacement Algorithm used by Linux is Least Recently Used (L.R.U.). Windows uses 4GB of physical memory on 32-bit computers, allowing each process to have a unique 4GB logical address (upper 2Gb-Kernel Mode, lower 2Gb-User Mode). Linux has a 3GB user mode and a 1GB kernel mode.

b. Were you able to find similarities between Linux and Windows virtual memory?

o If your answer is yes, explain each similarity.

- Yes. Operating systems, which are interfaces in charge of regulating computer use and sharing, include both Linux and Windows. In this capacity, they serve as hosts for computer programs. On both, the user interfaces are graphical.

o If your answer is no, explain the possible reason why there is no similarity.

- No. Linux is an open-source alternative to Windows OS, which is a for-profit operating system. Linux allows users to alter the code as necessary, in contrast to Windows, which prohibits users from accessing the source code. The Linux kernel's source code is available to users, who can alter it as necessary to suit their needs.

c. What are the possible drawbacks of not implementing virtual memory? You get less available hard disk space as a result. Stability of the system is jeopardized. Larger apps can now run on PCs that lack the actual RAM necessary for them to do so. It performs worse than RAM in terms of speed.

d. If you are to design a memory management system, would you incorporate virtual memory into your design? Why or why not? Virtual memory has several advantages over physical memory, including the ability to manage twice as many locations, so if I were designing the memory management system, I would use it. It now allows for the immediate use of more programs.