MODEL INSTITUTE OF ENGINEERING AND TECHNOLOGY

JAMMU, JAMMU AND KASHMIR

A REPORT - Implement and simulate fixed partitioning and variable partitioning techniques.

BACHELOR OF TECHNOLOGY (Computer Engineering)

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Acknowledgement

Through this section of our report, we want to present our gratitude towards our institute MIET. From here, we are able to work on projects that require you to analyse and solve a problem that exists in the real world. It is an experience that one can achieve rarely and we are happy and thankful to get that chance here. We would also like to thank our teachers Me. Pragti Jamwal and Ms. Swati Goyal for being a guiding force throughout this period.

Project Summary

❖ **Introduction:**

Memory partitioning is the system by which the memory of a computer system is divided into sections for use by the resident programs. These memory divisions are known as partitions. There are different ways in which memory can be partitioned: fixed, variable, and dynamic partitioning. Although the following simple/basic memory management techniques are not used in modern OSs, they lay the ground for a later proper discussion of virtual memory:

– Fixed/Static Partitioning
– Variable/Dynamic Partitioning
– Simple/Basic Paging
– Simple/Basic Segmentation

❖ Types of memory partition:

Fixed memory Partition:

Fixed partitioning is therefore defined as the system of dividing memory into non-overlapping sizes that are fixed, unmoveable, static. A process may be loaded into a partition of equal or greater size and is confined to its allocated partition. If we have comparatively small processes with respect to the fixed partition sizes, this poses a big problem. This results in occupying all partitions with lots of unoccupied space left. This unoccupied space is known as fragmentation. Within the fixed partition context, this is known as internal fragmentation (IF). This is because of unused space created by a process within its allocated partition (internal).

Key points:

- Partition main memory into a set of non-overlapping memory regions called partitions.
- Fixed partitions can be of equal or unequal sizes.
- Leftover space in partition, after program assignment, is called internal fragmentation.

Fixed memory Partition Algorithm:

a. Start the process
b. Declare variables
c. Enter total memory size
d. Allocate Memory for OS
e. Allocate total memory to the pages
f. Display the wastage of memory
g. Stop the process

Variable memory partition

Variable partitioning is therefore the system of dividing memory into non-overlapping but variable sizes. This system of partitioning is more flexible than the fixed partitioning configuration, but it's still not the most ideal solution. Small processes are fit into small partitions (item 1) and large processes fit into larger partitions (items 2 and 3). These processes do not necessarily fit exactly, even though there are other unoccupied partitions. Items 3 and 4 are larger processes of the same size, but memory has only one available partition that can fit either of them. The flexibility offered in variable partitioning still does not completely solve our problems.

Key points:

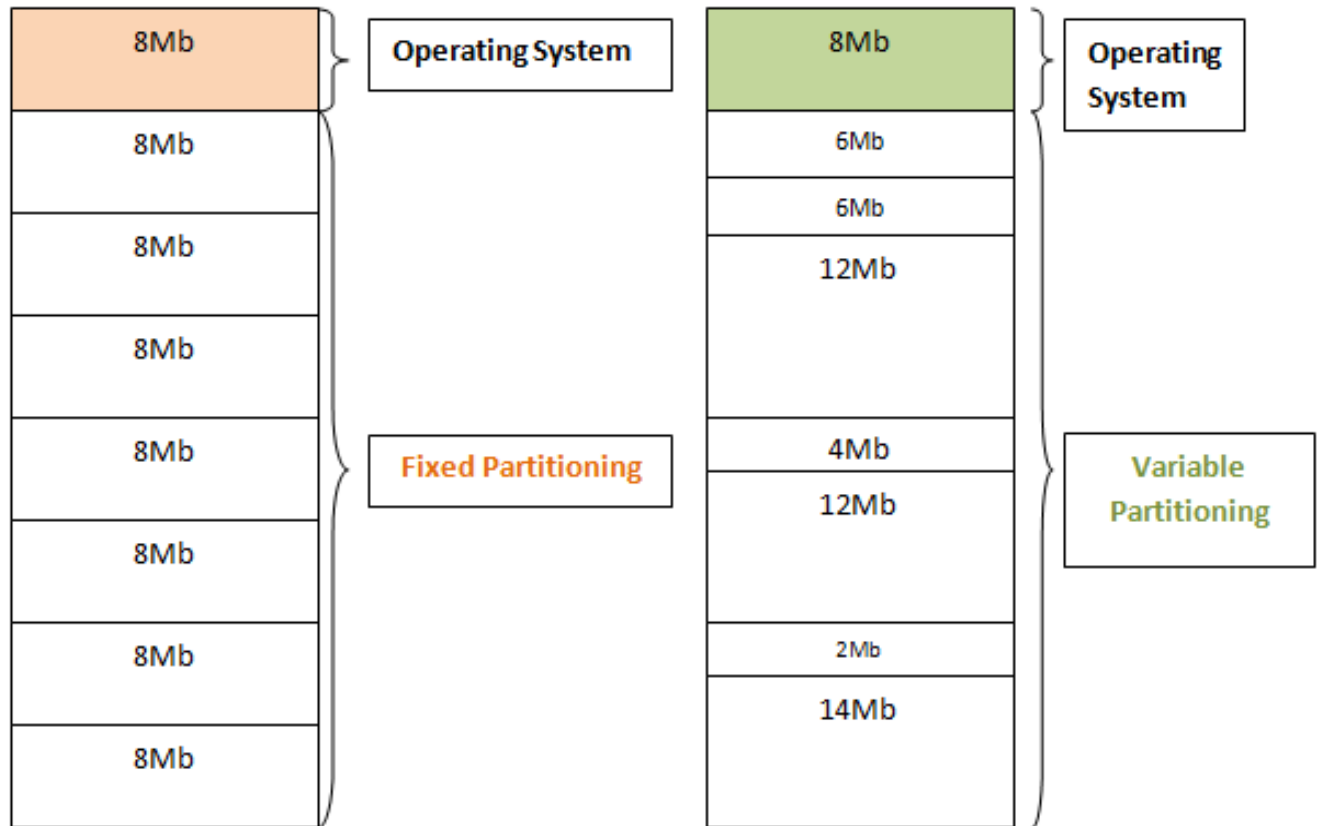– Degree of multiprogramming limited by number of partitions.

- Variable-partition sizes for efficiency (sized to a given process' needs).

- **Hole –** block of available memory; holes of various size are scattered
throughout memory.

- When a process arrives, it is allocated memory from a hole large enough to accommodate it.

- Process exiting frees its partition, adjacent free partitions combined.

- Operating system maintains information about:
a) allocated partitions   b) free partitions (hole)

Variable memory partition algorithm:

a. Start the process.

b. Declare variables.

c. Enter total memory size.

d. Allocate memory for OS

e. Read the no partition to be divided.

f. Read the process no and process size.

g. If process size is less than partition size while allocating then,

   update memory wastage-external fragmentation.

h. Print the results.

Problem statement

The fixed-sized partitioning limits the maximum size of processes that are loaded into memory. Even if we have a main memory of 4GB, we cannot load a process of even 10MB if the maximum block size we have is 5MB.

8Mb	Operating System
8Mb	
8Mb	
8Mb	
8Mb	Fixed Partitioning
8Mb	
8Mb	
8Mb	

8Mb	Operating System
6Mb	
6Mb	
12Mb	
4Mb	Variable Partitioning
12Mb	
2Mb	
14Mb	

Conclusion

We have compared both of the partition methods and we have come to the conclusion that the variable partitioning be a better and more appropriate method for partioning memory in OS memory management.

Fixed memory partition has external fragmentation as well as internal fragmentations. There is a quite amount of memory wastage.

Variable memory partition allows user to allocate memory by himself and hence there is only external fragmentation.

Therefore, variable memory partitioning utilizes the main memory effectively.

References

– The content teacher provided in the regular classes.

– Geeks for Geeks [GeeksforGeeks | A computer science portal for geeks](#)

– Codingninjas.com

– Galvin book for operating system.