Name: Nimra Nasir
Reg No: 19-CP-35

Operating System

Lab Manual : 08

Question:

What are the advantages and disadvantages of

- Sequential file Allocation
- Linked file Allocation
- Indexed file Allocation

Sequential file Allocation:

In the Sequential file allocation method, the file is divided into smaller chunks and these chunks are then allocated memory blocks in the main memory. These smaller file chunks are stored one after another in a contiguous manner, this makes file searching easier for the file allocation system.

Advantages:

- The sequential file organization is efficient and process faster for the large volume of data.
- It is a simpler file organization compared to other available file organization method.
- This method can be implemented using cheaper storage devices such as magnetic tapes.

- It requires fewer efforts to store and maintain data elements.
- The sequential file organization technique is useful for report generation and satistical computation process.
- This file organization is a prefered method for calculating aggregates that involve most of the data elements that have to be accessed while paiming the computation process. Some of the popular use cases are calculating grades for the students, generating payslips for the employees, and generating the invoices in the business.

Disadvantages:

- The shoting operation is a time-consuming process and more memory space for the storted file method in the sequential file organization.
- The shorting operations iterate for every writes operation such as insert, update, or delete.
- The traversing time is high in the sequential file organization as for each writes operation, the system or the program control cannot find a particular data item directly at one go, it has to traverse through the sequence of data items.

Linked file Allocation:

The linked list allocation method overcames the drawbacks of the contiguous allocation method. In this file allocation method, each file is treated as a linked list of disks blocks. In the linked list allocation method, it is not required that disks blocks assigned to a specific file are in the contiguous order on the disk. The directory entry comprises of a pointer for starting file block and also

for the ending file block.

Advantages:

There are various advantages of linked list allocation.

- In linked list allocation, there is no external fragmentation. Due to this, we can utilize the memory better.
- In linked list allocation, a directory entry only comprises of the starting block address.
- The linked allocation method is flexible because we can quickly increase the size of the file because, in this to allocates a file, we do not require a chunk of memory in a contiguous form.

Disadvantages:

There are various disadvantages of linked list allocation.

- Linked list allocation does not support direct access or random access.
- In linked list allocation, we need to traverse each block.
- If the pointer in the linked list break in linked list allocation, then the file gets corrupted.
- In the disk block for the pointer, it needs some extra space.

Indexed file allocation:

The indexed allocation method is another method that is used for file allocation. In the index allocation method, we have an additional block, and that block is known as the index block. For each file, there is an individual index block. In the index block, the entry holds the disk address of the ith file block.

Advantages:

The advantages of index allocation are:

- The index allocation method solves the problem of external fragmentation.
- Index allocation provides direct access.

Disadvantages:

The disadvantages of index allocation are:

- In index allocation, pointer overhead is more.
- we can lose the entire file if an index block is not correct.
- It is totally a wastage to create an index for a small file.

A single index block can't hold all the pointer for files with large sizes.