

OSL

ASSIGNMENT 8

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Aim

Implement the C program for Disk Scheduling Algorithms: SSTF, SCAN, C-Look considering the initial head position moving away from the spindle.

Theory

Disk Scheduling

Disk scheduling is done by operating systems to schedule I/O requests arriving for the disk. Disk scheduling is also known as I/O scheduling. Disk scheduling is important because:

- Multiple I/O requests may arrive by different processes and only one I/O request can be served at a time by the disk controller. Thus other I/O requests need to wait in the waiting queue and need to be scheduled.
- Two or more request may be far from each other so can result in greater disk arm movement.
- Hard drives are one of the slowest parts of the computer system and thus need to be accessed in an efficient manner.

Disk Scheduling Algorithms

First Come Forst Serve (FCFS) Algorithm

- FCFS (First-Come-First-Serve) is the easiest disk scheduling

algorithm among all the scheduling algorithms.

- In the FCFS disk scheduling algorithm, each input/output request is served in the order in which the requests arrive..
- In this algorithm, starvation does not occur because FCFS address each request.

Advantages

- In FCFS disk scheduling, there is no indefinite delay.
- There is no starvation in FCFS disk scheduling because each request gets a fair chance.

Disadvantages

- FCFS scheduling is not offered as the best service.
- In FCFS, scheduling disk time is not optimized.

Shortest Seek Time First (SSTF) Algorithm

- Basic idea is the tracks which are closer to current disk head position should be serviced first in order to minimise the seek operations.

Advantages:

- Better performance than FCFS scheduling algorithm.
- It provides better throughput.
- This algorithm is used in Batch Processing system where throughput is more important.
- It has less average response and waiting time.

Disadvantages:

- Starvation is possible for some requests as it favours easy to reach request and ignores the far away processes.
- There is lack of predictability because of high variance of

response time. • Switching direction slows things down.

Elevator (SCAN) Algorithm

- As the name suggests, this algorithm scans all the cylinders of the disk back and forth.
- Head starts from one end of the disk and move towards the other end servicing all the requests in between.
- After reaching the other end, head reverses its direction and move towards the starting end servicing all the requests in

between.

- The same process repeats.

Advantages:

- It is simple, easy to understand and implement.
- It does not lead to starvation.
- It provides low variance in response time and waiting time.

Disadvantages:

- It causes long waiting time for the cylinders just visited by the head.
- It causes the head to move till the end of the disk even if there are no requests to be serviced.

Circular LOOK (C-LOOK) Algorithm

- Circular-LOOK Algorithm is an improved version of the LOOK Algorithm..
- Head starts from the first request at one end of the disk and moves towards the last request at the other end servicing all the requests in between.
- After reaching the last request at the other end, head reverses its direction.
- It then returns to the first request at the starting end without servicing any request in between.
- The same process repeats.

Advantages:

- It does not causes the head to move till the ends of the disk when there are no requests to be serviced.
- It reduces the waiting time for the cylinders just visited

by the head. • It provides better performance as

compared to LOOK Algorithm.

- It does not lead to starvation.
- It provides low variance in response time and waiting time.

Disadvantages:

- There is an overhead of finding the end requests.

Conclusion:

- C program for Disk Scheduling Algorithms: SSTF, SCAN, C-Look was implemented.
- The program was understood considering the initial head position moving away from the spindle.