109590004 呂育瑋 作業系統 HW4 hand-written part

11.7:

(a)

contiguous：

儲存連續的物理塊位置，所以邏輯塊與物理塊之間關係為：物理塊位置 = 邏輯塊位置 / 512 + 邏輯位置 % 512，得知起始物理塊位置和長度就可以取得需要的物理塊位置。

linked：

每個邏輯塊中都存儲了下一個物理塊的位址。通過遍歷連結鏈表，可以從邏輯塊找到對 應的物理塊。

indexed：

每個檔案都有一個索引塊，其中包含了檔案中每個邏輯塊對應的物理塊位址。

　(b)

contiguous：

1個物理塊，如果要到邏輯塊4，可以直接用計算的方式直接取得邏輯塊4的物理塊位置。

linked：

4個物理塊，現在我們在邏輯塊10，但邏輯塊4的位置比較前面，所以從連結鏈表開頭遍 歷直到到達物理塊4，需要經過4個物理塊。

indexed：

2個物理塊，因為要先讀取標籤的物理塊，得到物理塊4的位置，再讀取物理塊4，所以會 經過2個物理塊。

11.8:

8KB / 4 = 8096 / 4 = 2048 = 2KB

maximum size = 12 \* 8 KB + 2KB \* 8 KB + (2KB)2 \* 8KB + (2KB)3 \* 8KB

12.3: Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4,999.

The drive is currently serving a request at cylinder 2,150, and the previous request was at cylinder 1,805.

The queue of pending requests, in FIFO order, is 2,069, 1,212, 2,296, 2,800, 544, 1,618, 356, 1,523, 4,965, 3,681

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk-scheduling algorithms?

1. FCFS (b) SSTF (c) SCAN (e) C-SCAN

(a)

345 81 857 1084 504 2256 1074 1262 1167 3442 1284

356 544 1212 1523 1618 2069 2150 2296 2800 3681 4965

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total distance |
| FCFS | 2150 | 2069 | 1212 | 2296 | 2800 | 544 | 1618 | 356 | 1523 | 4965 | 3681 |  |  | 13011 |
| SSTF | 2150 | 2096 | 2296 |  |  |  |  |  |  |  |  |  |  |  |
| SCAN | 2150 | 2296 | 2800 | 3681 | 4965 | **4999** | 2069 | 1618 | 1523 | 1212 | 544 | 356 |  | 4792 |
| C-SCAN | 2150 | 2296 | 2800 | 3681 | 4965 | **4999** | **0** | 356 | 544 | 1212 | 1523 | 1618 | 2069 | 9917 |

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12.9: Consider a RAID level 5 organization comprising five disks, with the parity for sets of four blocks on four disks stored on the fifth disk.

How many blocks are accessed in order to perform the following?

(a) A write of one block of data.

(b) A write of seven contiguous blocks of data.

12.10: Compare the throughput achieved by a RAID level 5 organization with that achieved by a RAID level 1 organization.

(a) Read operations on single blocks.

(b) Read operations on multiple contiguous blocks.