CS & IT

ENGINERING



Operating System

File System & Device Management

DPP 01 (Discussion Notes)



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TOPICS TO BE COVERED

01 Question

02 Discussion



What is cluster in a disk architecture?



- A. It is a group of one or more sectors on same track.
 - B. It is a collection tracks on same cylinder.
 - It is a group of one or more track one same platter.
 - D. It is a collection of platter on the disk.



Consider the following disk specifications.



Number of platters = 8

Number of tracks per surface = 512

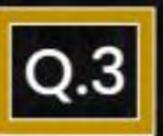
Number of sectors per track = 4096

Sector offset = 15



Calculates the unformatted capacity (in GB)?

[NAT]



In a computer system, a disk track can hold 32 sectors each having size of 256 bytes. The relation rate 200 or rpm. The data rate of disk is KB.



[NAT]

273 K Bytes

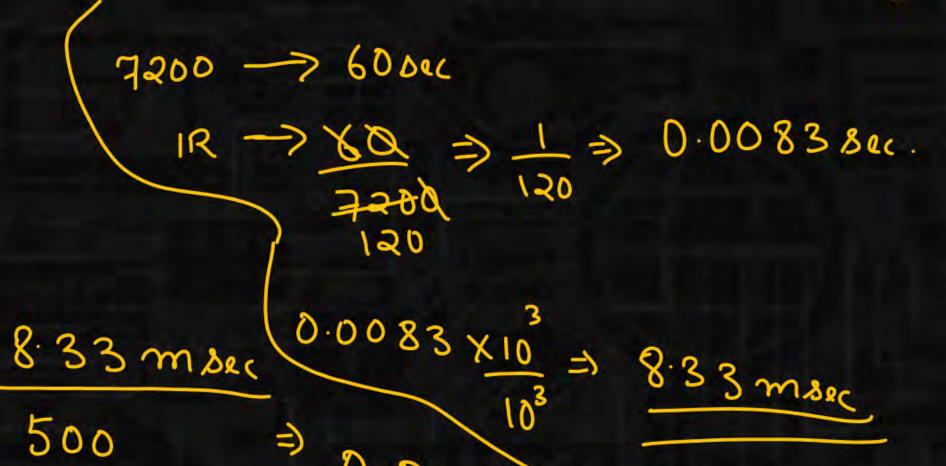


A disk rotates at 7200 RPM. It has 500 sectors of 512 bytes each around the outer cylinder. How long does it take to read a sector?

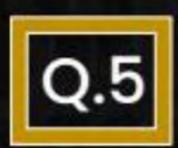


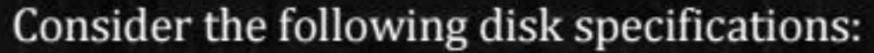
[MCQ]

- A. 14.87 μ sec.
- B. 15.67 μ sec.
- C. 13.87 μ sec.
- D. 16.67 μ sec.



0.01666 msec * 10 16.66 psec * 103





Pw

- A 10 GB disk rotates at 10,000 rpm
- Data transfer rates is 10 bytes/sec.
- Average seek time 8 ms.
- Blocks size is 32 KB.

What is the average services time to access a single disk blocks form a random location on the disk?





15.38 ms



14.28 ms



16. 48 ms



13.18 ms



=> Seek time + Rotational Lime + transfer Lime

Average notational time \Rightarrow 10,000 notation \Rightarrow 60 sec 1 notation \Rightarrow 60 \Rightarrow 0.006 10000 \Rightarrow 0.006 0.006 $\times 10^3 \Rightarrow$ 6 msec \Rightarrow 1 (6 msec) = 3 msec



10 Bytes -> 1 sec

32 KBytes = ?

=) 8+3+3.28 =) 14.28 m secs





A hard disk has 20 surface with 100 tracks for surface and 16 sectors per track. The disk transfer rate is 106 bytes/sec, page size is 512 bytes and the process size is 2048 bytes, and seek time is 25 msec. The disk is rotating at 300 rpm. What is the total swap time (in ms)? [upto three decimal places] [NAT]

Seek time => 25 msec

Avg. Rotational Latency
$$\Rightarrow$$
 300 R \rightarrow 60 sec
10 m sec. $1R \rightarrow 60$ sec \Rightarrow 0.02
 $5 300$ \Rightarrow 0.02
 $\frac{1}{2}(20) = 10 \text{ m/sec}$



10 Bytes -> 1 sec 2048 Bytes -> ?

2* 37.048 msec => 74.096 msec

2048 => 2.048 m sec

Swap time = 2* (Seek + Avg. rotational + Transfer time)

= 2 (25+10+2.048ms)





Consider a typical disk that rotates at 20000 RPM and has a transfer rate of 32kBps. If the average seek time is 6 msec. and the controller's transfer time is twice of the disk transfer time, the average time need to read or write a 1024 bytes sector of disk is msec. (upto 1 decimal places)

[NAT]







Two steps performed by operating system to uses a disk to hold disk its files are.



- A. partitioning
- B. Logical formatting
- C. Caching
- D. Swapping



