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Cs 149 – 3

HW#7

Problem 1)

Latency = seek time + rotation time + transfer time

Assuming that the Block size is 4Kb

a. Random Scattered

Seek = 12ms

Rotation time = $5400 \text{ RPM} / 60 = 90 \text{ RPS}$. $1/90 * .5 = 5.56\text{ms}$

Transfer time = $(4\text{KB}) / (3\text{GBits} / 1000 / 1000) = 1.33 \text{ us}$ (micro seconds)

Latency = $10,000(12\text{ms} + 5.56\text{ms} + 1.33\text{us}) = 175.6\text{s}$

b. Sequential sectors

seek = 12ms

rotation time = 5.56ms

transfer time = $1.33\text{us} * 10,000 = 13.3\text{ms}$

Latency = $12\text{ms} + 5.56\text{ms} + 13.3\text{ms} = 30.86\text{ms}$

c. SCAN

seek = $(2\text{ms} - (2\text{ms} * 10000)) = 2\text{ms} - 20\text{s}$

rotation time = $5.56\text{ms} * 10,000 = 55.6\text{s}$

transfer time = $1.33\text{us} * 10000 = 13.3\text{ms}$

latency = $(2\text{ms} - 20\text{s}) + 55.6\text{s} + 13.3\text{ms} = 55.6\text{s} - 75.6\text{s}$

because the alg runs from the outside in then inside out and they are randomly places wouldn't it just be able to run the range because it randomly placed.

But could the seek = 2ms max because it could randomly become the same problem as in d

d. SCAN Sequential

seek = 2ms

rotation time = 5.56ms

transfer time = $1.33\text{us} * 10000 = 13.3\text{ms}$

Latency = $2\text{ms} + 5.56\text{ms} + 13.3\text{ms} = 20.86\text{ms}$

Problem 2)

a.

$(12 * 6\text{k}) = 72\text{kb}$

b.

number of pointers / block = $6\text{k} / 6 = 1024$

$(12 * 6\text{k}) + ((1024) * 6\text{k}) + ((1024) * (1024) * 6\text{k}) + ((1024) * (1024) * (1024) * 6\text{k})$

72KB + 6MB + 6GB + 6TB

6.006TB

Problem 3)

a.

having a network with end nodes and not middle nodes. Having gates and routers to establish the network connections.

b. Fate-Sharing

Fate-Sharing is that the whole system will work together or crash together, so if there is 1 failure the entire system will fail. It works by protecting the numbers of failures between the system and keeping the whole system together. Keeping endpoints together.

c.

having large amount of data being sent around with different clock times.