

Chapter 12

5. Suppose I have a disk such as the 320 GB SATA drive described in Figure 12.9 (pdf pag.62) and I have a workload consisting of 10000 reads to sectors randomly scattered across the disk. How long will these 10000 requests take (total) assuming the disk services requests in FIFO order?

Seek time = 12 ms

$12 + (1 \text{ min} / 5400 \text{ rev} * 1 \text{ rev} / 2 \text{ half rev} * 60 \text{ sec} / 1 \text{ min} * 1000 \text{ ms} / 1 \text{ sec})$

Time per request = 12 ms + 5.5556 ms / half rev + 0.0006 ms transfer speed

Time per request = 17. 556 ms

total time = time per request * number of requests

Total time = 175.56 seconds

6. Suppose I have a disk such as the 320 GB SATA drive described in Figure 12.9 (pdf pag.62) and I have a workload consisting of 10000 reads to 10000 sequential sectors on the outermost tracks of the disk. How long will these 10000 requests take (total) assuming the disk services requests in FIFO order?

850 Mbit/s = 106 MB/s

$(512 \text{ bytes/s} * 10,000 \text{ sectors}) / 106 \text{ MB/s}$

$5.12 \text{ MB} / 106 \text{ MB/s} = 48 \text{ ms}$

Chapter 13

5. Suppose a variation of FFS includes in each inode 12 direct, 1 indirect, 1 double indirect, 2 triple indirect, and 1 quadruple indirect pointers. Assuming 6 KB blocks and 6-byte pointers What is the largest file that can be accessed via direct pointers only? To within 1%, what is the maximum file size this index structure can support?

Direct: $1024 * 6 = 6144 \text{ bytes per block} / 6 \text{ byte per pointer} = 1024 \text{ pointers can fit per block}$

$1024 = 2^{10} \text{ pointers} / \text{ block}$

Quad: 2^{10*4}

$2^{40} \text{ blocks} * (6*2^{10} \text{ bytes per block})$

$2^{50} * 6 = 6 \text{ PB}$