12.5. Suppose I have a disk such as the 320 GB SATA drive described in Figure 12.9 and I have a workload consisting of 10,000 reads to sectors randomly scattered across the disk. How long will these 10,000 requests take (total) assuming the disk services requests in FIFO order?

10,000 \* 200μs = 2,000,000μs = 2 s With no concurrency, performance is limited by read latency. Since the reads are to pages scattered randomly, assume they will be cache misses, which according to the figure cost 200μs each.

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

0.1 seconds With concurrency, we are limited by sustained read IOPs of 100,000 per second, 10,000 / 100,000 is 0.1 seconds or we are limited by the sustained bandwidth of 2,048,000,000 per second, (10,000 \* 4,000 = 40,000,000); 40,000,000 / 2,048,000,000 = 0.02 seconds.

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

a. What is the largest file that can be accessed via direct pointers only?

b. To within 1%, what is the maximum file size this index structure can support?