Understanding Software Dynamics Ch 5 Lab Report

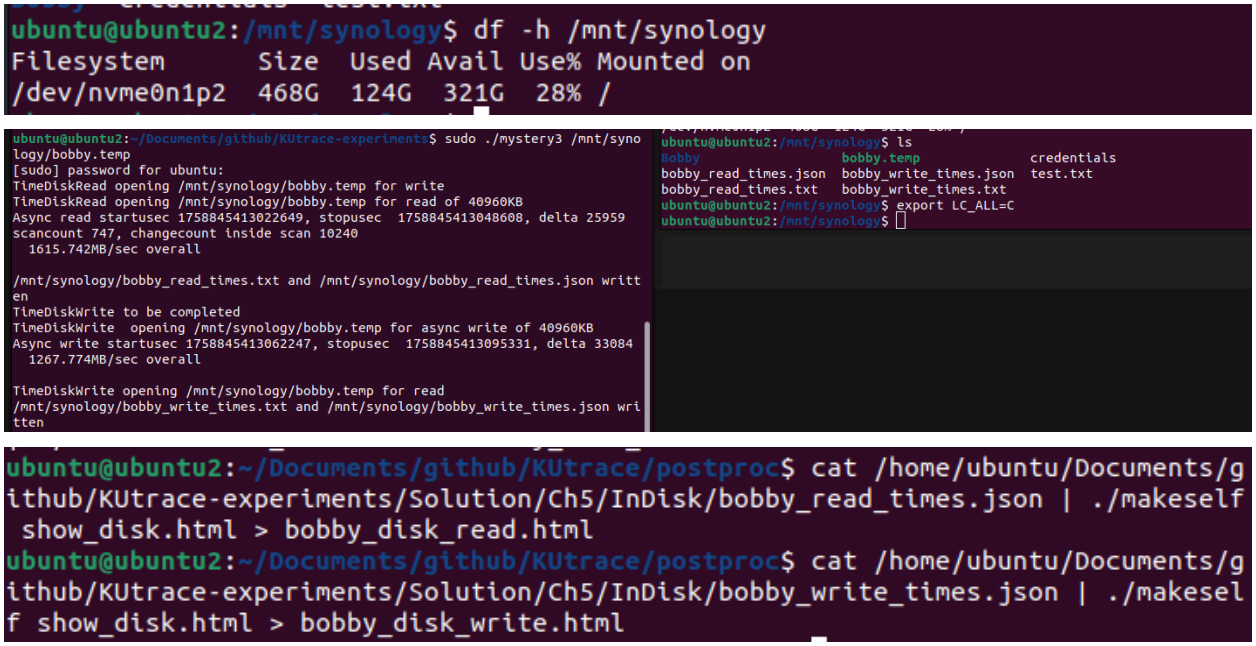
Notes:
- show a tree of block devices and their mount point:
$ lsblk

- mount a partition of a disk:
$ sudo mkdir /mnt/mydisk
$ sudo mount /dev/nvme0n1p1 /mnt/mydisk

- to ensure data is fully written to the disk but not in buffers
$ sync

5.0) follow Book p.73
my mounted disk(SSD, not hard disk) directory: /mnt/synology

It is noted that makeself program should run in /postproc folder. And check that show_disk.html is here too
And run export LC_ALL=C in /postproc folder.



I do not have a hard disk, so for 5.1-5.6 and 5.10. I can only predict what will happen.

5.1) [predict] track-to-track head switch and re-servo time.

5.2) [predict] because the filesystem logical block size does not align perfectly with disk sector size, or because of disk caches/ filesystem caches

5.3) [predict] smallest transfer time = 10-20μs
seek and rotate time to get the very first block read = 10-15μs

5.4) [predict] large transfer time (like 1GB files) = 1-10s

5.5) [predict] 100-200MB/s

5.6) [predict] 250-300MB/s. It is because of the on-disk track buffer

5.7) seek time = 200μs
transfer rate = 0.000195MB/s

5.8) bobby_disk_read.html, bobby_disk_write.html
No observable discontinuities. Because SSD use NAND flash memory with no moving parts, and has DRAM caches to buffer writes and stage read.

5.9) mystery3_time_disk_write.cpp

5.10) [predict] OS I/O scheduler may reorder or batch I/O requests to optimize.

5.11) bobby2_read_times.html, bobby2_write_times.html
It takes 30ms to complete now at a rate of 0.003ms. Because the added code will update the buffer's timestamps periodically along with writes, these timestamps are read and plotted.