

Week 7 Mass Storage

Question 1

Make a comparison of capacity, speed, battery life, form factor, reliability, durability, and price for hard disc drives (HDDs), solid state drives (SSDs), and solid state hybrid drives (SSHDs). What is your conclusion?

Question 2

1. What are the differences (i.e. bit per cell, read/write cycles, write speed, endurance, cost and usage) among Single Level Cell (SLC), Enterprise Multi Level Cell (eMLC), Multi Level Cell (MLC), and Triple Level Cell (TLC) flash memory?
2. What effect can the quality of flash memory have on SSD performance?
3. What functions are performed by an SSD controller? What effect can the quality of the SSD controller have on performance?

Question 3

Why is the difference between sequential and random access so significant for some kinds of mass storage devices, but not others?

Question 4

Hard disks use a technique known as *head parking* to make them more resilient to shock and rough handling when they are switched off. What is head parking? What situations (other than being switched off) might the drive heads be parked?

Question 5

What kinds of issues and situations prevent a mass storage device from working at its burst rate all the time?

Question 6

Why can't:

1. DVD discs be spun as fast as hard disk platters?
2. Laptop hard disk platters be spun as fast as desktop hard disk platters?
3. Desktop hard disk platters be spun as fast as server hard disk platters?

Question 7

Compare and contrast constant linear velocity (CLV) with constant angular velocity (CAV).