1. Why is a 10TB HDD cheaper than a 20 TB HDD ?

Source: Reddit Discussion

I'm assuming you're asking something like: Why does a 3TB drive cost more than a 2TB drive and the answer is yes, there are material costs involved. First take into consideration what a hard drive is made of:

- Enclosure (the casing)
- Controller (that green thingy on the bottom)
- Drive Platters (basically shiny discs that actually store your data)
- Drive Head & Etc (How the drive is read)

The enclosure and drive head are pretty unimportant in this argument since they rarely change between drive types. What increases the cost is usually in the controller and the drive platters.

Let's start with platters. Each platter has a certain physical capacity. Say for example you can fit 1GB of data onto a platter -- It would take 1000 of these to be able to store 1TB -- there's no physical way you could fit 1000 of these into a hard drive (which has certain height, length, width restrictions). So, you'll need to engineer some way to fit more space on a platter. You spend $$$ on research and development and finally (years later) you figure out how to get a whopping 250GB per platter. Now you can take 4 of these put them together to get 1TB. But ... you just spent a fortune figuring out how to store more data on these platters. So how do you recoup your costs? Make the price higher -- the high price reflects the huge investment made in figuring out how to make the drive in the first place. This is also why the price decreases as times goes by. The technology is mostly established for that drive, there's no more costs involved other than production (and occasional maintenance).

Now, on to the controller. The controller, as the name might imply, controls how the data is read or written to the drive; it's the interface for your computer to talk to a hard drive. Imagine you spend very little on making a controller. All it does is blindly read and write data -- there's no error checking. So if by some weird mishap data becomes corrupt, it won't bother telling you or even noticing. Sounds like a pretty shitty drive, right? Well, that's why a lot of work goes into making more robust controllers that are catered to the drive. A specific hard drive model will probably have a completely custom controller that cannot be swapped with the controller for a different hard drive model. And this, again, goes back to the R&D in making said controller.

After those factors, there's also supply and demand to take into consideration. Spinny drives on the smaller side have a smaller amount of demand, so supply is usually limited which drives the price

up a bit. So the price per GB is usually higher than larger sized drives.

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