

1

- a. Laptop, m.2 SSD. A plug-in memory component inside my laptop 1 TB

Samsung SSD 970 EVO Plus 1TB

- b. Nonvolatile, it will store information even though the power is off
- c. Ssd does both sequential and random, if it's a large file, it will be stored sequentially, but if it's a bunch of different smaller files, they will likely be randomly stored.
- d. Ssd uses floating gate transistors

2.

a. 500gb refers to the storage capacity of the hard drive, the 7200 rpm refers to the spinning speed of the disk inside the hard drive and corresponds to the overall speed of the drive.

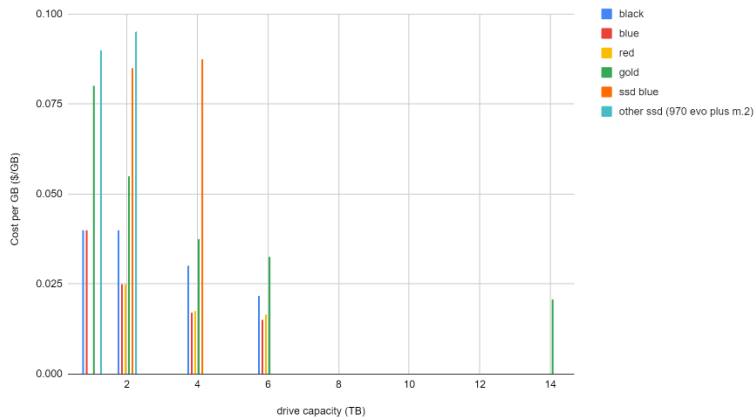
b.

I. hard drives use a disk that is magnetically charged and is controlled with a small arm that reads and writes the magnetic charge, an ssd has no moving parts and uses flash memory in an integrated circuit

II. both storage types are non volatile, and will not loose data even when there is no power

III. an SSd is a lot more durable than a hard drive because there are no moving parts, also during operation a hard drive does not like being moved because it may make the disk move and corrupt data

Aidan: Data Storage cost comparison (2022)



	Drive Capacity				
	1 TB	2TB	4TB	6TB	14TB
black	39.99	79.99	119.99	129.99	
blue	39.99	49.99	67.99	89.99	
red		49.99	69.99	99.99	
gold	79.99	109.99	149.99	194.99	289.99
ssd blue		169.99	349.99		
other ssd (970 e	89.99	189.99			
	1	2	4	6	14
black	0.03999	0.039995	0.0299975	0.021665	0
blue	0.03999	0.024995	0.0169975	0.01499833333	0
red	0	0.024995	0.0174975	0.016665	0
gold	0.07999	0.054995	0.0374975	0.03249833333	0.02071357143
ssd blue	0	0.084995	0.0874975	0	0
other ssd (970 e	0.08999	0.094995	0	0	0

The black drive is optimized for gaming, which means that the data retrieval speed should be very high to reduce load times in games

Blue is optimized for home use and is optimized to be cost efficient and reliable

Red is optimized for server use and should be very very reliable in a server environment

Gold is optimized for enterprise use and thus have many size options, especially very large ones

SSD blue is home use SSD and is very fast, up to 560MB/s while HDD blue only reads at 150 MB/s

The 970 evo plus is meant to have insanely fast read speeds at 3,500 MB/s 7 times faster than SSD blue

4.

Amazon S3 storage classes:

**Standard-**

First 50 TB / Month	\$0.023 per GB
---------------------	----------------

Next 450 TB / Month	\$0.022 per GB
---------------------	----------------

Over 500 TB / Month	\$0.021 per GB
---------------------	----------------

**Intelligent Tiering-**

Monitoring and Automation, All Storage / Month (Objects > 128 KB)	\$0.0025 per 1,000 objects
---	----------------------------

Frequent Access Tier, First 50 TB / Month	\$0.023 per GB
---	----------------

Frequent Access Tier, Next 450 TB / Month	\$0.022 per GB
---	----------------

Frequent Access Tier, Over 500 TB / Month	\$0.021 per GB
---	----------------

Infrequent Access Tier, All Storage / Month	\$0.0125 per GB
---	-----------------

Archive Instant Access Tier, All Storage / Month	\$0.004 per GB
--	----------------

**Standard IA-**

All Storage / Month	\$0.0125 per GB
---------------------	-----------------

**One Zone IA-**

All Storage / Month	\$0.01 per GB
---------------------	---------------

Amazon snowball - A storage optimized device that is highly secure and tamper proof. It also greatly increases performance and large transfer speeds. The pricing of the Snowball includes a per-day fee, plus an on-demand job fee. The cost of the device is \$300 for ten days, shipping included. A \$30 dollar fee is charged for each day of usage past the 10th day.

Amazon snowmobile- Similar to the snowball in function, this device works to quickly transfer large amounts of data, retrieve data, and protect data.

Cost- Provisioned Snowmobile Capacity - \$0.005/GB per month

5.

	Transfer rate	10 gb transfer time	1 eb transfer time
Wd black	227	44.05 s	$4.405 \cdot 10^9$
Wd blue	150	66.67 s	$66.67 \cdot 10^9$
Wd red	210	47.62 s	$4.762 \cdot 10^9$
Wd gold	249	40.16 s	$4.016 \cdot 10^9$
SSD	560	17.86 s	$1.786 \cdot 10^9$
Max Sata	600	16.67 s	$1.667 \cdot 10^9$
House download	6.8	1470.59 s	$1.47059 \cdot 10^{11}$
House upload	2.775	3603.6 s	$3.6036 \cdot 10^{11}$

6. surface area of sphere =  $4\pi r^2$

$$4\pi(6371000)^2 = 5.1006447191 \times 10^{14} = A$$

$$A/3 = 1.7002149064 \times 10^{14} \times 3 = 5.1006447191 \times 10^{14} \text{ bytes per day}$$

$$365 \times 5.1006447191 \times 10^{14}$$

$$1.8617353225 \times 10^{17} \text{ bytes in one year} = 186.17 \text{ PB}$$

For one years' worth of photos of the earth on google earth will be 186.17 PB if each day has a new picture of the earth