Disk Preparation

This process includes some required tasks such as formatting the drive and creating a partition in which to install the system, and, if you are implementing RAID, the setup of the RAID array.

RAID Types

RAID stands for Redundant Array of Independent Disks.

It's a way of combining the storage power of more than one hard disk for a special purpose such as increased performance or fault tolerance.

Due to the methods used to provide fault tolerance, the total amount of usable space in the array will vary.

RAID 0

- RAID 0 is also known as *disk striping*.
- This is a form of RAID that doesn't provide fault tolerance.
- Data is written across multiple drives, so one drive can be reading or writing while the next drive's read/write head is moving. This makes for faster data access.
- In RAID 0, since there is no fault tolerance, the usable space in the drive is equal to the total space on all the drives.

RAID 1

- RAID 1 is also known as *disk mirroring* .
- This is a method of producing fault tolerance by writing all data simultaneously to two separate drives.
- Disk mirroring doesn’t help access speed, and the cost is double that of a single drive.
- RAID 1 repeats the data on two drives, only one half of the total drive space is available for data.

RAID 2

- which is rarely used in practice, stripes data at the bit (rather than block) level, and uses a Hamming code for error correction.

RAID 3

- which is rarely used in practice, consists of byte-level striping with a dedicated parity disk. One of the characteristics of RAID 3 is that it generally cannot service multiple requests simultaneously,

RAID 4

- Consists of block-level striping with a dedicated parity disk. As a result of its layout, RAID 4 provides good performance of random reads, while the performance of random writes is low due to the need to write all parity data to a single disk,

- An advantage of RAID 4 is that it can be quickly extended online, without parity recomputation, as long as the newly added disks are completely filled with 0-bytes.

RAID 5

- RAID 5 combines the benefits of both RAID 0 and RAID 1
- Is known as *striping with parity* .
- It uses a parity block distributed across all the drives in the array.
- A minimum of three drives is required.
- RAID 5 uses 1/ *n* (*n* = the number of drives in the array) for parity information (for example, one third of the space in a three-drive array), and only 1 – (1/ *n*) is available for data.

RAID 6

- **RAID 6** is also known as Striping with double parity.
- RAID 6 is like RAID 5, but the parity data are written to two drives. That means it requires at least 4 drives and can withstand 2 drives dying simultaneously. The chances that two drives break down at exactly the same moment are of course very small.
- Like with RAID 5, read data transactions are very fast.
- If two drives fail, you still have access to all data, even while the failed drives are being replaced. So RAID 6 is more secure than RAID 5.

RAID level 10– combining RAID 1 & RAID 0

- It is possible to combine the advantages (and disadvantages) of RAID 0 and RAID 1 in one single system. This is a nested or hybrid RAID configuration. It provides security by mirroring all data on secondary drives while using striping across each set of drives to speed up data transfers.

- If something goes wrong with one of the disks in a RAID 10 configuration, the rebuild time is very fast since all that is needed is copying all the data from the surviving mirror to a new drive. This can take as little as 30 minutes for drives of 1 TB.

- Half of the storage capacity goes to mirroring, so compared to large RAID 5 or RAID 6 arrays, this is an expensive way to have redundancy.

- Which RAID type is also called mirroring?
- **A.** RAID 0
- **B.** RAID 1
- **C.** RAID 3
- **D.** RAID 5

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- **B. RAID 1**
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- D. RAID 5