

2.1 Storage Technologies

The user's lifestyle pertaining to computers may revolve around publishing documents, creating presentations, media management, networking on the Internet, and much more. In correlation with their wants and needs, there's the need to be able to have access to storage of the data being produced.

Storage is also referred to as 'memory', as it can be any type of hardware that's functionality includes, storing data, maintaining downloaded files along with extracting files as well. This can be performed through both permanent and temporary storage along with being internal to a device, or external.

Benefits

Cost-efficient

Speed

Enhanced efficiency.

Storage media is the hardware in which information is physically stored. Example- Actual CD/DVD disk itself or the memory within your computer known as Random Access Memory (RAM). Storage Device- e.g., CD/DVD drive in which you place your disks when inserting them into your computer or your flash drive reader.

2.2 RAID

The full form of RAID is Redundant Array of Independent Risks. Basically, the RAID was defined as redundant array of inexpensive disks, but as of now it is known as Redundant Array of Independent Risks.

RAID is a storage system which uses multiple disks, combined into one, to improve overall performance, and to increase storage capacity in a system.

Before RAID there was only single disk drive is used for storage. But RAID allows you to store the same data redundantly in a balanced way to improve overall performance.

RAID mainly used on server side. RAID is method of combining multiple hard disks into single logical array for better data availability, this gives high level of performance and reliabilities. Redundant disks are used to store parity bits.

RAID allows you to have group of disks that frame as one logical disk on your system, this provides magic background in the system. So you can have speed, redundancy, etc. There is

different configuration for hardware and software. RAID[1] has level0, level1-----level10. (It is a nested RAID level (1+0) or hybrid. Hence RAID[2] is used multiple hard disk so if one disk fails it doesn't affect another disk. RAID is used in all kind of critical applications like Aircraft Control System, etc. It saves your business from critical data lost and it is considered as protection for your data.

When computer people talk about RAID, they generally refer to RAID-5. RAID-5 includes a rotating parity array. (This means if there are 4 disks in an array, data is written to 3 of the disk units and space on the 4th drive is used for parity- or a way to validate the data so that if a drive in the array fails, the data can be reconstructed on the remaining 3 devices). Thus, all read and write operations can be overlapped. RAID-5 stores parity information but not redundant data. RAID-5 requires at least three and usually five disks for the array. It's best for multi-user systems in which performance is not critical or which do few write operations.

ADVANTAGES

1. Data Mirroring allows fault tolerance data access.
2. Data Stripping allows high speed data access.
3. Data Mirroring also enables reliability and data recovery.
4. Error and parity bits are also used.

DISADVANTAGES

1. It is expensive.
2. Mainly RAID is very complex to implement.
3. Data Mirroring results in redundancy disks.
4. Writes are lower than read operations.

2.3 RAID Technologies

Data Mirroring

Mirroring is another form of RAID-RAID1 for the purist. Mirroring consists of atleast 2 disks drives that duplicate the storage of data. More frequently, you will see 2 or disk units on each array so duplicate data is sent to the second array of disks. As such, if 1 disk drive fails in the first array, the system fails over to the second array of functional drives so the system can continue to operate. This gives you continuous operation while you wait to have the failed drive repaired and re-instate mirroring.

STRIPPING In RAID arrays

When you use stripping to write data to the hard disk drives in a RAID array, you divide the data (in stripes) across the various drives. A RAID 0 array uses two or more hard drives and

stripes data across all drives. This provides the greatest performance and efficiency. The smaller the stripes, the faster an array.

However, many experts say RAID 0 is not true RAID array, since it lacks the crucial element of redundancy. One failed hard drive in an array could mean the need for emergency data recovery services.

You can also use striping techniques with mirroring to deliver a boost in performance and stability which brings us to a second term commonly used in RAID technology: Mirroring. You can combine striping and Mirroring techniques as long as you have an even number of hard disks drives in your RAID array.

This creates a RAID system that is both stable and faster than a single hard drive