

Data Backup



■ Data is the **heart** of any organization; data loss can be costly as it may have financial impact to any organization

■ Backup is the process of making a **duplicate copy** of critical data that can be used for restore and recovery purposes when the primary copy is lost or corrupted either accidentally or on purpose

■ Data backup plays a **crucial role** in maintaining business continuity by helping organizations recover from IT disasters such as hardware failures, application failures, security breaches, human error, and deliberate sabotage

Backup Strategy or Plan

- Identify critical **business data**
- Select **backup media**
- Select **backup technology**
- Select appropriate **RAID levels**
- Select an **appropriate backup method**
- Choose the **backup location**
- Select the **backup types**
- Choose the **right backup solution**
- Conduct a recovery **drill test**

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RAID (Redundant Array Of Independent Disks) Technology



- RAID is a method of combining multiple hard drives into a single unit and writing data across several disk drives that offers **fault tolerance** (if one drive fails, the system can continue operations)
- Placing data on **RAID disks** enables input/output (I/O) operations to overlap in a balanced way, improving system performance, simplifying the storage management, and protecting from data loss
- RAID represents a portion of computer storage that can divide and replicate data among several drives working as **secondary storage**
- RAID has six levels: RAID 0, RAID 1, RAID 3, RAID 5, RAID 10, and RAID 50, to function effectively. All the RAID levels depend on the below storage techniques:
 - Striping
 - Mirroring
 - Parity



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Advantages and Disadvantages of RAID Systems



Advantages

- RAID offers **hot-swapping** or **hot plugging** i.e. system component replacement (in case a drive fails) without affecting **network functionality**
- RAID supports **disk striping**, resulting in an improvement of read/write performance as the system completely utilizes the processor speed
- Increased RAID **parity checks** prevent a system crash or data loss
- Increased data **redundancy** helps restore data in the event of a drive failure
- RAID increases **system uptime**



Disadvantages

- RAID is not compatible with some **hardware** components and **software** systems e.g., system imaging programs
- RAID data is **lost** if important drives fail one after another e.g., in the case of RAID 5, a drive that is exclusive for parity cannot recreate the first drive if a second drive fails too
- RAID cannot protect data and offer performance boosts for all applications
- RAID **configuration** is difficult

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RAID Level 0: Disk Striping



- RAID Level 0 splits data into blocks and written evenly across **multiple hard drives**
- Disk Striping improves I/O performance by spreading the **I/O load** across many channels and disk drives
- Data recovery **is not possible** if a drive fails
- It requires a minimum of **two drives**
- It does not provide **data redundancy**



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