**Understanding RAID Technology Exercise**

**Learning Goal – develop an understanding of RAID technology, what it is and how it is used.**

**Please carry out some research into RAID technology and answer the following questions.**

1. **What is RAID technology?**

**A:** RAID, also known as redundant array of independent disks, is a method used to store data across multiple hard disks or solid-state drives (SSDs) in order to safeguard against potential disk drive failures.

1. **What is its purpose?**

A: Safeguard against potential disk drive failures.

1. **How does it work?**

**A:** RAID functions by distributing data across multiple disks and allowing overlapping input/output operations, resulting in improved performance. It also increases fault tolerance by utilising redundant data storage, which extends the average time between failures.

From the perspective of the operating system, RAID arrays are seen as a single logical drive.

RAID utilizes two techniques: disk mirroring and disk striping Each disk's storage capacity is divided into units of varying sizes, ranging from 512 bytes to several megabytes. The data stripes from all the disks are interleaved and addressed sequentially. It is also possible to combine disk mirroring and disk striping in a RAID array.

1. **What are RAID levels?**

**A:** RAID devices use different versions, called levels. The original paper that coined the term and developed the RAID setup concept defined six levels of RAID, 0 through 5. This numbered system enabled those in IT to differentiate RAID versions.

* RAID 0 stripes data for performance.
* RAID 1 mirrors for redundancy.
* RAID 2 uses bit-level striping.
* RAID 3 employs byte-level striping with dedicated parity.
* RAID 4 uses block-level striping with a dedicated parity disk.
* RAID 5 combines striping with distributed parity for both performance and fault tolerance.

1. **What is striping?**

**A:** Disk striping divides data across multiple disks.

1. **What is mirroring?**

**A:** Disk mirroring involves duplicating identical data onto multiple drives.

1. **What is parity?**

**A**: A method used in certain RAID configurations to provide fault tolerance and data protection. RAID parityis employed to ensure that data can be recovered in the event of a disk failure.

In a RAID array, data is distributed across multiple disks. Parity information is generated and stored alongside the data on these disks.

**References:**

[**https://www.techtarget.com/searchstorage/definition/RAID**](https://www.techtarget.com/searchstorage/definition/RAID)[**https://www.router-switch.com/faq/what-is-parity-in-raid-and-how-parity-works.html**](https://www.router-switch.com/faq/what-is-parity-in-raid-and-how-parity-works.html)