Module 3: Exercise 1

RAID

Business Profile:

A telecom company, involved in mobile wireless services across the country, has about 5000 employees worldwide. This company has 7 regional offices across the country. Although the company is financially doing well, they continue to feel the competitive pressure. As a result, the company needs to ensure that the IT infrastructure takes advantage of fault tolerant features.

Current Configuration and Challenges:

- The company uses different applications for communication, accounting, and management. All the applications are hosted on individual servers with disks configured as RAID 0.
- All financial activity is managed and tracked by a single accounting application. It is very important for the accounting data to be highly available.
- The application performs around 15% random write operations and the remaining 85% are random reads.
- The accounting data is currently stored on a 5-disk RAID 0 set. Each disk has an advertised formatted capacity of 200 GB and the total size of their files is 730 GB.
- The company performs nightly backups and removes old information — so the amount of data is unlikely to change much over the next 6 months.

The company is approaching the end of the financial year and the IT budget is depleted. It won't be possible to buy even one new disk drive.

Tasks:

1. Recommend a RAID level that the company can use to restructure their environment fulfilling their needs.
2. Justify your choice based on cost, performance, and availability of the new solution.

Solutions:

First, look at the formatted capacity of the disks. A 200 GB disk holds only 186.3 GB of user data. The total size of customer data is 730 GB, which will fit on 4 disks. Therefore, we can consider a solution which uses parity-based RAID – RAID 3 or RAID 5. RAID 3 is useful only in environments where data access will be in large, sequential blocks; so we exclude it here. RAID 5 is the only solution that will not require purchasing of extra disks. As the proportion of writes does not exceed 25%, RAID 5 should perform reasonably well.

We recommend reconfiguring the disks as a RAID 5 set.

RAID level to use:	RAID 5
Advantages:	Low cost of data protection
Disadvantages:	High overhead due to rebuilt operation if a disk fails.