**Topic: Data Backup**

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Class Fundamental Concept of Data Security


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## Abstract

Data backup is a part of type data security, it’s providing a safeguard against data loss due to accidental deletion, hardware failure or cyber attack or it can sometime a damage from nature. This assignment is aims to analyze backup strategy including **incremental**, **decremental**, and **full back-up**. The report evaluates these technique to show how they improve data access and ensure operation run smoothly. It emphasizes the need for reliable backup systems as key parts of a strong data.

## Content



## 1. Introduction

In today's technology-driven world, life has become easier as it helps reduce work stress and handle daily needs, whether for personal life, work, or school. It's clear that saving important files like documents, photos, videos, and other essential data is very useful for the future. To protect these files and prevent losing them, people rely on techniques like **data backup** and **data recovery.**

## 2. What is data backup?

**Data backup** is the process of copying important files to a safe place, like the cloud or another device, so they can be recovered if something happens to the original files.

### 2.1. Why do we need data backup?

- Students

Data backup is very important, especially for students. It lets us store important files safely using cloud storage or backup software. This ensures we can access them later without worrying about losing them or accidentally deleting them.

- Employee/ Worker

Employees need to use data backup to protect important work files from being lost or damaged. It helps them recover data quickly if something goes wrong, like accidental deletion or a computer crash. Backing up data also ensures business continues smoothly and meets security requirements. It prevents the loss of important information and allows recovery in case of accidents or disasters.

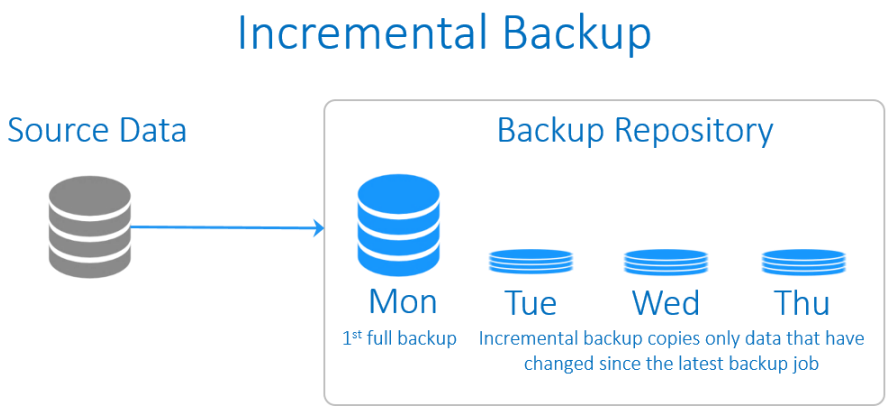
## 3. Methodology

One of the best ways to protect data from being lost or damaged is by using a good backup strategy. A backup plan involves copying and storing data in safe places, so it can be restored if something goes wrong, like system failure, accidental deletion, or a cyberattack. There are three main types of data backup methods: **Full Backup**, **Incremental Backup**, and **Differential Backup**. Each method has its own benefits and is useful in different situations. (Tech Target)

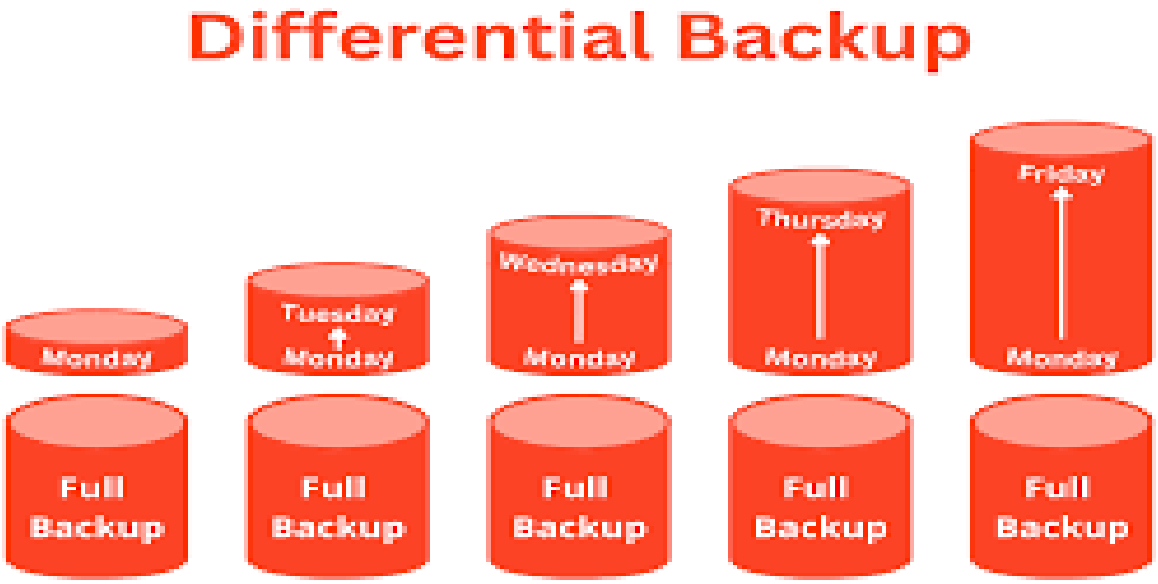
- **Full Backup:** it is a full copy of your entire data set. For example: You have 10 files in your folder: 5 photos, 3 homework assignments, and 2 school reports. A full backup will copy all 10 files to a safe location. If you lose a file or your computer crashes, you can restore the entire folder and get all 10 files back, exactly as they were.


- **Incremental Backup:** is a way to increase backup speed and decrease the storage space that it takes to do a full backup, and it only backup the data that has changed since the previous backup. For example: on Monday, you back up all 5 files. On Tuesday, you change one file, so the backup only saves that changed file. On Wednesday, you change

another file, and the backup saves just that one. Each day, the backup only saves the new or changed files, which makes it faster and uses less storage. To restore everything, you need the first full backup and all the incremental backups since then.




- **Differential Backup:** it is similar to an incremental backup in that it starts with a full backup and after it backup only contain data that has changed. For example: on Monday, you back up all 5 files. On Tuesday, you change one file, so the backup saves that file. On Wednesday, you change another file, and the backup saves both the new and changed files from Tuesday and Wednesday. Each day, the backup includes all the changes since the last full backup, not just the most recent ones. To restore everything, you need the first full backup and the latest differential backup.



# IN CASE YOU ARE WONDERING AND ASKING ME, BONG, what if in first day I do backup 3 files only, what happen in second day?

Remember: here is the explanation you back up only 3 files, this is your full backup in day one. Day2 you want to make some change in file2 or file4 the differential backup will save file2 and file4 because those files have changed since the first backup. On day3 you changed file3 and file5, the differential backup will save file 2,3,4,5 because these file have changed since the first backup. **To Restore your data:** you need to save all those file 1,2,3,4 and 5.

## 3.1. Different between Incremental and Differential Backup

**Incremental Backup**

An incremental backup saves only the changes made since the last backup, whether it was a full or incremental backup. For example:

- **Day 1:** You back up 3 files.
- **Day 2:** You change 1 file, and the backup saves only that 1 changed file.
- **Day 3:** You change another file, and the backup saves only that file.

Each day, only the files that have changed since the last backup are saved.

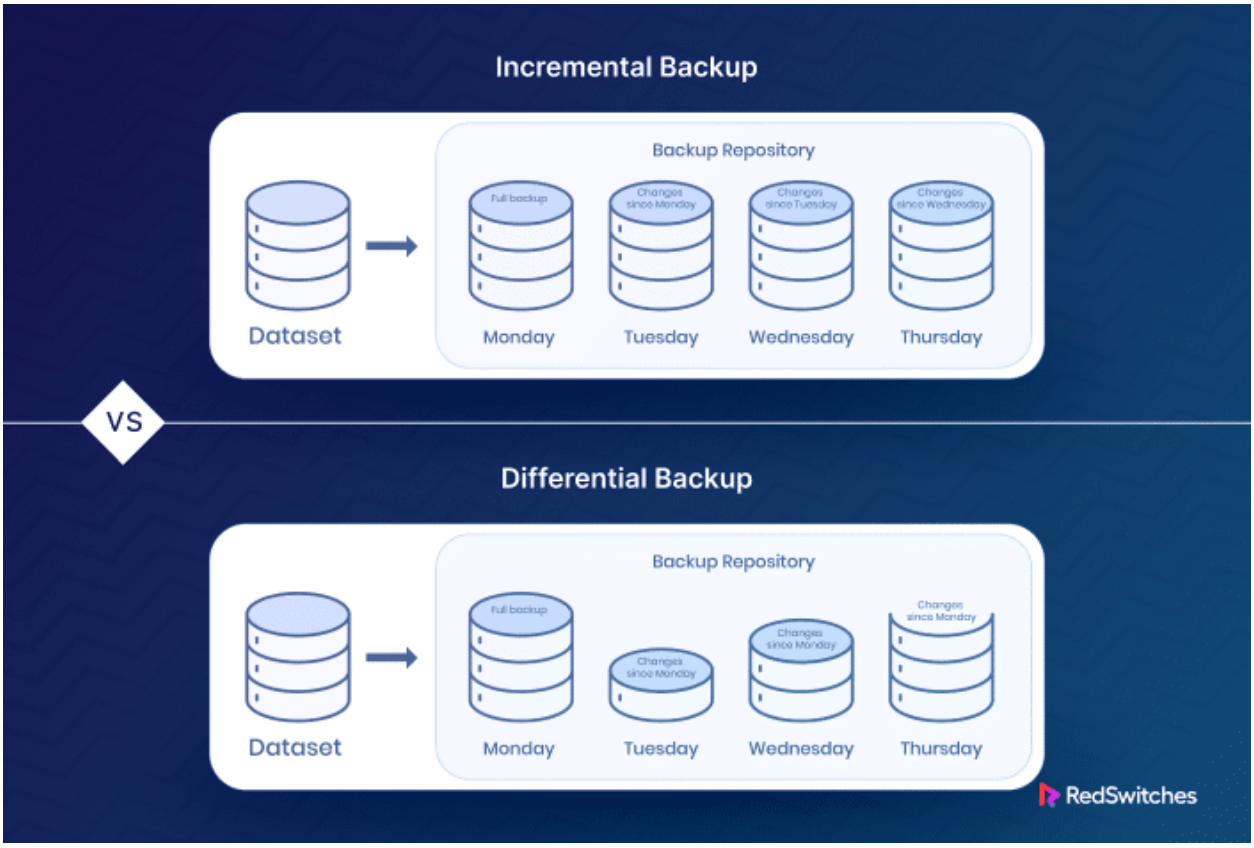
**Differential Backup**

A differential backup saves all changes made since the last full backup. For example:

- **Day 1:** You back up 3 files.
- **Day 2:** You change 1 file, and the backup saves that file.
- **Day 3:** You change another file, and the backup saves both the new file and the previously changed file.

Each day, the backup saves all changes since the full backup, not just the most recent changes.

The image below will help you understand the process and different between these two method:




### 3.2. Cloud Services


Cloud services like AWS, Google Cloud, Microsoft Azure, and Oracle help store your data safely on the internet instead of on your computer. They automatically back up your files, so if something goes wrong, like losing your files, you can easily get them back. These services keep your data

in different places to make sure it doesn't get lost, and they protect your information by locking it up with security. They also let you store lots of data without running out of space. Basically, they make sure your important files are safe, easy to access, and protected.

## 4. Conclusion

Backing up your data is like wearing a helmet when riding a bike it might seem unnecessary, but it can save you from a big headache! Whether it’s full, incremental, or differential backups, having a good plan helps protect your files from getting lost, deleted, or attacked by cyber villains. Cloud services are like your digital safety net, making sure your stuff is always safe and easy to get back if something goes wrong. So, don’t skip the backup it's your best friend when technology decides to be a little too adventurous.

## 5. Reference

**Chicago Style (Notes and Bibliography)**: TechTarget. "Data Backup Types Explained: Full, Incremental, Differential, and Incremental Forever Backup." *SearchDataBackup*. Accessed December 30, 2024. https://www.techtarget.com/searchdatabackup/tip/Data-backup-types-explained-Full-incremental-differential-and-incremental-forever-backup.