**Objective**

To understand disaster recovery principles, explore backup methods, and simulate failover scenarios in IT systems to maintain business continuity.

**Tools and Software Used**

* VMware Workstation and Oracle VirtualBox
* Windows Backup & Linux rsync
* External USB Drive (offsite backup)
* Windows 10 and Ubuntu (Admin Access)
* Notepad (for DR Plan), Optional: Keepalived demo

**Lab Tasks & Results**

**Task 1: Backup Simulation**

**Full Backup (Windows):**

* Used Windows File History to back up Documents and Desktop folders.
* Saved backup to external USB.

**Incremental Backup (Linux):**

rsync -av --delete ~/projects /mnt/backup/projects

* Only modified files were updated.

**Restore:**

* Recovered backed-up files to a new folder (/home/testrestore) and verified integrity.

**Task 2: Failover Demonstration**

**Environment Setup:**

* Created two VMs: Primary-Server and Backup-Server.
* Hosted static webpage and files on both.

**Simulation:**

* Shut down Primary-Server.
* Switched IP access to Backup-Server manually.
* Verified services remained available.

**Task 3: Basic Disaster Recovery (DR) Plan**

**Document Summary:**

* **Assets Protected:** File server, Web server, Admin PC
* **RTO (Recovery Time Objective):** 4 hours
* **RPO (Recovery Point Objective):** 12 hours
* **Backup Strategy:**
  + Daily incremental using rsync
  + Weekly full backup (USB + Google Drive)
* **Failover Plan:**
  + Switch DNS to backup server
  + Notify IT support group via SMS/email

**Expected Outcomes Achieved**

* Understood backup types and 3-2-1 strategy
* Performed file backup and recovery on Windows/Linux
* Simulated basic failover with dual virtual machines
* Drafted disaster recovery checklist and response flow

**Assessment Questions & Answers**

1. **What is the difference between RTO and RPO?**  
   ➤ **RTO** is how long it takes to recover; **RPO** is how much data can be lost.
2. **Name and describe three types of backup strategies.**  
   ➤ **Full Backup:** Entire system  
   ➤ **Incremental Backup:** Only recent changes  
   ➤ **Differential Backup:** Changes since last full backup
3. **What is the purpose of a failover system?**  
   ➤ To automatically or manually switch to a backup system in case of failure.
4. **Why is the 3-2-1 backup rule important?**  
   ➤ Ensures redundancy: 3 copies, 2 storage types, 1 offsite to protect against loss.
5. **List two common tools used in disaster recovery planning.**  
   ➤ rsync, Windows Backup, Pacemaker (Linux), and cloud platforms like AWS S3/Glacier.