Govt. Graduate College for Women Gujranwala

Bs.4-year Program: 8th Semester---2025   Roll No.………….

Paper: Virtual System and services   Course Code:DI-421L

Marks: 50

Q.1.   Use VM ware or Virtual box.
- Create new virtual machine.
- Why we use hypervisor .
- Write the configration of both types of hypervisors (hosted and bare metal)

Q.2   Implement the following.

- Installation of hadoop .
- Create steps of creating oracle account.
- Write the use of github.
- How we clone git with cloud.

Q.3.   What is the concept of containerization? How it important in actual deployment.

Solution

Q.1. Virtualization with VMware or VirtualBox

Create New Virtual Machine

You can use either **VMware Workstation** or **VirtualBox**. Here's how:

Using VirtualBox:

1. **Open VirtualBox**
2. Click **"New"**
3. Enter **Name**, e.g., *UbuntuVM*
4. Select **Type: Linux** and **Version: Ubuntu (64-bit)**
5. Allocate memory (e.g., 2048 MB)
6. Create virtual hard disk (VDI, dynamically allocated, e.g., 20 GB)
7. Add Ubuntu ISO in **Storage settings**
8. Click **Start** to install OS

Why We Use Hypervisor

A **hypervisor** is software or hardware that creates and runs **virtual machines (VMs)**. It allows one physical machine to host **multiple operating systems** at the same time.

Uses of a Hypervisor:

- Save hardware cost
- Test different OS without rebooting
- Provide isolated environments
- Improve security and resource utilization

Configuration of Hypervisors

1. Hosted Hypervisor (Type 2)

2. Bare-Metal Hypervisor (Type 1)

(Done it from theoretical part)

Q.2. Hadoop, Oracle, GitHub, and Cloud Cloning

Installation of Hadoop (on Ubuntu)

1. **Install Java:**
2. sudo apt update
3. sudo apt install openjdk-11-jdk
4. **Download Hadoop:**
5. wget https://downloads.apache.org/hadoop/common/hadoop-3.3.6/hadoop-3.3.6.tar.gz
6. **Extract Hadoop:**
7. tar -xzvf hadoop-3.3.6.tar.gz
8. mv hadoop-3.3.6 ~/hadoop
9. **Set Environment Variables (in .bashrc):**
10. export HADOOP_HOME=~/hadoop
11. export PATH=$PATH:$HADOOP_HOME/bin
12. **Apply changes:**
13. source ~/.bashrc

Steps to Create Oracle Account

1. Go to https://www.oracle.com
2. Click on **"Sign In"** → **"Create Account"**
3. Fill the following:
   a. Full name
   b. Email address
   c. Country
   d. Password
4. Accept terms and conditions
5. Click **Create Account**
6. Confirm email from your inbox

Use of GitHub

GitHub is a **platform for version control and code sharing** using **Git**. It helps:

- Store source code online
- Collaborate with team members
- Track changes in code
- Backup and restore code history
- Contribute to open-source projects

How to Clone GitHub Repo with Cloud Shell (Google Cloud)

1. **Open Cloud Shell**
2. **Authenticate your GitHub if needed**
3. **Clone Repository:**
4. git clone https://github.com/username/repo-name.git
5. cd repo-name
6. Make changes or deploy the project on the cloud

Q.3. Concept of Containerization and Its Importance

What is Containerization?

Containerization is the method of **packaging software code and all its dependencies** (libraries, frameworks, configs) into a **single container**.

These containers:

- Run in isolated environments
- Can be deployed anywhere (Linux, Windows, Cloud)
- Use Docker, Podman, or Kubernetes

Importance in Deployment

- **Portability:**
  Containers can run on any system (laptop, server, cloud) without changes.
- **Consistency:**
  Same environment for development, testing, and production.
- **Efficiency**:
  Uses less memory and starts faster than virtual machines.
- **Isolation**:
  Each app runs in its own container, reducing conflict.
- **Scalability**:
  Easily scale apps using container orchestration (e.g., Kubernetes)
- **Deployment**:
  Quickly deploy, update, and rollback versions.