Objective:

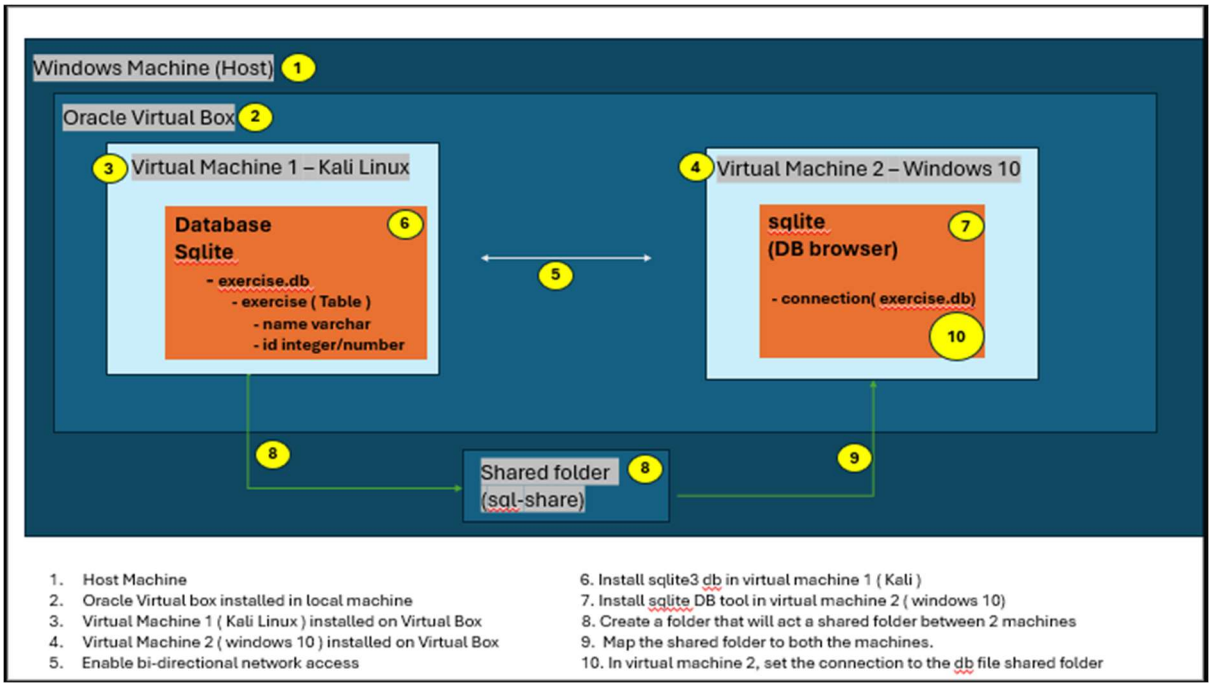
Create and configure multiple Virtual Machines (VMs) using VirtualBox, establish a network between them, and deploy a microservice-based application across the connected VMs.

Implementation Steps:

1. Installation of oracle virtual box
2. Identifying the VM type to be installed in the Virtual box.
3. Virtual Machine 1: Choose Kali linux
    a. Download kali linux iso image to local machine
    b. Proceed with the installation of kali linux inside virtual box
    c. Ideal configuration and verify login (**4 GB RAM, 2 cores, 20 GB storage, Debian distribution (64-bit), Network: Bridged adapter**)
4. Case -2: Choose windows10
    a. Download windows 10 iso image to local machine
    b. Proceed with the installation of windows 10 inside virtual box
    c. Choose ideal configuration and verify login (**6 GB RAM, 2 cores, 20 GB storage, Windows 10 (64-bit)**)
5. Choose micro-service:
    a. Download sqlite3 and install it inside VM1
    b. Create permanent database (exercise.db). sqlite3 by default shows up in-memory database.
        i. Inside terminal enter
        sqlite3 exercise.db
    c. Login to database and create table called exercise1 and insert records
6. Install sqlite db browser in the other virtual machine 2 (windows)
7. To enable database as a micro-service to be accessed between the 2 virtual machines.
    a. Create a shared-folder called sql-share in the physical windows machine
    b. Turn off both VM1 and VM2.
        i. In the VM1 and VM2 set this option **settings -> shared folders**
            1. Choose Machine Folders and auto-mount
        ii. Move the .db file inside virtual machine1 to the shared folder.
            1. Execute command that will provide necessary permission
            sudo usermod -aG vboxsf $USER
            2. Copy the .db file from the local folder within VM1 to the shared folder
            cp /home/vm1-kali-admin/Downloads/exercise.db /media/sf-sql_share/
    c. In the VM2, open sqlite DB application
    d. Choose the exercise.db connection from the shared folder.
    e. Verify the table and data showing up.

f. Creating a micro-service
    i. In the virtual machine 1, create a python file (**api-test.py**) that will query the database and respond with results.
    ii. Packages used are flask and sqlite3
    iii. Execute command to launch the application
    python api-test.py
    iv. Verify the results in windows machine through browser.
    http://192.168.68.109:5000/data

Architecture Design:



GitHub Repo Link:

https://github.com/shyaamkr/VirtualizationCloudComputing