Shell Scripting

Due to 14 October 2023

Environment:
Create three VMs with Ubuntu Desktop or Fedora Workstation.
Each VM should run on a different physical machine.
VM1 – is a server machine
VM2 - is a client machine
VM3 – is a client machine

Tasks 1 – Setup:

1. The server administrator must create local user accounts for each client on the server.
2. The server administrator must install a webserver, Apache (httpd) or nginx.
3. The server administrator must install/enable SSH.
4. The clients must install/enable SSH.
5. The server administrator must install SFTP.

Taks 2 – Configure:

1. Server (VM1)
    a. Create a welcome page and add the following welcome message: “Welcome to Lab 1 of Operating Systems”.
    b. Create a webpage that can be accessed only after successfully logging in to the webserver. This task assumes that you create user accounts on the webserver.
    c. The server should log all access attempts, successful and unsuccessful.
    d. Configure SSHD server such that clients can access the webserver via their local accounts, using username and password.
    e. Configure SFTP server such that clients can upload/download files on the server machine.
    f. Configure local DNS on the server VM such that 8.8.8.8, or 8.8.4.4 is used as the default DNS server permanently.
2. Clients (VM2 and VM3)

a. Configure/Enable SSH client to be able to access the webserver via network.
b. Configure/Enable SFTP client to be able to upload/download files on the server.
c. Continually test connectivity to VM1 (server VM) by using ping every 5 minutes. Store by using SCP the file named "connectivity" in VM1 under /home/username/heartbeat folder. The file should contain all connectivity tests.
d. The client should store a new file every hour on VM1 (the server) by using SCP the following information: Disk usage, CPU usage, Memory usage, Current running processes, and Network utilization. The information should be stored under /home/username/usageinformation/, and the file should be named with the current time (day-hour-minutes-seconds).
e. Configure SFTP such that clients can upload/download all the labs sheets on their reserved location at VM1 (server).
f. Configure local DNS on each client VM such that 8.8.8.8, or 8.8.4.4 is used as the default DNS server permanently.

Task 3 – Automation:

1. Run on each physical machine a fresh, live Fedora VM: VM1 (server), VM2 (client), VM3 (client).
2. Create a bash script for the server and for the client(s) that automates all the steps from task 1 and the following steps from tasks 2:
   a. The steps d), e) and f) on the server.
   b. All the steps on the client.
3. Make the bash script executable.
4. Execute the bash script to test the setup and the configuration.

Instructions & Deliverables: Please read carefully

1- In MS-Word document submit the following:
   - Cover page includes necessary details of the group members (Student Name, Student ID)
   - In a table format, specify each group member tasks and the contribution percentage into the project.
2- Submit your scripts with the MS-Word document on the Blackboard in one zipped file no later than **the below due date**
   Due to 14 October 2023
   Call the Zip file (StuentNAME1_StudentNAME2_StudentNAME3_StudentNAME4)
3- Copying and/or plagiarism (-100%) which includes:
   Inappropriate interaction with any other student, outside agency, website, or software that generates assessment responses.
4- Shell Script should be error free (Errors) (-25%).
5- In case of late submission, (-10%) for each day of delay (Max 3 days delay).
6- A group of three to four students can work on the project.
7- Team members are required to meet regularly for discussion and workload distribution.
8- It is the right of the instructor to use any way of testing the student in the discussion and demo session, and according to that in some cases (100%) graded project may be down to (-100%) graded project.
9- Discussion & Demo 50%. + Student Work 50%.