INFO-5094 LAMP2 Winter 2019
Lab 1 – Building a LAMP Server

Due: Friday, 1st February 2019 by 11:59 p.m. No late submissions or re-submissionswill be accepted.

Please remember that plagiarism is not tolerated.

Follow the instructions below carefully. You will lose marks for both errors and not following instructions.

This lab requires the submission of screen shots. **Some of these screen shots can only be taken as you are doing the lab, you will have to re-do the lab if you miss them.** There is a PowerPoint presentation in the FOL drop box for the lab that you are required to put the screen shots in. Download this PowerPoint presentation before you begin the lab, it already has a slide for each screen shot you are to submit and will help prevent you from missing anything.

NOTE: This lab is written assuming the use of VMWare Workstation 12.5.9 or higher. Students may also use VMWare Fusion for Mac 8.5.10 or higher.

Use the class materials for Week 2 to help you perform this lab.

Beginning at step 14, root privileges are required for all commands. Use sudo –i to get a root shell rather than using sudo on each command.

Instructions:

1) **This step must be done on-campus, the ity-ftp.fanshawec.ca server is not available off-campus.** Download the Ubuntu 18.04 Server installation ISO from \\ity-ftp.fanshawec.ca\ftp_IA&WD\INFO-5094

Create a VM

2) Create a new virtual machine in VMWare Workstation with the following configuration using the New Virtual Machine wizard. By default, the wizard will create a single network interface for the new VM on the NAT network, do not change the default network confugration.
    a. On the Welcome page select Typical installation
    b. On the Guest Operating System Installation page select the radio button to install the operating system later
    c. On the Select Guest Operating System page, select 'Linux' and then choose 'Ubuntu 64-bit' from the drop down list.
    d. On the Name the Virtual Machine page, specify a name for your VM and the location where you want to store it. Use a name and location of your choice
    e. On the Specify Disk Capacity page, allocate 50 GB for the disk (leave the file split options as they are)
    f. On the Ready to Create Virtual Machine page, click the Customize Hardware button and change the memory allocation to 4 GB and the total number of processor cores to 4. Close the Hardware window and then click Finish to create the VM.
3) Right click on the name of the new VM in the list on the left side of the VMWare window and select settings. The Settings dialog will open.

4) Take a screen shot of the first page of the Settings dialog and put it in the PowerPoint presentation as slide 1. (Fusion users need to take 2 screen shots, one of the General pane and one of the Processor and Memory pane and put them on the PowerPoint slide)

Install Operating System

5) Install the Ubuntu 18.04 Server operating system from the ISO file you downloaded using the following specifications:
    a. Choose English as the preferred language
    b. For all keyboard settings use English (US)
    c. Do not detect the keyboard layout
    d. Select the 'Install Ubuntu' option when asked what version of the operating system to install
    e. Use the default network configuration (There should only be 1 network interface listed on the Network connections screen of the installer. It should have an IP address in your NAT network address space.)
    f. No proxy server (leave the field blank).
    g. Use the default mirror address
    h. On the first disk configuration screen select 'Use Entire Disk and Set Up LVM'
    i. On the second and third disk configuration screens, select the default values
    j. On the Profile setup screen enter the following information:
        i. Enter your own full name in the 'Your name' field.
        ii. In the "Your server's name" field enter 'SRV-<yourFOLusername>' where <yourFOLusername> is your FOL user name. IMPORTANT: host names cannot contain underscore (_) characters, if your FOL username contains an underscore, replace it with a hyphen.
        iii. In the 'Pick username' field, enter your first name
        iv. Enter and confirm a password (make sure you know what it is, you will need it later)
    k. On the 'Featured Server Setups' screen DO NOT select any options.
    l. Select 'Reboot Now' on the "Installation Complete" screen to reboot the VM to the newly installed operating system. NOTE: during the reboot process you mey receive a message telling you to remove the installation media and press ENTER. If you get this message press ENTER.
6) Login to the VM using the username and password you created during the installation process.
7) Run the **df** command to see the disk partitioning from a user's perspective.
8) Run the **free** command to see how the VM's memory is being used.
9) Take a screen shot of the output of steps 7 and 8 together and put it in the PowerPoint presentation as slide 2.
10) Run the **ip addr show** command to display basic networking information. Make a note of the IP address of your VM, you will need it later. (the ip address should begin 192.168)
11) Run the **route** command to show network routing information
12) Take a screen shot of the output from steps 10 and 11 together and put it in the PowerPoint presentation as slide 3.

13) Run the command **system-resolve --status** to list DNS server information. Scroll to the end of the output from this command.
14) Take a screen shot of the output from step 13 and put it in the PowerPoint presentation as slide 4.
15) Get a privileged shell using **sudo –i**
16) Ping the gateway of your virtual network and use nslookup to test DNS name resolution using the name of your favourite web site. Make sure this step works before you go any further. If networking is not functioning properly the remainder of the lab won't work.
17) Run **apt-get update** and then **apt-get upgrade** to update the operating system software you just installed. This will take some time to complete.

Install Apache

18) Use **apt-get install apache2** to install the Apache Web Server.
19) Edit the /etc/apache2/apache2.conf file and add the ServerName directive to prevent error/warning messages when the service is started as described in the class materials.
20) Restart the web server.
21) Add the necessary firewall rules, as described in the class materials, to allow the web server to accept web requests.
22) Display the firewall rules currently in effect on your VM.
23) Take a screen shot of the output of step 22 and put it in the PowerPoint presentation as slide 5.
24) On your laptop, use a web browser to navigate to the web server installed on your VM. (http://<ip_address_of_your_vm>)
25) Take a screen shot of the top portion of the page found in step 24 and put it in the PowerPoint presentation as slide 6. Make sure you include the browser's address bar in the screen shot. The address bar must be clearly readable.

Install MySQL

26) Use **apt-get install mysql-server mysql-client** to install the MySQL server and client tools. s.
27)
28) Use the **mysql_secure_installation** command to set up the MySQL server for secure operations. Follow the prompts on the screen
    a. Use the VALIDATE_PASSWORD_PLUGIN
    b. Select option 1 for the password complexity (Low)
    c. Set the password for the MySQL root user (make sure you know what this is as you will need it later)
    d. Remove the anonymous user
    e. Do not allow remote root login
    f. Remove the test database and access to it
    g. Reload privileges
29) Change the MySQL root user's login issue as described in the course materials. Use the same password in the necessary SQL statement as used in step 27c above.
30) Start the MySQL CLI and log in as the MySQL root user.
31) Display all of the currently available databases.
32) Take a screen shot of the output of step 31 and put it in the PowerPoint presentation as slide 7.

Install PHP

33) Use the command **apt-get install php7.2-mysql php7.2-curl php7.2-json php7.2-cgi php7.2 libapache2-mod-php7.2** to install PHP on your VM. DO NOT PRESS 'Y' when prompted to confirm that you want to do the installation.
34) Take a screen shot of the output of step 33 and put it in the PowerPoint presentation as slide 8.
35) Now press 'Y' to do the installation of PHP.
36) Once the packages for PHP are installed issue the command **php –v** to check the PHP version that is installed.
37) Take a screen shot of the output of step 36 and put it in the PowerPoint presentation as slide 9.
38) Change directory to /var/www/html
39) Create a file in var/www/html called index.php and add the following line to it:
    <?php phpinfo(INFO_VARIABLES); ?>
40) Save index.php
41) Using a web browser on your laptop navigate to http://<ip_addres_of_your_vm>/index.php
42) Take a screen shot of the first few lines of output produced in step 41 and put it in the PowerPoint presentation as slide 10. Make sure that the web browser's address bar is clearly visible in the screen shot.

Submission

43) Make sure that you have put your name and student number on the title slide of the PowerPoint presentation
44) Save your PowerPoint presentation.
45) Upload your PowerPoint presentation to the FOL drop box for this lab. DO NOT ZIP the presentation.
46) After you upload the presentation, download it again to a different location on your laptop and check that you uploaded the correct file.
47) Shut down the VM
48) Close VMWare Workstation

Marking

The lab is marked out of 10 with each slide being worth 1 mark. A slide is either right or wrong, no part marks.