Lab 7

LAMP Server

# Goal

In this lab, you will learn how to do a basic install and configuration of the Apache Web server, MySQL Database, and PHP.

**Rubric:**

Below is the rubric. Items in the rubric should be demonstrated to the TA; there will be no separate iLearn code submission.

* Install httpd and serve a simple index.html page - 2 points
* Disable symbolic links feature in apache - 2 points
* Configure apache to serve php pages - 2 points
* Write some basic php code that connects and retrieves contents from a database - 4 points

# Procedure

LAMP stands for Linux, Apache, MySQL and PHP, which is a very common combination platform for Web Programming.

You will need to install the [Apache Web Server](http://www.apache.org/), [MySQL](http://www.mysql.org/), and [PHP](http://www.php.net/) on your virtual machine. Then you will verify that you installed and configured them correctly by using the browser on the host machine to access a couple of web pages being served by your virtual machine. Note: anything that is preceded by a '$' is command that you should run in a terminal.

## Apache Web Server

* Install an Apache Web Server on your virtual machine. Guess what the package name might be? *Hint*: do "yum grouplist" to find out the name.
* Edit the config file /etc/httpd/conf/httpd.conf. Change "ServerAdmin" to your email address. You can change "DocumentRoot" to the directory that stores your homepages, but it is OK if you leave the default: "/var/www/html".
* Start the web server:

$ systemctl start httpd.service

* If there are no errors then, the web server is installed and configured correctly. Stop the web server with the command:

$ systemctl stop httpd.service

* Create a file called index.html under '/var/www/html'. Inside index.html, write some simple html code to create a header with your name and text saying “Hello World”, like the following

<html>

<body>

<h1>Your Name</h1>

<p>Hello World!!</p>

</body>

</html>

* Once you have some simple html inside index.html, start up the web server and verify that your virtual machine is serving the page by installing a text browser (elinks is our recommendation) on the guest machine and navigating to http://127.0.0.1. The output of your html code should be displayed. Demonstrate to the TA that your website

## A little bit about security

Congrats, you have just installed and configured a web server. However, your server will be open to the rest of the world, which means that you have to make sure it is secure. A simple example of things you have to watch out for follows.

* Go to /var/www/html/, make a symbolic link to /etc/passwd
* With elinks, navigate to http://127.0.0.1/passwd

Not cool, not cool at all. How do we remedy this?

* Remove option "FollowSymLinks" from httpd.conf under the section titled: <Directory "/var/www/html">
* Restart the web server
* Try navigating to 'http://127.0.0.1/passwd' again, and make sure it fails. Demonstrate to the TA.
* Use the systemctl command to add the httpd service to the startup scripts. Reboot the virtual machine to make sure the Apache Web Server starts automatically after rebooting by running the following commands, immediately after the reboot.

$ uptime; systemctl status httpd.service; systemctl list-units httpd.service

## PHP

* Install PHP on your virtual machine. Make a guess again on what the package name might be.
* Restart your Apache web server, without having to restart the system (remember how you started and stopped httpd in the previous steps?).
* Create /var/www/html/index.php with the content below:

<?php phpinfo(); ?>

* Verify that your web server is able to serve PHP pages by navigating to http://127.0.0.1/index.php using elinks in your VM. Demonstrate to the TA.

## MySQL

* You will need to install MySQL from the community repository, which means you will need to download and add the MySQL community repository to your yum first. You will need to yum install wget and then run the following commands

$ wget http://repo.mysql.com/mysql-community-release-el7-5.noarch.rpm

$ sudo rpm -ivh mysql-community-release-el7-5.noarch.rpm

$ yum update

* Install MySQL on your VM. You would need to yum install mysql-server php-mysql.
* Start the MySQL server:

$ systemctl start mysqld.service

* MySQL comes with a utility that will help harder the default installation. Run mysql\_secure\_installation and follow the hardening walkthrough
* Create a text file named mysql.txt which is a script that creates a database (cs183) and a table (grades), and then inserts some data into the table. The content is as below:

# Create a database named cs183

create database cs183;

# Select the database

use cs183;

# Create a grades table

create table grades (name varchar(20), grade integer);

# Add data into the table

insert into grades values ('Alice', 80), ('Bob', 90), ('Claire', 92), ('David', 60);

* Once you have created the script you can have mysql execute it with the following:

$ mysql < mysql.txt

* Now, create a PHP script, /var/www/html/gradebook.php, that connects to the MySQL database and retrieves the information. The code is below; note that you may need to provide a password or a different username if you locked down MySQL:

<h1>183 Gradebook</h1>

<pre>

<?php

// Connect to the MySQL db

$conn = mysql\_connect("localhost", "root") or die(mysql\_error());

// Select the cs183 database

mysql\_select\_db("cs183") or die(mysql\_error());

// SQL query

$result = mysql\_query("select \* from grades order by grade desc;") or die(mysql\_error());

// Display the result

while ($row = mysql\_fetch\_assoc($result)) {

printf("%10s: %d\n", $row["name"], $row["grade"]);

}

// Free up resources

mysql\_free\_result($result);

mysql\_close($conn);

?>

</pre>

* Restart Apache.
* From the VM, navigate to http://127.0.0.1/gradebook.php. Demonstrate to the TA.
* Use systemctl command to add mysqld service to the startup scripts. Reboot your virtual machine to make sure MySQL Server starts automatically after rebooting. Run the following commands, immediately after rebooting.

$ uptime; systemctl status mysqld.service; systemctl list-units mysqld.service

At this point, demo to the TA and you are done with the lab.

**Notes & Tips:**

You might want to ssh into your virtual machine from the host machine so you can copy & paste text.