Lab 10: Using AWS (LAMP)

Details

Aim: To create a useable AWS virtual image, with LAMP (Linux, Apache, MySql and Php).

You will be assigned a Linux image within the Amazon Cloud.

Activities

L10.1 Start the Linux image on the desktop using napier with a password of napier123. Next copy the following text, and open a text editor on the Linux image and paste the following into mykey.pem:

```
-----BEGIN RSA PRIVATE KEY-----
MIIEpAIBAAKCAQEArkjpK3ZUYTU/xDl4IlQH1osSHX2RkCQfqEhWaZu8RnoJ8Xxg/c/YIXFU+JEJ
z31Z10PDsyvWH16ZUfZc6x6YCw/XSPzE+reKaT5jsR6fW5x3Vx8WZ++WnKLr3xd+GLOTD0tG9Hp/
2xP6I9mShuCB+PGQxVxASkoGD1Lu6zLPRKPB6yCyo+R5V7Ql8Tx5L9m94560COkeSmfDHoYpDaW7
r5IgY4PgcYbUqAql0KojtiJrgBa6239fY73h1xiXyJdRRVUBKH9vKblQnG2RGFB9eghKFNs3oKuB
RbxG+PAnqTxgHUL9C6vOw6hCtDXVb+ahtp1JbhwoKsxqBCUwhckblQIDAQABAoIBAQCJc/lpjLZ5
wAxdjtGfiVRxMVeFKK5v1v2ctAhq3Cd+Eevbp7O7GXwkzAQu0fzBxuPfMZObsHv8W5hiGwIncQaK
2uB4sNoNvkmMPWdUnokiMGGytVLvf/bx7FBIr3eEtcPK8Ryx3hcOSlAijArTEyeOlb4O2XXe4Uis
N0U0++qZ/5j3SV80p+RLAEYK2Qt7xSIhWHq7bje4Ib+IPgGJDWscsbU6oCIKtg8M4UPOhn3J9tc3
mokVn2RPF8i8TiaIQ6jbHZ0rORJxmJyvmTiJRGHiDSs56C4PqNsVPpmZQedvBIT8tM/9lUnOhBCy
RuqXKmJvMp/AaQmwTRC9jyCAb1mhAoGBAPDczN5FvJYj9TPV3JWB20HTk3zV6R6shpO7KIjt4yn/
RDwSbx6Yme6RzYiQASWta6ORNeJgXas6WG9EfV8qdPD6IzZf0BPKzaNKgCz3c3XvdA/sY0+tLBMh
E8lqCozlsK2Vmk7KEw33by5xdDZ2kfEs0QknKy8ZDsJwcucqcyUJAoGBALk888kf5cMBAXPyQpx3
yqNlaetgOZ6jLUm1NaWYwmUaKxBDFl5Ze2oWLX/V/4hYnuwJmG0P2ssn02SEFH+Yc85WkGLNw/Un
mfzVKhuhaT100hotSRixfviNGzSCPBz9lXlv1OB3d8eg9cnDPbxxd930ERdvd4XLSEGMnU0E5hEt
AoGAR49iMpuHdxgBzr+4RJcLHFiO1iT7mMhrR1LwrRX4Ss7zZ+GWMAHooe+hn/Qg0x/d/f+zgald
yvSPt6cilHaZvcqjUZFP0cGMLPqCcFmobR6SXfS+YLqzgI9wQIQH1GqdfkUXTldNJ/Yeiy7b9x5t
J7lH9a80bk7EitI74SBEi3kCgYAvJq6/YVkw3A6sntwJzAxOrz/Y5DOGh+69Nl0je9Dvv0t65jjJ
Z2mcxWxrf+N9p2E8n+ymxkRhNg//JAe7uuiveyVhoRLiUmRGEVSYl+ub8yKP+zsCCBxT1Ec6hHQc
xQfJU4gSYxagP/6Qjxwl3ZQvcTLwjjUUX3xTAyH/OuH9OQKBgQCvI1mxC9hNujoZ/f22Le6uslH6
4Jk+cQTpUXBw6f3+AJPZDlVRlpJBiGZuc0eTBokIlH70W3cayTm68Opx8+39MDBxzjV8ZnKEygpj
wYdAzHPYYaH6uUSMAas9ENCFUqMbNu2os+ATbAyYJOiY6Ug5GNyQcx0JXSfM9rn7CzR7+Q==
-----END RSA PRIVATE KEY-----
```

L10.2 Next log onto the image with (where you need to specify your EWS instance):

```
ssh -i mykey.pem ubuntu@ec2-xx-xx-xx-xx.compute-1.amazonaws.com
```

L10.3 Next update your image with:

```
sudo apt-get update && sudo apt-get upgrade -y
```

Determine the some details

IP address:

DNS:

MAC address of interfaces:

Which services are running:

L10.4 Change the superuser password to napier123 with:

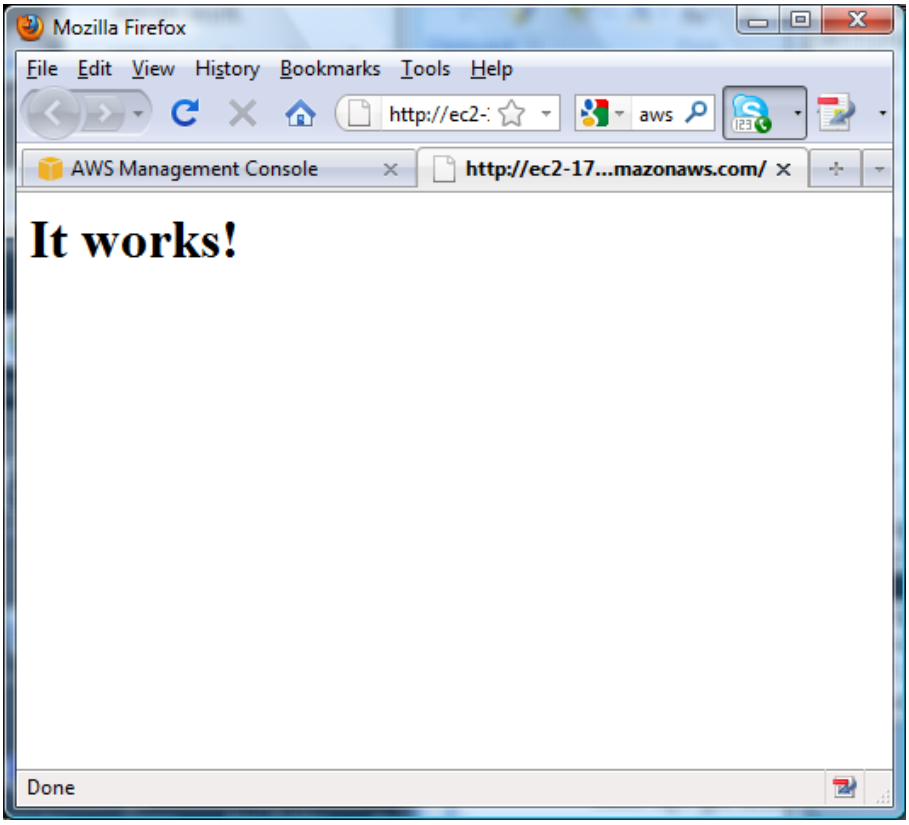
```
sudo passwd
```

Change the Ubuntu password to napier123:

```
sudo passwd ubuntu
```

L10.5 Enable the Web server with the following, and prove that you can access the Web server from inside the Linux Cloud image, and from your desktop:

```
sudo apt-get install -y apache2
```



L10.6 Go to the /var/www folder, and modify the home page so that it has a new greetings page.

L10.7 Go to the /var/log/apache2 folder, and view the log file for Web access. What information can you determine from the accesses:

Information

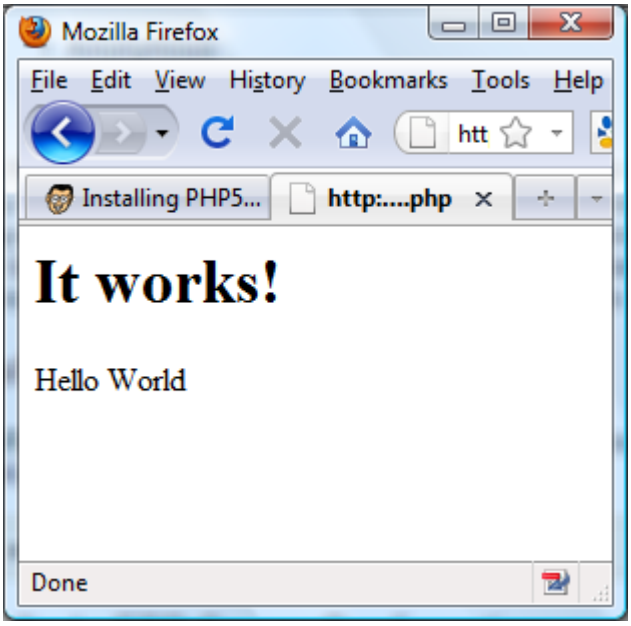
L10.8 Next install PHP with:

```
sudo apt-get install php5
sudo apt-get install libapache2-mod-php5
sudo a2enmod php5
sudo /etc/init.d/apache2 restart
```

and create a PHP file (new.php) in the /var/www folder and add:

```
<html><body><h1>It works!</h1>
<?php
print("Hello World");
?>
</body></html>
```

And test the access from your Desktop:



Next investigate the following PHP code:

```
<?php
print("<a href='php_test.php'>PHP Test</a>");
print("<br>This is an <b>important</b> example");
?>
```

```
<?php
$a = 24; # decimal number
$b = -24; # a negative number
$c = 024; # octal number
$d = 0x24; # hexadecimal number
```

```
print "<P>$a, $b, $c, $d";
$val1=1;
$val2=2;
$result=1/2;
print "<P>Result of 1/2 is $result";
?>
```

```
<?php
$name1 = "Fred ";
$name2 = "Smith";
print "Hello \"Fred\". How are you?";
print "<br>Your full name is " . $name1 . " " . $name2;
$name1 .= $name2;
print "<br>Your full name is " . $name1
?>
```

```
<?php
$today_us = date("Y-m-d");
$today_uk = date("d-m-Y");
$d_and_t = date("Y-m-d H:i:s (T)");
PRINT "Date (UK): $today_uk";
PRINT "<br>Date (US): $today_us";
PRINT "<br>Date and time: $d_and_t";
$today = getdate();
$month = $today['month'];
$mday = $today['mday'];
$year = $today['year'];
echo "<br>US Date is: $month $mday, $year";
?>
```

```
<?php
$value=0; //our variable
while($value<=10){
 print(" $value = ".($value*$value));
 print("<br />\n");
 $value=$value+1;
}
?>

<?php
for ($i=0;$i<11;$i++)
{
 $sqr_value=$i*$i;
 print "<BR>$i $sqr_value";
}
$i=0;
do
{
 $sqr_value=$i*$i;
 print "<BR>$i $sqr_value";
 $i++;
} while ($i<11);
$i=0;
while ($i<11)
{
 $sqr_value=$i*$i;
 print "<BR>$i $sqr_value";
 $i++;
}
?>
```

```
<?php
$colors = array('red','blue','green','yellow');
for ($i=0;$i<4;$i++)
{
  print "<BR>Color : $colors[$i]";
}
?>
```

```
<?php
print "<table border='1'>";
print "<tr><td>Value</td><td>Hex</td><td>Binary</td></tr>";
```

```
for ($val=0; $val<=16; $val++)
{
print "<tr><td>" . $val . "</td><td>" . dechex($val);
print "</td><td>" . decbin($val) . "</td></tr>";
}
print "</table>";
?>

<?php
$val1 = 11;
$val2 = 21;
Function Add () {
global $val1, $val2;
$val2 = $val1 + $val2;
}
function add_with_args($a,$b)
{
return($a+$b);
}


$result=add_with_args($val1,$val2);
print"<BR>Result is $result";
Add ();
print "<BR>Result is $val2";
?>

<?php
print("Browser: $HTTP_USER_AGENT <br />\n");
print("IP: $REMOTE_ADDR <br />\n");
print("Address: " . gethostbyaddr($REMOTE_ADDR));
?>
```

```
<?php
$fname = "index.html";
$dname=".";
print "<BR>Real path: " . realpath($fname);
print "<BR>Path name: " . basename($fname);
print "<BR>Dirname: " . dirname($fname);
print "<BR>Disk free space (MB): " . round(disk_free_space($dname)/1024/1024);
print "<BR>Total disk space (GB): " .
round(disk_total_space($dname)/1024/1024/1024);
print "<BR>File group: " . filegroup($fname);
print "<BR>File mode: " . fileinode($fname);
print "<BR>File owner: " . fileowner($fname);
print "<BR>File permissions: " . decoct(fileperms($fname));
print "<BR>File size (KB): " . round(filesize($fname)/1024);
print "<BR>File type: " . filetype($fname);

$str= strftime("%H:%M, Date: %d-%m-%Y ", fileatime($fname));
print "<BR>File last accessed: " . $str ;
$str= strftime("%H:%M, Date: %d-%m-%Y ", filemtime($fname));
print "<BR>File last modified: " . $str ;
if (is_readable($fname))
{
  print "<BR>File is readable";
}
else
{
  print "<BR>File is not readable";
}
if (is_writeable($fname))
{
  print "<BR>File is writeable";
}
else
{
  print "<BR>File is not writeable";
}
if (is_executable($fname))
{
  print "<BR>File is executable";
}
else
{
```

```
  print "<BR>File is not executable";
}
?>
```

L10.9 Next install Telnet from:

```
sudo apt-get install telnetd

sudo apt-get install inetutils-inetd

/etc/init.d/inetutils-inetd restart
```

L10.10 Next test that you can login in with Telnet using Putty, such as with:

```
ip-10-212-230-15 login: ubuntu
Password: napier123
Last login: Tue Mar 23 10:12:11 UTC 2010 from 5ac77477.bb.sky.com on pts/0
Linux ip-10-212-230-15 2.6.24-10-xen #1 SMP Tue Sep 8 19:06:53 UTC 2009 i686

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To access official Ubuntu documentation, please visit:
http://help.ubuntu.com/

  System information as of Tue Mar 23 10:30:01 UTC 2010

  System load: 0.0               Memory usage: 5%   Processes:       54
  Usage of /:  3.7% of 14.76GB   Swap usage:   0%   Users logged in: 1

  Graph this data and manage this system at https://landscape.canonical.com/
------------------------------------------------------------------------
At the moment, only the core of the system is installed. To tune the
system to your needs, you can choose to install one or more
predefined collections of software by running the following
command:

   sudo tasksel
------------------------------------------------------------------------
3 failures since last login.
Last was Tue 23 Mar 2010 10:32:21 AM UTC on pts/1.
```

L10.11 Install the FTP server with:

```
sudo apt-get install vsftpd
```

and login from your Desktop with an anonymous login:

```
220 (vsFTPd 2.0.6)

530 Please login with USER and PASS.
USER ubuntu
530 This FTP server is anonymous only.
USER anonymous
331 Please specify the password.
PASS w.buchanan@napier.ac.uk
230 Login successful.
PWD
257 "/"
```

By referring to:

https://help.ubuntu.com/6.06/ubuntu/serverguide/C/ftp-server.html

setup the server to allow other user logins.

L10.12 Install the MySQL with:

```
sudo apt-get install mysql-server
sudo apt-get install php5-mysql
```

and then restart with:

```
sudo /etc/init.d/apache2 stop
sudo /etc/init.d/apache2 start
```

L10.13 Next create you database with:

```
root@ip-10-212-230-15:/var/www# mysql -p  mysql
Enter password:
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 7
Server version: 5.0.51a-3ubuntu5.5 (Ubuntu)

Type 'help;' or '\h' for help. Type '\c' to clear the buffer.

Mysql>
```

Next enter the following commands:

```
create database mydatabase1;
use mydatabase1;
create table mynames (id INTEGER NOT NULL, name VARCHAR(50) NOT NULL);
insert into mynames values(1, 'fred smith');
select * from mynames;
```

and show that the output is in the form of:

```
+----+------------+
| id | name       |
+----+------------+
|  1 | fred smith |
+----+------------+
2 rows in set (0.00 sec)
```

L10.14 Create a new table named **Products**, and add the following data:

Item	Description	Price
XT311	CISSP Certification	10
XG312	CCNA Security	22
OT821	CCNP ONT	33
XP411	CCNP Route	44

L10.15 Next modify new.php to access your database (from the myname table) with:

```
<html><body>
<?
$user="root";
$password="napier123";
mysql_connect(localhost,$user,$password);
mysql_select_db('mydatabase1')
    or die('Could not select a database.');

$sql = "SELECT name FROM mynames";

$result=mysql_query($sql);
$row = mysql_fetch_array($result);
print "Showing $row[name]<hr/>";

mysql_close();

?>
</body></html>
```

L10.16 Next modify new.php so that it displays the Products table.

Toolkit

L10.17 Download **http://buchananweb.co.uk/toolkitnew.zip** and open up the solution. Next select the OS tab and the URL, and then the Show tab, double click, and add the following code to the Showhistory() method:

```
    this.dgURLCache.Rows.Clear();
           this.dgFileCache.Rows.Clear();
           urlHistory = new UrlHistoryWrapperClass();
           enumerator = urlHistory.GetEnumerator();
           list = new ArrayList();


           GetHistoryItems();

           list.Reverse();


           if (textBoxFilter.Text != "")
           {
               enumerator.SetFilter(textBoxFilter.Text,
STATURLFLAGS.STATURLFLAG_ISTOPLEVEL);
           }
           foreach (STATURL u in list)
           {
               string[] url = new string[2];

               url[0] = Convert.ToString(u.LastVisited);
               url[1] = u.URL;
               STATURL u1 = (STATURL)list[0];

               if (u.LastVisited >= dtStart.Value && u.LastVisited <= dtEnd.Value)
               {
                   u1 = (STATURL)list[list.Count - 1];

                   if (url[1].StartsWith("http")) this.dgURLCache.Rows.Add(url);
                   else if (url[1].StartsWith("file"))
this.dgFileCache.Rows.Add(url);
               }
           }

           GC.Collect();
```

Show that the previous URL's are displayed in the grid table.

L10.18 Select the **Find Hidden** tab, and double click on the **Start** button. Next add the following code to the **showFiles3** method:

```
try {
            if (rbHidden.Checked == true) DirSearch(listBox7, currentDrive, text-
Box23.Text, this.tbSF.Text, this.textBox22, FileAttributes.Hidden);
            if (this.rbReadOnly.Checked == true) DirSearch(listBox7, currentDrive,
textBox23.Text, this.tbSF.Text, this.textBox22, FileAttributes.ReadOnly);
            if (this.rbSystem.Checked == true) DirSearch(listBox7, currentDrive, text-
Box23.Text, this.tbSF.Text, this.textBox22, FileAttributes.System);
            }
            catch (Exception ex)
            {
                CreateMessageForStatusAppend(this.lbError, ex.Message);

            }
```

And then add the following method:

```
void DirSearch(ListBox lb, string sDir, string search, TextBox tb)
        {

            try
            {
                foreach (string d in Directory.GetDirectories(sDir))
                {
                    System.Threading.Thread.Sleep(20);
                    CreateMessageForStatus(tb,"Searching " + d + "....");
                    if (searchFlag ==false) return;
                    try
                    {
                        foreach (string f in Directory.GetFiles(d, search))
                        {
                            CreateMessageForStatusAppend(lb, f);
                        }
                        DirSearch(lb, d, search,tb);
                    }
                    catch { }
                }
            }

            catch (Exception ex)
            {
                CreateMessageForStatusAppend(this.lbError, ex.Message);

            }
        }
```

Show that it finds all the hidden files on the disk.

L10.19 Select the **Performance** tab, and double click on the **Start** button. Next add the following code on the timer3 tick event (timer3_Tick):

```
try
            {
                dgPerf.Rows.Clear();

                string[] s = new string[2];
                s[0] = "CPU"; s[1] = String.Format("{0:f2} %", pc1.NextValue());

                CreateMessageForStatusAppend(this.dgPerf, s);

                float f = pc2.NextValue() / (float)1e9;
                s[0] = "Available Memory"; s[1] = String.Format("{0:f2} GB", f);
                CreateMessageForStatusAppend(this.dgPerf, s);
```

```
                f = pc9.NextValue();
                s[0] = "Processes"; s[1] = String.Format("{0:f0}", f);
                CreateMessageForStatusAppend(this.dgPerf, s);

                f = pc11.NextValue();
                s[0] = "IPv4 Datagrams"; s[1] = String.Format("{0:F0} datagrams/sec",
f);
                CreateMessageForStatusAppend(this.dgPerf, s);

                f = pc3.NextValue();
                s[0] = "ICMP"; s[1] = String.Format("{0:f2} messages/sec", f);
                CreateMessageForStatusAppend(this.dgPerf, s);

                f = pc4.NextValue();
                s[0] = "Active TCP connections (established)"; s[1] =
String.Format("{0:F0}", f);
                CreateMessageForStatusAppend(this.dgPerf, s);

                f = pc5.NextValue();
                s[0] = "TCP Segments "; s[1] = String.Format("{0:F2} Received/sec",
f);
                CreateMessageForStatusAppend(this.dgPerf, s);

                f = pc6.NextValue();


                s[0] = "TCP "; s[1] = String.Format("{0:F2} Segments/sec", f);
                CreateMessageForStatusAppend(this.dgPerf, s);

                f = pc7.NextValue();
                s[0] = "UDP "; s[1] = String.Format("{0:F2} Datagrams/sec", f);
                CreateMessageForStatusAppend(this.dgPerf, s);



            f = pc10.NextValue();
                s[0] = "Disk time"; s[1] = String.Format("{0:F0} %", f);
                CreateMessageForStatusAppend(this.dgPerf, s);

                                    f = pc8.NextValue();
                s[0] = "CurrentUrisCached"; s[1] = String.Format("{0:F0}", f);
                CreateMessageForStatusAppend(this.dgPerf, s);


            }
            catch (Exception ex)
            {
                CreateMessageForStatusAppend(this.lbError, ex.Message);

            }
```

Show that the buttons displays some key performance metrics. Add three more performance monitors.

Appendix

Installs used:

```
sudo apt-get update && sudo apt-get upgrade -y
sudo apt-get install -y apache2
sudo apt-get install php5
sudo apt-get install libapache2-mod-php5
sudo apt-get install vsftpd
sudo apt-get install telnetd
sudo apt-get install inetutils-inetd
```

```
sudo apt-get remove -y apache2
sudo apt-get remove php5
sudo apt-get remove libapache2-mod-php5
```

```
sudo apt-get remove vsftpd
sudo apt-get remove telnetd
sudo apt-get remove inetutils-inetd
```