

Linux Challenge #1

In this challenge set, you'll install a piece of software on your Linux machine called a *web server*. This past year in Form 1 of ICT Practical, you learned how to make a web page. You wrote your web page on a laptop and opened it in Firefox or Chrome. This is fine for learning, but what if we want to write a web page that anyone in the world can view? We need a *web server* to “serve” our web pages to everyone on the Internet.

Two of the most popular web servers used on the Internet today are **Apache** and **nginx** (pronounced “ENGINE X”). We'll use nginx in this challenge.

1. Log in to your Ubuntu server. Before we can use nginx, we have to install it. On Ubuntu, we can use the **apt-get** program to install new programs. To learn more about apt-get, run the following command:

```
$ man apt-get
```

(Note: the “\$” means this is a Unix command – don't type the “\$”, type everything after it.)

The **man** command is short for *manual* – it allows you to read the manual for other programs. In this case, you are viewing the manual for the **apt-get** program. You will see a lot of information about what apt-get does. You can use the up and down arrows, and PageUp and PageDown buttons, to scroll up and down.

Write the first sentence under the DESCRIPTION section of the manual page for apt-get:

Scroll down to the AUTHORS section of the man page and write down the name(s) you see:

When you're finished, type “q” to close the man page and return to the command line.

2. Now you know what apt-get does, so you can use it to install nginx:

```
$ apt-get install nginx
```

You'll get an error message; write down the error message that you see here:

3. To understand why you got an error message, you have to understand that on every Linux machine, there is a special user called the *root* user. The root user can do anything to the machine – add software, delete important files, add new users, and so on. All other users can not do these things unless they have been granted permission to act as the root user. You are one of the users who is allowed to act as the root user with the **sudo** command. “**sudo**”

stands for “SuperUser **DO**”. To learn more about the **sudo** command, open its man page just like you did for apt-get earlier.

Write the first sentence under the DESCRIPTION section of the manual page for sudo:

Scroll down to the AUTHORS section of the man page and write down the name(s) you see:

4. Now that you understand what **sudo** does, try to install nginx again, this time using **sudo**. Fill in the blank:

\$ sudo _____

And then run this command. The apt-get program will print out the following and wait for you to answer its question:

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  fontconfig-config fonts-dejavu-core libfontconfig1 libgd3 libjbig0 libjpeg-turbo8
  libjpeg8 libtiff5 libvpx3 libxpm4 libxslt1.1 nginx-common nginx-core
Suggested packages:
  libgd-tools fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  fontconfig-config fonts-dejavu-core libfontconfig1 libgd3 libjbig0 libjpeg-turbo8
  libjpeg8 libtiff5 libvpx3 libxpm4 libxslt1.1 nginx nginx-common nginx-core
0 upgraded, 14 newly installed, 0 to remove and 10 not upgraded.
Need to get 0 B/2,995 kB of archives.
After this operation, 9,794 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

The apt-get program is telling you about all of the programs that you are about to install. One of them is called “nginx” - the web server we asked for. The rest are programs that nginx **depends on** in order to work. Without those other programs, nginx won’t run.

When you’re ready to continue with the installation, enter “Y”. The apt-get program will download all of the new programs from the Internet, and then it will install all of them on your machine. It will display many lines of output while it works. Write the last line of output apt-get printed on your screen before it finished:

5. Now you have successfully installed nginx on your machine. How do we know if it’s running? By using the following command:

\$ service nginx status

Read the output of that command. You’ll see several lines, one of which starts with “Active:”. Write the rest of the “Active:” line on your paper here:

6. Now you know that nginx is active and running on your machine. Whenever nginx is installed, it automatically serves up a basic web page. To see this web page, open a web browser (for example, Firefox or Chrome on a laptop, Safari on an iPad, etc.). Type the following address into the web browser and hit Enter:

You should see a very basic web page with a large header on the first line – write down what that large line says:

The address you typed in to your browser is called an **IP address**. Every computer, tablet, phone, etc. on the Internet must have an IP address in order to talk to each other. Now that you've installed nginx as your web server, any person in the world can type the above address into their web browser and see the web page that nginx is serving on your machine.

7. The default web page nginx shows us is helpful, but we want to serve our own web pages, right? We don't want to use the one nginx gives us. By default, nginx looks for our web pages in the **/var/www/html** directory. Using the **cd** command, go to that directory and run the **ls** command to view the files inside of it. There is a single file in that directory; write the name of that file here:

8. If we create a file called **index.html** inside of **/var/www/html**, nginx will show that web page instead of its own. Use the **nano** text editor to create an **index.html** file inside of **/var/www/html**. Create a web page that displays your first name, a sentence in Kiswahili, a sentence in English, and anything else you want. Use CSS styles to make your name bold and green. Check your work by saving your file and reloading your web page in your web browser.

When you're done adding everything to your page, bring your answers to the questions above to your ICT Practical instructor. He will review them for completion, and then he will use his own computer to visit your web page and see how it looks.