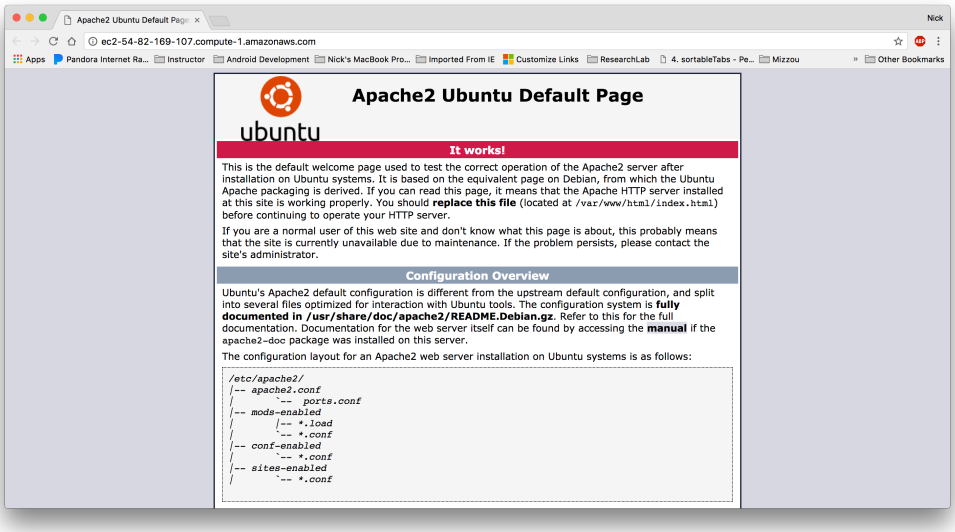
Virtual Hosts in Apache

Created by: Professor Wergeles for the University of Missouri CS4830

After successfully installing Apache, we can navigate to our virtual machine in a web browser. For example: http://ec2-54-82-169-107.compute-1.amazonaws.com/

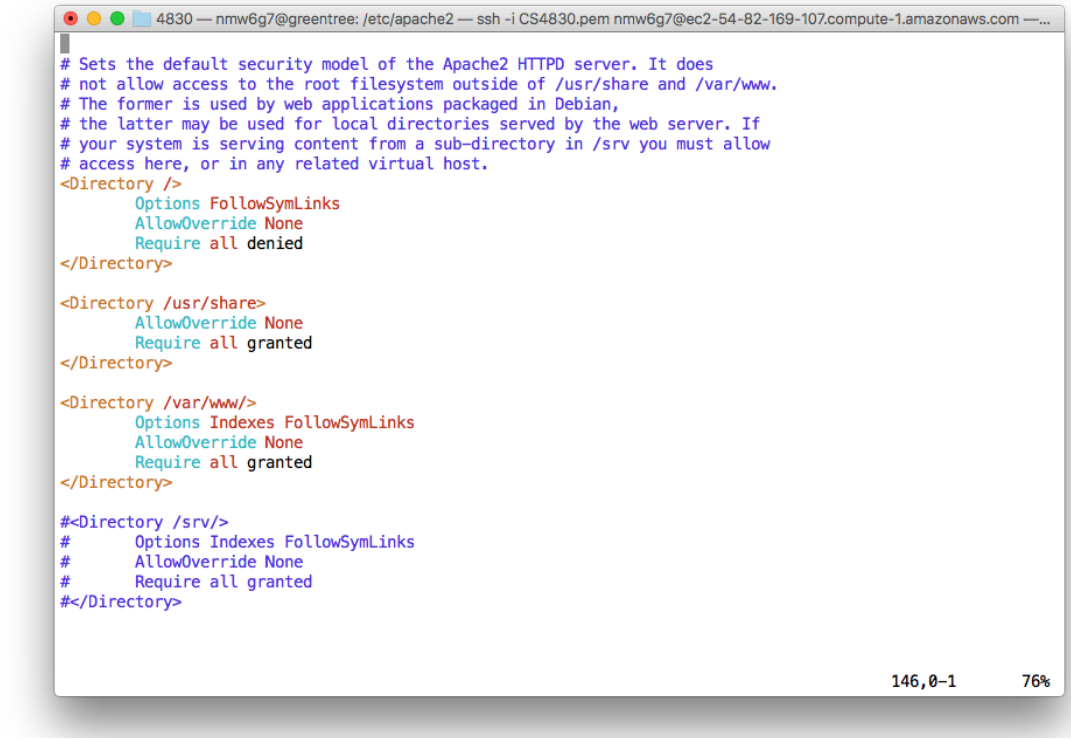
Doing that will bring up Apache's default webpage:



This page is located within /var/www/html/

/var/www/html/ is the default web-accessible directory, but we can change that. Let's take a look at Apache's default configuration, located in /etc/apache2/

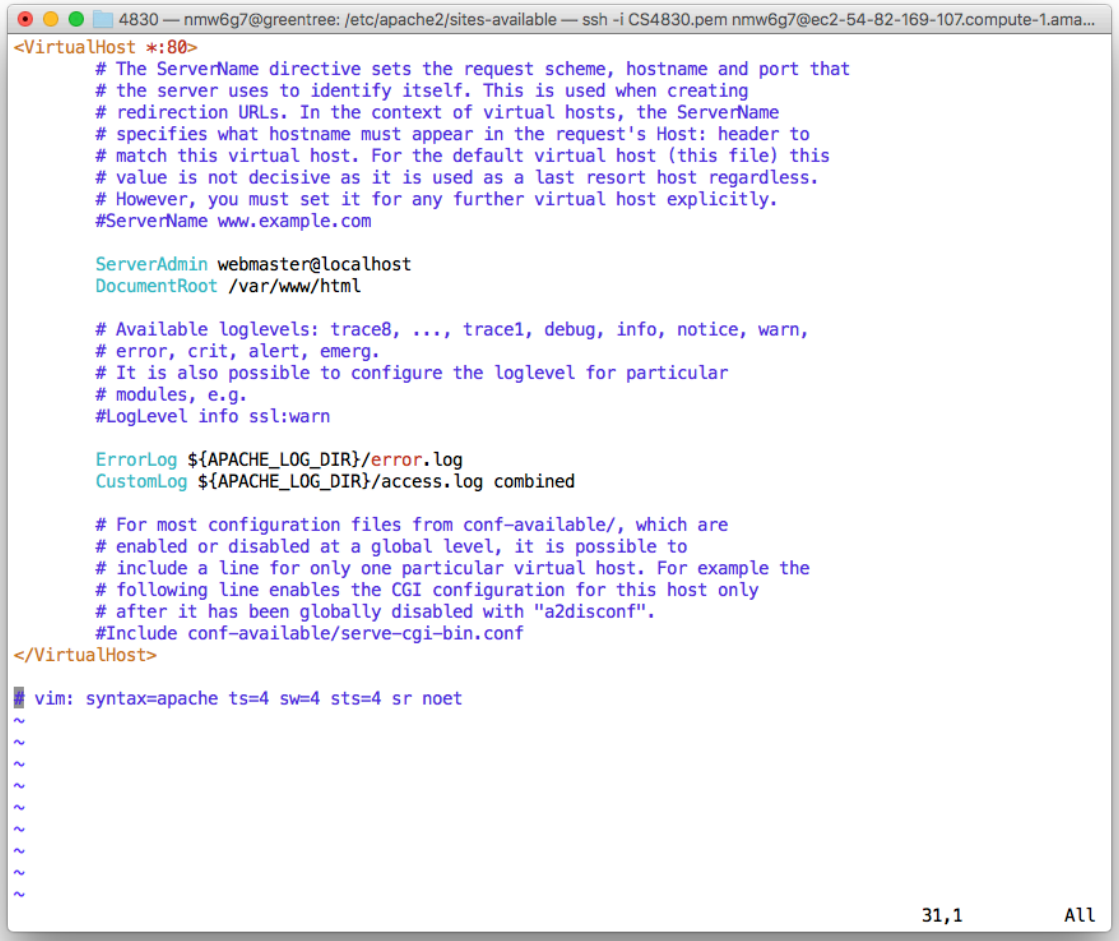
Within Apache's main configuration file, ***apache2.conf***, you'll find the following:



This is the default security model for Apache. The first <Directory> container states that everything on the file-system is **NOT** web-accessible (`Require all denied`).

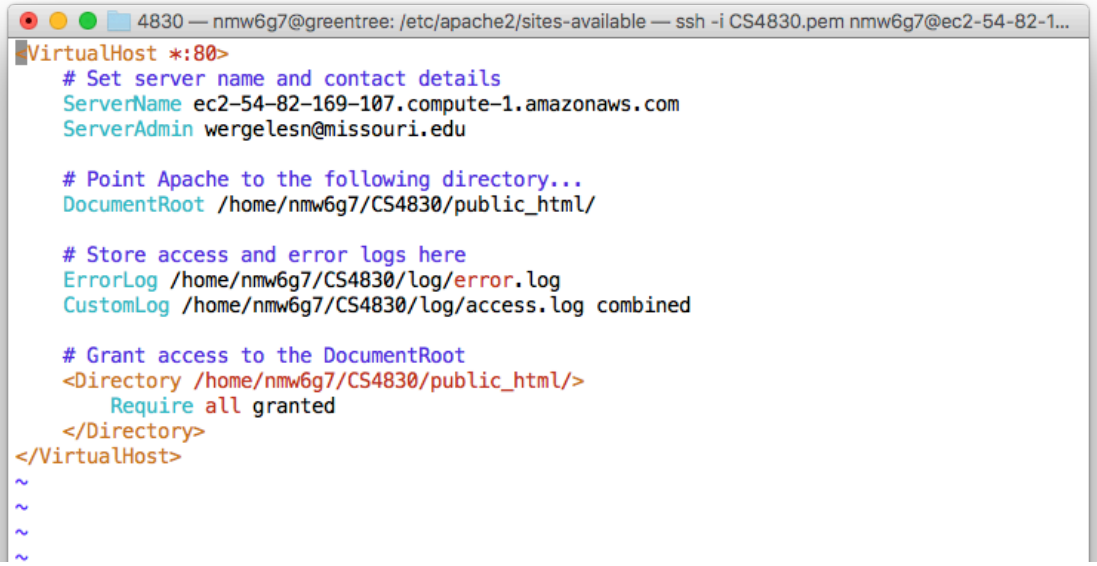
That's followed by two exceptions: the second and third <Directory> containers state that "/usr/share" and "/var/www" are both web-accessible (`Require all granted`).

So, ***apache2.conf*** allows access to /var/www. To point incoming requests to that location, another configuration file is needed. For that, open, the ***000-default.conf*** file located in /etc/apache2/sites-available/



000-default.conf defines a <VirtualHost> container. This container provides contact info (ServerAdmin), tells Apache where to serve content from (DocumentRoot), and specifies a destination for access and error data (ErrorLog/CustomLog).

To customize these options, create your own *.conf* file. I've created one named after my server's domain name, ***ec2-54-82-169-107.compute-1.amazonaws.com***



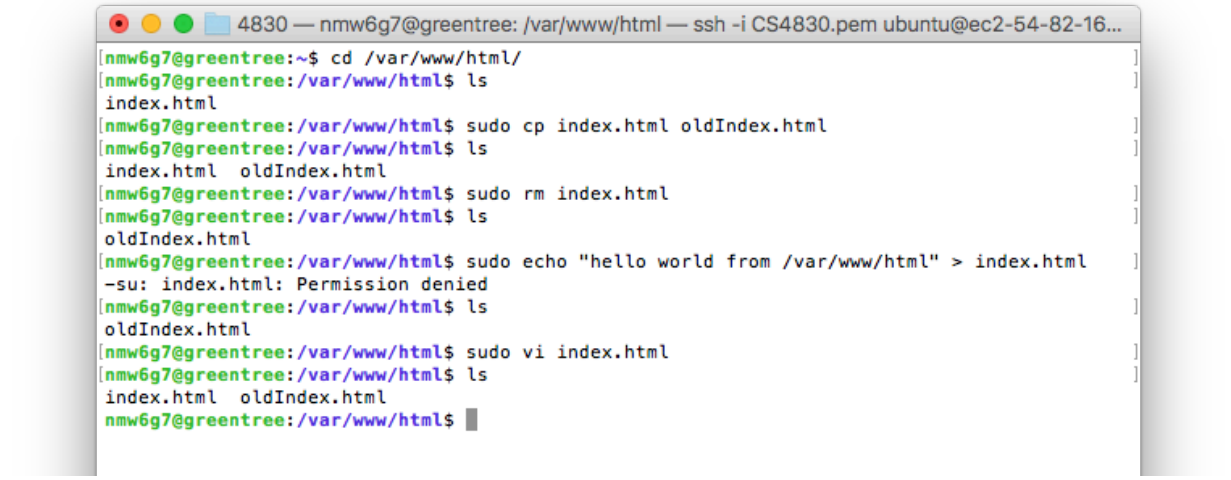
If you don't want to move your page for Challenge1 then set up like this (Method 2):

<u>Things to Note:</u>

- The ServerName has been updated to the virtual machine's domain name
- The DocumentRoot now points to a folder within my user's home directory
- The ErrorLog and CustomLog also point to a folder within /home/"pawprint"/CS4830/
- The last step is to grant access to the new DocumentRoot
    - We saw these rules previously in ***apache2.conf***
    - The <Directory> container here states that all files and folders within /home/"pawprint"/CS4830/public_html/ will be web-accessible

The next step is to create the directories mentioned by DocumentRoot, ErrorLog, CustomLog, and <Directory>. From /home/"pawprint"/CS4830 do the following:

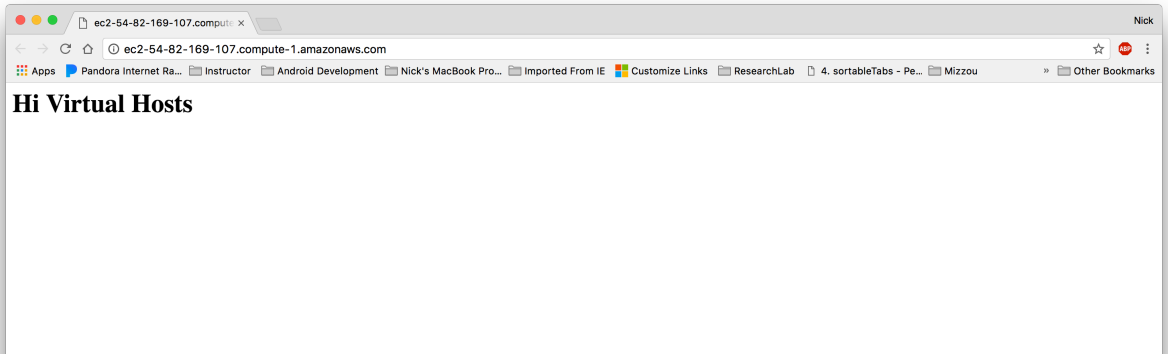
Or for Method 2:



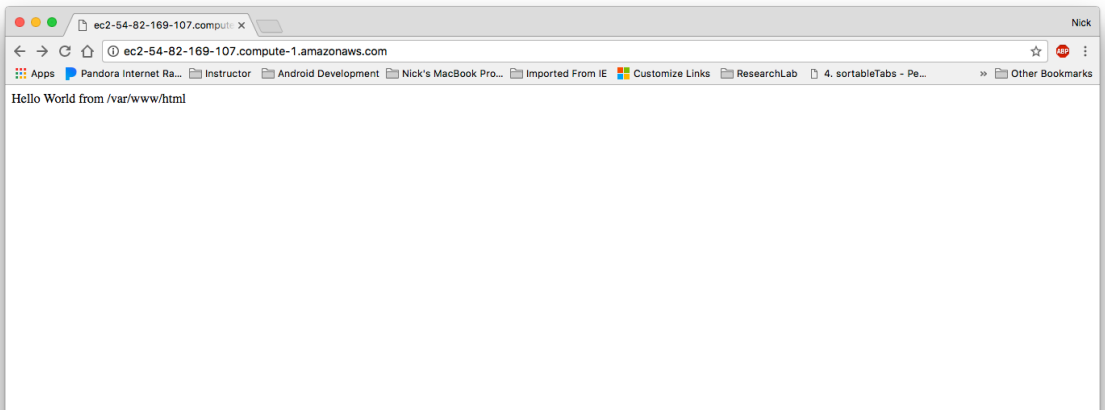
Let's also create a quick index.html page within public_html/ directory:

Finally, we need to disable the old virtual host (a2dissite) and enable the new one (a2ensite). After that, Apache should be restarted.

Now we can reach our content in a web browser!



Or Method 2:



What About Multiple Domains?

It is possible to host more than one website from a single server. To do that, we can use name-based virtual hosts. Here is a link to Apache's documentation:

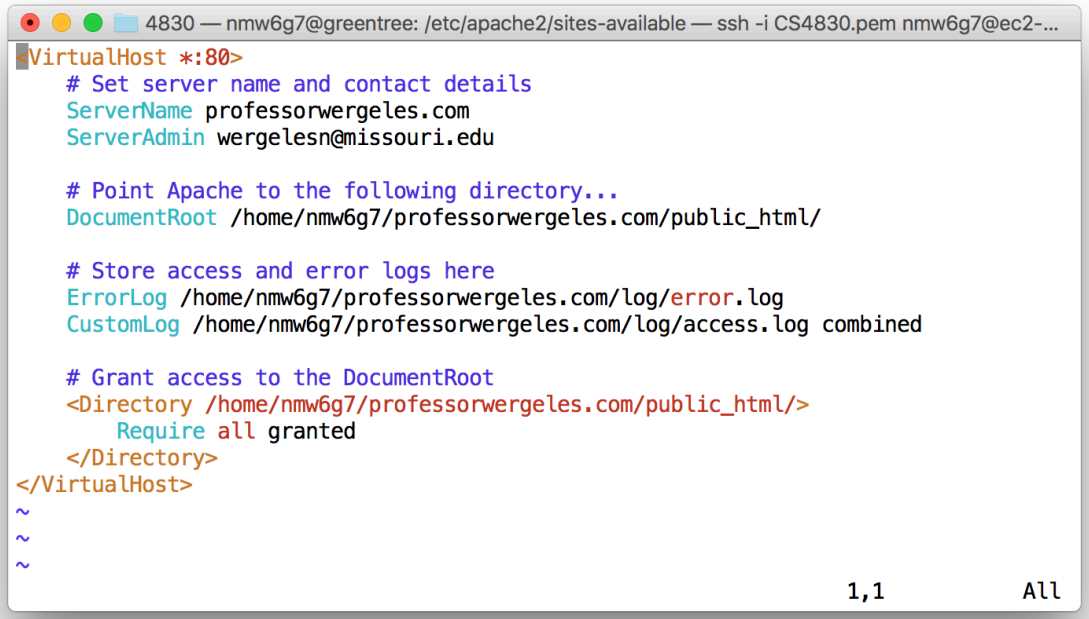
http://httpd.apache.org/docs/2.4/vhosts/name-based.html

I have the domain name: http://professorwergeles.com

Which I purchased from: http://namecheap.com

If I want my domain to point to my Amazon EC2 virtual machine which we made in class, I'll need to start by creating another <VirtualHost> configuration file in /etc/apache2/sites-available/

I'll name this file ***professorwergeles.com.conf***



This file is similar to ***ec2-54-82-169-107.compute-1.amazonaws.com.conf*** except that I've updated the ServerName and all of my filepaths.

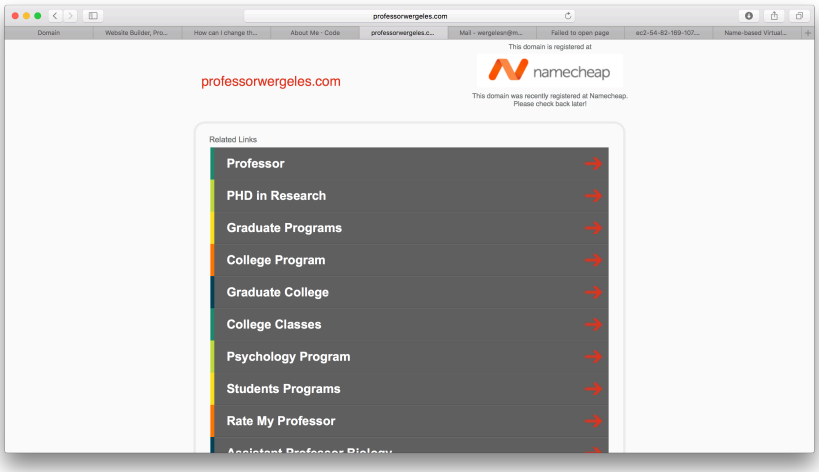
Next we need to create those files and folders:

```
4830 — nmw6g7@greentree: ~/professorwergeles.com/public_html — ssh -i CS4830.pem nmw6g7@ec2-54-82-169-107.compu...
nmw6g7@greentree:/etc/apache2/sites-available$ cd
nmw6g7@greentree:~$ mkdir professorwergeles.com
nmw6g7@greentree:~$ mkdir professorwergeles.com/public_html
nmw6g7@greentree:~$ mkdir professorwergeles.com/log
nmw6g7@greentree:~$ ls
CS4830  professorwergeles.com
nmw6g7@greentree:~$ cd professorwergeles.com/
nmw6g7@greentree:~/professorwergeles.com$ ls
log  public_html
nmw6g7@greentree:~/professorwergeles.com$ cd public_html/
nmw6g7@greentree:~/professorwergeles.com/public_html$ ls
nmw6g7@greentree:~/professorwergeles.com/public_html$ echo "Hello from professorwergeles.com" > index.html
nmw6g7@greentree:~/professorwergeles.com/public_html$ ls
index.html
nmw6g7@greentree:~/professorwergeles.com/public_html$
```

We can then enable and reload:

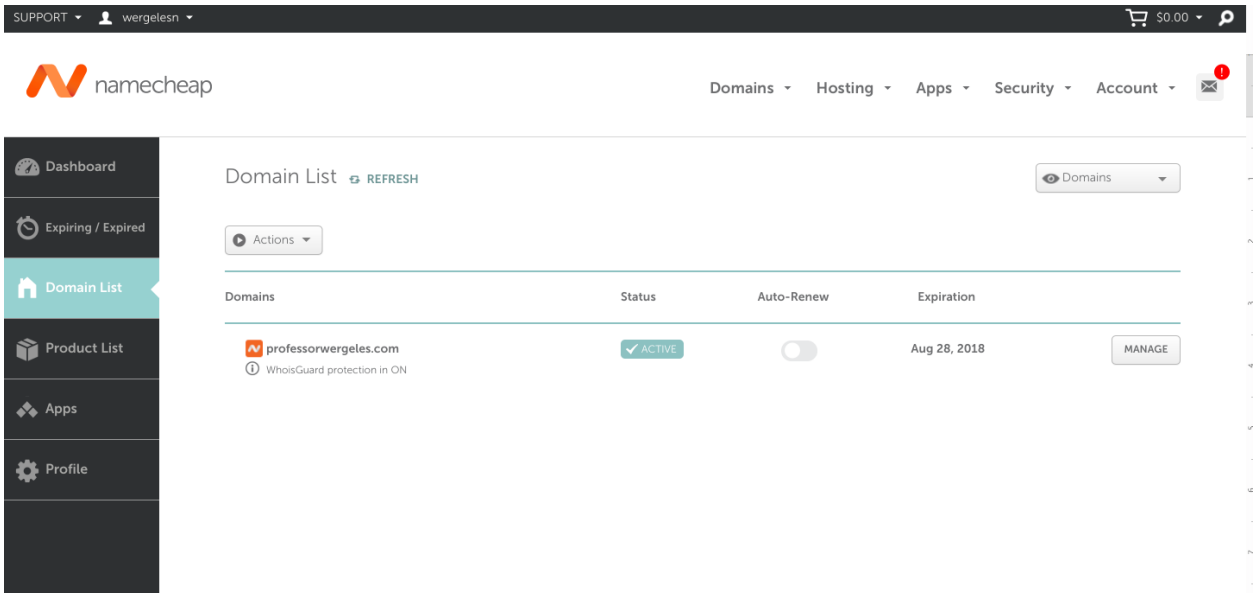
```
4830 — nmw6g7@greentree: /etc/apache2/sites-available — ssh -i CS4830.pem nmw6g7@ec2-54-82-169-107.compute-1.ama...
nmw6g7@greentree:~/professorwergeles.com/public_html$ cd /etc/apache2/
nmw6g7@greentree:/etc/apache2$ ls
apache2.conf    conf-enabled  magic          mods-enabled  sites-available
conf-available  envvars       mods-available  ports.conf    sites-enabled
nmw6g7@greentree:/etc/apache2$ cd sites-available/
nmw6g7@greentree:/etc/apache2/sites-available$ ls
000-default.conf  ec2-54-82-169-107.compute-1.amazonaws.com.conf
default-ssl.conf  professorwergeles.com.conf
nmw6g7@greentree:/etc/apache2/sites-available$ sudo a2ensite professorwergeles.com.conf
Enabling site professorwergeles.com.
To activate the new configuration, you need to run:
  service apache2 reload
nmw6g7@greentree:/etc/apache2/sites-available$ sudo service apache2 reload
nmw6g7@greentree:/etc/apache2/sites-available$ sudo service apache2 reload
nmw6g7@greentree:/etc/apache2/sites-available$
```

If you go to professorwergeles.com then you will see this

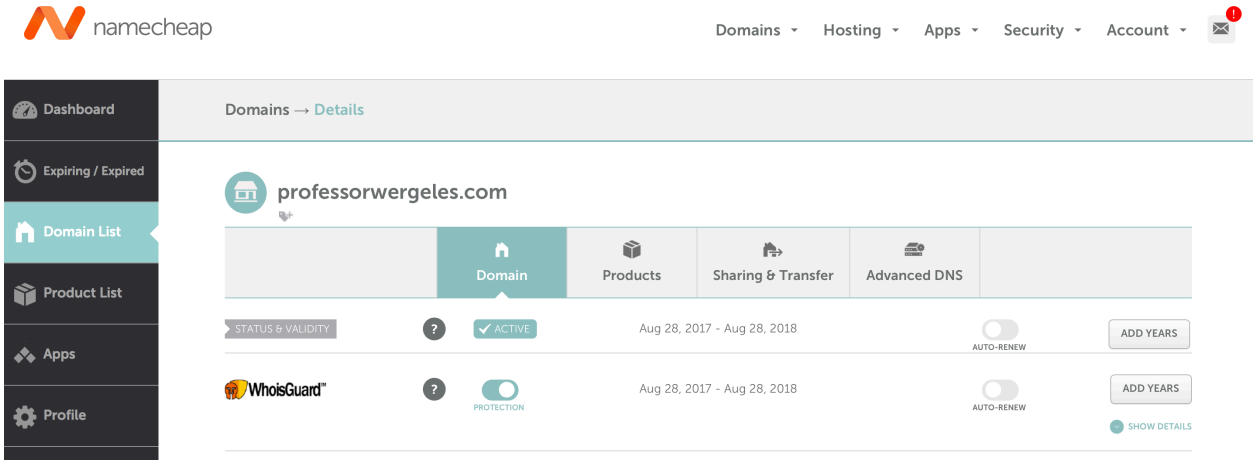


That is because we have not completed the final step which is to map our domain name to our Amazon virtual machine. This process will vary depending on where you've purchased a domain name from.

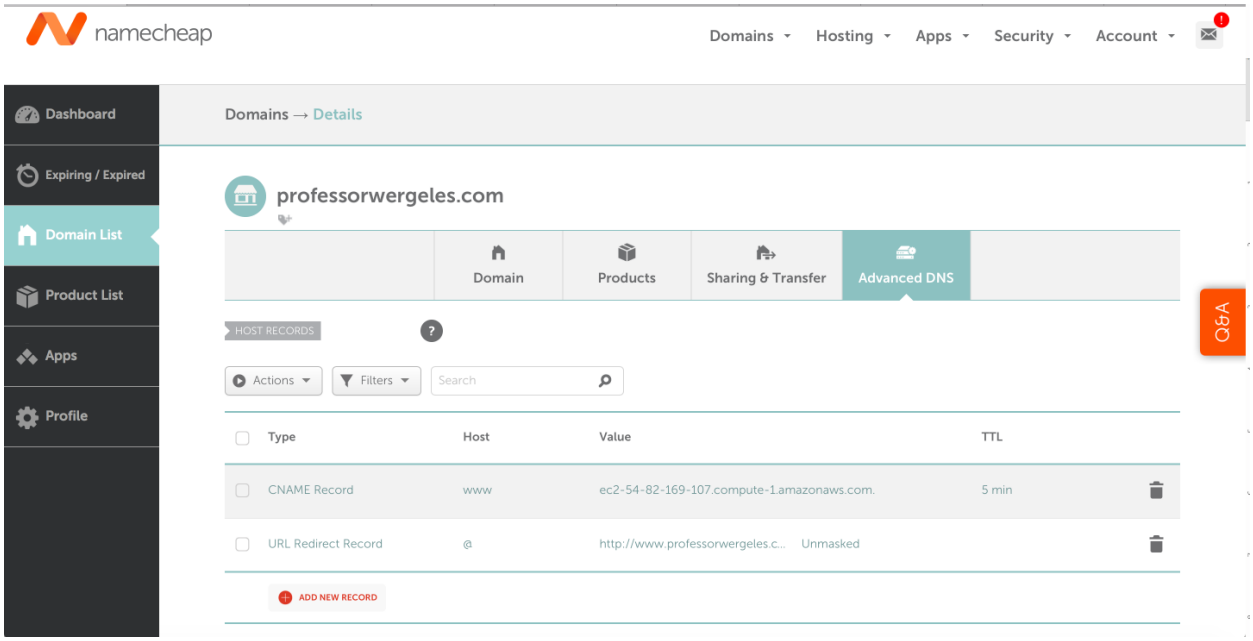
On http://namecheap.com, after you login, you go to your dashboard. From the dashboard, you will click on the "Domain List" tab on the left-hand side of the page.



Then click on "Manage" button next to the domain you would like to setup.



Now you can select the “Advanced DNS” tab near the top.



Under the advanced settings, there is a control panel where you can setup a CNAME:

Type	Host	Value	TTL
CNAME Record	www	ec2-54-82-169-107.compute-1.amazonaws.com.	5 min
URL Redirect Record	@	http://www.professorwergeles.c... Unmasked	

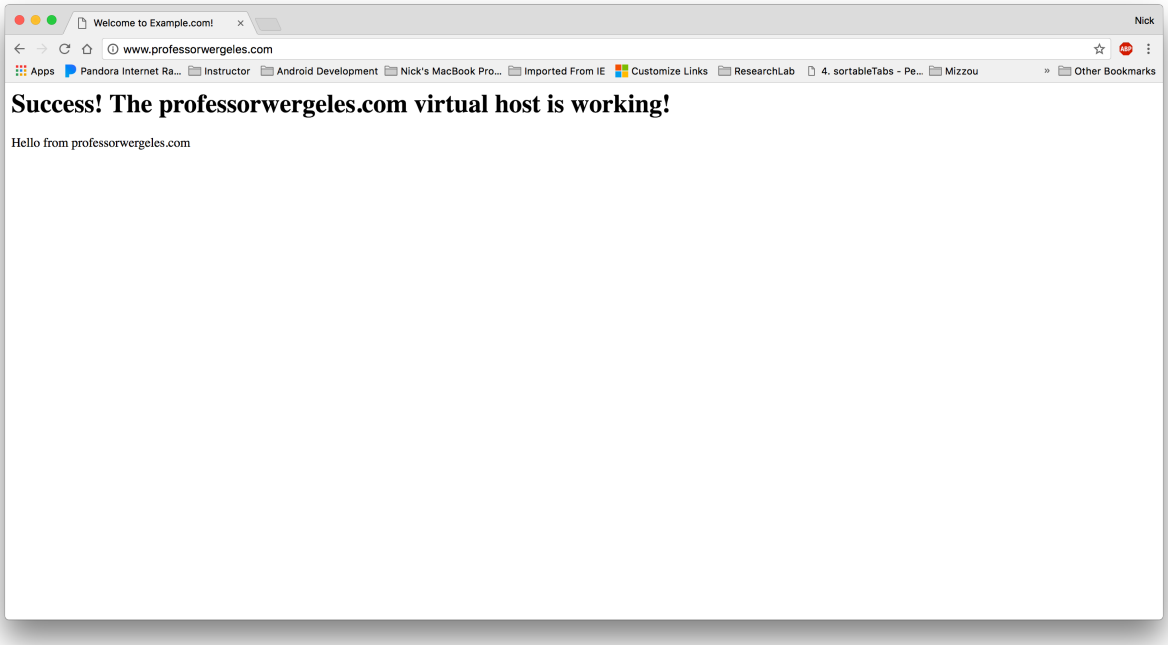
CNAME stands for Canonical Name. It matches a domain to another domain. In our case, it’s mapping http://professorwergeles.com to http://ec2-54-82-169-107.compute-1.amazonaws.com

For more information on CNAME and DNS, take a look at the following guide:
https://www.linode.com/docs/networking/dns/introduction-to-dns-records

Note:

- It takes time for these changes to go into effect
- Just how long depends on a value called Time-to-Live (TTL).

Now, we should be able to successfully access professorwergeles.com:

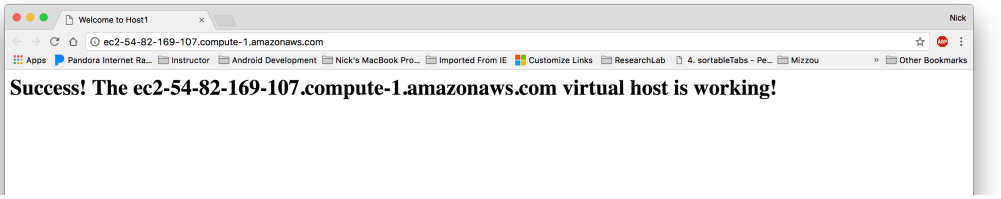


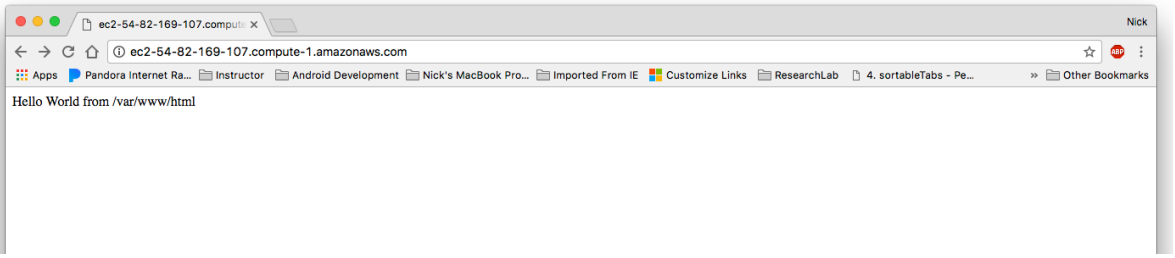
Note:

- If your page is not showing up and going to the original index.html page we first set up for **ec2-54-82-169-107.compute-1.amazonaws.com** then your configuration file might not be pointing to the right address
- For example
    - If we type “professorwergeles.com” in the URL of a browser, the browser will change the address to www.professorwergeles.com
    - Since we did not handle this in the configuration file
- Therefore, you will need to add an alias in the professorwergeles.com.conf file

-
- Make sure to restart apache after changing the configuration file
    - “sudo service apache2 restart”

Test your result:

- Go to:
  - http://ec2-54-82-169-107.compute-1.amazonaws.com/
  - You should see
  - 

  - **Or method 2**
  - 

- Go to:
  - **http://www.professorwergeles.com/**
  - You should see
  -