LEMP setup with Linux, (E)NGINX, Mysql (Maria DB) and PHP (with php-fpm), and allow some users like gsc user to execute php scripts with their own account.

Walrus will be installed with only NGINX and not Apache

Here are steps:

Turn on sshd service

Edit /etc/ssh/sshd.conf allow root access

systemctl enable sshd

systemctl start sshd

Vi /etc/hosts

Add <ip address> <hostname> <full domainname> as a line to the end of the file

Vi /etc/hostname

Replace localhost.localdomain with <full domainname>

When reboot the hostname will show on the shell prompt.

dnf install nginx php-fpm php-common

install php 7.2.12 modules

dnf install php-opcache php-pecl-apcu php-cli php-pear php-pdo php-mysqlnd php-pgsql php-pecl-mongodb php-pecl-redis php-pecl-memcache php-pecl-memcached php-gd php-mbstring php-mcrypt php-xml

Edit conf files of nginx, php-fpm

/etc/nginx/nginx.conf

/etc/php-fpm.d/www.conf

**configuration files need to be edited:**

 nginx/nginx.conf nginx/php-fpm.conf

**php-fpm looks for the configuration files in /etc/php-fpm.d/. php-fpm.d should not be in /etc/nginx directory. I used to have a duplicate on in /etc/nginx and php-fpm service is not looking configuration file there!! Trick bug to have.**

 I have [www.conf](http://www.conf), cs3110.conf, cs591.conf, cs691.conf, gsc.conf there.

**You can copy a sample configuration files from** <http://ciast.uccs.edu/nginx/bilbosetup/etc/>

**I copied the following configuration files from a local Users/cchow/Documents/cs/lab/fedora/nginx/bilbosetup/etc directory.**

 93 scp nginx.conf root@walrus.uccs.edu:/etc/nginx

 94 scp php-fpm.conf root@walrus.uccs.edu:/etc/nginx

 95 scp -r php-fpm.d root@walrus.uccs.edu:/etc/nginx

**We also copy the content of /usr/share/nginx/[cgi, data, html] on the backup server to the /usr/share/nginx of the new server.**

**the nginx/conf.d/php-fpm.conf indicates the**

**/run/php-fpm/www.sock contain a process specific sock file.**

**In bilbo we have configure quite a few local user to run php and therefore**

**we have 4 other .sock files there.**

**The /etc/php-fpm.d contains the configuration files of those local users and www php-fpm threads. In each of those configuration files, we create a new pool name, set the user/group name, indicate listen unix socket with listen=, and set permssion for unix socket, and set error log file such as php\_admin\_value[error\_log] = /home/cs3110/log/www-error.l**

Create php-fpm client specific sockets or ports?

systemctl start nginx && systemctl enable nginx

systemctl start php-fpm && systemctl enable php-fpm

you may find nginx failed to start and status indicate missing /etc/pki/tls/certs/localhost.crt as shown below.

Job for nginx.service failed because the control process exited with error code.

See "systemctl status nginx.service" and "journalctl -xe" for details.

[root@walrus nginx]# systemctl status nginx.service

**●** nginx.service - The nginx HTTP and reverse proxy server

 Loaded: loaded (/usr/lib/systemd/system/nginx.service; disabled; vendor preset: disabled)

 Drop-In: /usr/lib/systemd/system/nginx.service.d

 └─php-fpm.conf

 Active: **failed** (Result: exit-code) since Wed 2019-08-14 21:40:21 MDT; 9s ago

 Process: 3038 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCCESS)

 Process: 3039 ExecStartPre=/usr/sbin/nginx -t **(code=exited, status=1/FAILURE)**

Aug 14 21:40:21 walrus.uccs.edu systemd[1]: Starting The nginx HTTP and reverse proxy server...

Aug 14 21:40:21 walrus.uccs.edu nginx[3039]: nginx: [warn] could not build optimal types\_hash, you should increase either types\_hash\_max\_size: 2048 or types\_hash\_bucket\_size: 64; ignoring types\_hash\_bucket\_s>

Aug 14 21:40:21 walrus.uccs.edu nginx[3039]: nginx: [emerg] cannot load certificate "/etc/pki/tls/certs/localhost.crt": BIO\_new\_file() failed (SSL: error:02001002:system library:fopen:No such file or directo>

Aug 14 21:40:21 walrus.uccs.edu nginx[3039]: nginx: configuration file /etc/nginx/nginx.conf test failed

Aug 14 21:40:21 walrus.uccs.edu systemd[1]: **nginx.service: Control process exited, code=exited, status=1/FAILURE**

Aug 14 21:40:21 walrus.uccs.edu systemd[1]: **nginx.service: Failed with result 'exit-code'.**

Aug 14 21:40:21 walrus.uccs.edu systemd[1]: **Failed to start The nginx HTTP and reverse proxy server.**

You may need to create server certificate and key using openssl utility.

You can copy misc scripts file from <http://ciast.uccs.edu/coursera/pub/misc.tbz> and follow

the instructions in <http://ciast.uccs.edu/coursera/pub/project1dV5.pdf>

to create server key and certificate.

119 wget http://ciast.uccs.edu/coursera/pub/misc.tbz

 120 ls

 121 tar xjf misc.tbz

 122 ls -al misc

 123 misc/CA -newca

 124 vi openssl.cnf

 125 misc/CA -newca

 126 ls

 127 cd ..

 128 ls

 129 rm -rf CA

 130 cd tls

 131 misc/CA -newca

 132 cd ..

 133 ls

 134 cd CA

 135 ls

 136 mkdir /usr/share/nginx/html/cert

 137 cp cacert.pem /usr/share/nginx/html/cert

 138 cd ../tls

 139 misc/CA -newreq

 140 cp newkey.pem serverKey.pem

 141 cp newreq.pem serverReq.pem

 142 misc/CA -sign

 143 cp newcert.pem serverCert.pem

 144 cp serverCert.pem certs/localhost.crt

 145 openssl rsa -in serverKey.pem -out serverUnenc.key

 146 chmod 700 \*.key

 147 cp serverUnenc.key private/localhost.key

 148 systemctl restart nginx

 149 nmap localhost

 150 firewall-cmd --permanent --add-service=http

 151 firewall-cmd --permanent --add-service=https

 152 firewall-cmd --reload

For supporting cgi scripting with other languages such as perl and python, we need to install fcgiwrap

dnf install fcgiwrap

in /etc/nginx/nginx.conf we have the following section related to fcgiwrap with nginx with script directories in different places, /usr/share/nginx/cgi and /var/www/cgi-bin. Here we are not supporting user specific perl cgi-scripting or python cgi-scripting, only in system cgi-bin/cgi directory.

 location ~ ^/cgi/(.\*\.[cgi|py])(.\*)$ {

 alias /usr/share/nginx/cgi/;

 gzip off;

 fastcgi\_pass unix:/run/nginx/fcgiwrap.sock;

 # need to run "sudo -u apache ./fcgwrapStart.pl" in /root/bin

 # need to setup this with systemd

 #fastcgi\_index index.py;

 include fastcgi\_params;

 #fastcgi\_param SCRIPT\_FILENAME /usr/share/nginx/cgi/$2$3;

 # incorrect subpattern, should $1 (script) and $2 (name value pair)

 # resulting in 403 error since filepath not correct!!

 fastcgi\_param SCRIPT\_FILENAME /usr/share/nginx/cgi/$1$2;

 }

 location ~ ^/cgi-bin/(.\*\.[cgi|py])(.\*)$ {

 alias /var/www/cgi-bin;

 gzip off;

 fastcgi\_pass unix:/run/nginx/fcgiwrap.sock;

 # need to setup this with systemctl start|restart fcgiwrap.service

 #fastcgi\_index index.py;

 include fastcgi\_params;

 fastcgi\_param SCRIPT\_FILENAME /var/www/cgi-bin/$1$2;

 }

<https://www.howtoforge.com/serving-cgi-scripts-with-nginx-on-ubuntu-12.04-p3>

<https://www.nginx.com/resources/wiki/start/topics/examples/fcgiwrap/>

Enable and start httpd and nginx, php-fpm

Open firewall for http and https

firewall-cmd --permanent --add-service=http

firewall-cmd --permanent --add-service=https

firewall-cmd --reload

Setup info.php web page to test php script function

echo "<?php phpinfo(); ?>" > /usr/share/nginx/html/info.php

Configure userdir to show individual user web site

Install MariaDB

dnf install mariadb-server

systemctl start mariadb.service ; systemctl enable mariadb.service

mysql\_secure\_installation

Hit enter when asked for current password (initially it was not set, dangerous!)

Then enter the new password.

mysql -u root -p to test the mariadb.

Testing gsc upload php script execution.

* Make sure you have gsc.conf in /etc/php-fpm.d to create socket used by gsc php process
* Make sure the graduationList.txt in /home/gsc has httpd\_user\_content\_t token type. Use chcon -t httpd\_user\_content\_t <file> to change it.
* Make sure the SELinix MAC permission is set up right:
	+ chcon -R -t public\_content\_rw\_t /home/gsc/public\_html/pub/
	+ setsebool -P allow\_httpd\_anon\_write 1
	+ setsebool allow\_httpd\_anon\_write 1