AceEngineer

SERVER (COMPUTING & Web) SETUP

Development Document

14th October 2016

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Revision History:

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REV	SECTION	CHANGE DESCRIPTION

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1   INTRODUCTION

Server is a computer program or device that provides specific/general functionalities for other programs or devices (i.e. clients).

This document describes the following technologies:
- Set up local server, web servers and computing servers required to share and publish content or data securely for a typical company business.
    - A Linux computer is used as web server
    - Multiple domains are hosted on single server
    - Apache2 is used for webserver setup
- Set up computing server for memory/computing intensive operations with recommended rights
    - A single stand-alone computer with 2 processors (8 core) and associated RAM with restricted internet access

2   INFRASTRUCTURE

The basic infrastructure that is used to setup the server system is shown in Figure 2.1 and summarized below:
- Internet
- Internet Router: The main incoming internet
- Switch/Extender: Pass through without any security features
- Web Server: The computer on which the websever is set up.
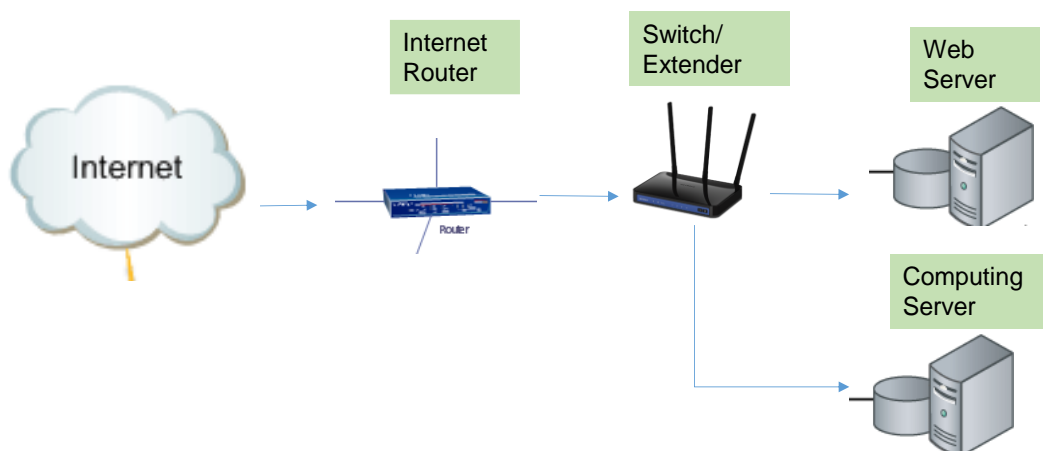- Computing Server: Computer on which a computing/programs are setup for intensive analysis or number crunching.

Figure 2.1 - Infrastructure

2.1 Internet

- Typically provided by regular internet service provider (ISP).
- The ISP may an IP address.
  - This IP address may be static or dynamic.
  - If no static IP address is provided, it may be required to ask the ISP (esp. Indian companies) to provide a static IP address for setting up web servers

2.2 Internet Router

- Typically accessible using 192.168.1.1 from a wired computer
- May have custom security settings which will require expertise to program
- Various ports can be accessed to use for different domains. To help access particular port, forward to a particular computer is required. The port forwarding details are provided in Appendix 1.2.

2.3 Switch/Extender

- A pass through router with minimum security features
- To avoid interfere with main router, this may need same username and password settings as the main internet router, section 2.2. Recommend to review user manual and set up switch/extender.

2.4 Web Server

- A computer with storage and programing to serve the client.
- A web server program is required to serve the purpose
- Internet routers may provide a different IP address when the entire network is restarted.
- A static IP address is required to be provided so as to ensure the web server works seamlessly

2.5 Computing Server

- A computer with storage and computing power to serve the clients.
- This may run powerful software or programs to reduce run time

3   WEB SERVER SETUP

A webserver can be built using available server programs such as Apache2, windows, ngix, GWS etc provided by Apache, Microsoft, NGINX, Google.

The setup of Apache webserver in Linux OS is given in this section.

3.1   Apache2 WebServer Setup

Apache2 is the most commonly used web server on Linux systems. Web servers are used to serve web pages requested by the client computers.
- The common browsers are Firefox, Opera, Chromium and IE
- The most common protocol is Hyper Text Transfer Protocol (HTTP)
  - HTTPS, FTP are also used
- Apache web servers are commonly in combination with MYSQL, PHP, Python and Perl. Also known as LAMP configuration (Linux, Apache, MySQL and Perl/Python/PHP). For high level introduction to LAMP, see Appendix 3.8.

The Apache2 setup on Linux machine is given in the following subsections.

3.1.1   Commands - Summary

A summary of commands used for Apache2 installation and web server set up is given in this subsection.

General Linux Commands Used	
sudo mkdir -p /var/www/myblog.com/html/	Create directory
sudo chown -R $aceengineeroilandgas:$aceengineeroilandgas /var/www/aceengineer.com/html	Ownership of folder to current user "aceengineeroilandgas"
sudo chmod -R 755 /var/www	Change ownership to all users to access web files
Kill <pid>	Kill a process with ID number "pid"
sudo netstat -ltnp | grep ':80'	Find the process running on port 80
-	Shell Scripts
Apache – General Commands	
sudo apt-get install apache2	Install Apache2
Apache – Website Commands	
sudo a2dissite aceengineer.com.conf	Disenable site
sudo a2ensite aceengineer.com.conf	Enable site

sudo a2enmod	# enable an apache2 module
sudo a2dismod	# disable an apache2 module

3.1.2 Install Apache2

Install Apache2 using the command below in Ubuntu terminal:
"sudo apt-get install apache2"

3.1.3 Create a Website

- Step 1: Create directory for website

sudo mkdir -p /var/www/hairbylizbellaire.com/html/

- Step 2: To grant permissions to current user (and outside users) for these directories. Run the commands below:

sudo chown -R $aceengineeroilandgas: $aceengineeroilandgas /var/www/hairbylizbellaire.com/html

       sudo chmod -R 755 /var/www/hairbylizbellaire.com/html

- Step 3: Create sample page with simple text line with website name.

sudo vi /var/www/hairbylizbellaire.com/html/index.html

Insert below code in "index.html" file:
<html>
 <head>
  <title>Welcome to hairbylizbellaire.com!</title>
 </head>
 <body>
  <h1>Success! The hairbylizbellaire.com virtual host is working (in Apache2) !</h1>
 </body>
</html>

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- Step 4a: Create virtual host directives/configuration for the website using Port 80.
  - Easiest way is to copy the default configuration file
  - sudo cp /etc/apache2/sites-available/000-default.conf /etc/apache2/sites-available/hairbylizbellaire.com.conf
  - Edit the information to suit the website (eg. Port number, domain name etc.)
    - \<VirtualHost *:80>
    - ServerAdmin admin@hairbylizbellaire.com
    - ServerName hairbylizbellaire.com
    - ServerAlias www.hairbylizbellaire.com
    - DocumentRoot /var/www/hairbylizbellaire.com/html
    - ErrorLog ${APACHE_LOG_DIR}/error.log
    - CustomLog ${APACHE_LOG_DIR}/access.log combined
    - \</VirtualHost>

- Step 4b: Create virtual host directives/configuration for the website using Port 90.
  - In virtual host, change to simple port number to computer number: port as shown below.
    - \<VirtualHost 192.168.1.109:90>
    - ServerAdmin admin@hairbylizbellaire.com
    - ServerName hairbylizbellaire.com
    - ServerAlias www.hairbylizbellaire.com
    - DocumentRoot /var/www/hairbylizbellaire.com/html
    - ErrorLog ${APACHE_LOG_DIR}/error.log
    - CustomLog ${APACHE_LOG_DIR}/access.log combined
    - \</VirtualHost>
  - **Note that giving a simple *:90 in "VirtualHost" in configuration directive file does not work. Need to give both IP address and port number as shown in above format.**

- Step 5: Add Listen port *:90 to ports.conf
  - Use following command to edit the ports.conf and add the above command.
    - sudo vi /etc/apache2/ports.conf

- Step 6: Enable website and restart Apache2
  - Use following command to enable website
    - sudo a2ensite hairbylizbellaire.com.conf
  - Use following command to restart Apache to make the changes into effect:
    - sudo service apache2 restart

- Step 7 (Optional): To test the webserver from localhost computer, add the host to the hosts file
  - sudo vi /etc/hosts
  - add the line below

- 98.198.29.162 hairbylizbellaire.com
  - o Optional step and works only on local computer. If this step works on local computer, does not mean it will work outside hosts.
  - o The IP address and port number should be accurate for the web server to respond to outside requests

References:

https://httpd.apache.org/docs/2.4/vhosts/examples.html
https://support.rackspace.com/how-to/set-up-apache-virtual-hosts-on-ubuntu/

http://stackoverflow.com/questions/12339044/how-to-run-multiple-sites-on-one-apache-instance   using 2 different ports

3.1.4   Folder Access Instructions

- Do NOT give folder access using "Nautilus" program to the main folder.
  - o /var/www/
- This will make all our websites vulnerable.
  - o For example, intruders can access our website using a port and get all our data if they intend to do so.
  - o Subdomains may contain important client reports which can be exposed to hack companies.
  - o Please see Appendix 2.3 for further explanation of this
- Only provide folder access of specific website html subfolder one by one as shown below:
  - o /var/www/aceengineer.com/html
- To reduce the programming load, a batch file can be created to run a set of instructions in 1 go. See Linux commands in Appendix 3.1 on how to run shell script.

3.1.5   Password Authentication

Websites (eg. Client web reports) sometimes require password authentication to gain access. The following plan is proposed
- This text file format will help updating of passwords periodically
  - o Passwords can be created using on of the following websites
    - ▪ http://passwordsgenerator.net/
    - ▪ https://lastpass.com/generatepassword.php
  - o Recommend to update password every 6 months
- The username and password can be setup at webserver level using instructions below:
  - o https://www.digitalocean.com/community/tutorials/how-to-set-up-password-authentication-with-apache-on-ubuntu-14-04

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- SSL encryption (self-signed) is also required so as to avoid sending credentials in plain text:
  - o https://www.digitalocean.com/community/tutorials/how-to-create-a-ssl-certificate-on-apache-for-ubuntu-14-04
- Define and note username and password prior to running Linux commands
  - o https://www.digitalocean.com/community/tutorials/how-to-set-up-password-authentication-with-apache-on-ubuntu-14-04
- Step 1: Run command below to define user
  - o sudo htpasswd /etc/apache2/.htpasswd user
  - o When running this command for the first time ONLY, then use –c attribute.
- Step 2: Enter password
  - o Re-enter password
- Step 3: check if username is added using the below command
  - o cat /etc/apache2/.htpasswd

3.1.6   Script Programming

Script programming for creating a website is given below:

- The sample client script is provided in
- \Home\Documents\Programming\Scripts\
- Make a copy of "webServerScript_client" and update as required
  - o Define/edit client, domain, apache username and password.
  - o See parameters below:

```bash
#!/bin/bash
# A script to prepare webServerScript Files for fdas client

# Parameters are defined
clientName="fdas"
webdomain="aceengineer"
authUserName="fdas"
authUserPassword="_j3AFFbMC}N,_4~?"
webServerIPAddress="192.168.1.109"
portNumber="151"

# Directory is created and permissions are given
sudo mkdir -p /var/www/$clientName.$webdomain.com/html/
sudo chmod -R 755 /var/www/$clientName.$webdomain.com/html/
```

- Add required Listen port to ports.conf manually, See step 5 in Section 3.1.3.
- Define username and password
  - o Keep username and password ready and store in scripting file (for future use)
  - o Using commands provided in Section 3.1.5 to setup username and password
- Execute the file using command "sudo webServerScript_client" and enter root password to perform following commands:
  - o Creating a custom website conf file
  - o Create custom index file

- o Enable website
- o Restart apache2
- For additional scripting information and learning, see Appendix 3.2.
- Troubleshooting tips:
  - o Ensure to check ports.conf file visually/manually.
    - ▪ Running the script twice will define single port twice.
    - ▪ Defining listen port twice will create Apache restart error.

3.2   Port Assignments

Port assignments and the domains served are summarized in this sub section.
- The key ports assigned is summarized in Table 3.1 and detailed in Table 3.2.
- To provide a web server port to a web domain host, instructions are provided in Appendix 1.2.
- The web domains pages may not be password protected.
- The client web reports will need to be password protected to ensure privacy.

Ports	Designated for
81 to 100	Web domains
151 to 200	Client web reports (possible subdomains)

Table 3.1 – Port Summary

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Ports	Domain Address	Description	Status
Web Domains			
81	aceengineer.com	Aceengineer Website	Live
82	aceengineeroilandgas.com	Aceengineer Oil and Gas Website	Not needed?
83	hairbylizbellaire.com	HairbyLiz website	Live
84	smilogasia.com	Smilogasia website	Waiting on Client to transfer
85	chandanabroskakinada.com	Chandanabroskakinada Website	Live Feedbacks not stored.
86	tekhubsolutions.com	Tekhubsolutions Website	Waiting on Client to transfer Comments not delivered.
87			
88	demo.aceengineer.com	D3JS chart Demos Other demos in future	
Client Web Reports			
151	fdas.aceengineer.com	Username: fdas Password:	Live
152	tesco.aceengineer.com tesco.aceengineer.com (with password)	Username: tesco Password: ace_reference	
153	sta.aceengineer.com (bare link) sta.aceengineer.com (with username and password)	Username: sta Password: ??	

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Table 3.2 – Port Assignments

3.3 References

https://en.wikipedia.org/wiki/Comparison_of_web_server_software
http://www.howtogeek.com/168379/10-useful-options-you-can-configure-in-your-routers-web-interface/

http://www.allaboutlinux.eu/how-to-host-multiple-websites-on-apache2/

https://www.liberiangeek.net/2014/09/run-multiple-websites-single-ubuntu-server-using-apache2/   Apache2 in Ubuntu

https://www.digitalocean.com/community/tutorials/how-to-configure-the-apache-web-server-on-an-ubuntu-or-debian-vps Apache2 in Ubuntu

https://httpd.apache.org/

https://www.digitalocean.com/community/tutorials/how-to-set-up-apache-virtual-hosts-on-ubuntu-14-04-lts

https://help.ubuntu.com/lts/serverguide/httpd.html

4 COMPUTING SERVER SETUP

Confidential information
Confidential programs
No internet access

4.1 Internet Access

Can internet access be set up at the router itself? This way, the computers can still speak with each other?

Also, only 1 computer will have internet and dropbox.
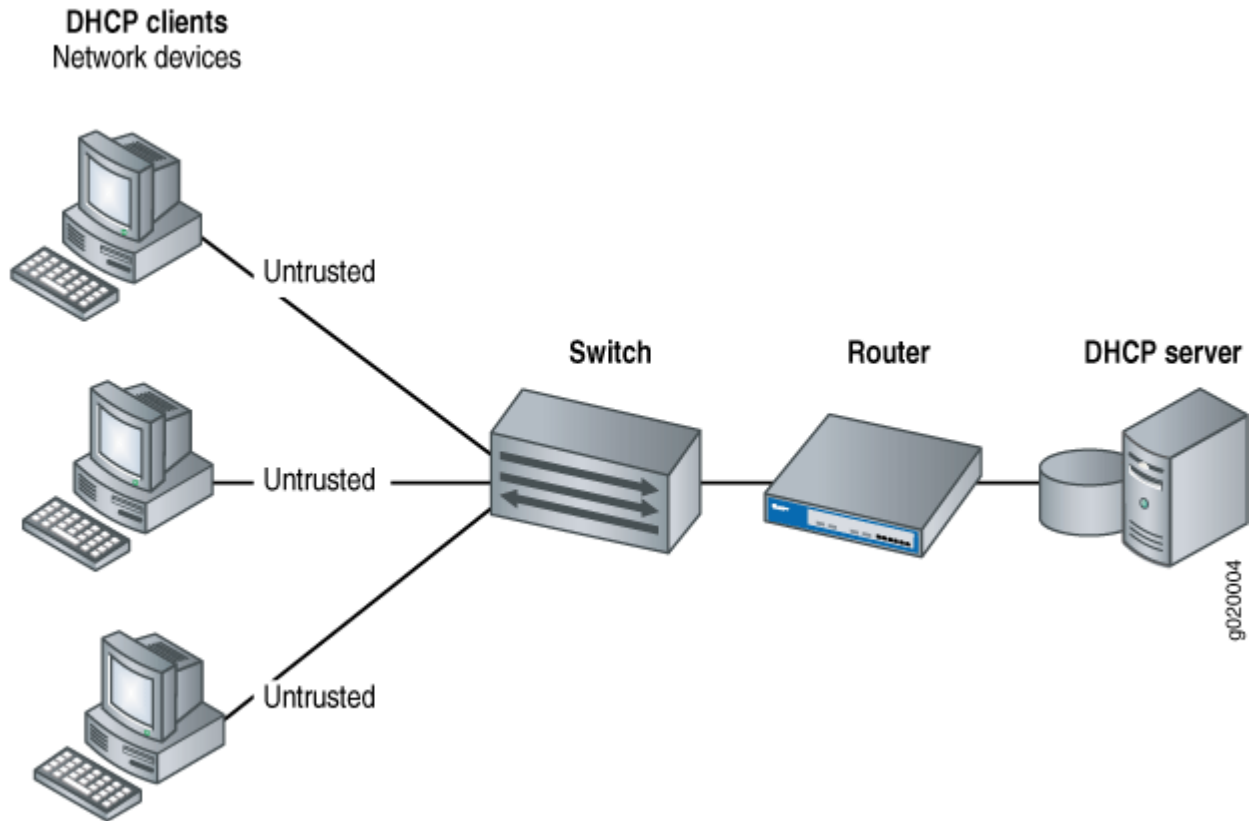
4.2   Access Computers Internally

Which program will work best? Access computers over network.

4.3   Access Server (DropBox)

The preliminary method proposed is below:
- Install DropBox on 1 online server
- Map the DropBox as separate independent drive
- Share the DropBox drive with rest of computers internally

4.4   US Architecture

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http://forums.xfinity.com/t5/Internet-Archive/How-to-verify-Comcast-as-ISP-and-understanding-IP-addresses/td-p/1282809

4.5   References

http://www.howtogeek.com/168379/10-useful-options-you-can-configure-in-your-routers-web-interface/

APPENDIX 1.0– WEB SERVER SUPPORT

1.1   Unzip .WAR file

Utilize any unzipping program.

1.2   Port Forwarding – Linksys E1300

- A static IP connection is required for setting a server. A wired connection is preferable.
- Login on router or modem connected to the computer:
  - Usually the router or modem can be accessed at 192.168.1.1 address.
  - Enter user id and password of the device.

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- Click on "Status".

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- Note the "Internet IP Address" (98.198.29.162) of the computer.

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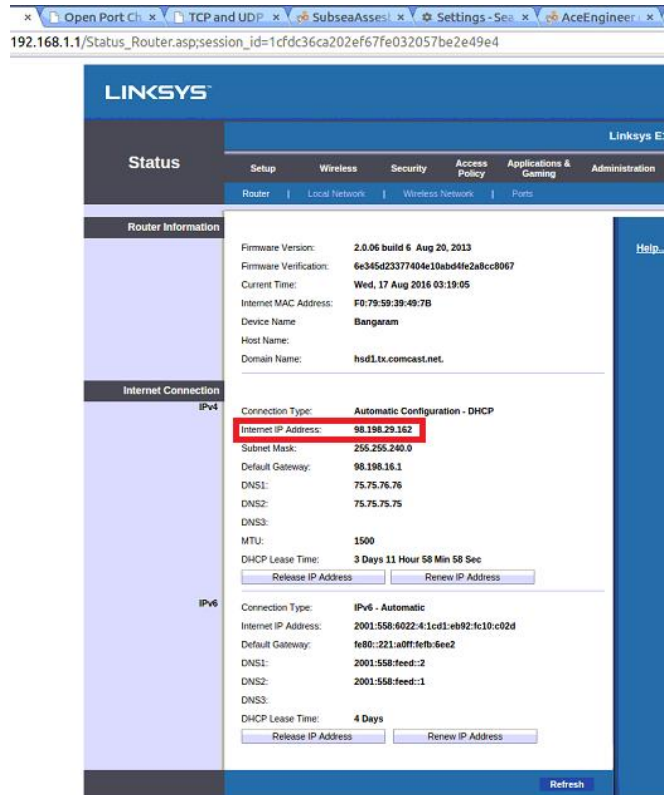
- Click on application and Gaming tab
    - Select "Port Range Forwarding" tab.
    - Enter the start and end port numbers, they should (can) be same number and fill the IP address number.
    - We can find the IPV4 address of the Linux computer by entering the command "nm-tool" in the command terminal. Check the box to enable the port forwarding. Click the "save settings" button on the bottom.
    - Note that the IPV4 address of website server needs to be updated if it is NOT a static IP address

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https://portforward.com/networking/static-win7.htm
https://portforward.com/networking/subnetting.htm

1.3   FireWall – Linksys E1300

- Firewall should be disabled to help ping from outside (see below)
- This will help ping the machine using ipv4 address from an outside machine.
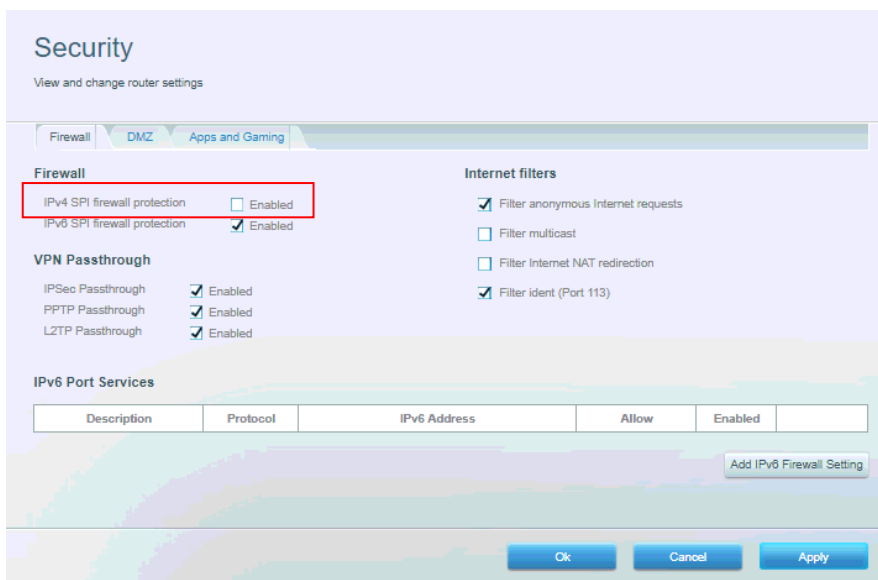
1.4   FireWall – Computer

- Go to windows firewall defender
- Allow connections from Public and private networks
- Experiment if public networks are absolutely needed for making this connection.

1.5   Port Forwarding – Linksys WRT1900AC

- A static IP connection is required for setting a server. A wired connection is preferable.
- Login on router or modem connected to the computer:

APPENDIX 2.0 - FORWARDING PORT

https://www.howtogeek.com/184310/ask-htg-should-i-be-setting-static-ip-addresses-on-my-router/
https://www.linksys.com/us/support-article?articleNum=142511

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https://www.control4.com/blog/2012/11/dhcp-vs-static-ip-which-is-better

Port Forwarding:
- Go to Security
- Apps and Gaming
- Set the port forward

Port Forward

Forwards

Application	Port from	Protocol	IP Address	Port to	Enable
VNC (Grey)	5900	Both	192.168.1.100	5900	☑
VNC (Hunter)	5901	Both	192.168.1.101	5900	☑
SAB (Grey)	8080	Both	192.168.1.100	8080	☑
SB (Grey)	8081	Both	192.168.1.100	8081	☑
Web (Grey)	80	Both	192.168.1.100	80	☑
SSH (Grey)	22	Both	192.168.1.100	22	☑
AFP (Grey)	548	TCP	192.168.1.100	548	☑

Add Remove

https://lifehacker.com/5831841/know-your-network-lesson-4-accessing-your-home-computers-from-anywhere

Installation Problems
During re-installing, delete all existing folders.
https://bugs.mysql.com/bug.php?id=78310

2.1.1 DHCP Reservation

DHCP reservation is an advanced feature on the Linksys Wi-Fi Router. It is especially useful when you are setting up a computer as well as wired or wireless network devices such as printers, network storage, gaming device, or server computers that you want to have access using a specific IP Address. This will save you the hassle of setting up a static IP Address to each network device.

To set DHCP Reservation, you should perform two (2) steps:

- Identify the MAC Address of the device
- Set up DHCP Reservation
-
Check the web-based setup page of your router

Connect your device by plugging it to the router using an Ethernet cable or by connecting it wirelessly to the network.

Step 1:
Access the Advanced Settings of your Linksys Connect software. To know how to do this, click here.

NOTE: Alternatively, you may also access the router's web-based setup page directly. For instructions, click here.

Step 2:
Once in the web-based setup page, make sure the DHCP Server under the Network Setup section is set to Enabled, then click the DHCP Reservation button.

Step 3:
The DHCP Reservation page will appear. You can check the MAC Address corresponding to the IP Address of the device on the first table.

NOTE: The first DHCP table displays all the wired and wireless devices, known as Clients, which are recognized by the router with their corresponding mode of connectivity (LAN/Wireless), along with the IP and MAC Address of each device.

Set up DHCP Reservation

Once you have obtained the MAC Address of your device, you will now be able to set up DHCP Reservation.

Select device from the DHCP table
Manually add the Client device

• Select device from the DHCP table

Step 1:
On the first table of the DHCP Reservation page, check the box underneath Select corresponding to the device or multiple devices you want to reserve an IP Address to and click Add Clients.

Step 2:
Check the Clients Already Reserved table to verify if the device is on the list. Once done, click Save Settings.

QUICK TIP: You may personalize the device name and assign a specific IP Address for each Client on the table.

2.1.2   Forwarding Port

- Click on Security
- Click on "Apps and Gaming"
- Set up the required ports

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| Firewall | DMZ | Apps and Gaming | | | | |

DDNS | Single Port Forwarding | Port Range Forwarding | Port Range Triggering

Application name	Start ~ End Port	Protocol	Device IP#	Enabled	
AceEngineer	81 - 81	Both	192.168.1.102	True	Edit/ Delete
AceEngineeroilandgas	82 - 82	Both	192.168.1.102	True	Edit/ Delete
Hairbylizbellaire	83 - 83	Both	192.168.1.102	True	Edit/ Delete
smilogasia	84 - 84	Both	192.168.1.102	True	Edit/ Delete
chandanabroskakinada	85 - 85	Both	192.168.1.102	True	Edit/ Delete
tekhubsolutions	86 - 86	Both	192.168.1.102	True	Edit/ Delete
web	87 - 87	Both	192.168.1.102	True	Edit/ Delete
web	88 - 88	Both	192.168.1.102	True	Edit/ Delete
web	151 - 151	Both	192.168.1.102	True	Edit/ Delete
web	152 - 152	Both	192.168.1.102	True	Edit/ Delete

Add a new Port Range Forwarding

https://portforward.com/linksys/wrt1900ac/

- Find the IPV6 address using ipconfig in a command window
  - https://ip6.nl/
  -

References:
https://superuser.com/questions/367780/how-to-connect-a-website-has-only-ipv6-address-without-domain-name

https://www.linksys.com/fi/support-article?articleNum=143599

2.2   Domain Forward Setup

2.2.1   GoDaddy

This subsection details the steps required to setup domain to the The Now to link the IP address of our computer to domain.
- Login to your domain account.
- Edit your domain details by clicking on "Manage Connections".

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- Click on "Forwarding".
- Enter the ip address of the computer and port number which we are using for the creating the port forwarding in the router.
- After entering ip address and ":" and port number.
- Always select "Forward with Masking options" and click okay.
  - o This setting will mask the exact webserver IP address and port number. This will help enhance the security of the web server
- Note that this process may vary from one domain provide to another. Examples of domain providers are godaddy, Yahoo etc.

Edit Forwarding

* Required

Forward to: *   Preview

http:// ▼ | 98.198.29.162:80 |

Redirect type: * ⓘ
◉ 301 (Permanent)   ○ 302 (Temporary)

Forward settings: * ⓘ
| Forward with Masking   ▼ |

Title: ⓘ

Description: ⓘ

Edit   Cancel

- Wait for a moment and enter your website address in browser.
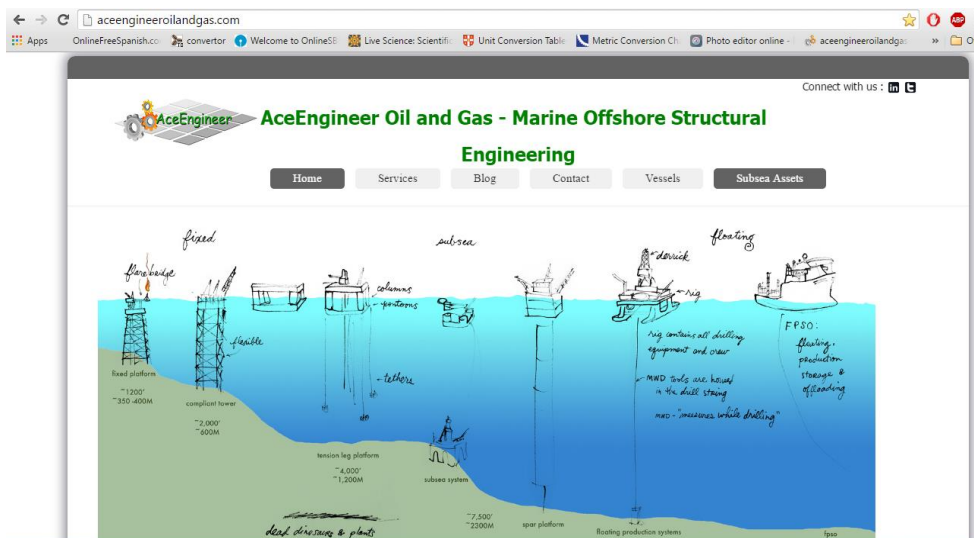
2.2.2   Yahoo (Now Illuminate)

A and CNAME Records

Use A and CNAME records to manipulate host names. Learn more.

Type:	Source:	Destination:	Actions:
A Record	*.aceengineer.com	66.185.31.230	Edit | Delete
A Record	aceengineer.com	66.185.31.230	Edit | Delete
A Record	ftp.aceengineer.com	66.185.31.230	Edit | Delete
CNAME Record	mail.aceengineer.com	ghs.google.com	Edit | Delete

MX Records

MX records specify the servers that power your email service. Learn more.

Mail Server Host Name:	Priority:
MX Records modified from default. Services may not be hosted by Aabaco	

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Small Business	
alt1.aspmx.l.google.com	20
alt2.aspmx.l.google.com	20
aspmx.l.google.com	10
aspmx2.googlemail.com	30
aspmx3.googlemail.com	30

TXT Records

A TXT record is a type of DNS record that provides text information to sources outside your domain. The text can be either human or machine readable and can be used for a variety of purposes. Learn more.

Name Servers

Your name servers specify the location of your web site and email repository. Learn more.
Note: Your domain is currently locked. To modify your name servers, you must first unlock your domain by clicking the "Unlock Domain" button below.Learn more.

Type:	**Hostname:**
Name servers have been modified from default. Services may not be hosted by Aabaco Small Business	
Primary	ns11.ia-dns.com
Secondary	ns12.ia-dns.com

2.3   WebServer – Open Access (NOT Recommended)

This subsection describes a method to make the web server access open to all websites and data. This method is NOT secure and is NOT recommended.

- Open port 100 on router

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- Add Listen *:100 in Ports.conf

- Restart Apache2 server
- Access http://98.198.29.162:100/ to access Apache 2 root directory
- A (partial) solution to host web reports with password access
- To define aceengineeroilandgas website on godaddy server, enter below:
  - 98.198.29.162:100/aceengineeroilandgas.com/html/
- This is not secure as it will leave the Apache2 root folder open to outside users and vulnerable

2.4   Static IP Address

How to set up static IP address? Still unknown

https://azure.microsoft.com/en-us/documentation/articles/virtual-networks-reserved-private-ip/
Use link below to find IP address of the computer
http://cmyip.com/

Linux Commands:
- Find netmask using below command:
  - ifconfig eth0
  - Note the "NetMask"
    - My computer settings: 255.255.255.0
- Find gateway using below command
  - route –n

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- Note the "Gateway"
  - My computer settings: 192.168.1.1
- Find nameserver in below file
  - /etc/resolv.conf
    - Nameserver 127.0.1.1
    - search hsd1.tx.comcast.net
- Assign new static IP Address by:
  - Search "Network Connections" in programs
  - Right click on properties.
  - In IPv4 settings, edit the following
    - Address
    - NetMask
    - Gatway
    - DNS Server (or Nameserver)
    - Search domain
  - Save the settings
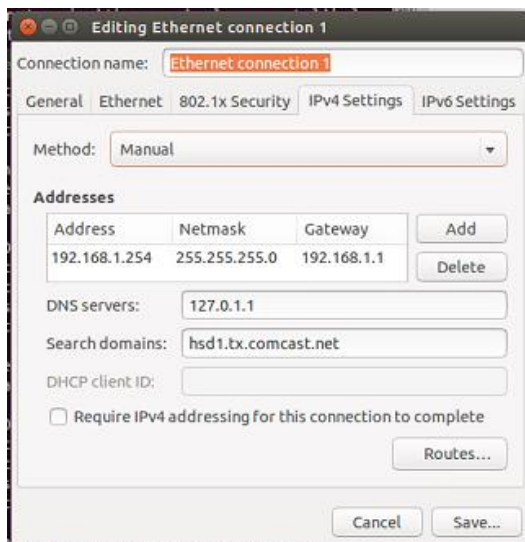
- Disconnect and reconnect the connection (or) restart computer
- Check the IP Address using ifconfig command and the IP address should be updated to Static IP Address assigned above.

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- o   Used the bleow link

- sudo ifconfig eth0 10.0.0.100 netmask 255.255.255.0

- o
https://help.ubuntu.com/lts/serverguide/network-configuration.html
But internet goes away. (Does not work)

https://help.ubuntu.com/lts/serverguide/network-configuration.html
http://askubuntu.com/questions/470237/assigning-a-static-ip-to-ubuntu-server-14-04-lts

http://askubuntu.com/questions/338442/how-to-set-static-ip-address (Graphically)

2.5   Disable Password Protect for localhost

Require valid-user
Allow from 127.0.0.1
Satisfy Any

http://viralpatel.net/blogs/password-protect-your-webpages-using-htaccess/
http://httpd.apache.org/docs/2.0/mod/core.html#satisfy

2.6   Disable Password Protect for subfolder

- Create a new .htaccess file in subfolder
- Add the following line

      o   *Satisfy Any*

http://viralpatel.net/blogs/password-protect-your-webpages-using-htaccess/

APPENDIX 3.0 –COMMANDS

3.1   Linux General Commands

Topic	Link	Notes
Linux Commands		
whoami	How to find out user?	whoami
sudo -s	To become root	sudo -s
	http://www.codecoffee.com/tipsforlinux/articles/21.html	Find files
	http://www.codecoffee.com/tipsforlinux/articles/20.html	Locate files
	http://askubuntu.com/questions/814/how-to-run-scripts-on-start-up	Run commands at astartup
rm filename	Remove filename	Remove filename
Sudo rm filename		
dir		Display files in directory
cd		Change directory
ls		List files in working directory
pwd		Present working directory
vi		Editor to edit files
gedit		Editor to edit files

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sudo gedit		To edit root protected files
gksudo gedit		To open a graphical interface in root
/etc/rc.local		To add commands at startup
locate		To find files or locations
Sudo nano		To open a virtual
/var/www/		To write the in that folder
sudo service apache2 restart		To restart the apache2
Clear		To clear the terminal tool
sudo Nautilus		Opens a explorer with root rights to read, write, execute and save files
/etc/init.d		Scripts executed during boot time
Tips		
	Root	~
	askubuntu.com/questions/89710/how-do-i-free-up-more-space-in-boot	Free up more boot space
Sharing		
	http://www.howtogeek.com/176471/how-to-share-files-between-windows-and-linux/	
Server Pending tasks:	Start x11vnc upon Startup	
	1/ through GUI	
	2/ through gedit /etc/rc.local	
File Transfer		
	How to transfer files over the network?	

	Windows Home Network password:	
	gN3sx9gU1u	
	trying to share Documents folder	
	\\98.198.21.50:5900\ Documents	
x11vnc	Go to root and type below:	
	x11vnc -rfbauth ~/.vnc/passwd rfbport 5900 - forever	
	(or) type below to prompt root:	
	sudo x11vnc - rfbauth ~/.vnc/passwd rfbport 5900 - forever	

3.2   Script Programming

Topic	Descriptoin	Notes
Batch File (Shell Scripts)		
Use Gedit, vi, nano or any text editor.	Open a file Write commads Save file Go to file manager, right click to select "Allow Execution of this file" Or "chmod +x myscript" Doubleclick file to run it in a terminal	http://askubuntu.com/questions/106666/is-there-a-way-to-make-a-file-that-would-run-a-terminal-command-when-you-click-i http://linuxcommand.org/lc3_wss0010.php
sudo chmod 755 Example1	Permissions to read, write and execute	http://linuxcommand.org/wss0010.php

./Example1	Executing the shell script	http://linuxcommand.org/lc3_wss0030.php

Function:

```
function today {
    echo "Today's date is:"
    date +"%A, %B %-d, %Y"
}
```

Type "today" in command window to see the output

Variable:
To define a variable

title="My system"

Variable name is $title
There should be no spaces on either side of "=" sign when defining the variable

Echo Text to Command window or file

#!/bin/bash

 # make_page - A script to produce an HTML file

```
cat << _EOF_
<HTML>
<HEAD>
   <TITLE>
   The title of your page
   </TITLE>
</HEAD>

<BODY>
   Your page content goes here.
</BODY>
</HTML>
_EOF_
```

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Backslash
To ignore shell command
\$
\"

Flow Controls
If then
And OR

Error and Exit

References:
http://linuxcommand.org/writing_shell_scripts.php

3.2.1   SubDomain Creation Script

```
#!/bin/bash
# A script to prepare webServerScript Files for fdas client

# Parameters are defined
clientName="fdas"
webdomain="aceengineer"
authUserName="fdas"
authUserPassword="_j3AFFbMC}N,_4~?"
webServerIPAddress="192.168.1.109"
portNumber="151"

# Directory is created and permissions are given
sudo mkdir -p /var/www/$clientName.$webdomain.com/html/
sudo chmod -R 755 /var/www/$clientName.$webdomain.com/html/

# Copy sample "configuration" and "index" files
sudo      cp      /etc/apache2/sites-available/000-default.conf      /etc/apache2/sites-
available/$clientName.$webdomain.com.conf
sudo cp /var/www/html/index.html /var/www/$clientName.$webdomain.com/html/index.html


# Change permissions for access
sudo chmod -R 777 /etc/apache2/sites-available/$clientName.$webdomain.com.conf
# Create custom configuration file with password protection
echo      "<VirtualHost      $webServerIPAddress:$portNumber>"      >/etc/apache2/sites-
available/$clientName.$webdomain.com.conf
```

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```
echo "          ServerAdmin   support@$webdomain.com"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "          ServerName   $clientName.$webdomain.com"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "          ServerAlias   www.$clientName.$webdomain.com"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "   DocumentRoot /var/www/$clientName.$webdomain.com/html"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "          ErrorLog   ${APACHE_LOG_DIR}/error.log"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "      CustomLog ${APACHE_LOG_DIR}/access.log combined"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "" >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "          <Directory  "/var/www/fdas.aceengineer.com/html">"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "                          AuthType   Basic"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "              AuthName   "Restricted   Content""   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "              AuthUserFile   /etc/apache2/.htpasswd"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "                          Require   valid-user"   >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "   </Directory>" >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "" >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf
echo "</VirtualHost>" >>/etc/apache2/sites-available/$clientName.$webdomain.com.conf

# Change permissions for access
sudo chmod -R 777 /var/www/$clientName.$webdomain.com/html/index.html
# Create custom index file
echo "<html>" > /var/www/$clientName.$webdomain.com/html/index.html
echo " <head>" >> /var/www/$clientName.$webdomain.com/html/index.html
echo "          <title>Welcome   to   $clientName.$webdomain.com!</title>"   >> /var/www/$clientName.$webdomain.com/html/index.html
echo " </head>" >> /var/www/$clientName.$webdomain.com/html/index.html
echo " <body>" >> /var/www/$clientName.$webdomain.com/html/index.html
echo "   <h1>Success! The $clientName.$webdomain.com virtual host is working (in Apache2) !</h1>" >> /var/www/$clientName.$webdomain.com/html/index.html
echo " </body>" >> /var/www/$clientName.$webdomain.com/html/index.html
echo "</html>" >> /var/www/$clientName.$webdomain.com/html/index.html

# Change permissions for access
#       sudo chmod -R 777 /etc/apache2/ports.conf
```

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Add listen command to new port
echo " " >> /etc/apache2/ports.conf
*## echo "Listen *:$portNumber" >> /etc/apache2/ports.conf*

 # Disenable, enable site and restart Apache
sudo a2dissite $clientName.$webdomain.com.conf
sudo a2ensite $clientName.$webdomain.com.conf
sudo service apache2 restart

3.3   vi Editor

Command	Description	Notes
w!	Save without exiting	
q!	Exit without saving	
wq!	Save and exit	
"Esc" and ":"	Change from "Insert/append" mode to command mode	

Table 4.1 – vi Editor Commands

3.4   Apache2

Command	Description	Notes
sudo a2ensite /etc/apache2/sites-available/aceengineer.com.conf	# enable site	
sudo a2dissite /etc/apache2/sites-available/aceengineer.com.conf	# disable site	
sudo service apache2 restart		
sudo service apache2 start		
sudo service apache2 stop		

Table 4.2 – Apache2 Commands

How to enable and disable services?
http://askubuntu.com/questions/19320/how-to-enable-or-disable-services/19324#19324
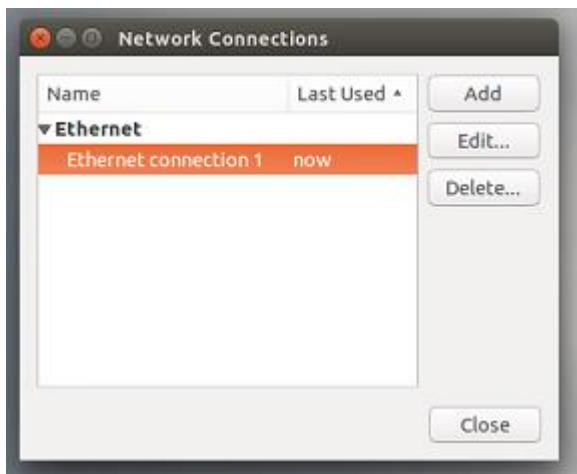
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3.5 Internet/Network Troubleshooting

3.5.1 No connection

- Step 1: Check wires and connections
  - https://help.ubuntu.com/16.10/ubuntu-help/net-wired-connect.html
- Step 2: Check the following settings
  - Ifconfig
  - /etc/network/interfaces code
  - /etc/resolv.conf
    - https://ubuntuforums.org/showthread.php?t=2247351
- Step 3: Delete network connection and reconnect as new connection
  - See below screenshot for details

3.6 References

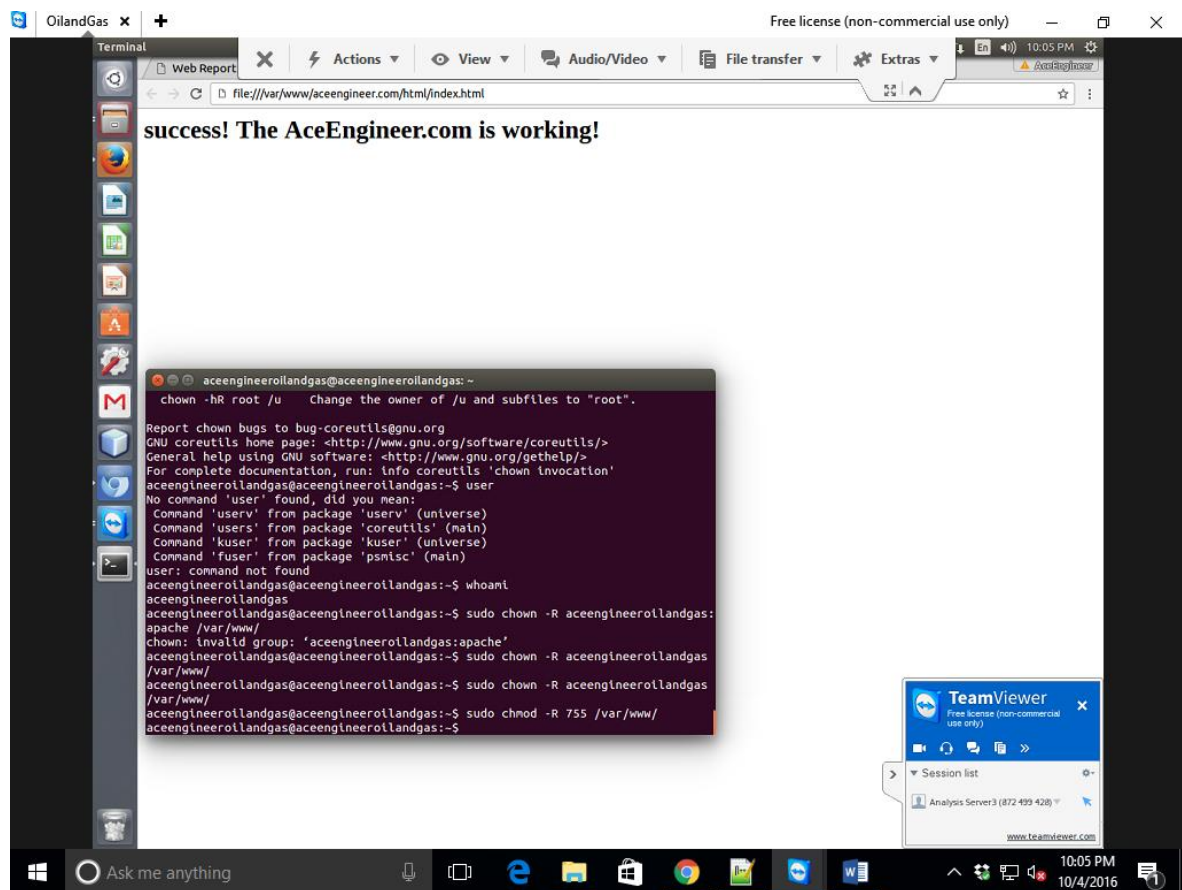http://www.cyberciti.biz/faq/linux-unix-vim-save-and-quit-command/
https://kb.iu.edu/d/adxz

Apache Errors:

https://thomas.vanhoutte.be/miniblog/fix-apache-error-ah00558/
http://askubuntu.com/questions/256013/could-not-reliably-determine-the-servers-fully-qualified-domain-name

3.7   Ports (Private vs. Public)

The solution to this would be to find out the 'external IP' of your router and enable a port forwarding for port 80 and 443 to your local IP.

Long answer:

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The Internet is divided into 'public' and 'private' IP spaces. Private IPs are usually not directly accessible from a 'public' IP. The IPs from the 192.168.0.1-255 are from one of these private subnets.

Your router (at home) usually has multiple IPs. One or more from your local private network (192.168.0.X) and one from your local ISP (I guess something like 193.xxx.xxx.xxx because your DNS is in that network) which is from the 'public' space.

To connect to your computer with the private IP from a public IP like the mentioned 254.231.52.xxx you would have to connect to the public IP of your router (the 193... one). You would also have to enable a mechanism that is called 'port forwarding'. This effectivley takes all internet traffic arriving at the public IP of your router on the forwarded ports and transfers it to the private IP you configured the forwarding to. E.g. 254.231.52.. -> 193...:80 -> 192.168...:80 Usually home routers have a configuration page where you can do this. The required ports you would probably use are 80 (http) and 443 (https).

Another possibility is using so called http-proxies which are also usually supported as a configuration option one home routers. You should refer to the manual of your router for configuration instructions of this.

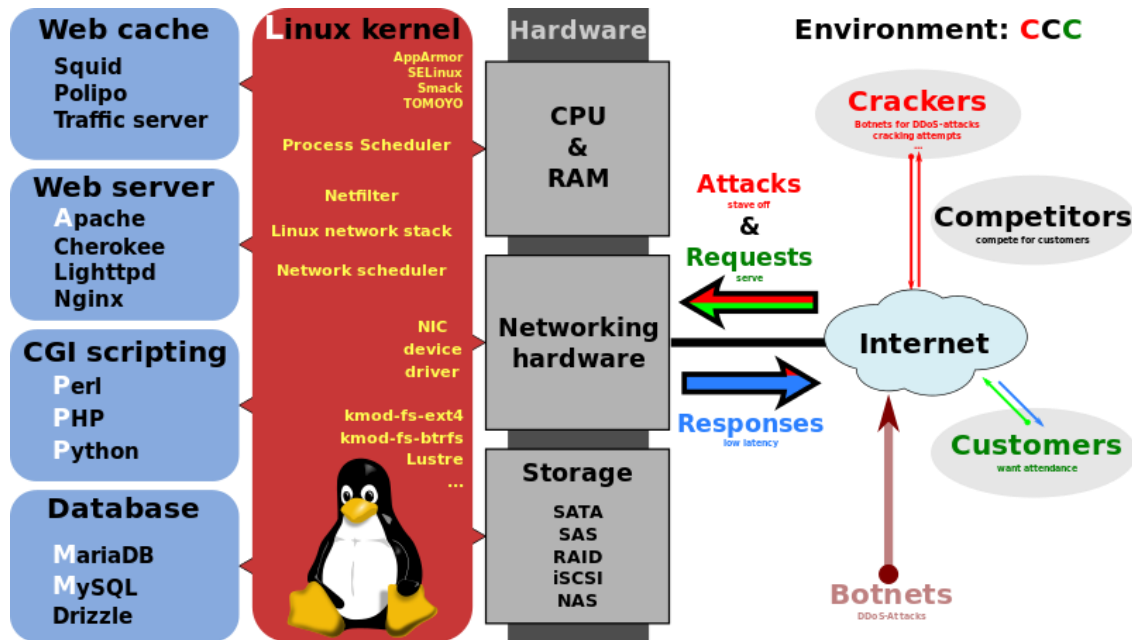http://stackoverflow.com/questions/9454503/apache-how-can-i-access-my-webpage-from-a-computer-outside-my-network

3.8   LAMPP

High level LAMP Configuration is provided in schematic below.

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| --- | --- |
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Stop LAMPP

sudo /opt/lampp/lampp stop

(or)

Edit the lampp file in startup folder so as to not start at all:
etc/init.d/lampp

https://wiki.sabayon.org/index.php?title=HOWTO:_Install_LAMPP_/_XAMPP_web_development_environment

https://www.apachefriends.org/faq_linux.html

http://askubuntu.com/questions/176030/start-lampp-at-startup-as-root

APPENDIX 4.0 – DOMAINS AND HOSTING

4.1   Domains

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GoDaddy
chandanabroskakinada.com
tekhubsolutions.com
AceEngineer.com
Hairbylizbellaire.com

4.2   Hosting

APPENDIX 5.0 – CODE FILELOG

Script files are located in computer in below location:

- Documents/programming/

Filename	Description/Objective	Revision	Date
subdomain_Client	Template Script for creating subdomains		
domain_Client	Template Script for creating domains		

APPENDIX 6.0– ROUTER PARENTAL CONTROLS

Parental controls can be set on the router
Password is "password"
Company name is "aceengineer"