could you reword anything that says i or we :)

please tracy !!!!! :D

!!!!!!!!!!!!!!!!!!!



Internet & Network Services

Assignment 2

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Date : 3 December 2014

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Assignment Requirements

As a systems administrator you have been asked to implement the following Internet & Network services using Ubuntu for a company called KhufuNet.

1. Web Server (Apache) with Virtual Hosting two sites.
2. DNS Server (BIND), Primary(Master) & Secondary(Slave)
3. DHCP Server for Ubuntu clients
4. SSH Server
5. eMail Server (Postfix) & POP/IMAP Server (Dovecot)
6. FTP Server
7. NFS
8. Network Printing (CUPS)

The domain name KhufuNet.com has already been registered. Apache will host www.arrowflash.com and a WordPress instance; blog.arrowflash.com

**Lab Topology**

The lab topology is made up of two PCs running VMware in “Bridged Mode” and connected via a hub. The virtual machines are specified as follows:

VM1 – Ubuntu desktop (DHCP client)

VM2 – Apache Server/Name Server 1(Primary)/Print Server/NFS /SSH Server

VM3 – eMail Server/Name Server 2(Secondary)/DHCP Server /FTP Server/SSH Server

VM4 – Ubuntu desktop (DHCP client)



Ip Address Table

This project was to be done in a group, comprised of Tracy Nixon and Robert Gabriel, with Robert handlng the installations on VM1 and VM2. Tracy taking VM3 and VM4.

The decision was made to use 192.168.10.0/24 as the network address and each machine was given an individual IP address as follows:

|  |  |
| --- | --- |
| **Device** | **Ip Address** |
| Network | 192.168.1.0 /24 |
| VM1 | 192.168.1.8 |
| VM2 | 192.168.1.9 |
| VM3 | 192.168.1.6 |
| VM4 | 192.168.1.7 |

After this, the basic connections were completed and it was then possible to communicate over the network by issuing the “ping” command. With this done the installation process and configuration of packages necessary for this project to work could be started.

|  |  |  |
| --- | --- | --- |
| **OS** | **Vm** | **Password** |
| desktop(master) | Vm1 | vm1 |
| server(master) | Vm2 | vm2 |
| desktop(slave) | Vm3 | vm3 |
| server(slave) | Vm4 | vm4 |

Setting Up Connection

This guide is based on Ubuntu 14.04 server, so you should set up a basic 14.04 server installation before you continue with this guide. The system should have a static IP address. Repeat each time for the IP address table above.

You can skip this part if you wish and come back to it later.

1. sudo su
2. nano /etc/network/interfaces

Make the necessary changes to the files so it looks like the following and plus ctrl + x:

Vm2

# The loopback network interface auto lo

auto lo

iface lo inet loopback

# The primary network interface auto eth0

auto eth0

iface eth0 inet static

address 192.168.1.9

netmask 255.255.255.0

gateway 192.168.10.1

Vm3

# The loopback network interface auto lo

auto lo

iface lo inet loopback

# The primary network interface auto eth0

auto eth0

iface eth0 inet static

address 192.168.1.6

netmask 255.255.255.0

gateway 192.168.10.1

nano /etc/hosts

The hosts settings don’t need to be changed.

Desktop Set up

On the two desktop vm machines (Desktop) the same settings need to be configured so that the computer can talk to your servers to set it up as a DHCP clients.

First we need to edit the network interfaces settings. Using the following command:

**nano /etc/network/interfaces**

Then edit the files below like so:

# The loopback network interface auto lo

auto lo

iface lo inet loopback

# The primary network interface auto eth0

auto eth0

iface eth0 inet dhcp

VM2 – Apache Server (LINUX , APACHE , MYSQL AND PHP)

Robert will be using root credentials (which gives him complete control over the server), if you are doing an installation with any other user just prefix sudo before all commands:

1. First Login into the server , using the username and password.
2. Next type in Sudo Su.
3. It will ask you for the password again.

Now the root credentials are set up.

**apt-get -y install apache2 mysql-client mysql-server php5**

You will be asked to provide a password for the MySQL root user this password is valid for the

user *root@localhost* as well as *root@server1.example.com*, so a MySQL root password does not have to be manually specified later on:

* ***New password for the MySQL "root" user:***
* ***Repeat password for the MySQL "root" user:***

Wordpress requires some more packages, which will be installed as follows:

**apt-get -y install graphviz aspell php5-pspell php5-curl php5-gd php5-intl php5-mysql php5-xmlrpc php5-ldap git-core**

## Virtual instances

## Create the Directory Structure

The first step which needs to be taken is to make a directory structure to hold the site data that will be served to visitors.

The document root (the top-level directory that Apache looks at to find content to serve) will be set to individual directories under the /var/www directory. A directory will be created here for both of the planned virtual hosts.

Within each of these directories, a public\_html file will be created to hold the actual files. This allows some flexibility in the hosting.

For instance, for the sites in question, the directories will be made like this:

* sudo mkdir -p /var/www/khufunet.com/public\_html
* sudo mkdir -p /var/www/blog.khufunet.com/public\_html

## Grant Permissions

The directory structure for the files is now in place, but they are owned by the root user. If the regular user is to be able to modify files in the web directories, the ownership can be changed by doing this:

sudo chown -R root:root /var/www/khufunet.com/public\_html  
sudo chown -R root:root /var/www/blog.khufunet.com/public\_html

The permissions should be slightly modified to ensure that read access is permitted to the general web directory and all of the files and folders it contains so that pages can be served correctly:

sudo chmod -R 755 /var/www

Your web server should now have the permissions it needs to serve content, and your user should be able to create content within the necessary folders.

## Create Demo Pages for Each Virtual Host

The directory structure is now in place. Now some content to serve must be created. As this is just a demonstration, these pages will be very simple. First, wordpress will be installed twice.

## Create New Virtual Host Files

Virtual host files are the files that specify the actual configuration of the virtual hosts and dictate how the Apache web server will respond to various domain requests.

Apache comes with a default virtual host file called 000-default.conf that can be used as a jumping off point. It must be copied over to create a virtual host file for each of the domains.

Firstly one domain must be configured, copied for the second domain, and then further adjusted as needed. The default Ubuntu configuration requires that each virtual host file end in .conf.

Create the First Virtual Host File

Start by copying the file for the first domain:

**sudo cp /etc/apache2/sites-available/000-default.conf /etc/apache2/sites-available/khufunet.com.conf**

Open the new file in your editor with root privileges:

1. sudo nano /etc/apache2/sites-available/khufunet.com.conf

The file will look something like this.

**<VirtualHost \*:80>  
 ServerAdmin webmaster@localhost  
 DocumentRoot /var/www/html  
 ErrorLog ${APACHE\_LOG\_DIR}/error.log  
 CustomLog ${APACHE\_LOG\_DIR}/access.log combined  
</VirtualHost>**

The items must now be customised for the first domain and some additional directives must be added. This virtual host section matches any requests that are made on port 80, the default HTTP port.

First, the ServerAdmin directive must be changed to an email address that the site administrator can receive emails through.

ServerAdmin [admin@khufunet.com](mailto:admin@khufunet.com)

After this, two directives must be added. The first, called ServerName, establishes the base domain that should match for this virtual host definition. This will most likely be your domain. The second, called ServerAlias, defines further names that should match as if they were the base name. This is useful for matching hosts you defined, like www:

**ServerName khufunet.com  
ServerAlias** [**www.khufunet.com**](http://www.khufunet.com)

The only other thing that must be changed for a basic virtual host file is the location of the document root for this domain. The necessary directory has already been created, so all that needs to be done is to simply alter the DocumentRootdirective to reflect the that:

DocumentRoot /var/www/khufunet.com/public\_html

At the end, the virtual host file should look like this:

**<VirtualHost \*:80>  
 ServerAdmin admin@khufunet.com  
 ServerName khufunet.com  
 ServerAlias www.khufunet.com  
 DocumentRoot /var/www/khufunet.com/public\_html  
 ErrorLog ${APACHE\_LOG\_DIR}/error.log  
 CustomLog ${APACHE\_LOG\_DIR}/access.log combined  
</VirtualHost>**

Save and close the file.

### Copy First Virtual Host and Customize for blog.khufunet.com

Now that the first virtual host file has been established, the second one can be created by copying that file and performing the necessary adjustments.

Start by copying it:

**sudo cp /etc/apache2/sites-available/example.com.conf /etc/apache2/sites-available/blog.khufunet.com.com.conf**

Open the new file with root privileges in your editor:

**sudo nano /etc/apache2/sites-available/blog.khufunet.com.com.conf**

You now need to modify all of the pieces of information to reference your second domain. When you are finished, it may look something like this:

**<VirtualHost \*:80>  
 ServerAdmin admin@test.com  
 ServerName blog.khufunet.com.com  
 ServerAlias www.blog.khufunet.com.com  
 DocumentRoot /var/www/blog.khufunet.com.com/public\_html  
 ErrorLog ${APACHE\_LOG\_DIR}/error.log  
 CustomLog ${APACHE\_LOG\_DIR}/access.log combined  
</VirtualHost>**

Save and close the file when you are finished.

## Enable the New Virtual Host Files

Now that the virtual host files have been created, they must enabled. Apache includes some tools that make this.

The a2ensite tool can be used to enable each of the sites like this:

1. sudo a2ensite blog.khufunet.com.com.conf
2. sudo a2ensite khufunet.com.com.conf

When you are finished, you need to restart Apache to make these changes take effect:

sudo service apache2 restart

You will most likely receive a message saying something similar to:

**\* Restarting web server apache2  
 AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.0.1. Set the 'ServerName' directive globally to suppress this message**

This is a harmless message that does not affect our site.

The creation of the virtual host is now complete.

Install Wordpress (VM2)

Once the virtual hosts have been installed, apache2 must once again be restarted. After this Mysql must be configured, a database called wordpress must be created as well as a user admin and password ‘vm2. Then once all this is entered, the user can view their phpmyadmin.

The wordpress database was created using the following commands

* mysql -u root -p

Then it requested the password vm1

The following sql must be used to create the database

* CREATE DATABASE wordpress;
* EXIT;

Next the wordpress files were downloaded and installed:

1. ***Apt-get install wordpress***
2. ***Find / -name wordpress***
3. ***Ls /usr/share***
4. ***Mv /usr/share/wordpress /var/www/*/blog.khufunet.com/public\_html**
5. ***Mv /usr/share/wordpress /var/www/*khufunet.com/public\_html**

This will allow you to view the wordpress site. The default config site was edited to allow the server to point to the wordpress folder.

* nano /etc/apache2/sites-available/khufunet.com.conf
* nano /etc/apache2/sites-available/blog.khufunet.com.conf

and edited the DocumentRoot /var/www/html to /var/www/html/blog.khufunet.com

and edited the DocumentRoot /var/www/html to /var/www/html/khufunet.com

r

Next go to vm1 (the desktops) and install wordpress. If an error should occur such as a the config file being missing, switch back to vm2 and use the default one which is located in the wordpress folder and edit it.

nano /wp-config-sample.php

Then add the

**database : wordpress**

**Username : ROOT**

**password : vm2**

Leave the rest as it was and save it as wp-config.php.

Return to vm1 and finish the step by step wordpress install.

check facebook messenger :)

Print Server ( VM2)

To install CUPS on your Ubuntu computer, simply use sudo with the apt-get command and give the packages to install as the first parameter. A complete CUPS install has many package dependencies, but they may all be specified on the same command line. Enter the following at a terminal prompt to install CUPS:

**sudo apt-get install cups**

Then configure the **/etc/cups/cupsd.conf** file and add the following.

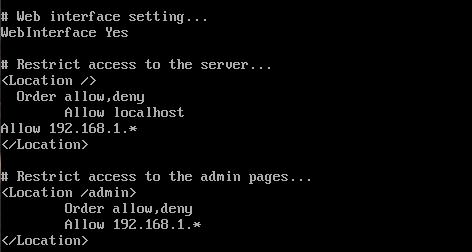
**#Only Listen for connections from the local Machine .**

**Listen localhost:631**

**Listen /var/run/cups/cups.sock**

**Listen 192.168.1.9:631**

|  |
| --- |
| Edit the following lines so that it resembles the example below. |



If you go to the any of the dhcp clients you can access the admin page from typing the 192.168.1.9:631 in the web browser.

Email (Vm3)

To install Postfix you must type the command

**sudo aptitude install postfix**

This command will bring you back to configuration if you accidently exit.

**sudo dpkg-reconfigure postfix**

In the configuration you will be prompted the following: General type of mail configuration: Internet Site System mail name: ns2.khufunet.com

Root and postmaster mail recipient: <Robert@mycit.ie>

Other destinations for mail: ns2.khufunet.com, khufunet.com Force synchronous updates on mail queue?: No

Local networks: 192.168.1.0/24

https://help.ubuntu.com/community/Postfix

Due to time constraints, this section had to remain unfinished.

Name Servers ( Master, Slaves - Vm2, Vm3)

## What is Bind 9

“BIND or named is the most widely used [Domain Name System](http://en.wikipedia.org/wiki/Domain_Name_System) (DNS) software on the Internet.On [Unix-like](http://en.wikipedia.org/wiki/Unix-like) operating systems it is the [*de facto* standard](http://en.wikipedia.org/wiki/De_facto_standard).

The software was originally designed at the University of California Berkeley (UCB) in the early 1980s. The name originates as an acronym of *Berkeley Internet Name Domain*, reflecting the application's use within UCB. The software consists, most prominently, of the DNS server component, called *named*, contracted for *name daemon*. In addition the suite contains various administration tools, and a DNS resolver interface library. The latest version of BIND is BIND 9, first released in 2000.”

Name Servers (VM2 ,VM3)

**Step 1: Install bind9:**

First to install it, run the following command.

**apt-get install bind9**

The default configuration is setup to act as a caching server. All that is required is simply adding the IP Addresses of your ISP's DNS servers.

Simply uncomment and edit the following in **/etc/bind/named.conf.options**:

**forwarders {  
 192.168.1.9 ; #vm2 master  
 192.168.1.6; #vm3 slave  
 };**

Now restart the DNS server, to enable the new configuration.

From a terminal prompt:

**sudo service bind9 restart**

To add a DNS zone to BIND9, turning BIND9 into a Primary Master server, the first step is to edit **/etc/bind/named.conf.local:**

**zone "khufunet.com" {  
 type master;  
 file "/etc/bind/db.khufunet.com";  
};**

Now use an existing zone file as a template to create the /etc/bind/db.khufunet.com file:

**sudo cp /etc/bind/db.local /etc/bind/db.khufunet.com**

Create an A record for the base domain, khufunet.com. Also, create an A record for ns1.khufunet.com, the name server in this example:

**;  
; BIND data file for khufunet.com  
;  
$TTL 604800  
@ IN SOA example.com. root.example.com. (  
 2 ; Serial  
 604800 ; Refresh  
 86400 ; Retry  
 2419200 ; Expire  
 604800 ) ; Negative Cache TTL  
 ;  
@ IN NS ns1.khufunet.com.**

**@ IN NS ns2.khufunet.com.  
@ IN A 192.168.1.9  
@ IN AAAA ::1  
ns2 IN A 192.168.1.9**

**ns1 IN A 192.168.1.6**

**www IN CNAME @**

**blog IN A 192.168.1.9**

**mail IN A 192.168.1.6**

You must increment the Serial Number every time you make changes to the zone file. If you make multiple changes before restarting BIND9, simply increment the Serial once.

Once you have made changes to the zone file BIND9 needs to be restarted for the changes to take effect:

**sudo service bind9 restart**

## Reverse Zone File

Now that the zone is setup and resolving names to IP Addresses a Reverse zone is also required. A Reverse zone allows DNS to resolve an address to a name.

Edit **/etc/bind/named.conf.local** and add the following:

**zone "1.168.192.in-addr.arpa" {  
 type master;  
 file "/etc/bind/db.192";  
};**

Now to create the db.127 to match the 192 which is the first octet of your ip address.

Now create the /etc/bind/db.192 file:

**sudo cp /etc/bind/db.127 /etc/bind/db.192**

Next edit **/etc/bind/db.192** changing the same options as **/etc/bind/db.khufunet.com:**

**;  
; BIND reverse data file for local 192.168.1.9 net  
;  
$TTL 604800  
@ IN SOA ns1.khufunet.com. admin.khufunet.com. (  
 2 ; Serial  
 604800 ; Refresh  
 86400 ; Retry  
 2419200 ; Expire  
 604800 ) ; Negative Cache TTL  
;  
@ IN NS ns1.  
10 IN PTR ns1.khufunet.com.**

For each A record you configure in/etc/bind/db.example.com, that is for a different address, you need to create a PTR record in /etc/bind/db.192.

After creating the reverse zone file restart BIND9:

**sudo service bind9 restart**

Configuring BIND on a Slave (Example)

Once a Primary Master has been configured a Secondary Master is needed in order to maintain the availability of the domain should the Primary become unavailable.

On the Primary Master server, the zone transfer needs to be allowed. Add the allow-transfer option to the example Forward and Reverse zone definitions in **/etc/bind/named.conf.local:**

**zone "khufunet.com" {  
 type master;  
 file "/etc/bind/db.khufunet.com";  
 allow-transfer { 192.168.1.6; };  
};**

**zone "1.168.192.in-addr.arpa" {  
 type master;  
 file "/etc/bind/db.192";  
 allow-transfer { 192.168.1.6; };  
};**

Restart BIND9 on the Primary Master:

**sudo service bind9 restart**

Next, on the Secondary Master, install the bind9 package the same way as on the Primary. Then edit the **/etc/bind/named.conf.local** and add the following declarations for the Forward and Reverse zones:

**zone "khufunet.com" {  
 type slave;  
 file "db.khufunet.com";  
 masters { 192.168.1.9; };  
};   
   
zone "1.168.192.in-addr.arpa" {  
 type slave;  
 file "db.192";  
 masters { 192.168.1.9; };  
};**

Restart BIND9 on the Secondary Master:

**sudo service bind9 restart**

# Network File System (NFS)

NFS allows a system to share directories and files with others over a network. By using NFS, users and programs can access files on remote systems almost as if they were local files.

## Setting Up the NFS Server (Master : Vm2)

An NFS mount is set up between at least two virtual servers. The machine hosting the shared network is called the server, while the ones that connect to it are called ‘clients’.

The following IP addresses will refer to each one.

**Master: 192.168.10.9 (Server)**

**Client: 192.168.10.8 (Client)**

The system should be set up as root. You can access the root user by typing

**sudo su-**

## Download the Required Software

Start off by using apt-get to install the nfs package.

**apt-get install nfs-kernel-server portmap**

### Export the Shared Directory

The next step is to decide which directory should be shared with the client server. The chosen directory should then be added to the /etc/exports file, which specifies both the directory to be shared and the details of how it is shared.

For example, in order to share /home

The directories must be exported to the other VPS:

**nano /etc/exports**

Add the following lines to the bottom of the file, sharing both directories with the client:

**/home 192.168.10.8(rw,sync,no\_root\_squash,no\_subtree\_check)**

These settings accomplish several tasks:

* rw: This option allows the client server to both read and write within the shared directory
* sync: Sync confirms requests to the shared directory only once the changes have been committed.
* no\_subtree\_check: This option prevents the subtree checking. When a shared directory is the subdirectory of a larger filesystem, nfs performs scans of every directory above it, in order to verify its permissions and details. Disabling the subtree check may increase the reliability of NFS, but reduce security.
* no\_root\_squash: This phrase allows root to connect to the designated directory

Once you have entered in the settings for each directory, run the following command to export them:

**exportfs -a**

## Setting Up the NFS Client (Slave : Vm2)

Download the Required Software

Start off by using apt-get to install the nfs programs.

**apt-get install nfs-common portmap**

Mount the Directories

Once the programs have been downloaded to the the client server, create the directories that will contain the NFS shared files

**mkdir -p /mnt/nfs/home**

Then mount them

mount 192.168.10.9:/home /mnt/nfs/home

You can use the df -h command to check that the directories have been mounted. You will see them last on the list.

df -h

In the video, it is apparent that a file was created and the server was checked to make sure the file was there.

## Testing the NFS Mount

Once you have successfully mounted your NFS directories, you can test that they work by creating files on the Client and checking their availability on the Server.

Create a file in each directory to try it out:

**touch /mnt/nfs/home/example /mnt/nfs/home/example**

You should then be able to find the files on the Server in the /home and /var/nfs directories.

**ls /home**

You can ensure that the mount is always active by adding the directories to the fstab file on the client. This will ensure that the mounts start up after the server reboots.

**nano /etc/fstab**

**192.168.10.9:/home /mnt/nfs/home nfs auto,noatime,nolock,bg,nfsvers=3,intr,tcp,actimeo=1800 0 0**

You can learn more about the fstab options by typing in:

**man nfs**

Any subsequent restarts will include the NFS mount—although the mount may take a minute to load after the reboot.

You can check the mounted directories with the two earlier commands:

**df -h**

**mount**

SSH Server ( vm2, vm3)

Secure Shell (**SSH**) is a cryptographic network protocol for secure data communication, remote command-line login, remote command execution, and other secure network services between two networked computers.

Installing Ssh server ( VM2, VM3)

To install ssh on both vm2 and vm3 . I did this both machines .

On the remote machine (ssh server) you do:

**# apt-get install ssh**

This installs ssh, sets it to start on boot up, and starts it up *right then*

Then you do, on the client machine:

**$ ssh-keygen**

Answer, the questions when prompted. Then do

**$ ssh-copy-id <user>@<ssh server>**

Where <username> is the user you want to authenticate as with your key, and <ssh server> is the ip address/host/dns of the SSH server you want to add your key too. Then test it!

**$ ssh <user>@<ssh server>**

Now that you're in you want to get root perms…

**$ sudo su**

And, now that you've got root perms, edit /etc/ssh/sshd\_config

**# vim /etc/ssh/sshd\_config**

That's it for setting up SSH on an Ubuntu machine. Now only you can get into it with your key.

FTP (Vm3)

File Transfer Protocol (FTP) is a TCP protocol for uploading and downloading files between

computers. FTP works on a client/server model. The server component is called an FTP

daemon. It continuously listens for FTP requests from remote clients. When a request is

received, it manages the login and sets up the connection. For the duration of the session it

executes any of commands sent by the FTP client.

## Step One—Install vsftpd

You can quickly install vsftpd on your virtual private server in the command line: the ftp is installed under the name vsftpd.

**sudo apt-get install vsftpd**

Once the file finishes downloading, VSFTP is already configured with a reasonable amount of security. However, it does provide access on your VPS to anonymous users.

## Step Two—Configure vsftpd

Once vsftpd is installed, you can adjust the configuration by uncomment the sign #.

Open up the configuration file:

* sudo nano /etc/vsftpd.conf

The biggest change you need to make is to switch the Anonymous\_enable from YES to NO:

* anonymous\_enable=NO

Prior to this change, vsftpd allowed anonymous, unidentified users to access the server's files. This is useful if you are seeking to distribute information widely, but may be considered a serious security issue in most other cases.

After that, uncomment the local\_enable option, changing it to yes and, additionally, allow the user to write to the directory.

* local\_enable=YES
* write\_enable=YES

Finish up by uncommenting command to chroot\_local\_user. When this line is set to Yes, all the local users will be jailed within their chroot and will be denied access to any other part of the server.

* chroot\_local\_user=YES

Save and Exit that file.

Because of a recent vsftpd upgrade, vsftpd is "refusing to run with writable root inside chroot". A handy way to address this issue to is to take the following steps:

1. **Create a new directory within the user's home directory**
2. **mkdir /home/files**
3. **Change the ownership of that file to root**
4. **chown root:root /home/*files***
5. **Make all necessary changes within the "files" subdirectory**

Then, as always, restart:

sudo service vsftpd restart

## 

## 

## Securing FTP

There are options in /etc/vsftpd.conf to help make vsftpd more secure. For example users can be limited to their home directories by uncommenting:

**chroot\_local\_user=YES**

You can also limit a specific list of users to just their home directories:

**chroot\_list\_enable=YES**

**chroot\_list\_file=/etc/vsftpd.chroot\_list**

After uncommenting the above noptions, create a /etc/vsftpd.chroot\_list containing a list of users one per line. Then restart vsftpd:

**#sudo restart vsftpd**

FTP can also be encrypted using FTPS. Different from SFTP, FTPS is FTP over Secure Socket Layer (SSL). SFTP is a FTP like session over an encrypted SSH connection. A major difference is that users of SFTP need to have a shell account on the system, instead of a nologin shell. Providing all users with a shell may not be ideal for some environments, such as a shared web host.

**#sudo restart vsftpd**

# Dynamic Host Configuration Protocol (DHCP)

## 

## The Dynamic Host Configuration Protocol (DHCP) is a network service that enables host computers to be automatically assigned settings from a server as opposed to manually configuring each network host. Computers configured to be DHCP clients have no control over the settings they receive from the DHCP server, and the configuration is transparent to the computer's user.

# Installation

At a terminal prompt, enter the following command to install dhcpd:

* sudo apt-get install isc-dhcp-server

You will probably need to change the default configuration by editing /etc/dhcp3/dhcpd.conf to suit your needs and particular configuration.

You also need to edit /etc/default/isc-dhcp-server to specify the interfaces dhcpd should listen to. By default it listens to eth0. and need to change it eth1

# **Configuration**

The error message the installation ends with might be a little confusing, but the following steps will help you configure the service:

Most commonly, what you want to do is assign an IP address randomly. This can be done with settings as follows:

**nano -w /etc/dhcp/dhcpd.conf**

**# Sample /etc/dhcpd.conf  
# (add your comments here)   
default-lease-time 600;  
max-lease-time 7200;  
option subnet-mask 255.255.255.0;  
option broadcast-address 192.168.1.255;  
option routers 192.168.1.254;  
option domain-name-servers 192.168.1.9, 192.168.1.6;  
option domain-name "mydomain.example";  
  
subnet 192.168.1.0 netmask 255.255.255.0 {  
range 192.168.1.10 192.168.1.100;  
range 192.168.1.150 192.168.1.200;  
}**

Click save and the installation is complete.

SUMMARY & CONCLUSION

The installation of Ubuntu server and the desktop may look difficult, however it is relatively uncomplicated if you follow our guide or one of the guides which are available online. I have written a simple step by step guide to installing Ubuntu and some of its packages, with definitions for some of the commands so that the basic user can understand in easily understand the various stages and learn during the process.

For security fixes for a basic user, I tweaked the apache files to make the guide more suited to someone with very little computer knowledge.

I would also use more snap shots for my VMware as when I was tweaking and changing the server settings , along with the ftp server causing my dhcp server not to work. This was fixed though restarting the service twice.

The ftp was easy no completions when you follow the guide. though the config file was completed as it had a lot of information and data you can change to make it more secure.

The name server for the slave was very easy as after the installing you write one block of code for the file. it was longer on the master as there was more information needed.

The only problem we could not solve was that the email did not work at the end of the project . there was an error the email would not contect.

Reference

**Nfs Server**

<https://help.ubuntu.com/14.04/serverguide/network-file-system.html>

https://www.digitalocean.com/community/tutorials/how-to-set-up-an-nfs-mount-on-ubuntu-12-04

**Ssh Server**

<https://help.ubuntu.com/community/SSH/OpenSSH/Configuring>

<http://ubuntuhandbook.org/index.php/2014/04/enable-ssh-ubuntu-14-04-trusty-tahr/>

<http://superuser.com/questions/274934/setting-up-ssh-server-on-ubuntu-dektop>

**FTP Server**

<https://www.digitalocean.com/community/tutorials/how-to-set-up-an-nfs-mount-on-ubuntu-12-04>

https://www.digitalocean.com/community/tutorials/how-to-set-up-vsftpd-on-ubuntu-12-04