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NAT Gateway, Iptables, Port Forwarding, DNS And DHCP Setup - Ubuntu 8.10 Server

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Submitted by [gibbsj](#) ([Contact Author](#)) ([Forums](#)) on Thu, 2009-01-08 11:26. ::
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NAT Gateway, Iptables, Port Forwarding, DNS And DHCP Setup - Ubuntu 8.10 Server

So you are too poor to afford another expensive router and want to do things yourself. You have found the right tutorial! This tutorial will show you how to set up an Ubuntu 8.10 router with NAT, port forwarding, a DNS server and a DHCP server.

Why Ubuntu you ask?

Not only is Ubuntu a great operating system, it's also very flexible and powerful enough to allow you to get up and

running in no time! **Note:** Please restart your computer after every step. This will ensure everything is working correctly.

Some of the basic things we are going to need are...

DHCP -- dhcp3-server

DNS -- bind9

iptables -- included /w ubuntu

First things first

You're going to need 2 network cards. Take your first network card, and plug your WAN connection into it. You should know what network card this is, eth0 eth1 ect... If you don't know what it is, trial and error my friend.

Let's just say that your WAN card is going to be eth0 (*if it's eth1, just do everything the same but adjust your config accordingly*). We want to locate the file `/etc/network/interfaces`. Do a VI on the file such as

```
sudo vi /etc/network/interfaces
```

You should see in the file (*if you have nothing setup yet*):

```
# This file describes the network interfaces available  
# and how to activate them. For more information see the  
# The loopback network interface  
auto lo  
iface lo inet loopback
```

We are going to add this to the file. *As a side note, if you don't know how to use VI use nano or learn VI.*

```
auto eth0  
iface eth0 inet dhcp
```

The `auto eth0` code tells eth0 to start on boot, similar to running

```
sudo ifconfig eth0 up
```

The code `iface eth0 inet dhcp` tells the eth0 interface to look for a DHCP server and get its info from there. This is important if your hooked up to a cable modem, as you will want to get a public IP from your ISP.

The next step to take is to configure your network card eth1. This will be your "LAN" card.

If you remember, our `/etc/network/interfaces` configuration looked like

```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see the network(8) man page
# The loopback network interface
auto lo
iface lo inet loopback
# The primary network interface
auto eth0
iface eth0 inet dhcp
```

We are going to VI into the *interfaces* file again and add a few more lines:

```
sudo vi /etc/network/interfaces
```

Add these lines to the bottom of the file.

```
auto eth1
iface eth1 inet static
    address          172.17.207.121
    netmask          255.255.255.0
    broadcast        172.17.207.255
    network          172.17.207.0
```

This just gives you a static IP address for your server on your LAN card.

Your file should now look like this.

```
# This file describes the network interfaces available on your system
# and how to activate them. For more information see the ifconfig(8)
# and ifup(8) man pages.
# The loopback network interface
auto lo
iface lo inet loopback
# The primary network interface
auto eth0
iface eth0 inet dhcp
auto eth1
iface eth1 inet static
    address          172.17.207.121
    netmask          255.255.255.0
    broadcast        172.17.207.255
    network          172.17.207.0
```

Now, before we forget, let's edit your `/etc/hosts` file.

```
sudo vi /etc/hosts
```

Make the file look like mine, though if you call your server `userve` or `myserver` you can change it.

Also note the `asus.local` domain name, it's a good idea to use your own such as `mydomain.local` but you can use what I have for learning purposes.

We use `.local` because it's easy to remember and it's not public, so we will not interfere with anything.

```
127.0.0.1    localhost server.localhost
172.17.207.121  server.asus.local server asus.lo
```

Now that we have our interfaces configured, we are going to install and set up a dhcp server. To install the dhcp server run the command

```
sudo apt-get install dhcp3-server
```

Let's edit the `dhcpd.conf` file. Start by running the command

```
sudo vi /etc/dhcp3/dhcpd.conf
```

Now if there is anything in that file, **REMOVE IT**.

Copy and paste this into your file, then write and quit.

```
ddns-update-style none;
option domain-name "whatever.local"; //change th
option domain-name-servers 172.17.207.121, 24.92
option routers 172.17.207.121;
default-lease-time 42300;
max-lease-time 84600;
authoritative;
log-facility local7;
subnet 172.17.0.0 netmask 255.255.255.0 {
    range 172.17.207.1 172.17.207.100; //you
}
```

Now run the command

```
sudo /etc/init.d/dhcp3-server start
```

This will start your DHCP server and we can label this part DONE.

Moving on to... DNS

Bind is the DNS package that we will be using. To install this, we just simply run


```
sudo apt-get install bind9
```

This will download and install our bind server.

Start by running the command

```
vi /etc/bind/named.conf
```

Then remove everything in the file and look for my comments, usually indicated by `//`.

```
// This is the primary configuration file for the
//
// Please read /usr/share/doc/bind9/README.Debian
// structure of BIND configuration files in Debian
// this configuration file.
//
// If you are just adding zones, please do that
include "/etc/bind/named.conf.options";
// prime the server with knowledge of the root server
zone "." {
    type hint;
    file "/etc/bind/db.root";
};
// be authoritative for the localhost forward an
```

Before we can make the two files `asus.local.db` and `rev.207.17.172.in-addr.arpa`, we need to edit another file. So

```
sudo vi /etc/bind/named.conf.options
```

Remove everything in the file and use this...

```
options {
    directory "/var/cache/bind";
    // If there is a firewall between you and your upstream
    // to talk to, you may need to fix the firewall
    // ports to talk. See http://www.kb.cert.org/vuls/id/202613
    // If your ISP provided one or more IP addresses
    // nameservers, you probably want to use them
    // Uncomment the following block, and insert
    // the all-0's placeholder.
    forwarders {
        24.92.226.41; //very important, change
24.92.224.40;
    };
    auth-nxdomain no; # conform to RFC1035
```

Pay attention to the comments, they tell you to **CHANGE** our forwarders address(es) to your LOCAL ISP's DNS.

Next, cd over to your bind directory:

```
cd /etc/bind/
```

```
sudo mkdir zones
cd zones
sudo vi asus.local.db
```

(Or use your domain name such as *mydomain.local.db*.)

Once you are in the *asus.local.db* file or *mydomain.local.db* file (whatever you called it), copy and paste this, make the appropriate changes to your domain name.

```
$ORIGIN .
$TTL 4000 ;
asus.local.      IN SOA  server.asus.local.  admin
2007031001      ; serial
28800           ; refresh
3600            ; retry
604800          ; expire
38400           ; min
)
                NS      server.asus.local.
$ORIGIN asus.local.
                IN      A      172.17.207.121
www             IN      A      172.17.207.121
server         IN      A      172.17.207.121
```

If you do an *nslookup macpro*, you will get *172.17.207.4* back as an answer, so change the domain names and IP's according to your settings.

Next, we are going to *vi* the *rev.207.17.172.in-addr.arpa* file that does not exist yet. But it will once we save it. So assuming you're still in the zones folder:

```
vi rev.207.17.172.in-addr.arpa
```

Copy and paste what I have here, making the appropriate changes.

```
$ORIGIN .
$TTL 28800      ; 8 hours
207.17.172.IN-ADDR.ARPA IN SOA  server.asus.local
                2008110601 ; ser
                28800      ; ref
                7200       ; ret
                604800     ; exp
                86400      ; min
)
                NS      server.asus.local
$ORIGIN 207.17.172.IN-ADDR.ARPA.
4                PTR     macpro.asus.local.
```

So now if you did a reverse lookup on *172.17.207.4*, you would get *macpro.asus.local*.

Now run the command to start named:

```
sudo /etc/init.d/named start
```

If it does not start, check the logs in `/var/logs`.

Last but not least, IPTABLES

First thing is first, we need to edit `sysctl.conf` in the folder `/etc/`, so:

```
sudo vi /etc/sysctl.conf
```

Uncomment line 28. That means removing the `#` in front of it. The line should be `net.ipv4.ip_forward=1`

Next, let's `vi` over to `rc.local`:

```
sudo vi /etc/rc.local
```

Add these two lines to the bottom of the file:

```
/sbin/iptables -P FORWARD ACCEPT  
/sbin/iptables --table nat -A POSTROUTING -o eth
```

This will set up your gateway using iptables. You can use iptables to make this more secure than this basic setup.

To forward ports, you can add something like this to the end of the `rc.local` file.

```
/sbin/iptables -t nat -A PREROUTING -p tcp -i et
```

The long line above will port forward all incoming traffic on port `3389` to the IP `172.17.207.4`, so I can remote desktop into my Windows box from outside my network.

You can do this with any ports you wish.

RESTART!

Also, report any problems and I will fix this tutorial with updates. Thanks, Jeremy user gibbsj.

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Comments will be published after administrator approval.*

finally, i can implement

Submitted by Anonymous (not registered) on Thu, 2009-10-08 11:01.

finally, i can implement this tutorial for my old cpu successfully. but in the client, YM cannot connect to the server. how to solve this?thanks before for the reply!

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Thanks

Submitted by Stas (not registered) on Mon, 2009-03-16 15:23.

Thank you!

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Complete setup

Submitted by Anonymous (not registered) on Sun, 2009-02-22 01:37.

So i just went through this entire article. It has been awhile since i have setup with linux but this tutorial was very well written.

I noticed in order for everything to work i needed to add these lines before the Exit 0 line in the iptable list

```
/sbin/iptables -P FORWARD ACCEPT
/sbin/iptables --table nat -A POSTROUTING -o eth0 -j MASQUERADE
```

and also the gateway didnt want to replicate out to the clients so i changed the order of option routers to just under the ddns update style...

```
ddns-update-style none;
option routers 172.17.207.121;
```

but other than that it is up smoothly... now i have to play around with IPtables to limit access to specific addresses...

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Port Forwarding

Submitted by Nausser (not registered) on Sat, 2009-02-14 05:56.

I've had zero luck with port forwarding 5900 to another Ubuntu machine. I'm running Ubuntu 8.10 64-bit server for my DHCP/NAT and hopefully someday VPN services. All in terms of internet access works great for connecting clients with the exception of the "Pinger Plus" device which cannot get an IP from my Ubuntu server, however, can obtain an address and ping with no problems if I use a windows or Cisco DHCP server. Not a huge deal but if anyone happens to know.

As far as the port forwarding goes, I've tried every flavor of the instructions above. Help is greatly needed!

Thanks!

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Bind9 tutorial

Submitted by Anonymous (not registered) on Mon, 2009-02-02 12:43.

Thanks, I have been looking around trying to get my DNS setup correctly and your article helped.

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Correction to dhcpd.conf

Submitted by [Jamie](#) (not registered) on Thu, 2009-01-22 15:59.

In the dhcpd.conf "subnet 172.17.0.0" should be "subnet 172.17.207.0"

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Unclear

Submitted by [Ryaz Khan](#) (not registered) on Thu, 2009-01-15 14:25.

I am very sorry but I never understood this guy guides, I know it could be just me. In this he did not mentioned about default gateway for LAN where we are setting static IP address. Will any internet connection work without gateway? Not sure about that so please help. I thought gateway is the main door to enter to other networks. Again I could be wrong

Thank you for reading my stupid comments

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Re: Unclear

Submitted by Nausser (not registered) on Sat, 2009-02-14 06:02.

You may very well have figured this out already...

However, if you havn't, I wanted to post for others that you are correct in saying a gateway address is always needed for internet access.

When a computer has two or more NICs (Network Interface Cards), it needs to know which card gets it to the internet. It knows to always use the one with the default gateway listed.

The other card probably eth1, does not connect to the internet, rather other computer connect to it as their default gateway to connect to the internet (internet sharing).

Hope this helps someone out.

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1:1 NAT?

Submitted by Seth (not registered) on Sun, 2009-01-11 05:08.

I am moving from a freeBSD router/gateway computer to Ubuntu, and am stuck on 1:1 Nat'ing.

I have a class C subnet from my ISP, and connect using PPPoE.

In freeBSD the PPP daemon could do nat'ing, and was as easy as:

ppp.conf: (public IPs changed to protect me)

...

```
nat enable yes
nat addr 192.168.1.2 x.x.x.170
nat addr 192.168.1.3 x.x.x.171
nat addr 192.168.1.4 x.x.x.172
nat addr 192.168.1.5 x.x.x.173
nat addr 192.168.1.6 x.x.x.174
nat same_ports yes
nat use_sockets yes
```

...

Would you have some suggestions on how to configure iptables to provide this behavior?

(selected IPs get an external IP through NAT (snat?), all other IPs get normal NAT)

Thanks,

Seth

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Re: 1:1 NAT?

Submitted by Seth (not registered) on Sun, 2009-01-11 18:51.

Not sure how I missed the message to not ask for help here, moving this to the forums :).

Seth

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Incorrect

Submitted by Anonymous (not registered) on Sat, 2009-01-10 01:18.

1. There is not necessity to restart.
2. Your set of ip, network and netmask is wrong.

Read more.

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Re: Incorrect

Submitted by gibbsj (registered user) on Sun, 2009-01-11 01:33.

Fixed the netmask problem. Restarting insures everything is working. Of course many times you could just do a /etc/init.d/networking restart ...

But sometimes it's just better to tell people to restart.

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"As a side note, if you

Submitted by Anonymous (not registered) on Fri, 2009-01-09 20:47.

"As a side note, if you don't know how to use VI use nano or learn VI."

Nano is 100 times better than that old clunky VI.

Your side / "funny" comments are so annoying I couldn't follow the article.... For the time being I'll stick to my ClarkConnect server...

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Re: "As a side note, if you

Submitted by Anonymous (not registered) on Fri, 2009-04-03 19:36.

a note for newbies: VI is hard to learn and easy to forget if not been using for a while but it's "legacy" and you can find it and using it in very old systems.

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Re: "As a side note, if you

Submitted by gibbsj (registered user) on Sun, 2009-01-11 01:44.

There really are not that many "funny" comments. Lighten up..

VI is far more powerful then nano, as VI does syntax highlighting ect.

Also, imagine you had someone who edited a file in notepad and now your document is full of ^M or something, with vi you could do

1,\$ s/^M//g to remove them...

You cant just do ^M though, you need to hit ctrl v to tell vi to use the literal input, then ctrl m to get your ^M. Now imagine if you has a whole slew of changes to make at once, you can also do that with vi, also, imagion if you had multupal files, since vi uses ex, you can make those changes to all the files at once! Very powerful stuff. You will find that most real coder's still use VI or VIM. Some use emacs which is also very good, but VI is the standard still. Also, imagion you get your first job, as it sounds if your young, but.. you get your first job, and you get on a unix box. No pico, no nano, no ee, but what is in ALL distrobutions of Unix??? VI! Learning to work with bare bone tools that are always there will save your self lots of troble..

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[Re: Re: "As a side note, if you](#)

Submitted by Anonymous (not registered) on Tue, 2009-02-17 14:02.

nano does have syntax highlighting.

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[thanks](#)

Submitted by snehal (not registered) on Thu, 2009-01-08 13:37.

Thanks a lot. :)

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