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How to : Configure Ubuntu as a Router
Posted on Saturday, July 27, 2013 by Mandar Shinde

Introduction

If you are having two network interface cards or some other component that connects you to the internet along with a network interface card installed in your ubuntu system, it can be transformed into an immensely powerful router. You can establish basic NAT (Network Address Translation), activate port forwarding, form a proxy, and prioritize traffic observed by your system so that your downloading stuff do not intervene with gaming. This article will explicate setting up your ubuntu system as a router which can later be configured as a firewall with prior knowledge of 'IPTables'. The resulting setup will help you to control traffic over ports and make your system less vulnerable to security breaches.

Gateway Setup

Pre-requisites:
- Computer with Ubuntu OS
- Two network cards
- Internet connectivity
- Knowledge of iptables

We will need two network cards installed in the computer. One network card connects to the Internet. We will call this card eth1. The other card connects to our internal network. We will call this as eth0.

Host A (192.168.1.8) ⇐⇒ Eth1 ⇐⇒ Ubuntu Gateway ⇐⇒ Eth0 ⇐⇒ Host B (10.10.6.205)

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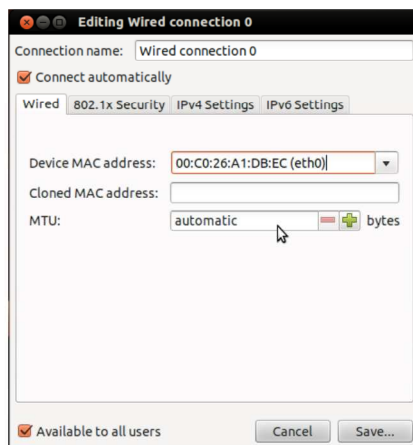

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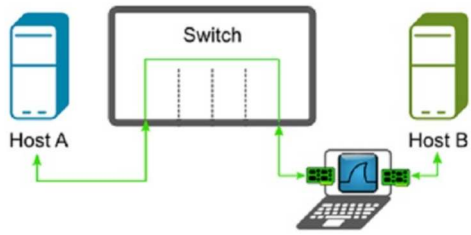
In summary:

- eth1 = Network adapter connected to internet (external).
- eth0 = Network adapter connected to a computer in the same subnet (internal).
- 10.10.6.0 = Subnet for eth0
- 192.168.1.8 = IP address of Host A, any computer in the internet.
- 10.10.6.203 = IP address of eth0.
- 10.10.6.204 = IP address of eth1.
- 10.10.6.205 = IP address of Host B, any computer in the same subnet.

Configuring Network Interface Cards

Each network interface has to be assigned with a static IP address. The method of allocating static IP addresses to the interfaces differs for desktop edition and server edition of Ubuntu. Both the methods are elaborated below.

For Ubuntu- Desktop edition:

System Settings ⇒ Network ⇒ Select Interface ⇒ Options

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For Ubuntu- Server edition:

1. Open Terminal (Ctrl+Alt+T)

2. Enter following command to edit 'interfaces' file:

```
sudo vim /etc/network/interfaces
```

3. Edit the file with the following lines:

```
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static
address 10.10.6.203
netmask 255.255.255.0
gateway 10.10.6.203

auto eth1
iface eth1 inet static
address 10.10.6.204
netmask 255.255.255.0
gateway 10.10.6.2
```

Enable IP forwarding

Configure the Ubuntu system so as to initiate routing between two interfaces by enabling IP forwarding:

```
sudo sh -c "echo 1 /proc/sys/net/ipv4/ip forward''
```

Edit /etc/sysctl.conf, and (up to 10.04) add these lines:

```
net.ipv4.conf.default.forwarding=1
```

From 10.10 onwards, it is sufficient to edit /etc/sysctl.conf and uncomment:

 # net.ipv4.ip forward=1

so that it reads:

net.ipv4.ip forward=1

IP Masquerading

To enable IP masquerading, enter following set of commands in terminal:

```
sudo iptables -t nat -A POSTROUTING -o eth1 -j MASQUERADE

sudo iptables -A FORWARD -i eth1 -o eth0 -m state --state
RELATED,ESTABLISHED -j ACCEPT

sudo iptables -A FORWARD -i eth0 -o eth1 -j ACCEPT
```


Result

Do not forget to save these IPTables rules. Unless they are saved, they will be lost after next system reboot as they are stored in volatile memory.

```
# iptables-save > /etc/iptables.rules
```

Above command will activate previously saved IPTables rules when system reboots making the changes permanent.

Credits: Mr. Mahesh Doijade (TechDarting.com)

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Posted in gateway setup, how to, IP forwarding, IPTables, Networking, ubuntu,

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16 comments:

Anonymous 24 September 2013 at 14:38

shouldn't eth0 be in the same network as the client? Is presume the client would use eth0 as its def gw?

Reply

Mandar 24 September 2013 at 23:28

Well, in above experimentation, eth0 (the router in fact) and the client were in the same network. And IP address of eth0 was the default gateway for the client.
Plus 1 for you. :)

Reply

Anonymous 26 September 2013 at 19:57

I cannot find the gateway 10.10.6.2 from your connection diagram or summary. Can you show me where it is.

Reply

  Replies

    Mandar 28 September 2013 at 01:40

    This experiment was performed in the college campus and the gateway 10.10.6.2 was located between the Switch and Host A.

    Reply

Ahmed Alaa 26 October 2013 at 06:58

shoudn't the eth0 gateway be (10.10.6.204) ? or it is right as you did it ?

Reply

  Replies

    Mandar 26 October 2013 at 10:36

    It worked fine for me.

    Reply

poison 28 October 2013 at 12:17

Getting an error:
firewall:~$ sudo iptables -A FORWARD -i eth1 -o eth0 -m state –state RELATED,ESTABLISHED -j ACCEPT
Bad argument `RELATED,ESTABLISHED'
Try `iptables -h' or 'iptables --help' for more information.

Any ideas?

Reply

poison 29 October 2013 at 05:28

Hi. Theres a mistype with your tuto, it should be: sudo iptables -A FORWARD -i eth1 -o eth0 -m state --state RELATED,ESTABLISHED -j ACCEPT

Thanks for the tuto, saved my day!

Reply

Ahmed Alaa 4 November

when i enter the command: sudo iptables -t nat -A POSTROUTING -o eth1 -j MASQUERADE
i get this message: iptable: no chain\target\match by that name
what should i do?

Reply

Replies

Mandar 4 November 2013 at 10:07

Try updating your kernel version and reboot your system.

Reply

post-factum 10 November 2013 at 07:23

Lots of crap may happen while using abovemention configuration.

First of all, it may be OK to enable Path MTU Discovery with MSS Clamping (http://lartc.org/howto/lartc.cookbook.mtu-mss.html). Otherwise half of sites won't work.

Secondly, sometimes it's necessary to disable TCP timestamps (http://www.tmltechnologies.com/html-2012/index.php/linux-rescue-kits/82-secret/91-disable-tcp-timestamps-on-linux). Otherwise you may face specific TCP ports unreachability.

Other tricks may involve MTU lowering.

Consider that.

Reply

Phat Ho 14 January 2014 at 17:46

I read your post. Thanks so much!
I have problems for my network: Host A, RedHat Linux (2 Lan Cards), Host B.
_ Host A: 192.168.1.2 netmask 255.255.255.0 gw 192.168.1.1 (connect to eth0 - RedHat).
_ RedHat Linux: eth0 192.168.1.1 netmask 255.255.255.0
eth1 192.168.2.1 netmask 255.255.255.0
_ Host B: 192.168.2.2 netmask 255.255.255.0 gw 192.168.2.1 (connect to eth1 RedHat).
From Host A, I can ping to eth0, eth1 but I can't ping to Host B
And From Host B, I can ping to eth0, eth1 but I can't ping to Host A
Can you help me?

Reply

Anonymous 13 February 2014 at 04:28

If Host A and Host B are in the same network, there is no need of a router!
I tryied with host A and host B in differents networks but it doesn't work :(
Any tips???

Reply

Anbarasan 16 February 2014 at 03:05

Here eth1 should be in 192.168.1.x network. then only Host A can reach eth1 as a Gateway. It should not be in 10.0.6.x

Reply

Anonymous 26 January 2015 at 19:28

If both of your cards are in the same [sub]network the PC is not routing is switching.
In the configuration described the Switch must be rounting or Host A

Reply

Anonymous 24 June 2015 at 05:15

DNS not resolving in the client machine, but it is resolving in the server. please help.

Reply

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