**How to create a PPPoE Server on Ubuntu?**

March 30, 2011[coder\_commenter](http://poundcomment.wordpress.com/author/theslan1/)[Leave a comment](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/#respond)[Go to comments](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/#comments)

For one reason or another, I needed to setup a PPPoE Server on my Ubuntu machine. Unfortunately almost all the guides found were talking about setting a PPPoE client connected to a PPPoE Server. So I spend a few days testing and trying out different configurations, until I finally found how to set it up from scratch. The below instructions will look similar to the guide I referenced, but there are some extra steps to ensure that your connection will be able to access Internet properly.

**Step #1: Topology Setup**

First of all, the topology needs to be setup as followed:   
   
PC --- PPPoE Server (Ubuntu) --- Internet   
   
You can add your typical cable modem and/or router into the mix. The main issue here is to ensure that your PPPoE Server can access the Internet without any problems. To verify this, just do a quick ping test to google.com or yahoo.com.  
   
**> ping**[**http://www.google.com**](http://www.google.com/)

PING www.l.google.com (74.125.155.103) 56\*84) bytes of data.

64 bytes from px-in-f103.1e100.net (74.125.155.103): icmp\_req=1 ttl=52 time=36.9 ms

64 bytes from px-in-f103.1e100.net (74.125.155.103): icmp\_req=2 ttl=52 time=37.5 ms

64 bytes from px-in-f103.1e100.net (74.125.155.103): icmp\_req=3 ttl=52 time=34.3 ms

64 bytes from px-in-f103.1e100.net (74.125.155.103): icmp\_req=4 ttl=52 time=37.6 ms

-- www.l.google.com ping statistics ---

4 packets transmitted, 4 received, 0% packet loss

If you cannot access this, check your interface. Most likely something is misconfigured there. There are several guides on how to enable your interface properly:  
– [Network Configuration](https://help.ubuntu.com/9.10/serverguide/C/network-configuration.html)

**Step #2: Install PPP and RP-PPPoE**

You will need to install these components to get the PPPoE Server working. The first one is simple: just grab the ppp package from Ubuntu:   
   
**> sudo apt-get install ppp**  
   
The second package (rp-pppoe) requires you to build it on your own. Start by grabbing the package from this [website (Roaring Penguin)](http://www.roaringpenguin.com/products/pppoe)  
   
> wget <http://www.roaringpenguin.com/files/download/rp-pppoe-3.10.tar.gz>  
> tar -zxf rp-pppoe-3.10.tar.gz  
> cd rp-pppoe-3.10/src  
> ./configure  
> make  
> sudo make install

**Step #3: Setup PPPoE Settings**

Several files need to be created before we can start PPPoE Server. First, modify the /etc/ppp/pppoe-server-options and change it to the following:   
   
*/etc/ppp/pppoe-server-options:*

# PPP options for the PPPoE Server

# LOC: GPL

#require-pap

require-chap

login

lcp-echo-interval 10

lcp-echo-failure 2

ms-dns 4.2.2.1

ms-dns 4.2.2.3

netmask 255.255.255.0

defaultroute

noipdefault

usepeerdns

Next, add a username into the correct secrets file. Since we’re using require-chap, we will add it into /etc/ppp/chap-secrets. The syntax is simple: follow the example below to add a user (alice) with a simple password (1234).  
   
*/etc/ppp/chap-secrets:*

# Secrets for authentication using CHAP

# client server secret IP addresses

"alice" \* "1234" 172.32.50.2

One note: make sure that the file has the correct permissions. Sometimes the PPPoE Server won’t start if the file isn’t restricted enough. A simple chmod command will do here:  
   
> sudo chmod 600 /etc/ppp/chap-secrets  
   
Last of all, setup the IP addresses to lease for the PPPoE Server. We’re giving IP addresses 172.32.50.2 to 172.32.50.30:  
   
*/etc/ppp/ipaddress\_pool:*

172.32.50.2-30

**Step #4: Set PPPoE Scripts**

We are ready to start PPPoE Server. Several things to worry about: the firewall needs to be set properly so that the PPPoE Server will be able to transfer traffic from one interface to the other, and IP forwarding needs to be enabled. Since these options will have to set every time Ubuntu reboots, they’re part of the start PPPoE script. It’s placed under /etc/ppp/start\_pppoe.  
   
*/etc/ppp/pppoe\_start:*

#!/bin/bash

##############################

# Simple script that starts PPPoE Server

##############################

# Enable IP Forwarding

echo 1 > /proc/sys/net/ipv4/ip\_forward

# Start PPPoE Server

pppoe-server -C isp -L 172.32.50.1 -p /etc/ppp/ipaddress\_pool -I eth1 -m 1412

# Set Firewall rules

iptables -t nat -F POSTROUTING

iptables -t nat -A POSTROUTING -o eth0 -j MASQUERADE

The -m option for pppoe-server is needed so that the packets don’t go beyond MTU size after the PPPoE header is attached.

For complete purposes, below is a stop script to nicely tear down the PPPoE Server and revert any changes.  
   
*/etc/ppp/pppoe\_stop:*

#!/bin/bash

##############################

# Simple script that stops PPPoE Server

##############################

# Disable IP Forwarding

echo 0 > /proc/sys/net/ipv4/ip\_forward

# Kill PPPoE Server

killall pppoe-server

killall pppd

# Flush the IPtable rules.

iptables -t nat -F POSTROUTING

**Step #5: Automatically start/stop PPPoE Server**

All we have to do is add them into the /etc/network/interfaces so that once the computer boots and detects the interface is connected, it’ll boot up the PPPoE Server. The PPPoE Server resides in eth1 in this example below:   
   
*/etc/network/interfaces:*

...

auto eth1

iface eth1 inet manual

post-up /etc/ppp/pppoe\_start

post-down /etc/ppp/pppoe\_stop

...

That’s it! Once that’s completed, then the PPPoE Server will boot up automatically and start handling traffic.

**Troubleshooting**

Usually, there’s always some sort of issue getting the PPPoE Server working. I found that using [wireshark](http://www.wireshark.org/) makes it easier to debug the situation. However, usually the interface (eth1) isn’t up for wireshark to sniff. Make the modifications below to bring up the interface without assigning an IP address to it:

*/etc/network/interfaces:*

...

auto eth1

iface eth1 inet manual

up ifconfig $IFACE 0.0.0.0 up

post-up /etc/ppp/pppoe\_start

post-down /etc/ppp/pppoe\_stop

down ifconfig $IFACE down

...

That should make it easier to debug.

**References:**

[How to do it yourself: PPPoE Server](http://www.howtodoityourself.org/2010/12/01/pppoe-server-how-to-do-it-yourself.html)

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1. http://0.gravatar.com/avatar/3bd50e955ae1a42295fb3449315f66d9?s=32&d=identicon&r=G

**coder\_commenter**

August 16, 2011 at 6:51 pm

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=23#respond)

It seems that there were a few problems with the post above after I had to duplicate another PPPoE Server for someone else. I’ve made changes and fixed them (especially when I mixed my scripts between pppoe\_start, pppoe\_stop and pppoe-up, pppoe-down… sorry!)

This post should be working flawlessly now. If not, post a comment below and I will investigate it.

1. http://2.gravatar.com/avatar/bcaf6a08b6ec49b52706b692cc13220d?s=32&d=identicon&r=G

**john**

November 2, 2011 at 3:55 am

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=27#respond)

Thanks for the post … unfortunately when I tried logging on 3 different pc’s at the same time with the same username and password it still works.

John

1. http://1.gravatar.com/avatar/76b7ca8c91094e8639bca0cf6f9c4daa?s=32&d=identicon&r=G

[**alpha**](http://alphatang.com/)

November 14, 2011 at 6:23 am

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=28#respond)

yes it works. just so you know, i didn’t forget to say thank you!

1. http://1.gravatar.com/avatar/a08d3b3821b1cf3ece626f3d08dff845?s=32&d=identicon&r=G

**Simon**

November 22, 2011 at 7:59 pm

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=29#respond)

I think there’s a typo: /etc/ppp/pppoe-servers-options should actually be /etc/ppp/pppoe-server-options  
.  
Unfortunately I can’t get this to work – I always get the error PADT “RP-PPPoE: Child pppd process terminated”. Sadly google hasn’t offered any solutions :(

* + http://0.gravatar.com/avatar/3bd50e955ae1a42295fb3449315f66d9?s=32&d=identicon&r=G

**coder\_commenter**

January 3, 2012 at 10:34 am

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=30#respond)

[**Simon**](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/#comment-29)**:**

I think there’s a typo: /etc/ppp/pppoe-servers-options should actually be /etc/ppp/pppoe-server-options

Oops! That’s correct… I missed that small detail. Thanks for catching it.

1. http://0.gravatar.com/avatar/f4217340c86093c3da686bc9d6f2295f?s=32&d=identicon&r=G

[**lnicolodi**](http://gravatar.com/lnicolodi)

January 12, 2012 at 6:04 pm

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=33#respond)

Hello coder\_commander,

based on your guide, I have automated the installation of a PPPoE concentrator on Ubuntu 11.10 x64 (there are some changes in since your post).

If you need them I can send them to you.. I will create, in any case, a post on my site about this… if you want, you can also add a link to my post where these scripts will be available.

How can we get in touch?

BTW, thanks a lot for the guide, it saved me a lot of testing-hours.

Lo

* + http://0.gravatar.com/avatar/3bd50e955ae1a42295fb3449315f66d9?s=32&d=identicon&r=G

**coder\_commenter**

January 15, 2012 at 8:08 am

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=34#respond)

Post it here, and I’ll add a blurb about it.

If I remember correctly, this was created for 10.04 LTS, so I’m not completely surprised there are minor changes made for another version of Ubuntu.

1. http://0.gravatar.com/avatar/f4217340c86093c3da686bc9d6f2295f?s=32&d=identicon&r=G

[**lnicolodi**](http://gravatar.com/lnicolodi)

January 18, 2012 at 11:05 pm

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=37#respond)

Hello coder\_commander,

here is the micro-article I have written based on your guide:

<http://www.lo-online.net/cs/install-pppoe-concentrator-on-ubuntu-server-11-10.html>

Hope it helps!

Bye and thanks again for your guide!

Lo

* + http://1.gravatar.com/avatar/42b9ef8b71c2a855a6422c4d82431b0c?s=32&d=identicon&r=G

[**erdemc**](http://gravatar.com/erdemc)

May 28, 2012 at 10:04 pm

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=55#respond)

great work buddies, especially thanks to you Inicolodi!  
erdem

1. http://1.gravatar.com/avatar/7836199f999a2e5f606a83fde9e93e4a?s=32&d=identicon&r=G

[**Levente Cseh**](http://gravatar.com/lcseh)

April 16, 2014 at 3:46 pm

[Reply](http://poundcomment.wordpress.com/2011/03/30/pppoe-server-on-ubuntu/?replytocom=124#respond)

I followed this description and although it needed some finetuning, I thought I’d put here my working config. Please note you need to follow the following rule:

Set your first ethernet card as WAN and the second as PPPoE.  
I had eth1 as WAN and ETH3 as LAN side.

root@ubuntu:~# cat /etc/ppp/pppoe-server-options  
# PPP options for the PPPoE server  
# LIC: GPL  
# require-pap  
require-chap  
login  
lcp-echo-interval 10  
lcp-echo-failure 2  
ms-dns 8.8.8.8  
ms-dns 4.4.4.4  
netmask 255.255.255.0  
defaultroute  
noipdefault  
usepeerdns

create a pppoe-up script and chmod to executable:

root@ubuntu:~# cat /etc/ppp/pppoe-up  
#!/bin/bash  
# —————————————————-

# Starts the PPPoE server and turns on NAT

# —————————————————-

# MAX is the maximum number of addresses your server

# is allowed to hand out.  
PROV=pppoe  
MAX=10

# BASE is the lowest IP address your server is allowed

# to hand out.

#BASE=192.168.1.238  
#PLA=192.168.1.0/24

BASE=10.0.213.2  
PLA=10.0.213.0/24

# NAT is the set of addresses which your server will

# NAT behind it. Other addresses behind your server

# WILL NOT be NATed.

#NAT=172.32.50.0/24

# MYIP is the public IP address of this server.

MYIP=10.0.213.1

##########################################

# Here is where the script actually starts executing.  
##########################################

# Disable IP spoofing on the external interface.

/sbin/iptables -t nat -F POSTROUTING

# Enable NAT for the private addresses we hand out.

# /sbin/iptables -t nat -A POSTROUTING -o eth0 -j MASQUERADE  
/sbin/iptables -t nat -A POSTROUTING -s 10.0.213.0/24 -o eth1 -j MASQUERADE

# Launch the server.

/usr/sbin/pppoe-server pty -T 60 -I eth3 -L $MYIP -N $MAX -C $PROV -S $PROV -R $PLA

echo “1” > “/proc/sys/net/ipv4/ip\_forward”

root@ubuntu:~#

Voilá….

Create an upstart for the script to be started upon boot and you are ready. This works.