MLPPP guide

Contributors

Name	Contribution Type	Current Version
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	Ubuntu Configuration	
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What is MLPPP

MLPPP is a communication protocol which will use two or more physical connections to increase the maximum bandwidth available to a user through a technique called bonding.

What is needed

- A Linux PC (FreeBSD preferred) [FreeBSD Handbook](#)
- Two or more phone lines (can be dry or wet)
- Two or more DSL logins (unless ISP allows multiple logins with one login)
- ISP must support MLPPP
- Two or more DSL modems or ADSL PCI cards

How to build MPD5 from CVS

1. Log into your bsd box via ssh or open a terminal
2. Make a new directory ~/mpd-cvs
3. Hit return when it asks you for a password; then run

   $ cvs -d:pserver:anonymous@mpd.cvs.sourceforge.net:/cvsroot/mpd login

4. Switch to the src directory

   $ cvs -z3 -d:pserver:anonymous@mpd.

   $ cd mpd/src

5. Configure, make, make install

   $ ./configure

   $ make

   $ sudo make install

Congrats; if you didn't get any errors you now have the cvs version of mpd installed on your box you can confirm this with:

   $ mpd5 -v

   Version 5.1rc2 (root@ 20:06 29-Mar-2008)

Configuration Testing

To ensure that everything works just type

> $ mpd

Once you know it works it can be run in the background as a daemon with

> mpd –b

Enjoy your bonded connection

Default PPP installation on FreeBSD Userland PPP Configuration

This is the default configuration that FreeBSD uses for its PPP connections.

Location: /etc/ppp/ppp.conf

This configuration should work for most

```
1.  default:
2.      set log Phase Chat LCP IPCP CCP tun command
3.  ispname:
4.      set authname AuthName
5.      set authkey AuthPasswd
6.      set device PPPoe:x10 PPPoE:x11
7.      set dial
8.      set login
9.      set logout
10.     set hangup
11.     set speed sync
12.     enable tcpmssfixup
13.     enable mssfixup
14.     disable lqr ipv6cp acfcomp pred1 protocomp vjcomp deflate chap81 pap
15.     deny lqr acfcomp pred1 protocomp vjcomp deflate mppe chap
16.     accept pap chap
17.     set ifaddr 10.1.1.2/0 10.1.1.1/0 0 0
18.     add! default hisaddr
19.     set timeout 0
20.     set mru max 1440
21.     set mrru 1528
22.     set server /var/run/ppp-tun%d 0177
23.     clone 1,2
24.     link deflink remove
25.     link 1,2 set mode ddial
26.     link 1 set device PPPoE:x10
27.     link 2 set device PPPoE:x11
```

This configuration was posted by a dslreports user

```
1.  default:
2.      set log Phase tun command
3.      disable ipv6
4.  ispname:
5.      set authname AuthName
6.      set authkey AuthPasswd
7.      set dial
8.      set login
9.      set logout
10.     set hangup
11.     set speed sync
12.     Set server /var/run/ppp-tun%d 0177
13.     set ifaddr X.X.X.X Y.Y.Y.Y 255.255.255.255
14.     add! default hisaddr
15.     set timeout 0
16.     disable lqr ipv6cp acfcomp pred1 protocomp vjcomp deflate ipv6
17.     deny lqr acfcomp pred1 protocomp vjcomp deflate mppe
18.     accept pap chap
19.     set mtu max 1492
20.     set mru 1486
21.     # FOR CISCO use 1524 mrru and for Juniper use 1590 mrru
22.     set mrru 1590
23.     clone 1,2
24.     link deflink remove
25.     link 1,2 set mode ddial
26.     link 1 set device PPPoE:x10
27.     link 2 set device PPPoE:x11
```

location: /etc/ppp/ppp.linkup

```
1.  MYADDR:
2.  !bg /sbin/ifconfig tun0 mtu 1486
```

The most important line in these configurations is the 'set mrru' line. This is the line that actually tells ppp to create a multilink connection. As for the proper values for 'set mtu', 'set mru', and 'set mrru', that is going to depend on your ISP and the connection you have to them. You'll also need to modify the MSS of outbound packets to account for the different MTU and MRU settings. pf has builtin support for MSS mangling, while tcpmssd can be used with ipfw to achieve the same result.

MPD Configuration

Mpd is the Multilink PPP Daemon. It has been designed specifically for MLPPP, and so should have some additional features some users may find useful. The author has only used it mostly to prove that it works, but has not had any need to use the advanced features. Mpd supports better control of the individual links than userland ppp.

These mpd configurations are for a 3 link setup. These are known to work with the CVS versions of mpd4 and mpd5 as of the end of January 2008. Any release of mpd4 or mpd5 since then should include fixes that were a result of some testing I did with the developer.

Mpd4

Location: mpd.conf

```
1.  startup:
2.    set console ip 127.0.0.1
3.    set console user admin password
4.    set console open
5.  default:
6.  new sam 10 11
7.  set bundle enable multilink
8.  set bundle enable round-robin
9.  set iface route default
```

location: mpd.links

```
1.  10:
2.    set link type pppoe
3.    set pppoe iface x10
4.    set pppoe disable incoming
5.    set pppoe enable originate
6.    set auth authname AuthName
7.    set password AuthPasswd
8.    set link max-redial 0
9.    open
10.  11:
11.    set link type pppoe
12.    set pppoe iface x11
13.    set disable incoming
14.    set pppoe enable originate
15.    set auth authname AuthName
16.    set auth password AuthPasswd
17.    set link max-redial 0
18.    open
19.  12:
20.    set link type pppoe
```

```
21.    set pppoe iface fxp0
22.    set pppoe disable incoming
23.    set pppoe enable originate
24.    set auth authname AuthName
25.    set auth password AuthPasswd
26.    set link max-redial 0
27.    open
```

location: mpd.links

```
1.  default:
2.    create bundle static B1
3.    set iface route default
4.    create link static L1 pppoe
5.    set pppoe iface x10
6.    set auth authname AuthName
7.    set auth password AuthPasswd
8.    set link enable multilink
9.    set link max-redial 0
10.   set link action bundle B1
11.   open
12.
13.   create link static L2 pppoe
14.   set pppoe iface x11
15.   set auth authname AuthName
16.   set auth password AuthPasswd
17.   set link enable multilink
18.   set link max-redial 0
19.   set link action bundle B1
20.   open
21.
22.   create link static L3 pppoe
23.   set pppoe iface fxp0
24.   set auth authname AuthName
25.   set auth password AuthPasswd
26.   set link enable multilink
27.   set link max-redial 0
28.   set link action bundle B1
29.   open
```

PF Configuration

These three lines help with the MLPPP packet reassembly

```
1.  Scrub in on $ext_if all fragment reassemble min-ttl 15 max-mss 1440
2.  Scrub in on $ext_if all no-df
3.  Scrub on $ext_if all reassemble tcp
```

Split packets vs. Round Robin

MLPPP can work in two ways. The simplest is when packets are sent whole down each link in a round robin fashion. This will double your bandwidth but won't allow you to bypass restrictions on the packet size (1492 for PPPoE).

The other way is to split the packet in two, and send each half down each link. This is the preferred way to work, as the connections are truly bonded. Along each link the packet has a further 6 byte header added to it, but because the packet has been split in half the packet as a whole can be greater than 1492. Packet splitting should result in less jitter than the round robin setup, though this will be most noticeable on the upload side of the connection.

Setting up MSS in iptables

To Setup MSS in iptables type the following, if you wish to have this loaded every time the system is started a simple bash script can be written and attached to the startup procedures.

```
1.  iptables -t mangle -A INPUT -i ppp0 -p tcp --tcp-flags SYN,RST SYN -m tcpmss --
    mss 1415: -j TCPMSS --set-mss 1414
2.  iptables -t mangle -A FORWARD -i ppp0 -p tcp --tcp-flags SYN,RST SYN -m tcpmss --
    mss 1415: -j TCPMSS --set-mss 1414
3.  iptables -t mangle -A OUTPUT -o ppp0 -p tcp --tcp-flags SYN,RST SYN -m tcpmss --
    mss 1415: -j TCPMSS --set-mss 1414
4.  iptables -t mangle -A FORWARD -o ppp0 -p tcp --tcp-flags SYN,RST SYN -m tcpmss --
    mss 1415: -j TCPMSS --set-mss 1414
```

MLPPP on Gentoo

mlppp net setup

location: etc/conf.d/net

```
4.   cat /etc/conf.d/net
5.   # This blank configuration will automatically use DHCP for any net.*
6.   # scripts in /etc/init.d.  To create a more complete configuration,
7.   # please review /etc/conf.d/net.example and save your configuration
8.   # in /etc/conf.d/net (this file :]!).
9.
10.  config_eth0=( "192.168.0.1 broadcast 192.168.0.255 netmask 255.255.255.0" )
11.  config_eth1=( "192.168.0.155 broadcast 192.168.0.255 netmask 255.255.255.0 ")
12.
13.  config_ppp0=( "ppp" )
14.  config_ppp1=( "ppp" )
15.
16.  link_ppp0="eth2"
17.  link_ppp1="eth3"
18.
19.  plugins_ppp0=( "pppoe" )
20.  plugins_ppp1=( "pppoe" )
21.
22.  #-------------------------------------------------------------
23.  username_ppp0='user@teksavvy.com'
24.  password_ppp0='pass'
25.  pppd_ppp0=(
26.          "logfile /var/log/ppp0"
27.          "defaultroute"
28.          "mru 1486"
29.          "mtu 1492"
30.  #       "usepeerdns"
31.          "multilink"
32.  )
33.  #-------------------------------------------------------------
34.  username_ppp1='user@teksavvy.com'
35.  password_ppp1='pass'
36.  pppd_ppp1=(
37.          "defaultroute"
38.          "usepeerdns"
39.          "logfile /var/log/ppp1"
40.          "ipcp-accept-remote"
41.          "ipcp-accept-local"
42.          "mru 1486"
43.          "mtu 1492"
44.  #       "mrru 1500"
45.          "debug"
46.          "multilink"
47.  )
```

Also have my mangle iptables setting mss to 1414 to fix the overhead

Debian or Ubuntu

Requirements

- A kernel which supports ppp and pppoe support enabled (module or built-in)
- Ethernet driver for the interface on which you expect to connect using PPPoE
- pppoeconf

To bring up the graphical gui type installgui modules=ppp-udeb in the command line

1. in the command line run /etc/ppp/peers/dsl-provider, /etc/ppp/*ap-secrets files and /etc/network/interfaces

```
48. auto eth0
49. iface eth0 inet manual
50.
51.
52. auto dsl-provider
53. iface dsl-provider inet ppp
54. pre-up      /sbin/ifconfig eth0 up
55. provider   dsl-provider
```

2. pppoeconf try to load pppoe kernel module (modprobe -q pppoe). If there is a file /proc/net/pppoe, configuration will be in "kernel_mode". It's the case for a large majority of users because standard Debian installation have a kernel with pppoe compiled in module.

PPPoE with kernelspace pppoe driver

```
1.  plugin rp-pppoe.so eth0
```

Documentation on how to use the kernel module without rp-pppoe can be found at here

3. Alternatively, user-space agent pppoe can be used.

PPPoE with userspace pppoe driver

```
1.  pty "pppoe -I eth0 -T 80 -m 1452"
```

add the following to the userspace driver

mp
mtu 1442

Windows XP MLPPP

## Creating a PPPOE Connection
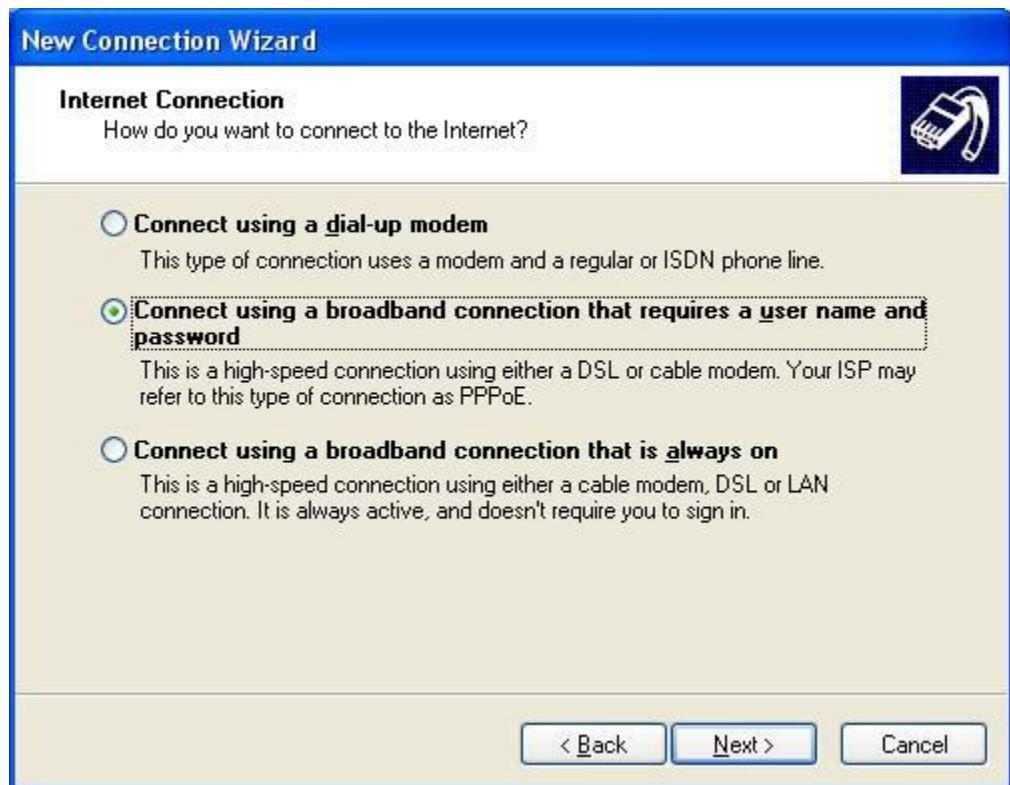
1. Click on the **Start Menu** then click on **Control Panel**
2. Double click on **Network Connections**
3. On the **left pane** click on **create a new connection**
4. At the **New Connection Wizard** click Next
5. Select the first radio button **Connect to the Internet** and click Next
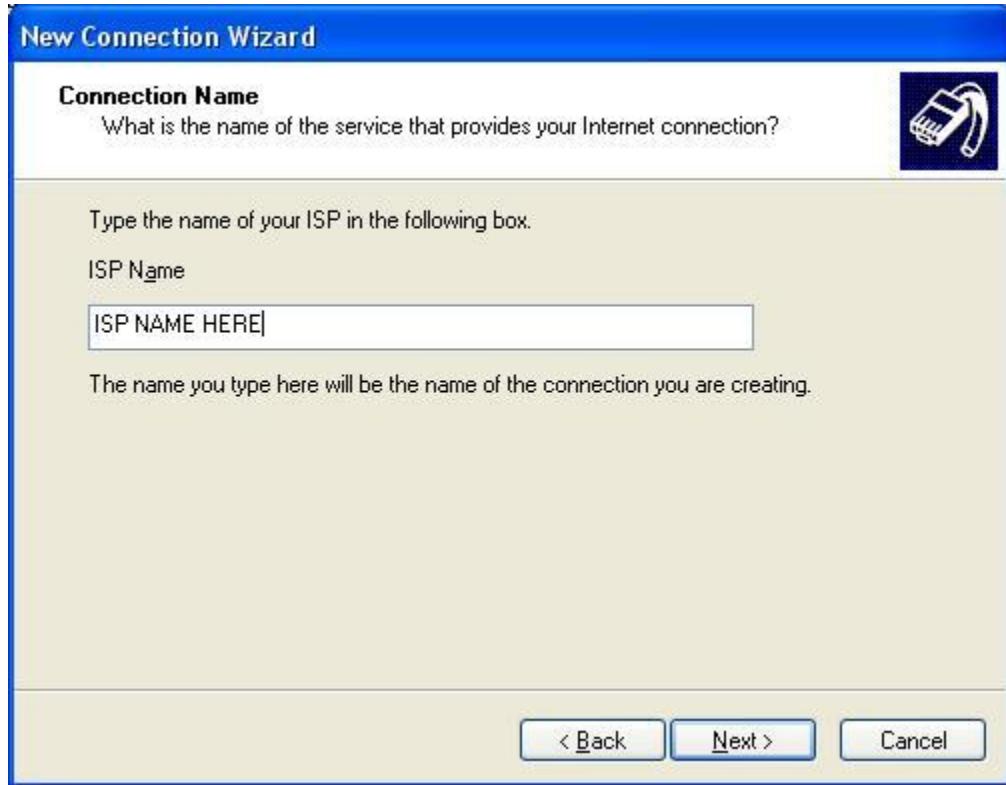
6. Select the second radio button **Set up my connection manually** and click Next
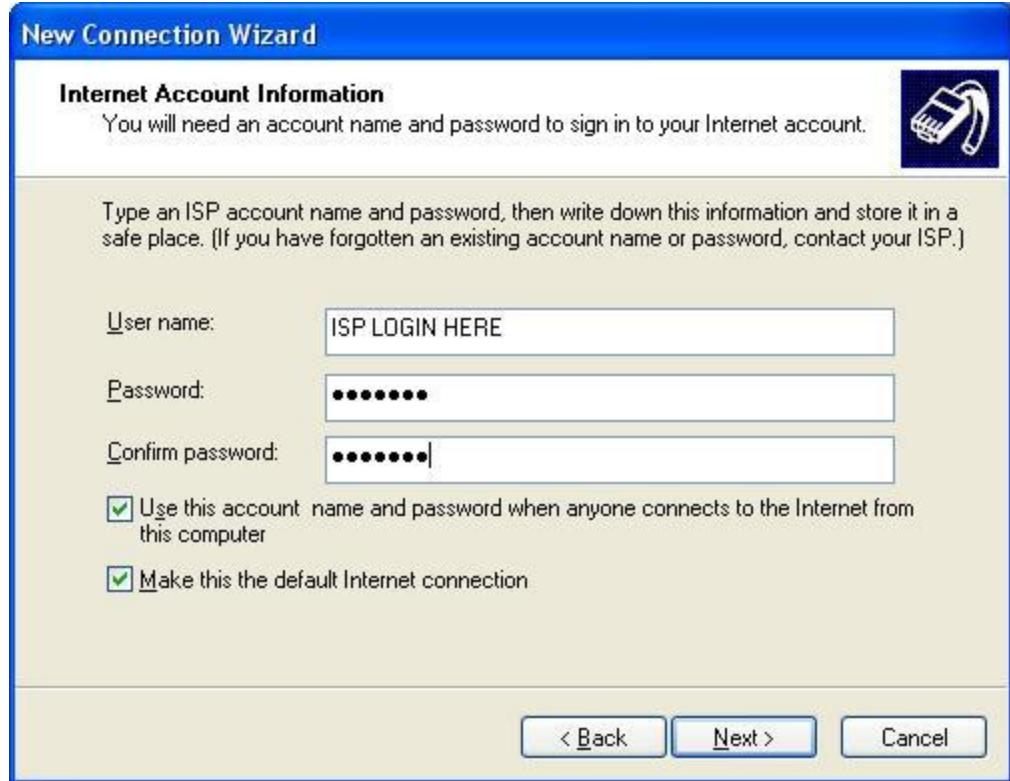
7. Select the second radio button **Connect using a broadband connection that requires a user name and password**

8. In the **ISP Name** field please enter your desired ISP Name here it can be anything you want

9. In **User name**: type your ISP's Login name and under Password: type your login name password and once more under Confirm password:

10. *Optional*: if you wish anyone to connect to the internet on the connection check off **Use this account name and password when anyone connects to the internet from this computer**
11. *Optional*: if you wish this connection to be your default internet connection check **Make this the default Internet connection**
12. Once finished click Next
13. *Optional*: if you wish to have a shortcut on the desktop check **Add a shortcut to this connection to my desktop** and click on Next

New Connection Wizard

Completing the New Connection Wizard

You have successfully completed the steps needed to create the following connection:

Teksavvy
- Make this the default connection
- Share with all users of this computer
- Use the same user name & password for everyone

The connection will be saved in the Network Connections folder.

☑ Add a shortcut to this connection to my desktop

To create the connection and close this wizard, click Finish.
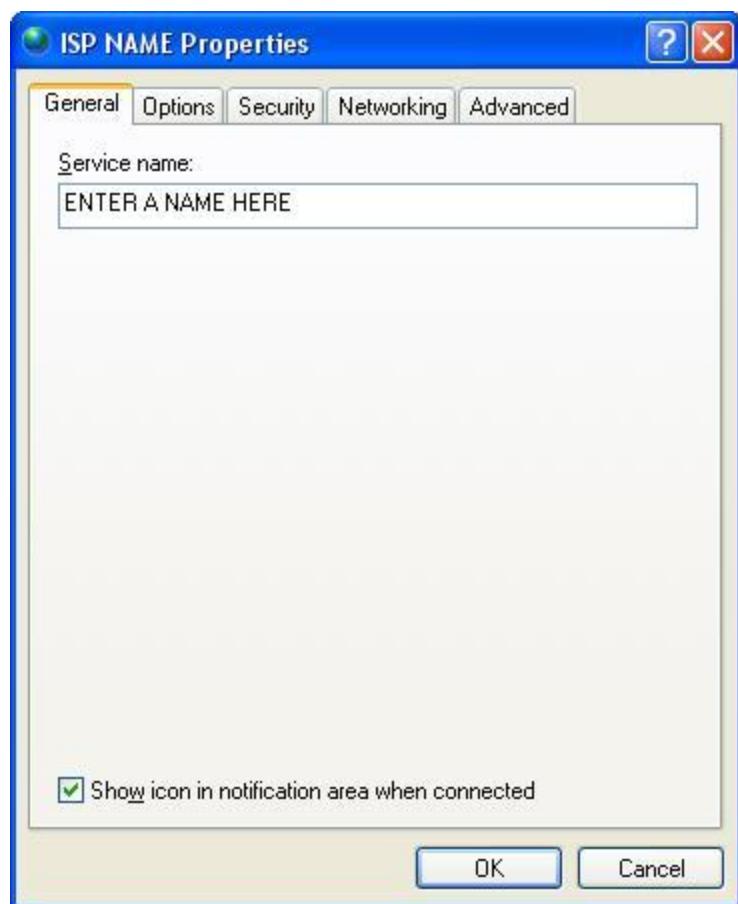
[< Back] [Finish] [Cancel]

Setting up MLPPP on a PPPOE connection
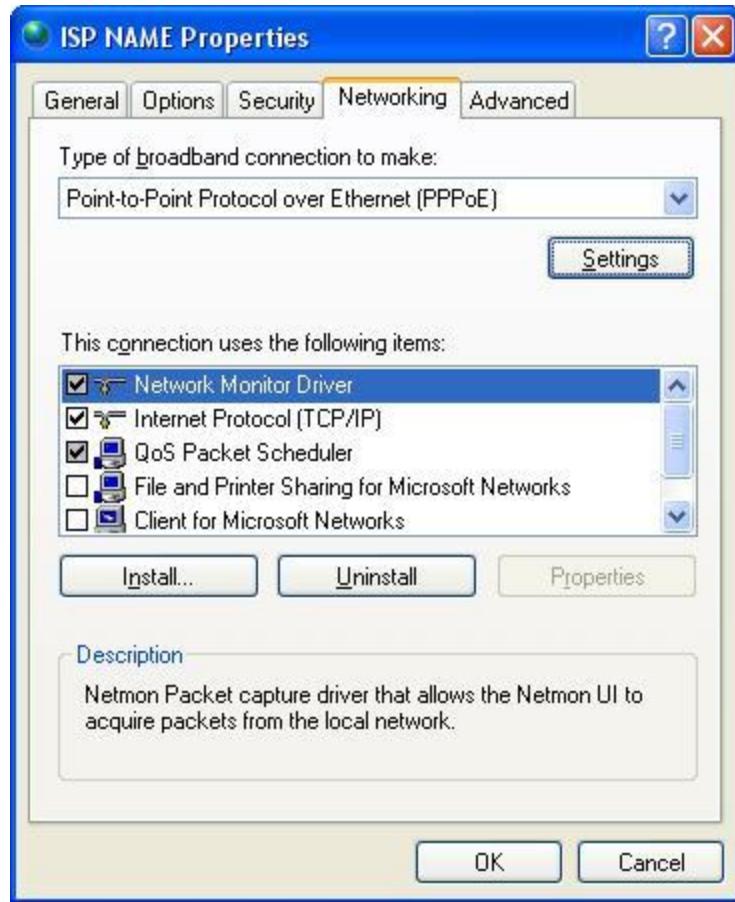
1. Click on the **Start Menu** then click on **Control Panel**
2. Double click on **Network Connections**
3. Double click on your **WAN Miniport (PPPOE) connection**
4. Click on **properties**

5. Optional: Under the **General tab** enter a Service name

6. Under the **Networking tab** click on **Settings**

7. Check mark **Negotiate multi-link for single link connections** and click Ok

8. *Optional*: under **Advanced tab** click Allow other network users to connect through this computer's Internet connection and under **Home networking connection** select the network interface which the Internet connection is attached to.
9. *Optional*: If you wish to establish a connection whenever you use the internet check **Establish a dial-up connection whenever a computer on my network attempts to access the Internet**
10. *Optional*: If you wish to allow other users to be able to enable or disable the ability to share the internet connection check **Allow other network users to control or disable the shared Internet connection**
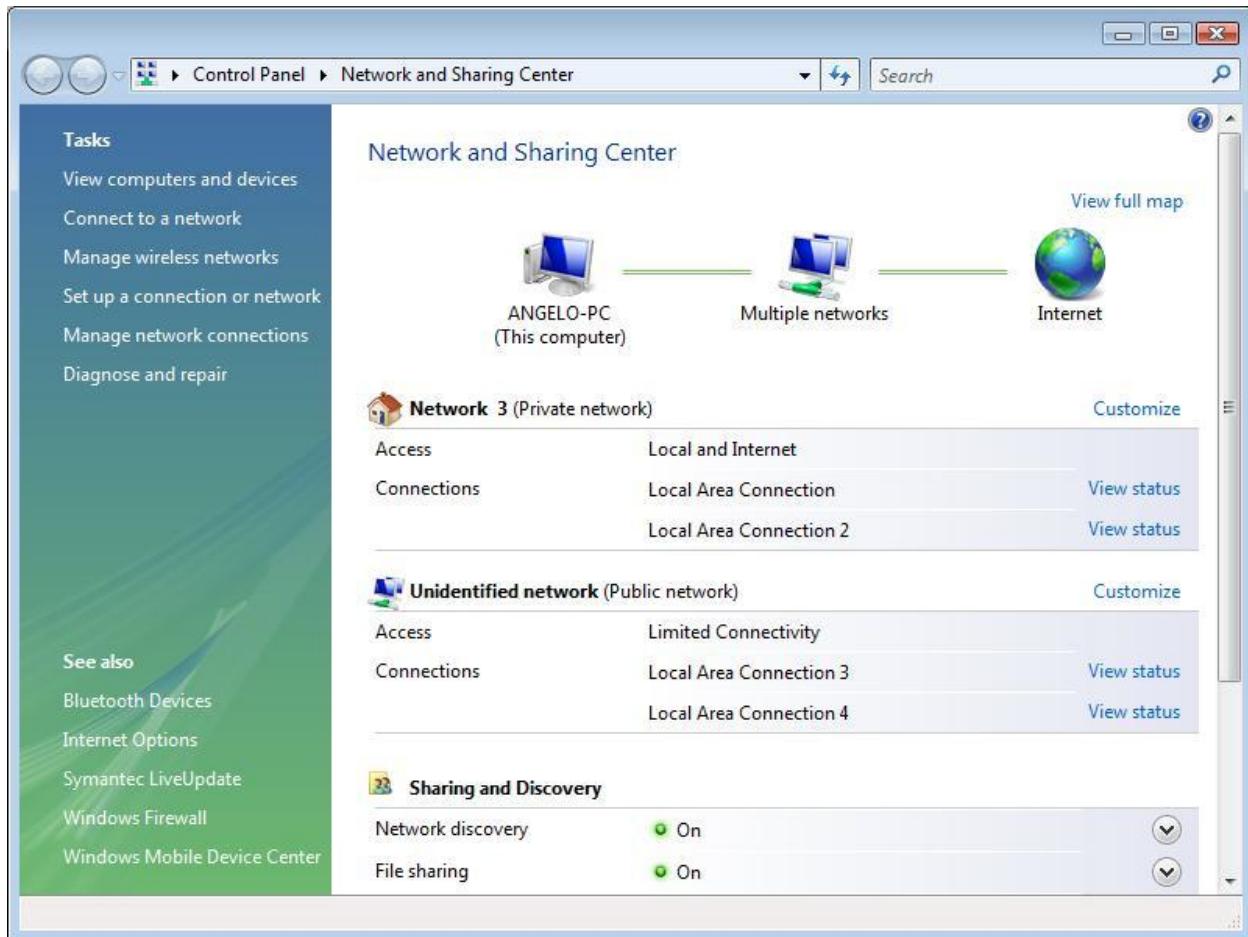
11. Click Ok
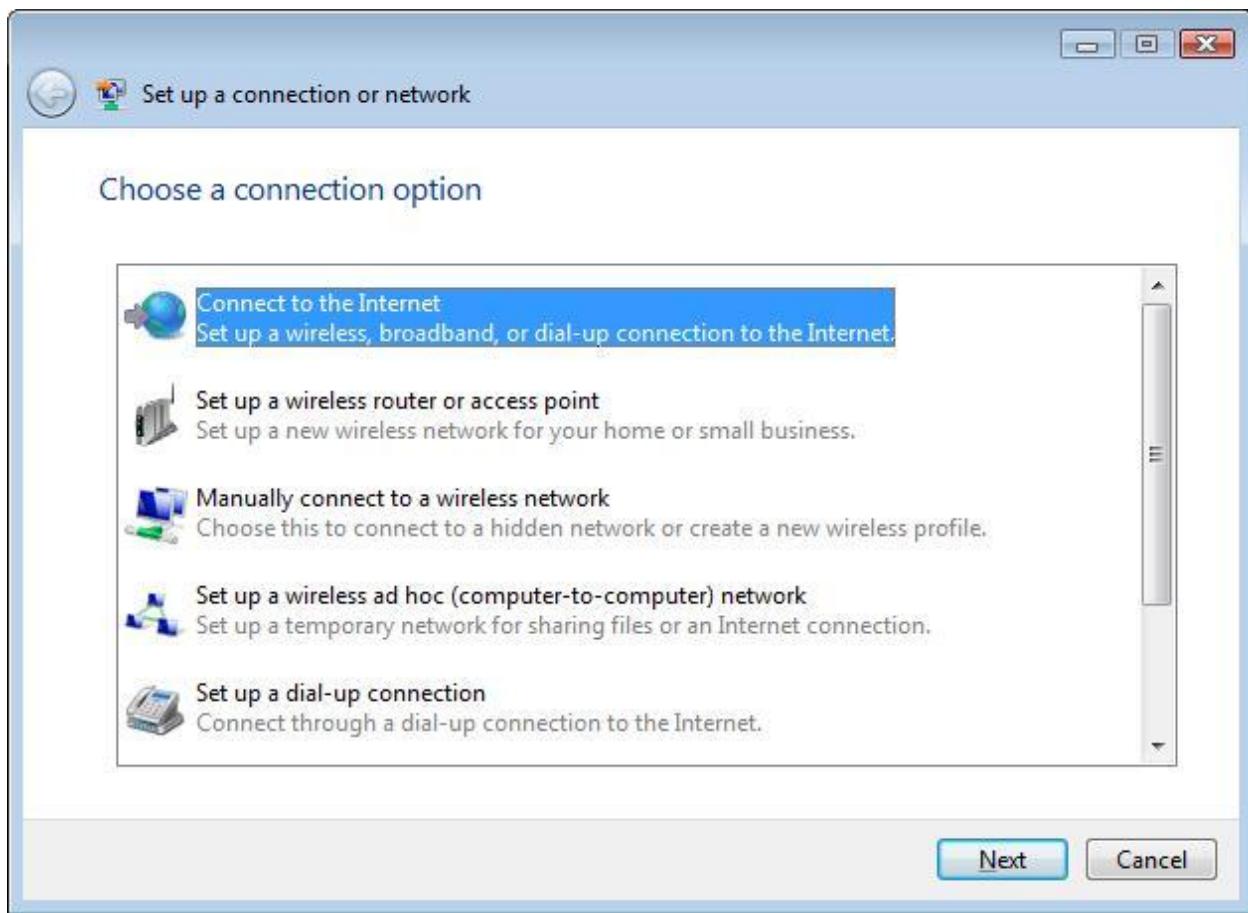
Windows Vista MLPPP

Creating a PPPOE Connection
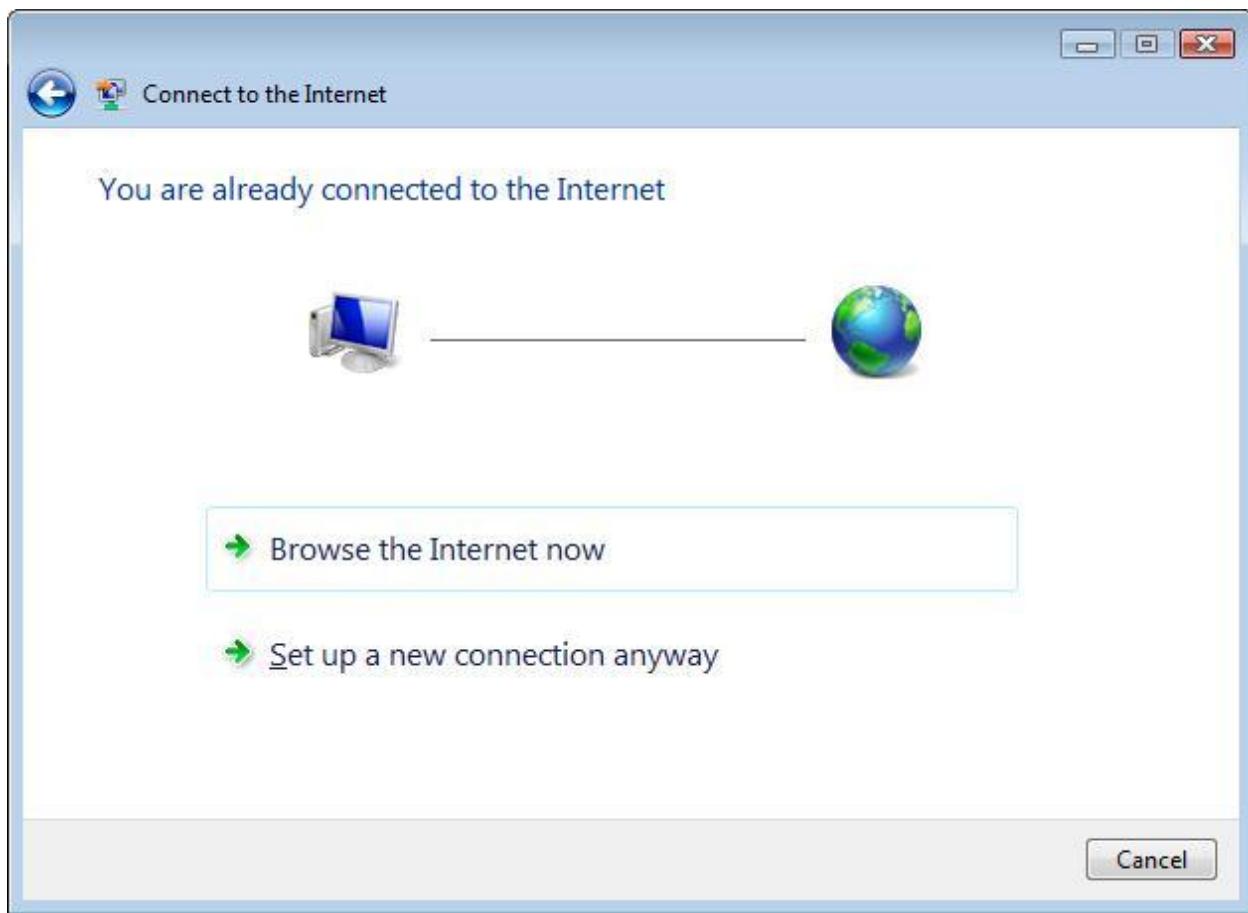
1. Click on the **Start Menu**
2. Right click **Network** and click properties on the pane which appears

3. Click **Set up a connection or network** on the left pane
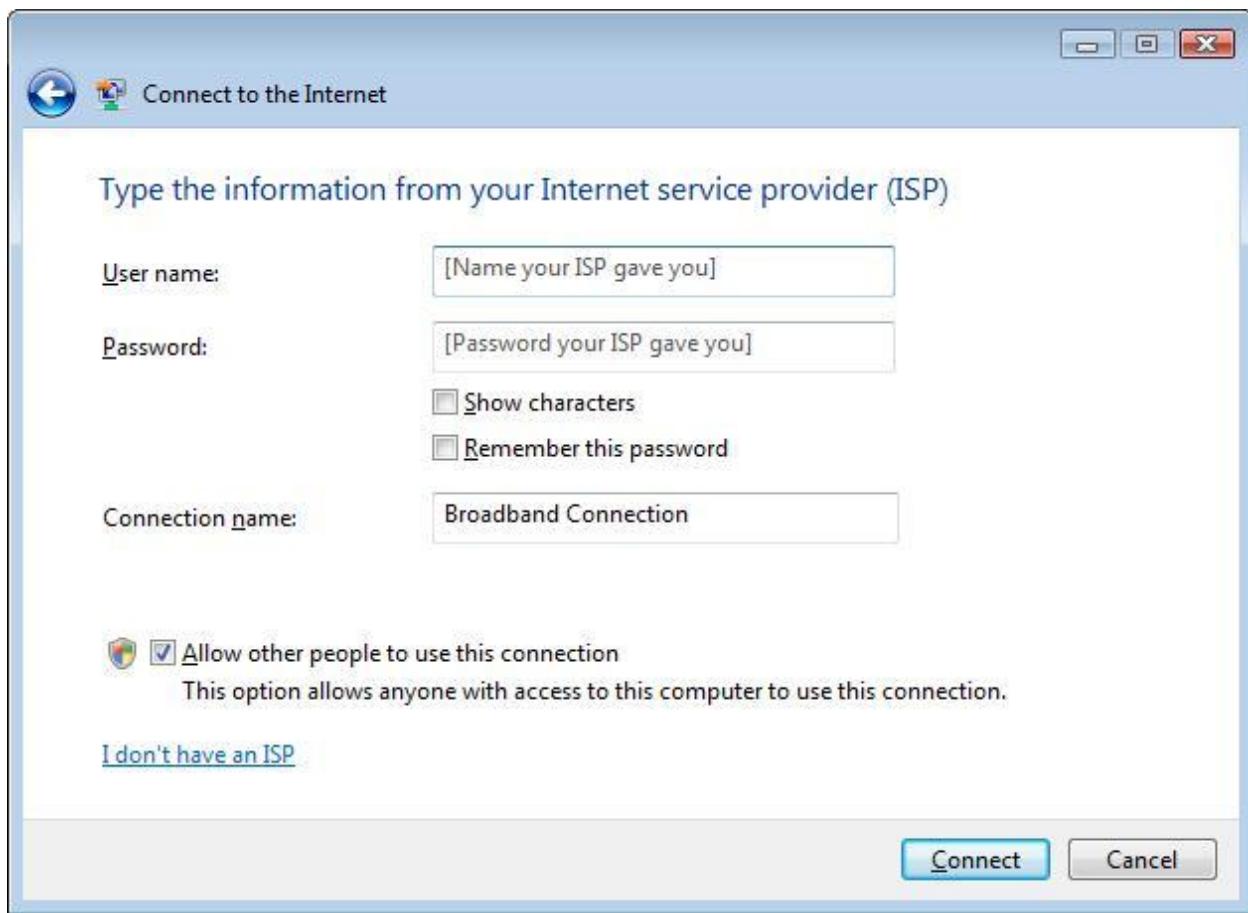
4. Select on **connect to the Internet** and click Next
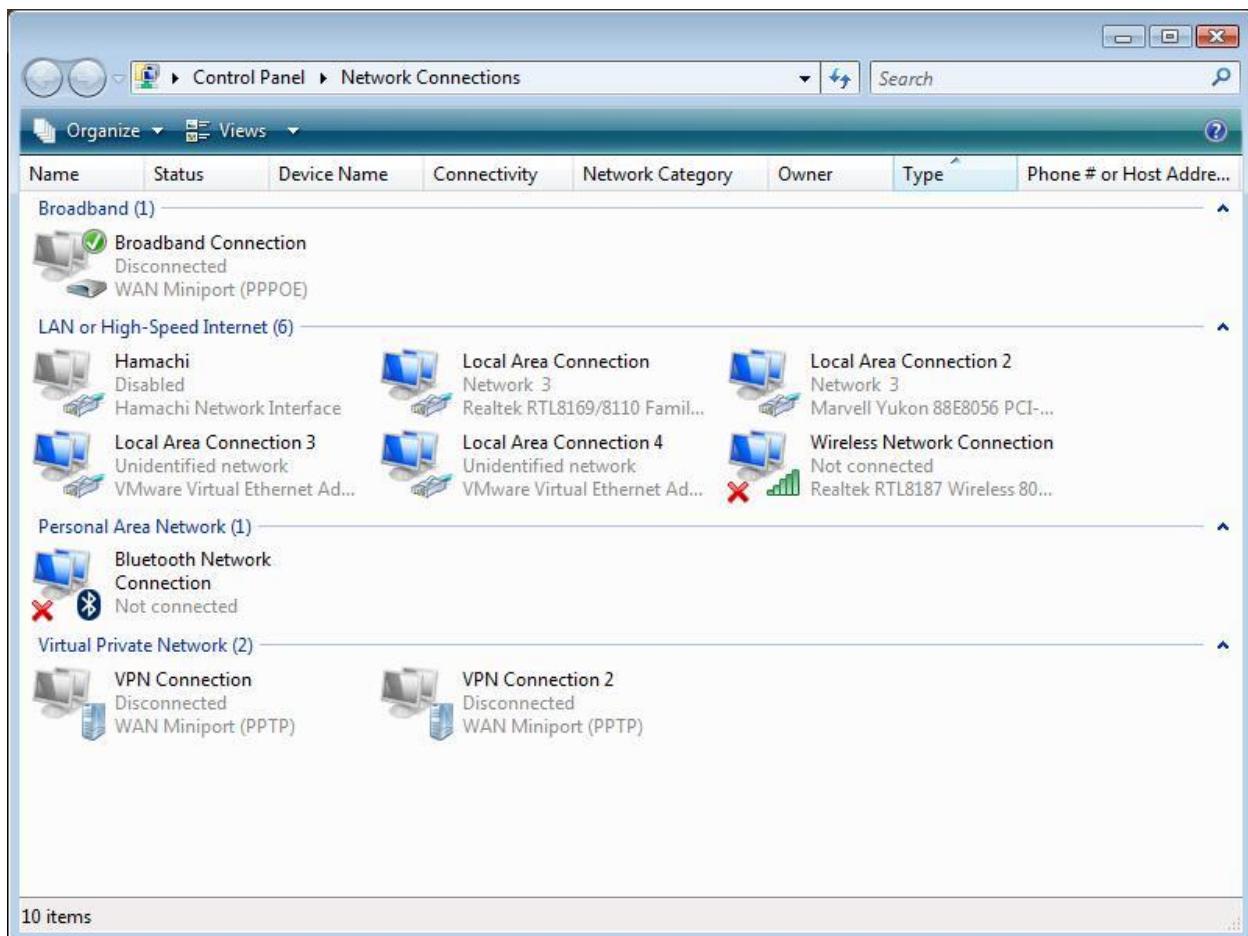
5. Click **Browse the Internet now**

6. Select **Broadband (PPPoE)**
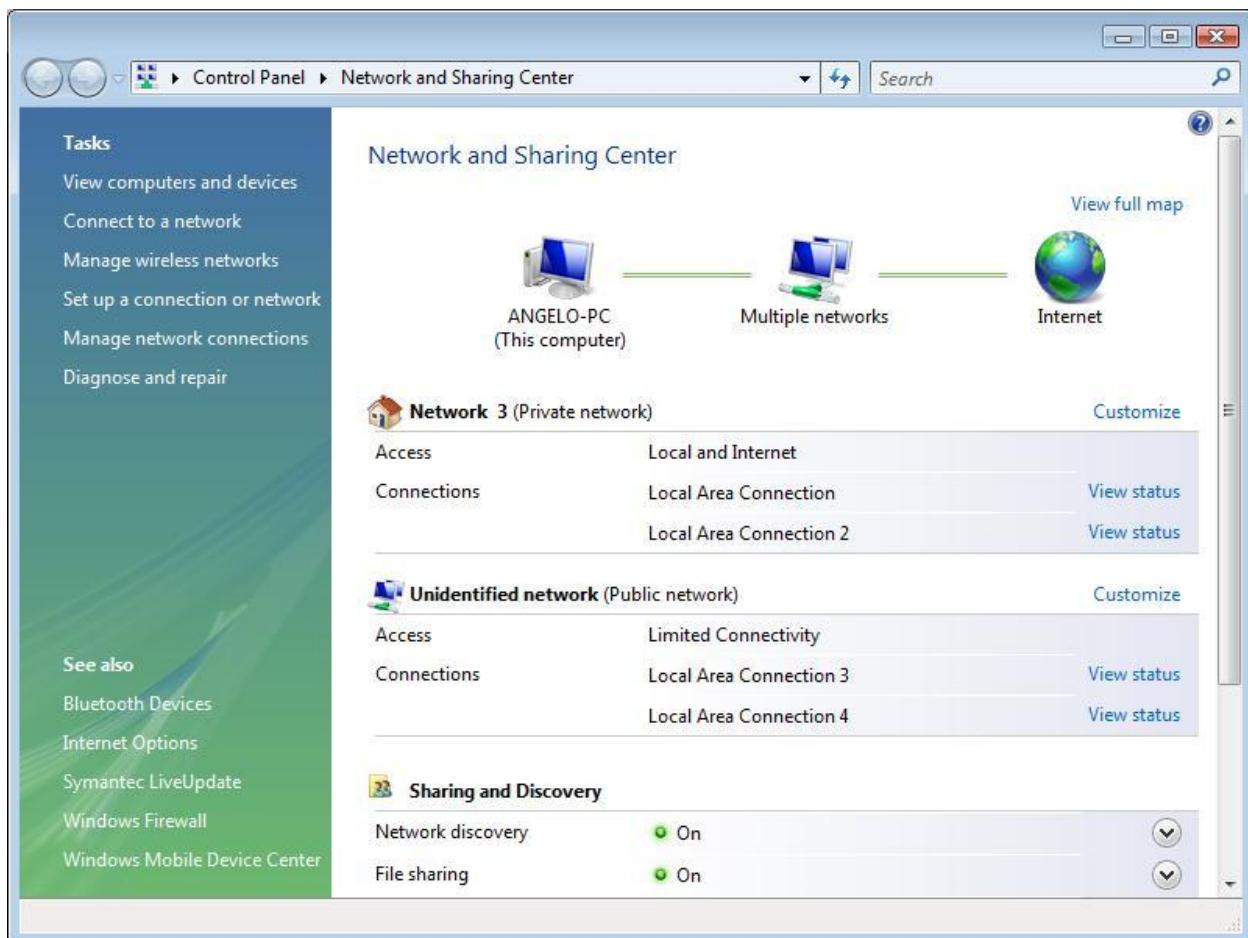
7. Type in your ISP login name in the **User name** field, and your login name password in the **Password** field. If you wish to have the password saved check Remember this password.
8. Optional: If you wish to allow others to use the internet connect check **Allow other people to use this connection**
9. Click **Connect**
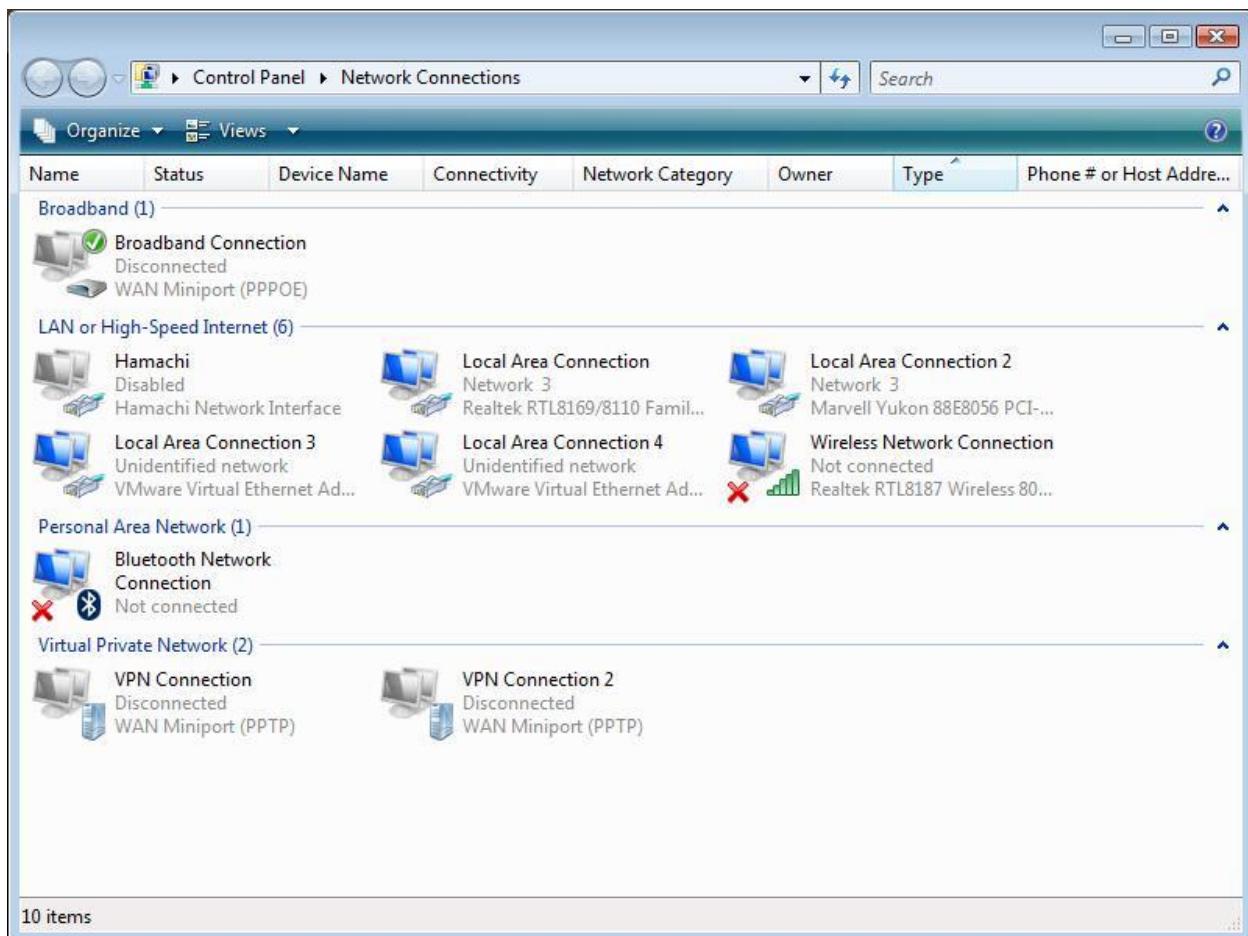
10. Congratulations you should now see your PPPOE connection in Network Connections

Setting up MLPPP on a PPPOE connection

1. Click on the **Start Menu**
2. Right click **Network** and click properties on the pane which appears
3. Select **Manage network connection** on the left pane
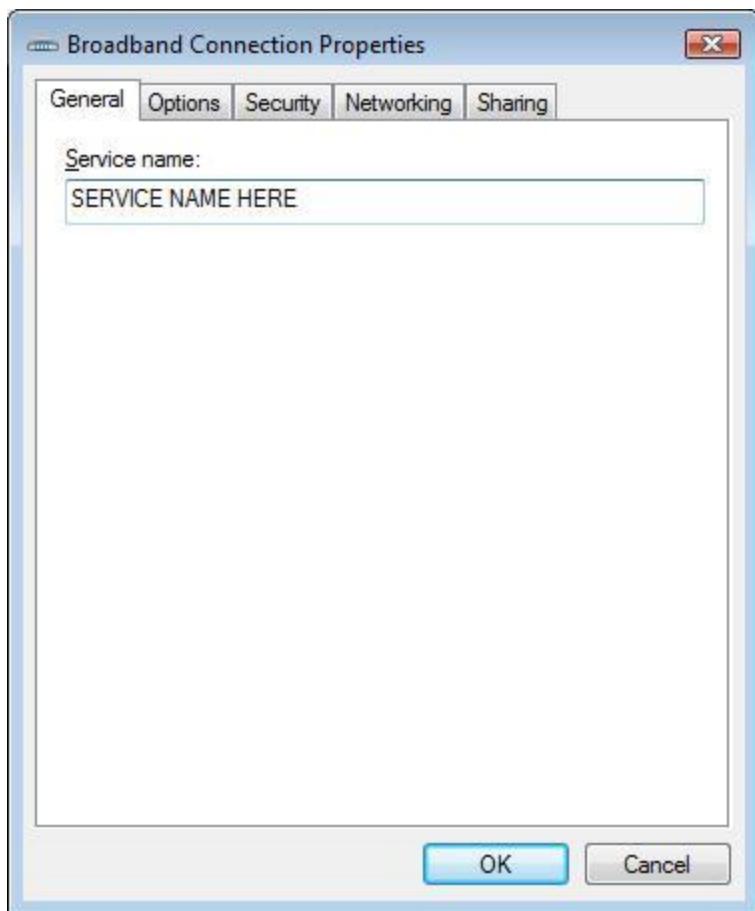

4. Double click on your PPPOE connection
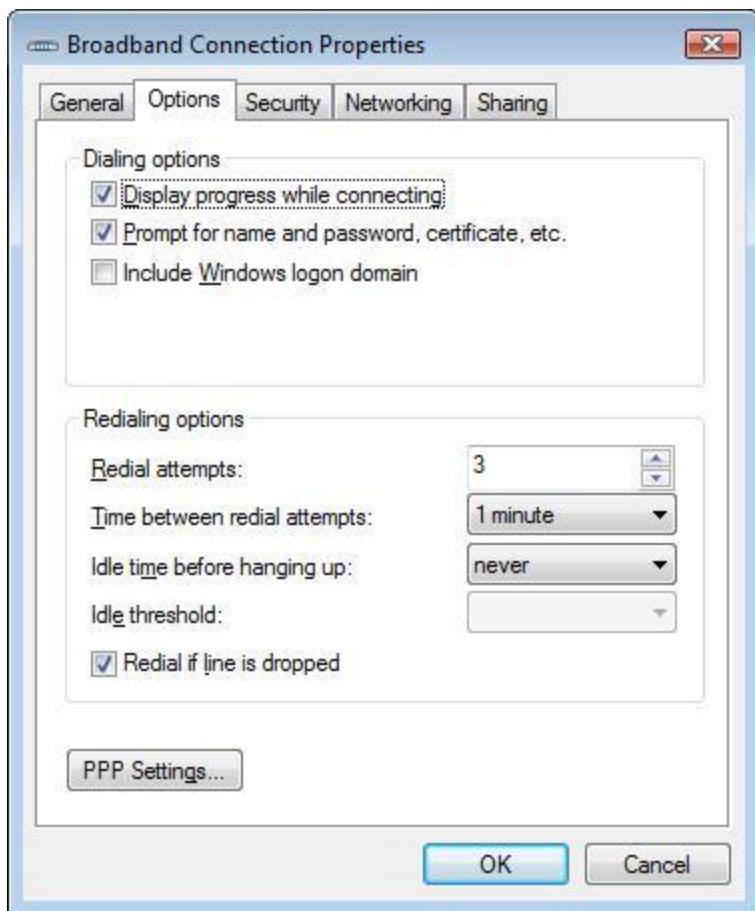
5. Click on **Properties**
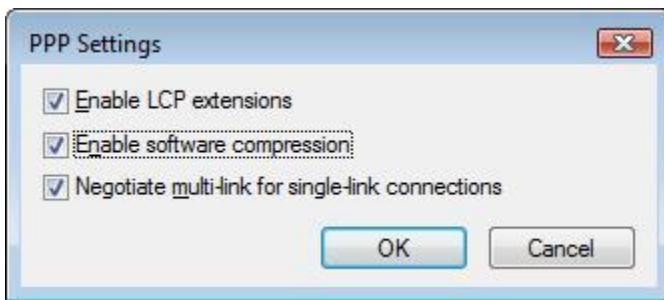
6. Type in a service name for your MLPPP connection in the **Service name** field
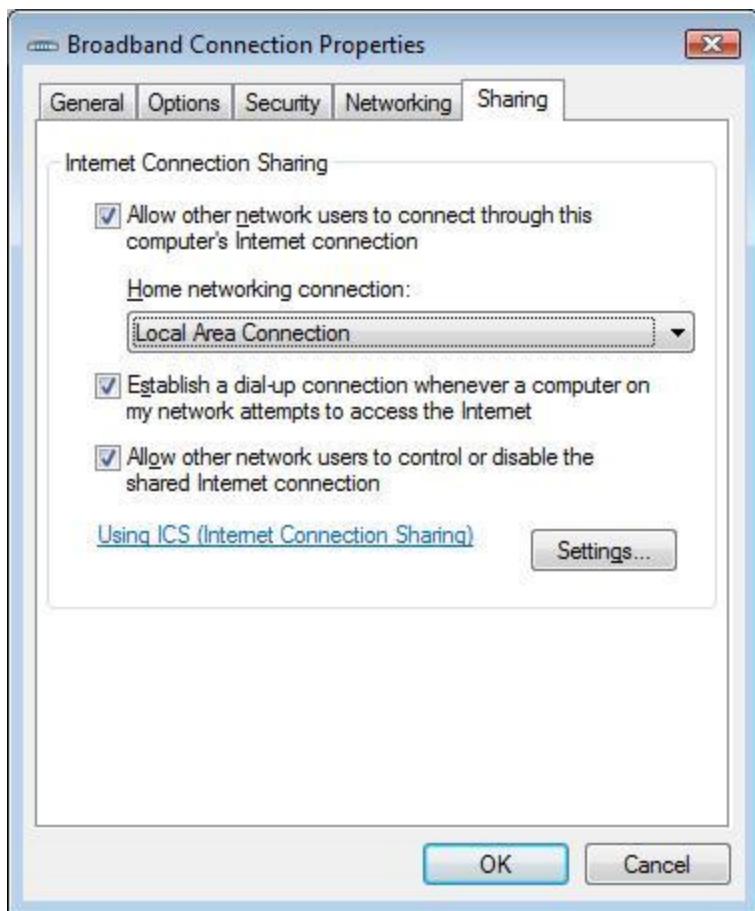
7. Click PPP Settings

8. Optional: Check Enable software compression if you wish to have software compression on your MLPPP connection

9. Check **Negotiate multi-link for single-link connections**

10. Optional: if you wish to have other devices on the network share your internet connection check **Allow other network users to connect through this computer's Internet connection** and scroll through the drop down menu and select the correct interface

11. Optional: If you wish to have your internet connection to be on whenever other devices on the Internet check **Establish a dial-up connection whenever a computer on my network attempts to access the Internet**

12. Optional: If you wish to be able to disable or enable the MLPPP connection check **Allow other network users to control or disable the shared Internet connection**

13. Click **OK**

Windows 2003

Coming soon