Systems and Software
Broadband Connections

Overview

Broadband is the access to the internet. This document describes some of the technologies that are involved and provides example setups. The document does not describe or compare the various internet service providers.

Broadband Access Points

Broadband is usually provided to a single point in the premises. The position is usually governed by the convenience of the service provider rather than the consumer. This is where a wireless network comes in.

There are 2 main categories of Broadband. Those provided by a cable supplier such as NTL and those provided over the telephone lines such as BT, Virgin etc.

Broadband Access Points – Cable

Broadband from a cable TV supplier (NTL) often comes in the form of a wired Ethernet cable from the NTL decoder box that also feeds to TV. The Ethernet cable can be connected directly into the socket labelled “internet” on the Broadband Router.

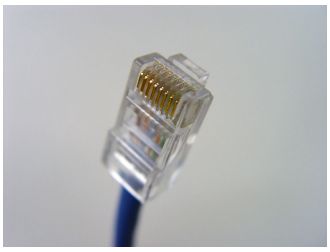

Figure 1 RJ45 Ethernet Cable Connector

One example of a Wireless Broadband Router is the Linksys DSL-WRT54G.

Broadband Access Points - Telephone

Broadband over BT lines comes in through the normal telephone socket and a Filter/Splitter is used to separate the telephone calls from the internet data. The filter removes high pitched whistles from the telephone call and provides a socket for the broadband modem.

The best way to connect the filter is at the BT master socket. The telephone output of the filter can then supply all the other phones in the house. If the telephone cabling is less straightforward, filters may be needed on all of the telephone sockets. The filters cost less than £10 so this is not a great expense.

Figure 2 ADSL Filter/Splitter

The data connection requires a special cable that will have been supplied with the Broadband Router with integral ADSL or ADSL2 Modem. ADSL2 supports higher speeds.

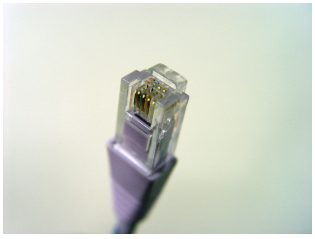

Figure 3 RJ11 ADSL/ADSL2 Modem Connector

One example of a Wireless Router with ADSL2 Modem is the Billion BiPAC 7800N.

The Billion box shown above supplies a wired Gigabit Ethernet hub connection to PCs as well as a wireless link.

Another popular way of connecting to an ADSL modem is USB. This is the solution favoured by many internet suppliers, as it simplifies the installation process. A USB cable is connected to your PC and the ADSL2 cable connected to the filter/splitter. The configuration is done on the PC via a CD-ROM. The limitation of this type of connection is that only one PC can access the internet at any one time. The wireless router type solutions allow many PCs to connect at the same time.

Installation

The installation of a Broadband router is complicated by there being many providers of broadband boxes and many providers of internet services.

The internet service provider will supply the username and passwords required to configure the broadband box.

In some cases, the service provider may only support a particular modem. If this is the case, it may take a little longer to find the right combination of parameters. A Google search should provide the configuration details fairly easily. I.e. ADSL settings used by Virgin

The settings used by Virgin are shown in the figure below.

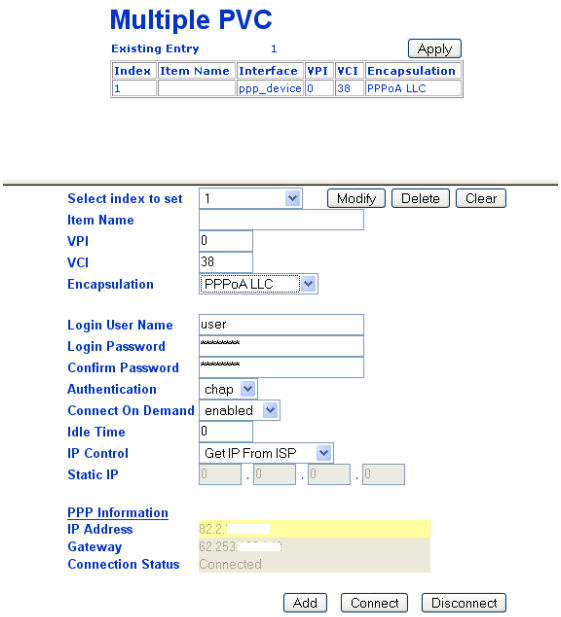

Figure 4 Typical Settings for Virgin ADSL

The ADSL/ADSL2 modem needs to be configured for the internet service provider before it can be used. This is typically done by connecting the box to a PC via a console connection or via one of the Ethernet ports on the back. The Internet browser (IE or Firefox) is used as the interface. The address is typically http://192.168.0.1 or http://192.168.1.1. Note that there is no www prefix on this address.

The admin password should be supplied in the literature. It is not unusual for the username and password to be set as the default admin admin. These should be changed as part of the configuration for security.

Fault Finding

If the internet connection has been lost completely (no email, no browsing etc) etc then try the following steps. If email works but browsing doesn't then it is unlikely that the broadband link is the problem.

1) Check the diagnostic lights on the broadband box. Is the status LED blinking?
2) Reboot the broadband box by removing the power lead for a few seconds. It is amazing how many times this is all that is needed.
3) Check for obvious cables that might have been accidentally removed or been dislodged.
4) Open a connection to the box using an internet browser at address http://192.168.1.1. Does the status show Connected? Some boxes plot the line condition etc.
5) Open a Windows Command prompt and try to "Ping" the box. I.e. at the prompt, type "ping 192.168.1.1". If the connection to the box is okay, responses should be received.

Wired or Wireless?

The most reliable, secure and easily installed solution is to connect PCs to the Broadband Access Point is to route Ethernet cables to all of the PCs. Unfortunately, this will almost certainly involve routing cables through walls and ceilings. Wireless offers a solution to this problem, but there are pitfalls too. For more details, see Setting Up Wireless Network.