



**Cerberus Networks
ADSL2+ Broadband Guide
For X2 Connections**

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1. Setup: Computer

Computer Requirements

Please ensure that your computer is equipped with the following minimum specification:

- A built-in Ethernet socket or fitted network card capable of 10Mbps or 100Mbps or 1000Mbps connection.
- Windows XP, Windows Vista or Windows 7; Mac OS 9 or Mac OS X; or a modern Linux distribution.
- Microsoft Internet Explorer 6 or newer; Firefox 2 or newer; or most modern browsers.

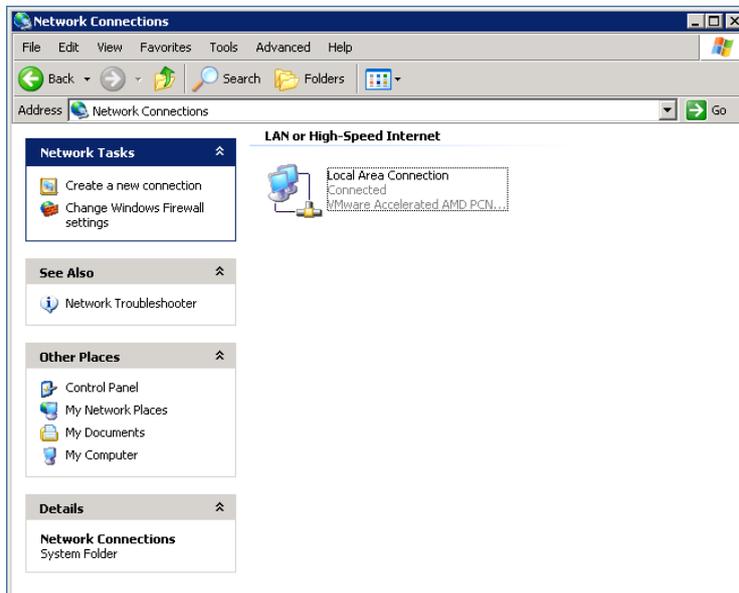
Please note that any computer operating system that supports TCP/IP will work with this service, including BSD, Solaris etc. We are able to fully support Windows and Mac OS, but other basic OS support will only be provided on a best endeavours basis.

Network Settings

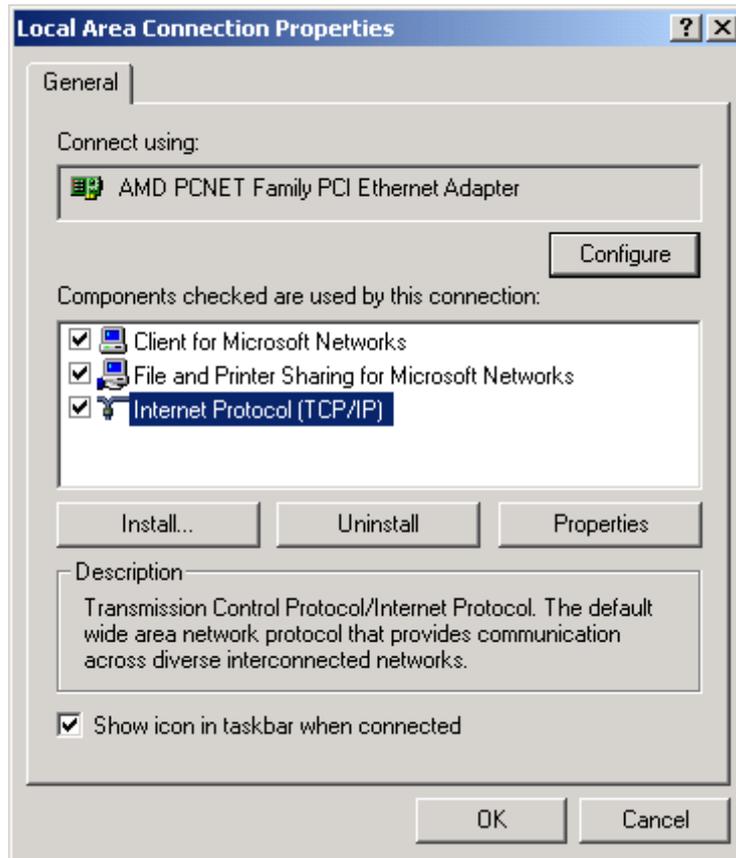
For ease of use and configuration, we recommend leaving your new router to give out network addresses to all of the computers using it, either wired or wireless. Most computers are already set to obtain their address automatically, but if you are having trouble connecting to your router, you may want to check to make sure that this is the case by following the instructions for your operating system below.

Windows 2000/XP

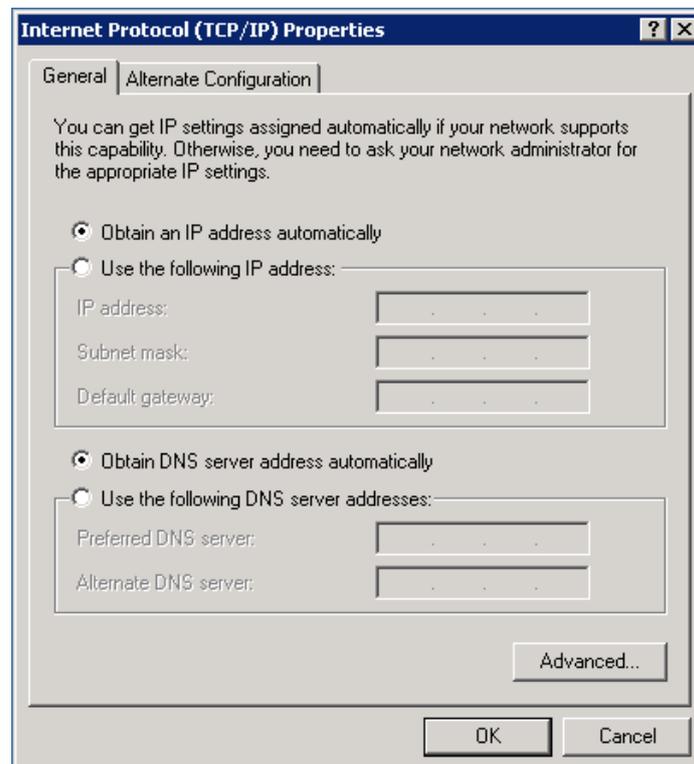
1. Click the **Start** button, and select **Control Panel**.
2. Click on the **Network and Internet Connections** icon and then click on the **Network Connections** icon (if you are viewing your Control Panel in Classic View, then just double-click on **Network Connections**).
3. You should be presented with a window similar to the following:



4. Right-click on the icon for your Ethernet network card, usually called **Local Area Connection**, and choose **Properties**:



5. Click on **Internet Protocol (TCP/IP)** and click on **Properties**:



6. You should ensure that **Obtain an IP address automatically** and **Obtain DNS server address automatically** are selected (they have a 'dot' next to them, like above).
7. Press **OK** to close this window, and **OK** to close the previous window.
8. Your computer is now set to pick up an address automatically from your router. We would recommend rebooting your computer at this point just to ensure that a new address is obtained properly.

Windows Vista and Windows 7

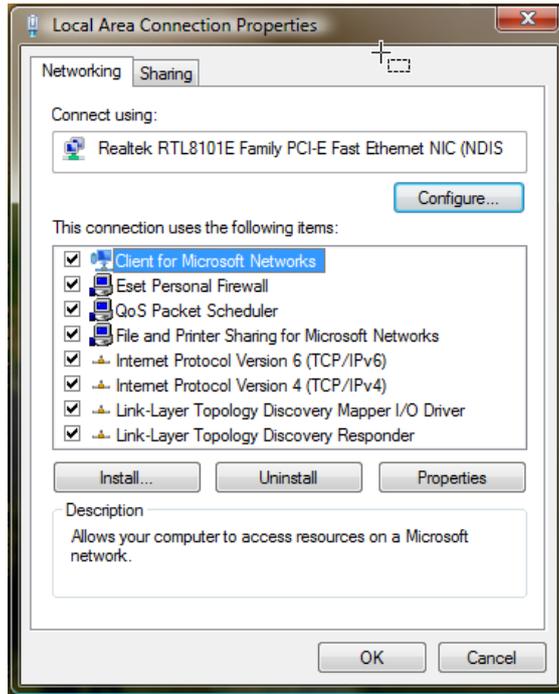
1. Click the **Start** button, and select **Control Panel**.
2. Click on the **Network and Internet** icon and then click on the **Network and Sharing Center** icon (if you are viewing your Control Panel in Classic View, then just double-click on **Network and Sharing Center**).
3. You should be presented with a window similar to the following:



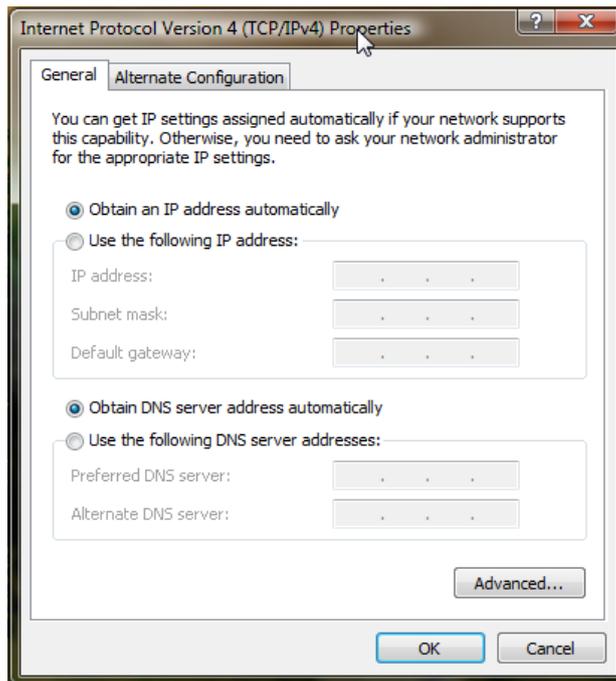
4. Click on **Manage network connections** on the left hand side menu:



5. Right-click on the icon for your Ethernet network card, usually called **Local Area Connection**, and choose **Properties**. You may be presented with a **User Account Control** window at this point - just click **Continue**:



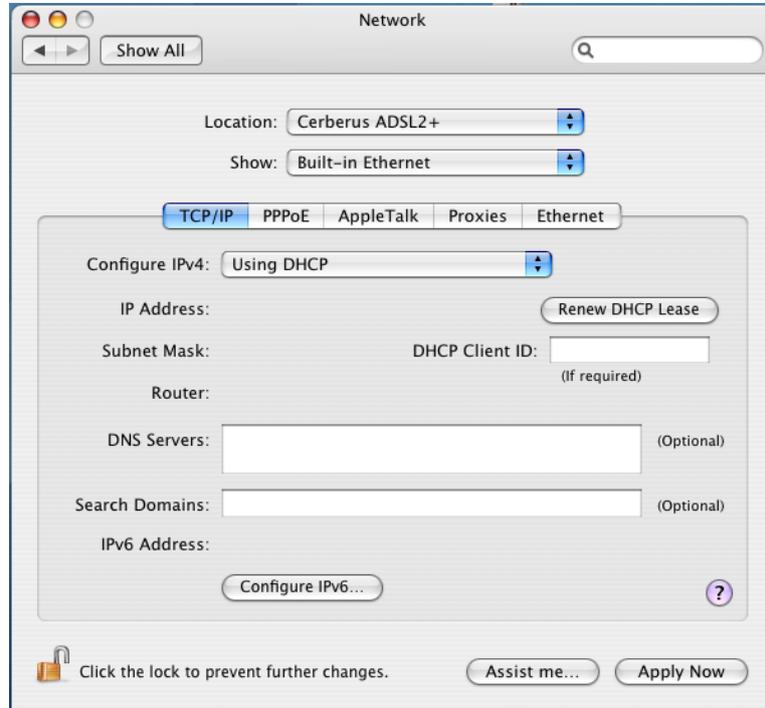
6. Click on **Internet Protocol Version 4 (TCP/IPv4)** and click on **Properties**:



7. You should ensure that **Obtain an IP address automatically** and **Obtain DNS server address automatically** are selected (they have a 'dot' next to them, like above).
8. Press **OK** to close this window, and **OK** to close the previous window.
9. Your computer is now set to pick up an address automatically from your router. We would recommend rebooting your computer at this point just to ensure that a new address is obtained properly.

Mac OS X

1. Click on the Apple menu, then move down to **Location** and select **Network Preferences**.
2. Ensure that **Built-in Ethernet** is selected next to **Show**.
3. Make sure that **Configure IPv4** is set to **Using DHCP**:



4. Press **Apply Now** and then close this window.
5. Your computer is now set to pick up an address automatically from your router. We would recommend rebooting your computer at this point just to ensure that a new address is obtained properly.

2. Setup: Line Bonding

Line requirements

Successful setup of an X2 bonded service requires two working ADSL2+ services connected to adjacent ports on the DSLAM equipment on which your phone lines terminate at the exchange and for a special bonded configuration to be applied to these ports.

If we are providing X2 as a new service on phone lines which do not currently have broadband from another supplier then you do not need to worry about these stages of provisioning, we will complete all three stages at the earliest possible opportunity.

If we are migrating an existing broadband service to become one of the two lines required for the X2 bonded service, then we will discuss the provisioning process with you and agree timing for the provisioning stages to manage any downtime.

Adjacent Ports

Once the two ADSL2+ lines are confirmed as active the next step is to search for two adjacent ports on the DSLAM equipment that is connected to the other end of your phone lines at the local exchange.

When available adjacent ports have been confirmed we will request BT to carry out a "lift and shift". This process involves physically moving the lines from their current ports to the new adjacent ports. This stage of the work can take up to a maximum of 3 days but is typically completed in less than 1 day. After the "lift and shift" is completed the new ports are then updated with line configuration details, in order to prepare them for the final stage of the bonding.

Bonding the lines

The last stage will be to apply the bonding configuration to the two connections. Unless this is a completely new provide, then before the lines are bonded together our Ops team will contact you to arrange a time that is suitable for you to apply the bonding, as there will be some downtime.

Once the bonding configuration has been completed and you have connected our equipment as described in **section 3, Setup: ADSL2+ X2 Bonded Service**, both ADSL1 and ADSL2 lights on your Comtrend Nexus Link router will display a solid green light.

If the ADSL lights are flashing, or only one ADSL light is active, this can indicate a fault. Please see **section 5, Troubleshooting: Basic**.

3. Setup: ADSL2+ X2 Bonded Service

Connect Your ADSL Filters

First, you need to plug in your ADSL Filters. They're the small boxes that look like a telephone adapter.

1. If there's a telephone plugged into your telephone socket, unplug it.
2. Plug an ADSL Filter into the socket.
3. Plug your telephone into the telephone socket on the ADSL Filter.

You need to do these steps for **everything** that's connected to your landline including other telephones, fax machines, Sky boxes etc.



Connect Your ADSL2+ Bonded Router

Now that you've plugged in your ADSL Filters at every phone socket, you can connect up your router. These instructions assume you have a Comtrend Nexus Link router as supplied as standard by Cerberus Networks for X2 services.

1. Plug the two single ends of the black DSL Y-Cable into the socket marked 'ADSL modem' on each of the provided ADSL Filters.
2. Plug the other end of the black DSL Y-Cable into the socket marked 'ADSL' on your router.
3. Plug one end of the grey Ethernet cable into the yellow socket marked '1x' on your router.
4. Plug the other end of the cable into the network port of your computer.
5. Connect the wire from the power supply to the router.
6. Plug the power supply into the wall and switch it on at the socket.



4. Setup: Common Router Settings

If you choose to use your own router, rather than one supplied pre-configured by Cerberus Networks, then the following settings should be used. Please bear in mind that there are slight variations in naming conventions between different router makes and models.

Router Setup Page

Refer to router manual, but commonly one of the following:

192.168.1.1 or 192.168.1.254

Common Settings

Bonding Modulation	G.998.1 (ATM Based Multi-Pair Bonding)
VPI:	0
VCI:	101
Virtual Circuit (if present):	Enabled
MTU Size (if present):	1500
Protocol:	MAC Encapsulation Routing/ Bridging and NOT PPPoA/PPPoE (if present)
ADSL Username/Password:	Leave blank. If you can't leave it blank, make sure you are using MAC Encapsulation Routing/ Bridging and not PPPoA/PPPoE

Connection Type or Encapsulation and Multiplexing

Unfortunately, common naming conventions haven't really properly caught on with the different router manufacturers, so there are a large number of ways of saying the same thing. The following list contains the most common – any manufacturer that is not in the list is likely to use a variation on the same theme.

Router Setting	Manufacturer
1483 Bridged IP + NAT Protocol with LLC Encapsulation	Zoom
1483 Bridged IP LLC	Billion, Buffalo, D-Link, Draytek, TP-Link
1483 Bridging	US Robotics
1483 Bridging-DHCP / 1483 Bridging-FixedIP	US Robotics
Bridged LLC	2Wire
LLC	Belkin, D-Link, Safecom
LLC Based	Netgear
LLC Bridged	D-Link
MAC Encapsulation Routing (MER) Connection Type with LLC/SNAP-BRIDGING Encapsulation	Kasda, Plexus, TP-Link, US Robotics, Comtrend NexusLink
RFC1483 Bridged Encapsulation with LLC Multiplexing	Buffalo, Linksys

DNS Servers:

Primary : 195.167.185.162
Secondary: 195.167.187.133

5. Troubleshooting: Basic

Troubleshooting Broadband Connection Problems

If you're having trouble getting online or if the ADSL lights on your router aren't on, there might be a problem with your connection. There's usually a fairly simple solution, so please try the steps outlined below.

Test Your Telephone Line

Broadband over a telephone line requires that the telephone line itself is working. Unless you have ordered a special type of phone line from Cerberus which does not allow phone calls, then you should check that your phone line has a dial-tone and that you are able to make and receive calls. If you do have a phone line provided by Cerberus on which calls are barred you can request that our support team temporarily remove the bar in order for you to test the line.

If tests of your phone line indicate a problem you will need to report this problem to the provider of your phone line and they must have resolved the fault before Cerberus are able to log a broadband specific fault.

Turn Everything Off

Turn everything off and then back on again. Sometimes the simplest things work best. Switch your computer off first, and then turn your router off. Most routers have a power switch on the back.

Take a moment to check there that aren't any loose cables. Then turn the router back on. Wait for the lights on ADSL1 and ADSL2 to come on and stay on. Then turn your computer back on.

Check the Lights on the Comtrend Nexus Link Router

If there's a problem with your connection to the Internet, you can often tell from the lights on your router. Check to see if the lights on the front of the router for both ADSL1 and ADSL2 are solid green. If so the bonded connection should be working normally.

If one or both are not on or are red, then there might be a problem. Both ADSL1 and ADSL2 lights should stop flashing soon after you turn the box on, and remain steady, but if you find that one or two of the lights continuing to flash or doesn't flash at all then this can indicate a either configuration issue on the router, bonding configuration with the line or the router might be connected to the wrong line. In this situation please ensure that the router is connected to the right landline, you can check the number of the socket by connecting a telephone handset in the BT socket where router the router is connected too and dialling 17070 and confirming the line number.

Check the Wires

Make sure you use only the supplied black DSL Y-Cable to connect your router to the phone lines. Don't use your own extension leads, and if you're using a splitter to turn one phone socket into two, remove it. If you are at all unsure please contact Cerberus.

If you have other things plugged into your phonenumber, disconnect them one at a time. If removing something in particular fixes the problem then it was probably interfering with your router.

Plug the Router into the BT Master Socket

Your router will work best if it's connected to the main BT socket in your home. This is usually the socket nearest where your telephone line comes through the wall into your house. See **section 7, Troubleshooting: BT Master Test Socket**, for more details.

Still Having Issues?

If none of the above steps helped, then please move on to the next troubleshooting sections. Please bear in mind that Cerberus Networks are unable to log faults on the line until the day after broadband activation.

6. Troubleshooting: Wireless

Wireless Tips

If your wireless connection seems to be weak or intermittent, then the following tips may help you.

- As metal, walls, and floors will interfere with your router's wireless signals, move the router off the floor and away from walls and large metal objects (such as metal filing cabinets). Your connection will be weaker the closer your router is to these obstructions.
- Try not to position your router against an outside wall of your home/office as the signal will be weak on the other side of your home/office. Position it, where possible, in a central location. The antennas that are supplied with wireless routers are designed to be multi directional around the router, so if your router is near an outside wall, a significant amount of the signal from the router will be wasted.
- Your computer sends as well as receives signals. Sometimes your router can broadcast strongly enough to reach your computer, but your computer can't send signals back to your router. You can improve your PC adapter by replacing it with one with an external antenna. However, laptops with built-in wireless capability usually have adequate antennas and don't need to have their network adapter's upgraded.
- Wireless routers have channels in a similar way that radio stations use different channels. Some channels have a better quality signal than others. Some signals may suffer interference so, if you are having problems, try changing your wireless router channel to see if the signal strength improves. Please consult the manufacturer's manual included with your router for instructions, or contact Cerberus.
- Avoid using other wireless electronics (such as cordless phones) that use the 2.4GHz frequency as these may interfere with you wireless network performance. Phones that use 5.8GHz or 900MHz frequencies are far less likely to cause interference.

7. Troubleshooting: BT Master Test Socket

Testing Your Connection from the BT Master Test Socket

The BT telephone line coming into your premises terminates at the BT Master socket. BT only guarantee service, regardless of whether it is broadband or telephone, to the BT Master Test Socket. This socket can be found behind the front plastic cover of standard BT (NTE5) sockets.

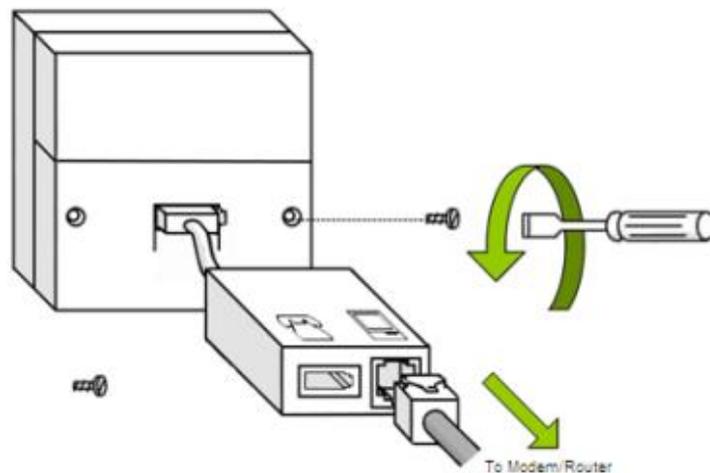
All other sockets in your premises (even the plastic front cover of the BT Master socket) are extensions from the BT Master Test Socket. These cables can get damaged over time through use or by accident. This can cause a loss of connection or intermittency on your line.

Testing your connection from the Master test socket will eliminate the internal extension wiring as being the cause of a fault. This test forms an important diagnostic step that **resolves the vast majority** of connection problems.

Perform the Test

Before trying this, please ensure that the BT Master socket in your premises is a standard BT (NTE5) socket. The socket will have a horizontal split through the middle of the front plastic cover, with two screws on the bottom half as illustrated below.

If there is no horizontal split through the middle of the front plastic cover, **DO NOT REMOVE THE SCREWS** as this is the wrong type of socket. Please contact Cerberus Support.



Remove the screws from the front plastic cover using a screwdriver. Once the screws are removed, carefully pull the front plastic cover away from the rest of the socket. The front plastic cover may not be completely removable, so please **DO NOT PULL IT AWAY WITH EXCESSIVE FORCE**.

8. Troubleshooting: Intermittent Connections

Intermittent Connection Faults

An Intermittent Connection fault is a fault which results in connectivity to the Internet being lost, but returning after a short period of time or after a hardware reboot. Disconnections which occur at specific times of day can also be referred to as Intermittent Connection faults. These faults can be caused by a variety of factors: extension wiring; the quality of your telephone line; interference from other nearby electrical devices; or problems with communications between your router and our equipment at the telephone exchange.

Check Your Setup

The majority of Intermittent Connection faults can be fixed or avoided by ensuring your equipment is set up correctly. Check that you have set up your equipment as directed in the Setup section of this guide.

You should check your ADSL Filter setup first and ensure that nothing has changed. Even if you are sure that nothing has changed, it is always possible that someone else may have changed your setup without your knowledge, introducing a fault to the service. For example, someone may have attached a telephone without an ADSL Filter to an extension socket that wasn't previously in use.

If your computer is not near the BT Master socket, then connect a long Ethernet cable from your computer to the router and connect your router to the BT Master socket. Avoid using telephone extension cable from the BT Master socket to the router where possible, as extension cables often pick up line interference and almost invariably cause a reduction in broadband speed as well as sometimes causing connection drops.

Broadband Equipment Checks

It is possible that a temporary issue with your hardware may be causing your Intermittent Connection fault. Before starting more extensive checks there are some basics to cover with the Broadband equipment which could result in a quick resolution to the fault:

- If you have multiple devices plugged in to your router, but the problem is only occurring on one of the devices, then it is most likely the device configuration at fault rather than the broadband. Please refer to **section 1, Setup: Computer**, above.
- Reboot your router when you experience the problem. Once done monitor the connection for long enough to see if the problem persists.
- If the problem persists check your router's configuration is correct.
- Ensure that any peer-to-peer software (BitTorrent etc) is shut down. In some cases, the load on the router from these types of service can result in the router dropping the connection or crashing.
- If available, try using another ADSL router to see whether the problem continues.

Check for Faulty ADSL Filters

If the fault has still not been resolved, it is possible that the problem lies with one of your ADSL Filters.

If you have spare filters, try replacing the filters you are using, one at a time, until you either find the faulty filter or have eliminated the possibility of the filters being the cause of the fault.

If you do not have any spare filters (just the two that came with your router), you should unplug all of your equipment from the telephone line so you have just one telephone and the router plugged in to a telephone socket through one ADSL Filter. Then swap the filter being used with the other, and monitor again. If you find the fault is not present with one of the filters, but is with the other, then you have most likely identified a filter fault. However, you may wish to monitor for an extended period to be sure that this is the cause.

If you have had a recent electrical storm in your area it is possible that this could have damaged one or more filters. Consider obtaining some spare filters to eliminate this as the potential cause.

Checking For Faulty Extension Wiring or Other Equipment

Extension wiring can become damaged or degraded over time, especially if it is old or runs under carpets or through doorways, and this is often the cause of Intermittent Connection faults. It is also sometimes the case that other equipment is causing interference, despite being filtered.

Begin by ensuring that your ADSL2+ bonded router is connected to the BT Master socket, through an ADSL Filter, as shown earlier. Monitor your connection and see whether simply moving to the BT Master socket has resolved the problem.

If the problem continues with your ADSL2+ bonded router connected to the BT Master socket through an ADSL Filter then the next step will be to eliminate any extension wiring which is connected to the BT Master socket. With older Master sockets that do not have the detachable faceplate there is no easy way to do this without contacting a qualified telephone engineer yourself.

If you are using an NTE5, as illustrated in **section 7, Troubleshooting: BT Master Test Socket**, then you're in luck, because this socket has been designed to allow you to reach a special BT Test socket, which excludes any extension wiring. Please follow the instructions in **section 7** to test your connection using the BT Master test socket.

If the Intermittent Connection fault is resolved through use of the BT Master test socket, then you have identified a fault with either the extension wiring, or some other telephony device in your premises. Connect the Master Socket face plate again and unplug all of your telephony equipment plugged in to extensions one at a time, each time monitoring to determine if the Intermittent Connection fault returns. If the problem returns when a particular device is connected, then it is either that device or the extension wiring leading to it that is at fault. In this case we recommend that you consult a qualified telephone engineer or consider replacing the equipment.

Checking For Problems Caused By Other Electrical Equipment

It is possible that other electrical equipment in your premises is causing interference. Common causes can be, but are not limited to: Televisions, Sky Digital Boxes, other electrical equipment connected to the same socket or multi-plug as the router, Central Heating Systems, Microwaves and Christmas Tree lights.

To determine if other electrical equipment is responsible for the problem, first follow the advice for eliminating faulty wiring and filters. If the problem occurs at specific times of day make a note of the times and identify any electrical equipment that switches on at these times. Monitor the connection with this equipment switched off. If the problem occurs regardless of the time of day, then power off as much of your electrical hardware as possible one at a time and monitor for intermittency.

If the problem is eliminated then you have most likely identified the cause of the intermittent connection and will need to consult the supplier of the equipment for further advice. Alternatively you may find that the intermittent connection does not return if the ADSL2+ bonded router is connected directly to the BT Master socket (through an ADSL Filter) permanently, rather than through a telephone extension socket.

Still Having Issues?

If the problem continues, even when connected through the BT Master Test Socket and having eliminated as many causes of electrical interference as possible, then please contact Cerberus Support for assistance.

Please call 0845 257 1335

or email support@cerberusnetworks.co.uk

Our support staff are available from 8AM to 7PM Monday to Friday.

If you email support please use the email address you originally supplied to Cerberus when you took the service, if you do this our systems will automatically link your email to your other records.

Please leave the router connected to an ADSL Filter that is plugged into the BT Master Test Socket (where available) until the fault is resolved, so that any diagnostics run on your line and broadband service return the most accurate results. It is best if you can call us from the same location as the broadband.