

## Introduction

This document should help introduce the fundamentals of networking technologies to a new user.

## Explanation of terms and technologies

### WAN

Wide Area Network – For the purposes of this document you can substitute WAN for Internet, as in WAN (Internet) side of your router.

### LAN

Local Area Network – Local network of PCs and network devices. To be used as LAN side of your router.

### Ports

Internet traffic travels through ports. This method is used, as it can identify what sort of data the TCP packet is carrying. For instance web browsing uses port 80, email uses port 25 etc.

### TCP

Transmission Control Protocol – The protocol used to guarantee that packets of data get to the correct destination, and that they are received in the correct order.

### ADSL / Cable Modem

These are usually USB devices that the computer sees as a traditional dial up connection. The PC has to “dial” the Internet connection, the connection is always available, but not always connected.

### ADSL Modem Router (Gateway)

These are becoming more and more common. Most ISPs now give the user a router rather than a modem.

Routers are usually connected to your computer via an Ethernet cable. A router is a device that sits between a LAN (Local Area Network) and the Internet.

Routers are far more advanced than ADSL modems, and offer the following benefits:

- Enhanced Security via a hardware firewall
- Improved connections speeds
- Always on Internet connection
- Superior reliability

If you have a router, all traffic coming from that network going to the Internet, appears to come from the same IP address (Your Internet or WAN IP Address). Some setups will have a network of PCs sharing the Internet connection, rather than just one PC

## Firewall

Either a piece of hardware (usually part of a router) or software used to limit unauthorized network connections into a network or computer.

## Port Forwarding

Port Forwarding can also be referred to as Port Redirection, Virtual Servers or NAT (Network Address Translation). They all fundamentally do the same thing.

The reasons why port forwarding is necessary, is that behind one router, there may be several PCs running several services, for instance one PC may be an email server, one may be a webcam video server etc. With port forwarding we can tell the router to forward IP traffic to different LAN PCs based on the port the IP traffic is using.

(WAN) IP address that the web page is running on.

## Useful tools

The following tools are run from the command prompt. To access the command prompt, you need to do the following:

Select Run from the Start Menu  
Type "cmd"  
Hit <Enter>

Once at the command prompt you can run the following commands.

NB to cancel a command you can press <CTRL> + <X>. This may not always work, some commands you will have to wait for them to timeout

## Ping

Used to define whether an IP address is alive. For instance if there is a GeoVision system on your network that is not accessible via the WebCam the first thing to check is that the other network PCs can communicate with the GeoVision PC on a basic (ping) level.

### **Usage**

ping <IP ADDRESS>

### **Example**

ping 192.168.1.100

### **Reply**

There are 2 possible responses from the PING command, they are as follows:

Request timed out

And

Reply from <IP ADDRESS>: bytes=32 time<1ms TTL=128 **<or similar>**

## Telnet

Telnet can be used to determine, whether you can communicate through a specified port. This can be very useful in troubleshooting WebCam issues. The four ports used by GeoVision as standard are 80, 4550, 5550 and 6550. This can be used over a LAN to check for software firewalls, or over a WAN to test router configurations

### **Usage**

telnet <IP ADDRESS> <port number>

### **Example**

telnet 192.168.1.100 4550

### **Reply**

There are 2 possible responses from the PING command, they are as follows:

A blank screen with a flashing prompt. This means that the port was open and a connection has been successful.

And

Connecting to <ip address>...Could not open connection to the host, on port <port number> Connect failed

## Trace Route (TRACERT)

Used to map a path from one computer to another, useful if you are experiencing problems with your WebCam connection. It will give you a list of all the router you pass through.

### **Usage**

tracert <IP ADDRESS>

### **Example**

tracert 64.233.161.147

### **Reply**

```
1  1 ms  1 ms  1 ms  10.10.10.x
2  47 ms 47 ms 45 ms btdhg552-hg1.ealing.broadband.bt.net [217.47.50.xx]
3  45 ms 47 ms 49 ms 217.47.50.xx
4  46 ms 55 ms 51 ms 217.47.50.110
5  49 ms 52 ms 49 ms 217.47.219.106
6  47 ms 49 ms 50 ms 217.41.168.25
7  51 ms 52 ms 52 ms 217.41.168.130
8  60 ms 47 ms 50 ms 217.41.168.50
9  57 ms 50 ms 47 ms 217.47.83.113
10 52 ms 47 ms 49 ms core2-pos9-0.ealing.ukcore.bt.net [194.72.17.209]
11 51 ms 51 ms 60 ms core2-pos1-0-0.telehouse.ukcore.bt.net [62.6.201.86]
12 49 ms 50 ms 54 ms ge-1-3-6.mpr1.lhr2.uk.above.net [208.185.156.217]
13 123 ms 122 ms 120 ms so-4-0-0.cr1.dca2.us.above.net [64.125.27.57]
14 125 ms 125 ms 123 ms so-0-0-0.cr2.dca2.us.above.net [64.125.29.122]
15 119 ms 121 ms 122 ms so-5-0-0.mpr2.iad1.us.above.net [64.125.27.209]
16 121 ms 122 ms 121 ms so-3-0-0.mpr2.iad5.us.above.net [64.125.28.14]
17 119 ms 124 ms 123 ms 216.200.151.110.available.above.net [216.200.151.110]
18 124 ms 124 ms 126 ms 216.239.47.130
19 123 ms 124 ms 124 ms 216.239.49.38
20 122 ms 125 ms 121 ms 72.14.236.200
21 126 ms 124 ms 135 ms 216.239.49.214
22 123 ms 124 ms 120 ms od-in-f147.google.com [64.233.161.147]
Trace complete.
```

## IPCONFIG

This command will show you your current LAN IP address. This is essential when configuring port forwarding on a router.

### **Usage**

ipconfig

### **Example**

ipconfig

### **Reply**

```
Connection-specific DNS Suffix . :  
IP Address. . . . . :10.10.10.150  
Subnet Mask . . . . . :255.255.255.0  
Default Gateway . . . . . :10.10.10.1
```

## **Whatismyip.com**

A website you can visit that will give you your perminter WAN IP address, usually the external IP address of your router.