



What is a router and what does it do?

The Internet is massive. I mean really massive. One massive mess of data packets flying all the over place, down wires across land and sea, spanning pretty much the entire planet. To store everything on the internet on disc, you would need a stack of blank CDs that reached the moon and a considerable distance back again. But how does this plethora of information know where to go and how to get there?

Many people confuse routers with modems. This is not the case. A modem is a much simpler device that purely connects kit to the Internet. Think of it is a sort of decoder – it takes the information from your home and is able to push it out to the Internet in the correct format required. You can access the Internet with just a modem by connecting your PC directly to it but this isn't very practical. By connecting a router to the modem, or having a modem built into the router, the router is able to service many PCs simultaneously by taking the information from the modem and delivering it across a network. A router is capable of taking information from many different networks and delivering them to many different devices almost in an instant.

IP addresses are unique numeric addresses across the Internet that give everything a virtual location of sorts. Routers play a fundamental role in guiding traffic between those locations. A router will typically have several ports on it where you can connect various pieces of equipment, even an entire network behind one port. Each one of those ports can have its own address, servicing a network of further addresses on each port. The router does exactly what it says on the tin – it routes the traffic back and forth between all those networks, translating information between one location address and another.

On a very basic level a router will typically have two IP addresses assigned to it, one for its “inside” address and one for its “outside” address. The inside portion would be, for instance, your home, which contains numerous devices that all have their own addresses that are unique to your home but make no sense to the Internet. The outside address portion of the router is facing the Internet and has an address assigned to it that makes sense to the rest of the Internet. The router is able to take the information that only makes sense to your home and translate it into information that is readable and understood by the rest of the planet. The router will have a thing called a routing table stored in it, which is essentially a table of information that would say, in this simple example, take everything from “inside” that needs to get the Internet and send it to “outside”.

On a much more complex level we have huge routers that sit at key points in the Internet, often referred to as Core routers because they operate at the very core of the Internet. These routers can be the size of a car and operate almost as massive mail rooms. They take information from millions and millions of “outside” addresses across the planet and direct them towards the other “outside” addresses where they need to go, at which point a much smaller router would take over and translate that traffic to its destined “inside” address e.g. your home or an office. If you are sending information across the Internet, it is likely that your information will be redirected through several Core routers before it reaches its destination, all of which will be simultaneously processing millions of other redirections at the same time as yours. These Core routers are the fibre that holds the Internet together.