

## Thanks a ~~Million~~ Billion!

In most cases, small business and home users connect to the internet via a wireless router. Typically these all-in-one devices provide several functions: they have an ADSL modem to make the physical link to the internet; they have a number of Ethernet ports to connect wired computers; they have a wireless (wi-fi) component so laptops can be connected. They also usually have a firewall to control unauthorised usage and access; some also have a built-in USB port to enable a printer to be shared. As such, the router is one of the most important parts of any small network. And yet, the devices that are typically used are often low-cost, low-performance and unreliable. Indeed, some can be described as downright 'cheap and nasty'. Our view is that this is one area where a small or home based office cannot afford to compromise and that an upgrade to a professional or prosumer ('professional consumer') grade router is a smart move.

### The Problem

There is an old adage - you get what you pay for – and this is certainly the case when it comes to routers. Most electronics have fallen dramatically in price over the past decade, and this applies with a vengeance when it comes to routers. Just over a decade ago, a wireless router cost around £1000. The retail price is now around £50, but most people expect to receive one 'for free' when they sign up for broadband with an ISP. These low cost routers typically cost around \$10-\$20 to manufacture and, as the saying, something has to give.

A router may not have a keyboard or a screen, but to all intents and purposes it is a computer. It has a processor and memory. It has an operating system, although this is usually referred to as 'firmware'. However, unlike a general purpose computer that can be used for a myriad of different tasks, a router is dedicated to running a single program: connecting to the internet and then sharing out that connection to several other computers.

Because the router is so low-cost, it has to have a cheap (that is, slow) processor and only a small amount of memory. In a domestic environment, where only 1 or 2 computers are connected, that may not be a huge problem. But when more computers are connected, the workload becomes greater and the router simply cannot cope, resulting in flaky or dropped connections.

You'll probably be familiar – although hopefully not too familiar – with your PC acting oddly or even freezing or crashing. Exactly the same thing can happen with routers. These problems are caused by bugs (deficiencies) in the software. To minimise costs, most router manufacturers use free or so-called open source software. There is certainly nothing wrong with open source software as such, but it does have to be customised by the manufacturer to work with their chipset or router and often they make a poor job at this. Consequently, some features may not work as advertised and the router may crash or simply need to be restarted on a regular basis.

### Towards a 'Goldilocks' Router

The main suppliers of low-cost routers are Belkin, Netgear, Dlink, LinkSys and Thomson. In the high street retail market Belkin tends to dominate, although this is purely down to distribution networks and nothing to do with the merit of the product. Thomson don't sell under their own name, but make many of the routers for BT, O2, Orange and others. As described above, these devices are

made for a particular market and to a strict price. In the home environment they are usually adequate, but can fall short in the small business environment.

Routers designed for the corporate marketplace are an altogether different prospect. Here, performance, reliability and throughput are essential. This market is dominated by companies such as Cisco, Juniper and 3Com (owned by HP). However, these devices cost hundreds or even thousands of pounds and are too complicated for the average small business to use and maintain.

What is really needed is something which is in-between these two categories: something which is not too small, not too big, but just right. In effect, a 'Goldilocks' router. Fortunately, such 'Prosumer' (Professional Consumer) routers are available, providing good, reliable functionality at an affordable price.

### **Billion**

Billion is not a company that many people have heard of, but has been in existence for nearly 40 years and have a strong presence in the Pacific Rim and Australasia. They produce a wide range of routers, but have products in the £100-£200 price bracket that work particularly well in the small business environment. The products have a strange sort of retro look, being vaguely reminiscent of 1960's transistor radios. But it is what is inside them that makes them so useful: they are absolutely rock solid, reliable and well able to cope with the demands of a typical small office. They are also easy to setup and manage, plus have a serviceable firewall that can block certain websites and types of traffic.

Some of the Billion routers can handle two incoming internet lines. So, for instance, if the main internet connection goes down the router can switch to a backup one. This backup can be another ADSL service, or a cable service, or even a 3G service using a dongle or 3G SIM card. Whilst the average household doesn't need this type of failsafe capability, it is very desirable in a business that cannot afford to be without the internet for any length of time. Plus, in the era of cloud computing (Google Apps, Office 365 etc) no internet means no computing at all, so a fallback is essential.

### **Conclusion**

CTACS recommend that any small or home business using a domestic type of wireless router should consider moving to a better quality, prosumer type of device. We have found that Billion routers are particularly well suited to small business usage, with their products offering a good compromise between price and performance, along with useful and desirable fallback features.