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Melb PC member Stewart Adam provides a Gigabit Ethernet How-To update and combines it with a review of the Netgear RangeMax Wireless-N Gigabit Router (WNR3500).

Like me you probably read a few magazines, including PC Update, and Google your way around the Web before launching into any complex endeavour involving PC or network updates. This is particularly the case when it comes to any serious expenditure. I’ll be honest; sometimes I read the reviews after the fact, just as I sometimes read the instructions after an installation goes pear-shaped. This How-To is one of those experiences.

The first matter to think through was whether Gigabit Ethernet is necessary. After all, even when connected to the Internet using a Big Pond Cable Extreme Liberty plan, with the claimed download speeds of up to 30Mbps available in some parts of Sydney and Melbourne, one hardly needs a Gigabit Ethernet to move Web and e-mail data over a home local area network (LAN). While the reality for most cable users is download speeds of less than 4Mbps (visit the tcp/iQ website http://www.tcpiq.com/tcpiq/Linespeed/Default.aspx, then test your own speeds), there are other reasons to upgrade your LAN to Gigabit Ethernet. For a good introduction to TCP/IP and networking terms see Mike Chambers’ PC Update Online article, available at http://www.melbpc.org.au/pcupdate/2403/2403article6.htm.

One aim in setting up a faster LAN was to stream music, pictures and video from a Linux server to a PlayStation 3 (PS3). While music doesn’t require huge bandwidth, video certainly does.

**why netgear?**

A reviewer sparked my interest in an upgrade of my local area network (LAN) with an announcement of the arrival of Netgear’s RangeMax Wireless-N router (WNR3500). The promise of an increase in WiFi speed from an existing 54G WiFi router, on top of an increase in WiFi range thanks to the eight in-built antennas and a 4-port gigabit Ethernet switch, was enough to open my wallet. The full details can be found at Netgear’s website (netgear.com.au).

There are three models in the RangeMax line-up, and your needs will determine which model you might buy. The increase in wireless range from the eight internal antennas is simply astounding.

Moreover, connecting the various devices on my network was simple enough thanks to the Smart Wizard Installation CD that came in the box along with a Cat5 cable. When changing routers do write down all MAC and allocated IP addresses (if you are using any) to make the changeover as smooth as possible.

My choice of the WNR3500 was not based on any deep love of Netgear as a brand. It was a value-for-money decision based on a desire to interconnect various PCs and notebooks, some over WiFi, with a networked storage device, and separately, to connect

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*Figure 1 - local area network (LAN) example using Gigabit Ethernet*
a media server to a PlayStation 3 at gigabit speeds. Needless to say, the decision also involved the price I paid to my wholesaler/retailer of choice. Figure 1 presents some possible connections and other vital information discovered in the process of setting up a Gigabit Ethernet LAN and should also be seen together with Mike Chambers’ schematic of a possible local area network.

use a switch
One of the more common misconceptions is that if you have PCs and games machines connected via a wired network, simply plugging them into a Gigabit Ethernet router like the WNR3500 will automatically result in the entire network running at 1000mbps—where 1000 megabits per second equates to 0.125 GBps (gigabytes per second).

Those yellow LEDs on the WNR3500 may not turn green as planned, for invariably, you will own PCs with 10/100mbps LAN ports or PCI cards, or perhaps an Xbox games machine, and connecting these into the router ports on the WNR3500 along with devices like the PlayStation3 and a 1000Mbps capable media server will result in the entire network running at the slower speed.

Let us assume that one PC is connected to the WNR3500 via a Gigabit PCI card on the PC and that under Windows Vista this card cannot auto-negotiate a connection faster than 10Mbps. This was but one situation that I faced, with the result that the entire LAN ran very slowly indeed. The only solution to this particular problem was to remove the Realtek-driven PCI card and be content with the 100Mbps that the onboard Broadcom LAN port could deliver. This older motherboard and Vista combination was not capable of allowing the particular PCI card to operate at higher speeds. However, under WinXP, the maximum speed was 100Mbps.

As Figure 1 illustrates, it’s necessary to inter-connect Gigabit-capable devices to a Gigabit switch and from there to the WNR3500 to get speedier connection between the faster devices. I chose a TP-Link 8-port switch, once again seeking value for money from my chosen supplier. I chose a 10/100/1000 switch meaning that I am not locked into converting every machine to Gigabit Ethernet at the one time. In any event, devices like wireless access points and printers must be connected at slower speeds.

cabling
Cabling is another issue in that Cat5e cabling should be replaced in favour of Cat6e or Cat6 twisted-pair copper wire cables between the switch and Gigabit Ethernet capable devices. If you make these cables yourself, as I did, Cat5e RJ-45 modular plugs are easily installed with a 6P/8P crimping tool after stripping the outer cable insulation with a rotary coax stripper tool.

Installing the RJ-45 modular plugs to Cat6 cable takes a lot longer as the thicker insulation inhibits insertion of the Ethernet cable into the plug. Cat6 is somewhat better insulated against interference, but Cat5e does the job quite adequately.

Another inhibitor to Gigabit Ethernet speed is the speed of your hard drive(s). This is not an issue that I’ve researched, as I run recently upgraded to SATA drives in RAID configurations.

streaming and file movement
A comment on streaming and file movement would seem in order, given the main aim of the network upgrade. Moving files between a Windows Vista or XP PC and in this case a Fedora Core 10 PC is no problem these days. Linux has become much more user friendly, and the Samba protocol much easier to set up on the Linux box.

When moving large files I recommend running TeraCopy on the Windows PC. When streaming music (such as mp3), pictures (such as jpg) and video (avi and mpeg) from a Linux box to a PlayStation 3 I use MediaTomb rather than Ushare or Fuppes or other software packages. The main reason is that MediTomb can be easily installed via the Yum package manager and doesn’t require recompiling the kernel. Moreover, MediaTomb relies on an SQLite database and the software is easily configured. Of course, Windows aficionados will know that Vista and XP are also recognised by the PS3 as a media server. However, I use a dedicated Linux PC as a matter of preference. Whatever works for you, use it.

conclusion
The first question an astute reader will ask is ‘Was it worth the money and bother to upgrade to Gigabit Ethernet?’

The benefits of a faster wireless network with increased range justified the purchase of the WNR3500 over other models. As I did not have interference issues, a single-band wireless router sufficed. However, if I had a slower router and only wanted to set up a Gigabit Ethernet, then I only needed to install a good quality Gigabit switch with backward capability (a 10/100/1000mbps switch). As I only had Cat5e cabling installed, the upgrade to Cat5e cable was still needed.

Moving large files between the gigabit-enabled devices at up to 60MB/s and faster, and generally staying abreast of the changes in network technology, made the expenditure and effort worthwhile. When visitors see and hear the final results of the media server streaming to the PS3 connected to home theatre system it certainly causes comments to fly.

about the author
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