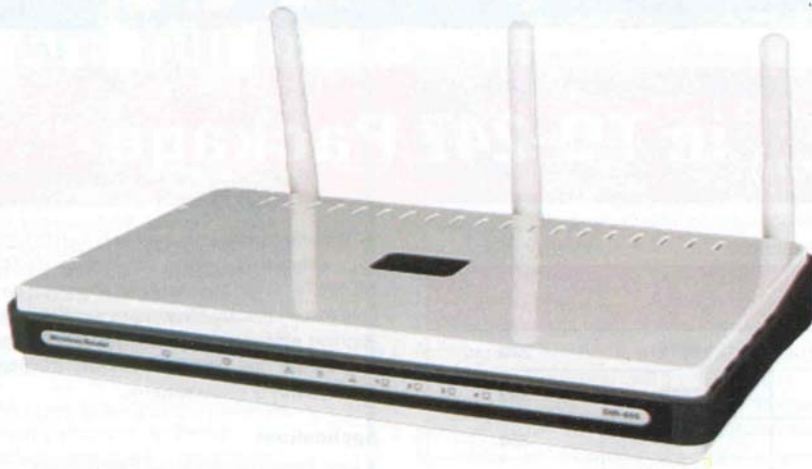


Gen 2.0 Wireless Gigabit Routers – ‘N’ Times Better

Over the past year or so, a new generation of wireless routers—wireless-N and gigabit Ethernet—has taken the market by storm. What makes this generation of wireless routers better than the earlier ones, and what interesting features do these come with?



D-Link DIR-655 Xtreme N gigabit router

■ JANANI GOPALAKRISHNAN VIKRAM

Ever since the Wi-Fi Alliance started testing and certifying products for the 802.11n draft 2.0 specification in June 2007, the market has been greeted by a slew of wireless-N gigabit routers, starting with D-Link's RangeBooster N 650 DIR-655 and Netgear's WNR854T. Now almost every player has a wireless-N gigabit router on offer. What do these mean in the context of wireless routers? The answer to this question is extremely essential in understanding the current

generation of wireless routers, and we shall seek some clarity in this article.

Multimedia-grade Wi-Fi

The 802.11n specification (now in the draft 2.0 stage) is a significant stride ahead for wireless routers, especially those targeted at the SOHO (small office-home office) segment. 802.11n technology enhances the robustness, speed, coverage and other capabilities of Wi-Fi networks. Products based on this standard can deliver up to five times the throughput and twice the range of older wireless products. Therefore the Wi-Fi Alliance rightly

describes an 802.11n network as a 'fat pipe' that multiple users can use effectively across a large area to quickly transfer bulky files and to smoothly run content-rich applications ranging from high-definition video streaming to online gaming. Security options have also been spiked up in the new standard.

The 'n' advantage

What makes 802.11n better than 802.a, b and g? Older technologies tuned out all the weak signals and made use of only the strongest signals detected by the devices. On the other hand, wireless-N products are capable of using echoes to make signals stronger and faster. Hence, they overcome obstructions and reach a wider area easily.

Wireless-N devices are also capable of sending and receiving more than one communication signal at the same time, using multiple antennae. This is what you would find described in product brochures as MIMO (multiple-in, multiple-out) technology. The benefits of MIMO are especially high when all the devices in a network are wireless-N. However, the advantages are definitely noticeable even if only a few devices are MIMO-capable.

Perhaps one of the most noticeable advantages of wireless-N devices, which also makes the technology very multimedia-friendly, is its ability to reduce latency. 802.11n devices have

Buying tips

Consider the following factors when buying a gigabit router:

- Performance
- Number of gigabit ports
- Multiple functionality
- Interoperability
- Built-in firewall and other security features
 - Capability of the processor to handle the networking requirements
 - Availability of ADSL, wireless, gigabit switching ports and gigabit WAN ports

a built-in intelligence called 'quality of service,' that helps them recognise applications that cannot tolerate even mild delays (such as streaming video) and prioritise the applications running in parallel such that the most sensitive applications experience the least latency. Moving to wireless-N devices significantly reduces disturbances during voice calls and distortions while streaming video and games.

It's already here

With so many advantages, manufacturers could not wait any longer to bring out the products on their anvil, and the market saw the launch of several 'pre-n' products based on 802.11n technology even before the Wi-Fi Alliance started certifying products based on draft 2.0 in 2007. Realising the market's eagerness and also confident about the maturity of the technology, the Alliance started testing and certifying products based on the draft 2.0 in 2007, even though the standard as such is expected to be ratified only in 2010.

Till date, over 500 products including several multimedia and enterprise products have been certified by the Alliance, and it is advised that consumers go only for certified products to ensure interoperability, security and backward compatibility when using multiple products from different manufacturers in the same network.

Wireless-N routers are doing well in the Indian market too. Suresh Balasubramanian, national sales director-India, Cisco Consumer Business

Group, explains that India is an extremely unique market in terms of its sensitivity to the cost of both Internet infrastructure as well as consumption. This means that consumers need to be able to have wireless connectivity with minimum investment and also need to manage their usage effectively. As a result, wireless-N routers are especially suited for the India market, both in terms of features as well as cost competitiveness.

Giga-speed with wireless-N

Wireless-N is not the only buzzword doing the rounds in the wireless router market. Without 'gigabit Ethernet' ports, a wireless-N router will be like a hawk without its talons!

A decade old standard, Gigabit Ethernet builds on the Ethernet protocol, scaling up its speed to 1000 megabits per second (Mbps) or 1 gigabit per second (Gbps), that is, 10/100 Mbps at the desktop level to 1000 Mbps in the data centre. Gigabit Ethernet is old, in fact, gigabit routers started arriving in the market as early as 1996. Now the term is used widely in the context of new wireless-N routers that come with gigabit Ethernet ports and enable these wireless routers to also connect to high-speed Ethernet connections.

Gigabit routers are in great demand in the Indian market, thanks to the customers' growing need for reliable high-speed data transmission.

"Gigabit Ethernet is fast becoming the de-facto standard for metropolitan area networks (MANs), corporate wide area networks (WANs) and campus backbones as a cost-effective approach to traditional ATM and SONET rings.

Internet Protocol-based virtual private networks (VPNs) are also getting

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more popular, thereby increasing the demand for gigabit routers," says Subhashini Prabhakar, chief technology manager, Dax Networks. "This is true in developed as well as developing nations, since the utilisation of gigabit routers depends only on the application, the type of backbone, etc, and not constrained by slower Internet connections and other such factors."

Prem Nithin, senior technical consultant, Cisco, India & SAARC, explains that people use multi-function gigabit routers not just for connecting to the Internet from home but for telecommuting to work. Unified business-class wireless networking and remote working solutions are where gigabit routers are most useful, thanks to the inherent speed and reliability. "Teleworking is gaining great traction in India due to various factors," he says, hinting that it automatically increases the demand for wireless gigabit routers.

He also adds that the next stage in the evolution is 10 gigabit Ethernet, which is likely to become the norm in the near future.

Meeting consumer needs with new features

With great demand come great innovations. The network as such has great potential to improve the performance and functionality of almost every component of the IT environment—from servers to applications, middleware as well as end points. Technological developments and new features introduced in networking products, such as routers, are attempting to do just that.

"Routers have now matured to become intelligent network devices incorporating features such as content processing, VPN, firewall and load balancing. Wireless capabilities are also becoming popular, replacing the need for separate wireless access points for small office networks," says Balasubramanian.

Let us take a look at some of the interesting features in today's wireless-N gigabit routers.

Dual band. Dual-band wireless-N gigabit routers such as Linksys by Cisco WRT610N, Netgear's WNR3500 and TRENDnet's 300Mbps Dual-band Wireless-N Gigabit Router enable the user to take advantage of 802.11n grade wireless connections operating in the 2.4GHz wireless band and/or the wider 5GHz band. The 5GHz band is less crowded than the 2.4GHz band that is used by other devices like DECT phones or microwaves, and therefore better suited for carrying latency sensitive data like video and audio. A dual-band wireless router is like having two N band routers in one device. "The 5GHz band is ideal for streaming media and provides more than seven times the number of non-overlapping wireless channels, allowing for clearer transmissions. The 2.4GHz spectrum allows older network devices like print servers, cameras or older notebooks and PCs to access the network. As opposed to other solutions, the WRT610N is designed to allow consumers to achieve full Wireless-N network speeds on both bands at the same time," explains Balasubramanian.

Push 'n' connect. Some of the newer wireless-N routers such as Netgear's WNR3500 RangeMax Wireless-N Gigabit Router provide a feature called 'push 'n' connect'. This feature basically allows you to wirelessly connect to supported devices easily without having to remember the security password and enter it every time. 'Push 'n' connect' is based on the Wi-Fi Protected Setup (WPS) standard. It enables you to configure the router's network name (SSID) and security settings and then easily connect wireless clients securely and easily to the router. WPS automatically configures the network name (SSID) and wireless security settings for the router (if the router is in its default state) and broadcasts these settings to the wireless client. So, you do not have to remember cumbersome security settings and details every time you want to connect a wireless client.

The future of wireless routers is all about integration—solutions that are highly secure, flexible and built to be compatible with future technologies

Powerline AV adapter. A wireless networking related innovation that won an innovation award at this year's Consumer Electronics Show (CES) is Netgear's Powerline AV Adapter with an integrated four-port fast ethernet switch. The adapter turns any electrical power outlet into an Ethernet network connection that can handle up to 200 Mbps speed. According to them, this 'no new wires' technology will allow users to carry high-speed data network traffic on existing electrical wiring. The adapter is designed for use with high-performance applications like high-definition video streaming, networked attached storage and console gaming.

M-Drive technology. M-Drive is a significant innovation from Cisco, which is known for having come out with the first enterprise-class unified wireless network platform using the full potential of 802.11n. M-Drive technology is a new system-wide set of features that further enhances 802.11n performance by improving wireless coverage and capacity, optimising device connections and simplifying wireless management. One particular feature of M-Drive technology, ClientLink (yet to be launched) also helps extend the life of existing 802.11a and g devices. The technology uses beam forming to improve the throughput of existing 802.11a and g devices, increase overall wireless channel capacity and reduce wireless coverage holes for legacy devices.

Xtreme N. D-Link's award-winning Xtreme N product family has several interesting products that tap the potential of 802.11n technology, including the GamerLounge and the

MediaLounge. Their new product, the DIR 685 all-in-one router won an innovation award at CES 2009. The all-in-one router is a wireless-N router that doubles up as a network attached storage (NAS) device. It also has a 8.1cm (3.2-inch) LCD monitor for displaying photos, desktop applications and network performance diagnostics. Truly an all-in-one device!

The future is all about integration

The future of wireless routers is all about integration—solutions that are highly secure, flexible and built to be compatible with future technologies. In a way, such integrated network router solutions are already here, and the trend is likely to strengthen in the coming years.

We will see the router transform into an intelligent device that performs multiple functions including prioritisation of network applications—a feature that is already here, thanks to 802.11n. With high speed, reliable transmission, routers will easily bring the office right to the worker's living room—telecommuting will be much easier than it is now. Integrated services will enable technical staff to monitor the health and security of devices from a central location. Intelligent routers and other network devices will make it possible for the network itself to take up the responsibility for its security at various levels, rather than relying on a centralised software-based security solution. This will help protect companies from the influx of viruses, malicious code and other infections that end users' laptops might unknowingly acquire.

In short, a network will no longer be a mere collection of devices but a well-rehearsed ballet performed by intelligent devices. No more disruptions, no more fears. We are at the brink of an age of fast, secure, integrated wireless networks. ●

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