Delving into Wireless AC – upwards and onwards

In our increasingly mobile and always-on world the 2.4GHz radio spectrum, traditionally used by Wi-Fi networks, is no longer fit for purpose. It's far too crowded and can't be pushed to deliver any more bandwidth, which is why the latest Wireless AC technology is leaving the past behind and switching instead to 5GHz which has a lot more to offer.

Through the Wi-Fi ceiling

Most current Wi-Fi networks operate within a radio spectrum (at 2.4GHz) which has been running out of steam for some time due, partly, to the sheer number of devices competing for airspace. Everything from wireless door bells, garage door openers and cordless phones through to car and house alarms operate here, along with Bluetooth phone accessories and, of course, Wi-Fi routers plus the various devices we now routinely expect to connect wirelessly throughout the home and business.

Because of its popularity, Wi-Fi in this waveband is extremely prone to interference from other electronic devices, not least the humble domestic microwave, frequently leading to performance issues. Continual pauses for buffering when streaming video over Wi-Fi is a prime example, along with poor coverage and unreliable connections - as anyone who has ever tried to use their smartphone as a personal Wi-Fi hotspot in a big city can confirm!

So the next generation of Wi-Fi - Wireless AC - will move to the much emptier 5GHz spectrum where there is far less competition for space and much less interference. Existing Wireless N networks can already make use of this waveband, whereas the new Wireless AC standard, is designed to use the 5GHz spectrum exclusively. That way you're assured of cleaner airspace while backwards compatibility and interoperability with older devices is provided for by incorporating a separate Wireless N radio alongside the new interface – dual-band wireless.

Channel benefits

Another advantage of the move to 5GHz is room to split the available spectrum into a lot more channels. That's important because Wi-Fi networks are divided into 20Mhz channels with room for just four (non-overlapping channels) at 2.4GHz. At 5Ghz, that shoots up to 19 added to which, just as with Wireless N those channels, can be combined to deliver more bandwidth per connection. However, whereas Wireless N has a bonding limit of just two, to give a pair of 40MHz channels, Wireless AC introduces support for four-way bonding (80MHz channels) and, ultimately, eight (160MHz channels) enabling the available bandwidth to be radically increased.

How that translates into deliverable performance is dependent on implementation, but the bare figures are impressive regardless. The D-Link Wireless AC1750 Dual Band Gigabit Cloud Router (DIR-868L), for example, offers up to 1.3Gbps - four* times the throughput of a standard Wireless N router.

Wireless AC

More for all

In the meantime, Wireless AC has yet more up its sleeve beyond extra channels and the ability to bond more channels together. Options such as the ability to concentrate wireless signals and beam them directly at target devices – beamforming - something D-Link offers already on Wireless N products using its SmartBeam™ technology and which has been further enhanced and extended for Wireless AC. Allied to which the new Wi-Fi enhances another technology from Wireless N, known as MIMO (Multiple Input, Multiple Output), to further boost wireless speed and coverage.

In essence MIMO is all about splitting transmitted data into so-called spatial streams. These can then be delivered simultaneously using multiple antennae (one stream per antenna) before being re-combined at the receiving end to boost the amount of data transferred.

In addition Wireless AC adds Multi-User MIMO (MU-MIMO) which goes one step further by allowing spatial streams to be assigned to more than just one device at a time. Just how many will depend on the number of antennae and how MU-MIMO is implemented . Regardless of implementation however, it will enhance throughput and will be of most value when handling smartphones and other mobile devices equipped with only one antenna as it will stop clients "hogging" antennae on shared wireless routers and access points. And that will be hugely important both for businesses struggling to cope with workers bringing their own devices into the office, and in the home, where multiple device ownership is fast becoming the norm.

Add that to everything else that Wireless AC has to offer and the new Wi-Fi looks set to enable us to satisfy our ever-growing need for fast, reliable wireless connectivity wherever we happen to be. And with D-Link you can future-proof your network and get it now, so why wait?

For more information: www.dlink.com

D-Link European Headquarters. D-Link (Europe) Ltd., D-Link House, Abbey Road, Park Royal, London, NW10 7BX.
Specifications are subject to change without notice. D-Link is a registered trademark of D-Link Corporation and its overseas subsidiaries.
All other trademarks belong to their respective owners. ©2013 D-Link Corporation. All rights reserved. E&OE.

Updated June 2013

D-Link®
Building Networks for People