Amphenol Broadband Solutions®

Home Networking Applications Outpacing Your Wi-Fi?

The newest breed of category cable can enhance the user experience.

by Bill O'Donnel, Director of Product Management - Amphenol Broadband Solutions

When increased internet speeds outpace premises Wi-Fi capabilities, category cables can deliver the high speed and low latency demanded by consumers.

With the continued increase in data speeds available over the internet, the throughput of Wi-Fi in subscriber locations may not be able to keep up in terms of speed and latency. A hardwired solution using category cable will overcome some of these shortcomings of Wi-Fi. This article compares solutions including the various category cable options available, as well as offering an environmentally-friendly approach to cable packaging.

We are constantly seeking the next electronic device that will make our lives easier, and moves us closer to connecting our homes to the world as part of the Internet of Things (IoT). As advancements in technology grow, so too does our insatiable appetite for data. You may have noticed ads from internet providers touting Gigabit speeds and, instinctively, we know that must be fast. But how fast is it?

To put such speeds into perspective, downing a 2-hour movie at a typical 10Mbps would take roughly 11 minutes. While this is a marked improvement over the five hours it used to take to download just one song in the '90s we simply cannot accept this "long" wait. Instead, we demand content be available instantly at the touch of a button. With Ultra-High-Speed Broadband Internet, that same movie file will take a mere eight seconds to download. Just searching for the movie in the first place will take you 100 times longer than that!

With these accelerating speeds, the problem is that most devices are utilizing Wi-Fi signals in the home that limit the amount of bandwidth that can actually be received at the device.

	Theoretical	Actual
802.11b	11 Mb/s	5.5 Mb/s
802.11a	54 Mb/s	20 Mb/s
802.11g	54 Mb/s	20 Mb/s
802.11n	600 Mb/s	100 Mb/s
802.11ac	1300 Mb/s	200 Mb/s

While in-home wireless networks continue to improve their ability to stream faster, they tend to operate at around 50% of their theoretical peak.

This is a huge concern for people seeking the fastest connection possible with the least amount of delay. Every gamer knows the struggle of having a lag or latency in their connection, and will typically seek out ways to hardwire their gaming system using category cable rather than a Wi-Fi connection.

With so many options available for category wiring, what is the best solution when considering wiring your premises? The first questions to ask are:

- **How far away is your device from the router or modem?**
- **What speed am I trying to achieve?**
- **Will I need more bandwidth in the future than the category cable will allow?**

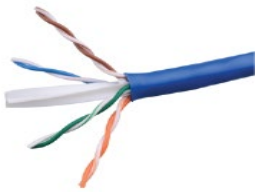
To help determine the right cable to use, the following explains the differences among the types of category cable.

Category 5e

Cat5e is the most common type of cabling due to its ability to support Gigabit (Gbps) speeds at a cost-effective price.

Cat5e supports a maximum frequency of up to 100MHz and is flexible enough for small space installations like residences, though it is still used in commercial spaces as well. Of all the current cabling options, Cat5e is the least expensive that is capable of operating up to 1 Gbps at a maximum distance of 300 feet.

Category 6



Cat6 wiring can support up to 10 Gbps and frequencies of up to 250 MHz.

Cat6 cables are more tightly wound than Cat 5E and sport thicker jacketing sheaths to help avoid pesky interference. CAT6 cable is capable of transmitting 10 Gbps up to about 180 feet.

Category 6a

Cat6a supports bandwidth frequencies of up to 500 MHz, twice the amount of Cat6 cable, and can also support 10 Gbps like its predecessor.

However, unlike Cat6 cabling, Cat6a can support 10 Gigabit Ethernet up to roughly 300 feet. Cat6a also features more robust sheathing which eliminates alien crosstalk (AXT) and improves the signal-to-noise ratio (SNR). The "A" in the cable's title stands for "augmented." Its stronger sheathing makes Cat6a cabling considerably thicker than Cat6, thereby making it less flexible to work with.

While Cat5E will meet most of today's demands, it makes sense to discuss making sure home networks are "future-proofed" by installing Cat6 right from the start. This way, as our networks continue to gain speed, we ensure our infrastructure will keep pace.

Eco-Friendly Cable Packaging

Amphenol Broadband Solutions (ABS) has taken category cables to the next level by literally looking "outside of the box" for ways to make handling cable easier.

Traditionally category type cables come in boxes or on reels that ultimately end up in landfills. Amphenol has changed that paradigm, and the customer experience, by utilizing our eco-friendly coil solution in the packaging for these products.

The new package design offered by ABS utilizes our already successful eco-friendly Technician Service Bag, which will hold up to a 500 feet coil of the cable. The bag provides an easy way for technicians to lay out the amount of category cable needed for each custom application. The Technician Service Bag for category cables ensures a professional and functional approach to structured wiring installations.

Bill O'Donnell is the Director of Product Management for Amphenol Broadband Solutions. He has been working in the telecommunications industry for over 20 years. Bill works with network providers to help define their challenges for which he draws on the corporation's global resources to develop innovative solutions. Contact Bill at bodonnell@abs-go.com.