

# Top 9 Reasons for the Rise of 10GBASE-T Cabling Systems

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For over two decades, Ethernet network speeds have seen exponential growth. Fast Ethernet network speeds of 100 Mb/s (100BASE-T) are no longer considered "fast", as 1,000 Mb/s (1000BASE-T) is the primary network speed and migration toward 10GBASE-T is well underway. 10GBASE-T requires a CAT 6A structured cabling system, which a rapidly-growing number of end users are now deploying. The following reasons are driving these decisions.

## 1. Backwards Compatibility

CAT 6A cabling systems allow and end-user to support Gigabit Ethernet today and provide a seamless migration path towards 10GBase-T for future network requirements. This prevents the need to re-cable to upgrade to CAT 6A, avoiding possible network disruption and additional project costs in the future. End-users and building owners who are planning for network upgrades or new construction in the near future should consider the expected life of the cabling system and benefits of CAT 6A to maximize their return on investment.

## 2. Auto Negotiation

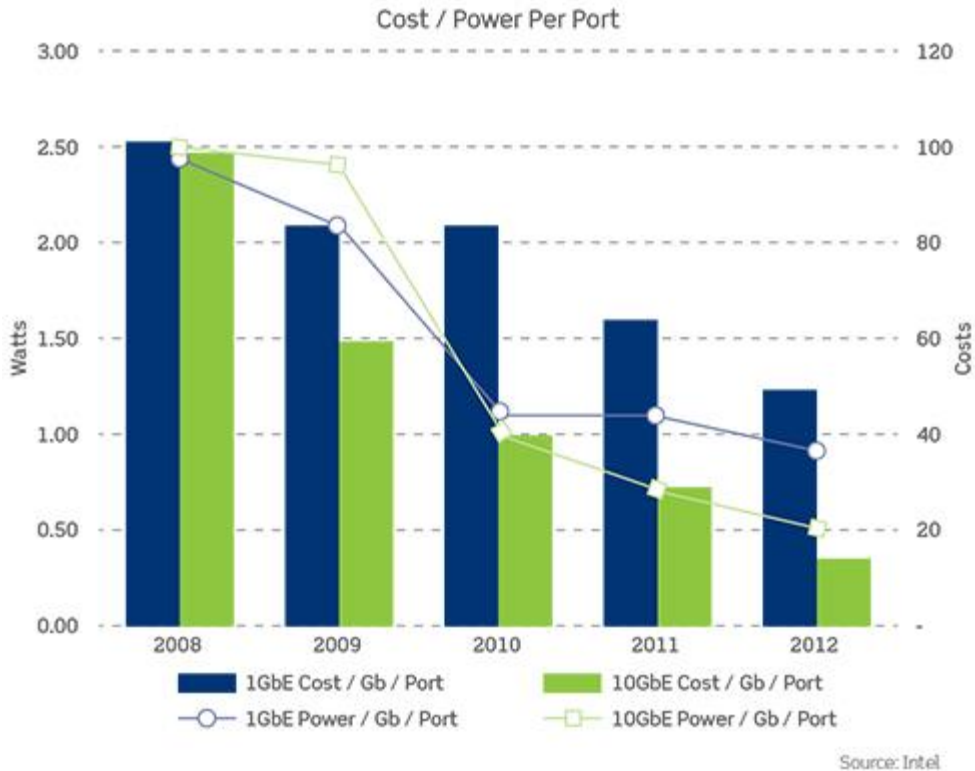
The 10GBASE-T standard includes an auto negotiation clause that two Ethernet devices can connect to each other and select a common transmission speed that both devices support. This allows 1G and 10G Ethernet equipment to communicate at 1G network speeds. It also allows network migration to 10GBase-T to be done in phases for a portion of the network or during a complete network upgrade, giving end-users some flexibility in terms of timing, disruption and cost for upgrading their network.

## 3. Bandwidth Demand

Gigabit Ethernet (GbE) usage has already peaked and the number of GbE ports is now declining, as businesses and data centers look for a solution with greater bandwidth. The IEEE 802.3an 10GBASE-T standard is the fastest defined network application for twisted-pair cabling systems. 10GBASE-T requires CAT 6A cabling to deliver 10GbE, and the current global adoption rate of CAT 6A cabling is 12% and growing, according to the Building Services Research and Information Association (BSRIA).

## 4. Lower Price and Power Consumption

The IEEE 10GBASE-T standard was published in 2006. As with any new technology, the cost of first-generation 10GBASE-T PHYs was expensive, and power consumption was high. However, current technology has reduced both costs and power requirements for 10GBASE-T ports. The 2012 launch of the Intel® Xeon® Processor E5 family accelerated adoption, as its 10G Ethernet LAN-on-motherboard (LOM) helped drive down the price, lowered power requirements, and increased density. These improvements will expand growth of 10G Ethernet over the next several years.



## 5. Cabling Reach

Initial 10G equipment incorporated Direct Attached Copper (DAC) assemblies such as SFP+. This is used to connect two network devices but is limited to distances of less than 10 meters for passive cable assemblies. Today's CAT 6A (10GBASE-T) technology can deliver 10G performance at 100 meters, giving it a greater reach than other 10GbE media types. This length allows data center managers more options when it comes to network topologies and placement of active equipment.

## 6. Shorter Distance for Data Center Applications

Data centers have a high concentration of equipment, many with distances below 50 meters, and even as short as 3 meters in a typical top of rack (ToR) architecture. In addition to supporting longer cable runs, CAT 6A cabling can maintain high performance in these shorter permanent links.

## 7. File Size

In enterprise networks, Ethernet switches and servers are shared among a large number of users to access files and information. Since 10GBase-T operates at speeds 10 times faster than Gigabit Ethernet, it can reduce the time to transfer and retrieve larger files from minutes to seconds (depending on file size). The reduced time to retrieve or transfer files improves the efficiency and productivity of larger organizations.

## 8. Smaller Diameter CAT 6A Cables

The first generation of CAT 6A cabling had a bulky average outside diameter (.330 inches).

Today's CAT 6A cable designs have a smaller diameter, lighter weight, and a smaller bend radius, improving fill capacity in pathways and spaces. In January 2013, cable manufacturer Superior Essex introduced an improved CAT 6A UTP cable that reduces the nominal diameter to an industry-leading .275 inches.

### **9. PoE+ Applications**

The latest Power over Ethernet devices — known as PoE+ — are able to provide up to 30 watts of power and beyond. This increase in wattage can impact the electrical performance of cabling systems, but CAT 6A cabling can handle the higher wattage, temperature rise, and heat dissipation in these applications.

With the benefits of lower costs and reduced power requirements backwards compatibility and easier migration, and better flexibility for data center topologies, more people are seeing the return on investment with 10GBASE-T and CAT 6A.