

The Future of Copper Beyond 10G

While 10G technologies make great strides in the market, some data centers are already evaluating their networks migration to even higher-speed Ethernet applications. As bandwidth-hungry services such as virtualization and cloud computing gain momentum, many CIOs anticipate upgrades to 40G speeds or higher. It is not far fetched to expect adoption rates for 40G switching equipment to outpace 10G in just five years, as predicted by Cisco Systems.

In 2010, IEEE published the 802.3ba standard for 40 and 100 Gigabit Ethernet transfer rates using single or multimode fiber and twinaxial copper DAC (Direct Attached Copper). This new standard accelerated interest in higher speed applications. However, copper links defined in the standard address short point-to-point distances only, and many in the industry expect to see a next generation of copper twisted pair cabling that meets 40G transfer rates.

Global cabling systems standards bodies TIA and ISO are both in the early stages of developing next generation copper cabling standards that support 40G or higher. The TIA TR 42.7 committee plans on defining standards to support 40G speeds while using twisted-pair cabling system with a frequency of up to 2 GHz (2,000 MHz) performance. The ISO/IEC next generation cabling standard currently under development, known as ISO/IEC 11801-99-x, looks similar to the draft TIA standard. It also targets speeds of 40G or higher and a frequency of up to 2.0 GHz.

Existing CAT 7A (class FA) cabling and connectors have been suggested as a possible solution to support 40G applications.

However, this technology presents several limitations. Current CAT 7A operates at 1GHz (as defined by ISO, the only standard body recognizing CAT 7A), but both TIA, ISO, and IEEE are currently targeting frequencies well above 1GHz — as high as 2GHz (noted above) — for next generation cabling.

At this point in time, it is anticipated that IEEE will evaluate a 40GBase-T project later this year to address next generation copper standards. Support is growing inside and outside the Ethernet community and the growth of 10GBase-T supports technical consideration for a next generation copper cabling system.

Copper twisted pair (CAT 6A) is emerging as the dominant delivery method for 10G due to its flexibility, low cost, reach, and backwards compatibility. It only makes sense that CIOs and IT managers will expect a similar 40GBASE-T option, creating a simple migration to higher speed Ethernet networks. Leviton staff members and engineers are closely involved in industry standards committees and dedicated to defining the most ideal solutions; we'll be sure to keep you updated in CrossTalk as to where our research takes us over the next year.

Resource:

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