INFRASTRUCTURE: CHOOSING THE RIGHT CABLING FOR YOUR DATA CENTER

Making A Sound Investment

A cabling system's expected life span plays a significant role in determining if multiple generations of continually evolving hardware can be supported without having to fully replace the cabling system. With most data center applications necessitating 10 gigabit per second speeds within the next 15 years, customers that choose to install older technologies such as Category 5 and 5e will lose the extended life cycle of their investments. When designing a data center, it is important to consider future transmission speeds and the infrastructure to support them.

Copper Solutions For The Data Center

Recent testing from Anixter's Infrastructure Solutions Lab illustrates how the effects of alien crosstalk, which is noise coupling between multiple cables installed in the same conduit or cable tray (see Figure 1), can impact 10GBASE-T (10 Gigabit Ethernet) performance. Because alien crosstalk is considered a random noise source that is difficult to eliminate with 10GBASE-T electronics, it must be reduced within the installed cabling plant so the electronics operate error free. The Lab conducted a series of tests to compare the effects of alien crosstalk on 10GBASE-T signaling when using Category 6 and Category 6A cabling systems.

Using a worst-case, 6-around-1 configuration (see Figure 1) in which one disturbed link located in the center of the bundle is surrounded by six disturber cables, The Lab created seven 55-meter Category 6 and seven 100-meter Category 6A cabling bundles. Because video is highly sensitive to network errors, The Lab created a test scenario where video was streamed over a 10GBASE-T link running between two high-performance workstations connected via the disturbed cabling system to determine the affects of alien crosstalk of the disturber links (running full wire speed 10GBASE-T traffic) on the video. For the Category 6 cable, the alien crosstalk significantly degraded the video transmission (see Figure 2). In testing the Category 6A cable, all disturber cables were brought online with minimal errors or degradation to the disturbed channel, resulting in a clean video image (see Figure 3).

Category 6 cable was not designed to minimize alien crosstalk. Anixter recommends Category 6A cabling for optimal 10GBASE-T performance because it minimizes alien crosstalk noise and will provide the greatest potential to handle future applications while extending the projected life span and overall capabilities of the infrastructure for a greater return on investment.

Fiber Solutions For The Data Center

Fiber can provide up to 60 percent space savings over copper UTP cabling in trunking or backbone cabling applications, making it an important factor where equipment density and heat dissipation are a concern. With interlocked armor jacketing providing additional protection and up to 96 fibers now able to be terminated in one rack space (1U), fiber can be terminated closer to server cabinets and racking rows while reducing the need for underfloor raceway.

When installing optical fiber in the data center, Anixter and the ANSI/TIA/EIA-942 recommend laser-optimized multimode 50-micron/ISO OM3, which has the advantage of lower costs associated with shorter wavelength optical modules (850 nm) without compromising performance and physical reach. Additionally, recent proposals in the IEEE 802.2 LAN/MAN standards committees outline the use of multi-fiber ribbon assemblies to support the upcoming 40 Gigabit and 100 Gigabit Ethernet standards.

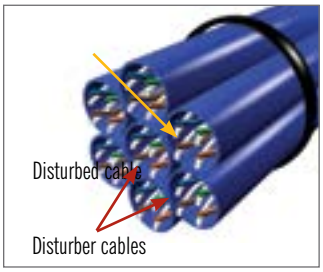

Figure 1: 6-around-1 cable configuration

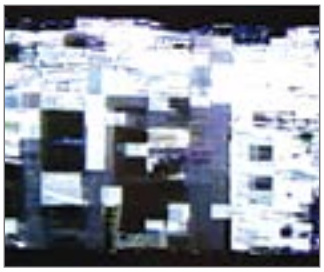

Figure 2: Category 6–55 Meters

Figure 3: Category 6A–100 Meters

For more information about data center performance or the latest testing results from Anixter's Infrastructure Solutions Lab℠, contact your local Anixter representative at 1.800.ANIXTER.

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