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Tech Tips

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Fiber-to-the-TE

In the telecommunications infrastructure and applications world, change is constant. We have seen information transmission rates change from 10 Mbps to 100 Mbps to 1,000 Mbps (1 Gbps) and now the standards are working on 10 Gbps for copper. As a result, industry standards for the media that support those applications also have to change. For example, the industry has gone from a Category 5 UTP horizontal infrastructure to a Category 5E to a Category 6. Now the standards bodies (TIA) is in the process of writing the standard for "augmented" Category 6 UTP media to support 10 Gigabit data transmission. Throughout all this change, however, two elements have remained somewhat constant: the fiber in the backbone that feeds the horizontal applications, and the hierarchical star architecture, which is recommended by the ANSI/TIA/EIA standards, to support the multiple applications like Ethernet, Token Ring, ATM, etc.

Fiber Benefits

With the emergence of higher speed applications, such as 10 Gigabit Ethernet, the industry is rediscovering the benefits of fiber optics. With the advancements in fiber manufacturing, the industry has seen the birth of a new and improved, laser optimized, 50um multimode fiber, which supports the higher data rates being utilized today; as well as those being developed in the near future. Since the standards supporting 10Gbps over UTP are still being developed, the industry has turned to fiber optics to support the immediate needs of these higher speed applications. The other benefit that fiber optics brings is that it can support those higher data rates out to extended distances beyond the capabilities of the UTP media.

Passive Zones (TSB 72)

In the mid 90s, the industry adopted TSB 72 for centralized fiber cabling and TSB 75 for open office cabling, which later became part of the standard. The centralized architecture of TSB 72 allowed the electronics to be centralized into one location versus having them distributed throughout the facility, which increased port utilization and again lowered cost. TSB 75 gave greater flexibility for open office architecture by allowing a single multi-fiber cable to feed a passive zone in the Telecommunications Room, which would accommodate multiple work areas and make moves, adds and changes (MACs) much easier and cost effective. Together these additions allowed for the use of consolidation points and/or multi-user telecommunications outlet assemblies (MUTOA) in conjunction with the centralized fiber architecture. By creating zones, a designer could eliminate the need for multiple cable runs back to a Telecommunications Room (TR), which saves material cost and labor. Once the zones were created, the final connection to the work area equipment was made with a patch cord.

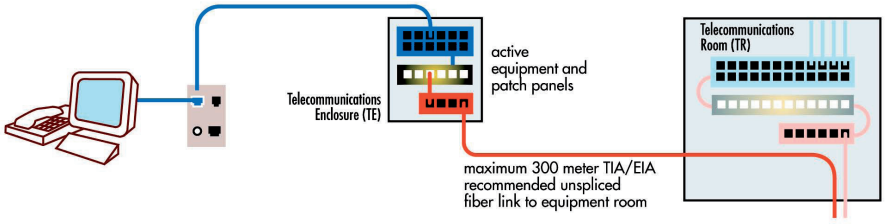
at work

Active Zones (TIA/EIA 568-B.1 and 569-B)

Recently, the ANSI/TIA/EIA released standards, which takes the zone concept to the next level. These new standards allow for the implementation of what is being collectively referred to as Fiber To The Telecommunications Enclosure (FTTE), which is made up of addendum 5 of the TIA/EIA-568-B.1, which covers the cabling requirements for the new Telecommunications Enclosure (TE) and TIA/ EIA-569-B, which covers the space requirements for the Telecommunications Enclosure (TE). Basically, the TE is used in addition to the required TR, but serves the same basic functions as a TR. The TE is essentially an active zone. Utilizing the TE, also known as a mini-TR, a designer can create active zones which house small port count switches and cross-connect components. These zones may be fed by centralized fiber cable(s) and then the designer can utilize either a fiber cable/patch cords, or a UTP cable/patch cord to connect to the work area equipment. Since most desktop computers come standard with copper NICs, a designer can take advantage of both the benefits of the extended distances and higher bit rates that fiber offers and enjoy the cost savings of utilizing the copper NICs.

FTTE Benefits

While the traditional star topology does give end-users some flexibility and benefits, incorporating the FTTE architecture gives greater flexibility and in many cases saves money. By combining the benefits of the centralized fiber architecture and the new FTTE architecture, new buildings can be designed to consolidate larger port count electronics, reduce the number of TRs needed, reduce the amount of cable needed, reduce fuel load and weight load in a building and potentially save upwards of 50 percent in initial cost, as reported by the cost model of the TIA Fiber Optic LAN Section. As more networks are becoming converged; combining voice, data and video, FTTE makes sense. All these applications can be transmitted via the fiber to the Telecommunications Enclosure, taking advantage of the extended distances and higher bandwidths that fiber offers, and then at the TE break out into the UTP or Coax or Wireless media. This architecture has all ready proven to be very cost effective and flexible in the education markets. While FTTE architecture may not be the best choice in every situation, these additional options provide new alternatives to optimally meet the needs of a greater variety of installations.



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