LEVITON®
Network Solutions

5 Reasons COPPER is RIGHT for your Data Center

On average, only three percent of funds budgeted for the data center are allocated to the physical layer. But this three percent has a significant impact on all data center investments and directly affects overall network performance.

With the demand for higher bandwidth in a smaller footprint, a fiber solution is an obvious choice for increasing bandwidth without expanding your physical layer. However, copper structured cabling is flexible, energy efficient, cost effective, has an embedded base, and is capable of providing dependable high-gigabit performance throughout your data center for years to come, ensuring the most resource-efficient solution per gigabit to secure the highest return on infrastructure investment.

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1 FLEXIBLE

Passive Twinax direct attach cable (DAC) is a common, non-structured cabling approach used in top-of-rack (ToR) architectures, typically acting as an interconnect between servers and switches. However, the reach constraints (7 meters) of this solution limit applications to intercabinet and ToR configurations. Currently, the Institute of Electrical and Electronics Engineers (IEEE) is considering QSFP+ DAC and RJ-45 twisted pair as viable strategies for supporting 25G and 40G applications. While QSFP+ DAC is limited to 15 meters, a BASE-T twisted-pair solution will provide IT managers with further range and deployment flexibility. With 25GBASE-T and 40GBASE-T, interconnect reach can be extended up to 30 meters. This type of flexibility opens the door for end-of-row (EoR) or middle-of-row (MoR) configurations; something not possible with a DAC approach.

EXTENDING reach to 30 meters

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2 ENERGY EFFICIENT

Over the years we have seen a significant increase in the efficiency of BASE-T structured cabling systems. Three years ago a Cat 6A system would require approximately 10 watts per port. Today we are seeing numbers as low as 2-3 watts per port with Technology advancements such as Energy Efficient Ethernet (EEE) and port intelligence, as well as improvements in cable and connector designs, have made this possible. Integrating BASE-T systems in the data center allow for higher switch port utilization and enable EEE deployment to decrease overall power consumption. With higher switch port utilization you can accomplish the same network capacity using fewer switches, reducing the amount of energy required to power the data center. EEE allows for less power usage during periods of low data activity. This level of power reduction is achieved by sending a low power idle request to connected devices when no data is being sent, effectively placing connected devices into a sleep mode to decrease power consumption and minimize operating costs. EEE also sets the stage for implementing wake-on-LAN (WoL) and power back-off features to further reduce power consumption and increase overall energy efficiency.

as low as **2-3 WATTS** per port with Cat 6A

3 COST EFFECTIVE

Structured cabling BASE-T systems are emerging as the most cost-effective access layer networking option, providing significant savings over fiber or Twinax. The inherent lower costs combined with deployment flexibility facilitates designs capable of consolidating (centralizing) switch placement, allowing for the use of less switches by providing 100% effective port utilization. This reduces administration costs by minimizing switch sprawl. Beyond that, higher gigabit copper systems can offer additional savings over lower gigabit BASE-T networks. Higher bandwidth enables improved network performance. Currently, 10GBASE-T (Category 6A) is the most cost-effective access layer networking option, but with 25GBASE-T (Category 8) and 40GBASE-T (Category 8) on the near horizon, future networks are expected to benefit from near one-to-one port utilization (through MoR or EoR configurations) and provide even more cost savings.

significant **SAVINGS** over fiber or Twinax

4 EMBEDDED BASE

Structured cabling BASE-T solutions are a cornerstone of the data center infrastructure. Dependable, field proven, and continuing to grow in the access layer, the RJ-45 is recognized and adopted as a go-to infrastructure choice throughout data centers worldwide. With auto negotiation, backwards compatibility, and staggered active gear upgrading, BASE-T solutions, allow for mixed server speeds in each rack or cabinet. This increases flexibility throughout data center deployment and operation by supporting the use of any combination of 1G, 10G, and 25G or 40G servers as they become available.

BASE-T solutions allow for **MIXED** server speeds

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5 SCALABLE

Within the next 18 months, industry standards bodies (TIA, IEEE, ISO) will release best practices for deploying four new BASE-T data rates. The new 2.5G, 5G, 25G, and 40G standards will help support emerging enterprise and data center applications. They will enhance the life and flexibility of copper structured cabling networks, providing a more cost-effective option for future network migrations. And though 25GBASE-T and 40GBASE-T standards have not yet been finalized, when Cat 8 structured cabling systems become available they will provide better performance for the cost, offer greater network flexibility, and will be readily adopted across the industry, providing a formidable alternative to QSFP+/Twinax products. Additionally, as there will be minimal upgrades required throughout the expected life of the Cat 8 system, once installed, the effective life cycle of the infrastructure is expected to significantly increase (compared to earlier category-rated systems).

four **NEW** BASE-T data rates, 2.5G, 5G, 25G, and 40G

FLEXIBLE

ENERGY EFFICIENT

COST EFFECTIVE

EMBEDDED BASE

SCALABLE

OF COURSE, there is no one-size-fits-all solution. It breaks down to what best fits the layout, scope, bandwidth needs, scalability, manageability, and budget of a specific data center. But as emerging data center architectures create a need for more flexibility and scalability using high-speed copper links, the demand for faster gigabit performance in a smaller footprint will continue to grow. With BASE-T emerging as the most cost-effective access layer networking option, copper structured cabling solutions will continue to be fundamental within the data center infrastructure.

FOR MORE INFORMATION on how copper structured cabling can benefit your network, check out our webinar, 1 to 40G: Strategies for a Simple Migration at leviton.com/ns/webinars.

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