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› Europe

DEFINING THE EDGE Data Center and Networks that Support It

By Dave Mullen, Senior Product Manager, Fiber and Data Center, Leviton Network Solutions

Looking back 8-10 years ago, the "cloud" was the big topic when it came to data centers. Today, it is the "edge" garnering the hype and press. While it may seem like a buzzword, edge computing is a very important development. As more and more devices around us become connected and require near instant feedback — from traffic sensors to smart watches — the latency (time delay) for data to transfer needs to be much shorter. This simply can't be addressed without bringing computing power to data centers at the edge of the network, closer in proximity to where the connected devices are located.

The biggest catalyst for the growth of edge data centers comes from emerging 5G mobile technology. 5G is opening up opportunities for new IoT applications and smart city technologies that rely on real-time data, such as improved automation in factory and buildings, flow of pedestrian traffic in dense urban areas or sporting events, and even responsive autonomous vehicles in the future. 5G is creating a complex digital transformation that will converge telecom and IT networks, and edge data centers will be needed to address the lower latency and higher bandwidth requirements that 5G brings.

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Leviton WINS GOLD in the 2021 Innovators Awards

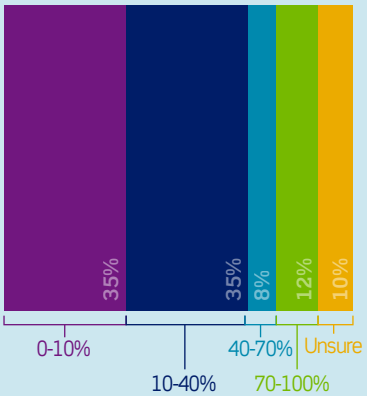
Leviton was recognized among the best in the industry by the 2021 Cabling Installation & Maintenance Innovators Awards, bringing home a Gold award in the connection and cross-connection category. Leviton was awarded for its enhanced Cat 6A Patch Cords with a compact plug and boot design.

The enhanced Cat 6A patch cords give network managers added flexibility, durability, and improved bend radius for addressing applications such as wireless, smart building technologies and PoE. The short boot reduces potential force applied to the jack/plug interface and uses less material to create a 30% lighter plug on average than traditional patch cord plugs. This innovative design is available on both Leviton standard Cat 6A Patch Cords, and Cat 6A Small Diameter High-Flex Pach Cords.

IN THIS ISSUE

LEVITON POLL

What percentage of your installations are using Modular Plug Terminated Links (MPTL) drops?



From a June 2021 survey of 55 network professionals.

UPCOMING WEBINAR

Straight Talk on SPE: a No-Nonsense Look at Single-Pair Ethernet
Tuesday, 19th October
2:00 p.m. BST
Register Now ›

Defining the Edge Data Center and Networks that Support It

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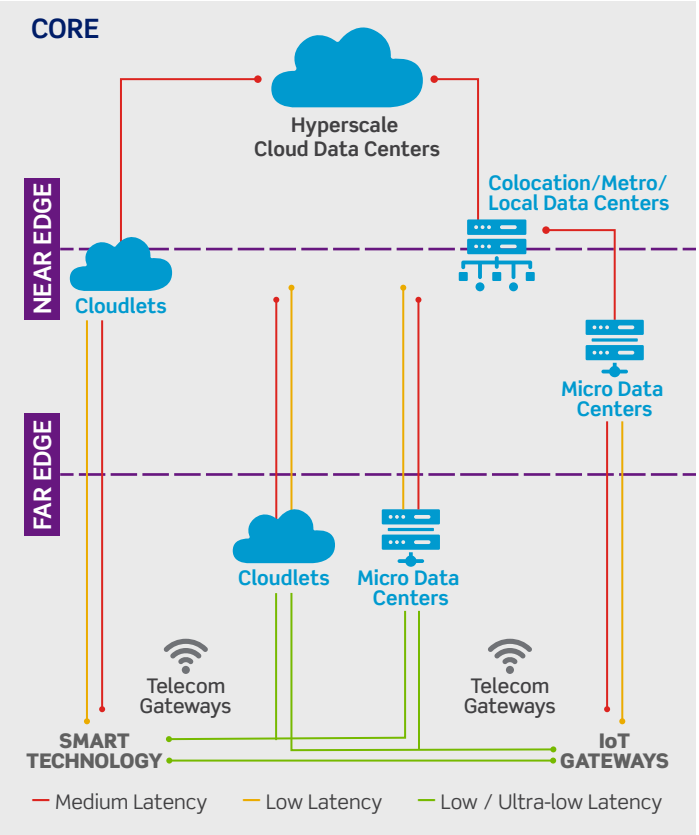
In general terms, medium latency for data transmission from an end device to a centralized or hyperscale cloud data center can be around 20 milliseconds or longer. When moving the data storage and processing to the edge, latency can drop to 10-15 milliseconds; this is considered low latency. This may seem fast: for reference, our brains need about 13 milliseconds to recognize what our eyes see. However, some emerging IoT applications for on-premises networks such as factory assembly lines will require ultra-low latencies that drop down to 5 milliseconds or less. Low and ultra-low latency performance can only be accomplished with an architecture where edge and traditional cloud data centers work together by sharing processing power and reducing latency when applications require it.

Understanding the Edge

Not all edge data centers look the same. "Near edge" data centers could take the form of a "cloudlet," or small-scale cloud data center that moves some of the resource-intensive computing closer to the edge. Similarly, small data centers used by colocation and service providers could serve that edge location role. These are dedicated facilities that even have the power, cooling, and security commonly associated with a traditional data center, and might host 10 to 100+ cabinets. These offer low or medium latency and are typically found in second tier or mid-size cities with fewer than a million people.

"Far edge" data centers are located in even closer proximity to users and end devices, with the goal of attaining low to ultra-low latency at 5 milliseconds or less. These tend to take the form of micro data centers or very small data centers ranging in size from a half-rack height up to five cabinets. They are versatile solutions that could be located in a warehouse, wiring closets, or remote sites — anywhere on-premises to support workloads that are critical to a business.



Data Rates and Cabling Infrastructure

It is important to recognize the effect of 5G deployment goes beyond adding more edge computing — it also places more strain on the core cloud computing performed in centralized data centers. Roughly 90% of data is still processed in these data centers today, and 5G will speed up the introduction of 400 Gb/s and 800 Gb/s optics and switches in hyperscale and cloud data centers as a way to move data faster. 400 Gb/s switch options entered the market fairly recently, introduced by manufacturers in late 2018 and early 2019, and adoption of these new switches took off in 2020. The new 400 Gb/s switches, based on 12.8 Tb/s chips, provide much faster speeds and greater network density.

However, as we begin to see more 200 Gb/s, 400 Gb/s, and eventually 800 Gb/s in hyperscale cloud data centers, we will also see 100 Gb/s optics deployed at servers and in edge data centers. 100 Gb/s is now a fundamental building block in data centers, and there will remain a strong demand for 100 Gb/s in the near future. According to the IDC Quarterly Ethernet Switch Tracker, Q3 2020 port shipments for 100 GbE switches rose 35 percent year over year.

It is also important to note the majority of 100, 200, and 400 Gb/s transceiver options are for single-mode networks because of bandwidth and distance capabilities. This trend is also partially a result of the decreasing cost of single-mode optics, prompted by their adoption by cloud companies with major purchasing power, and recent standards committee activities that specify more single-mode options for higher speeds. As this trend continues, centralized and near edge data centers may find single-mode solutions to be more enticing.

Networks for micro data centers use a combination of copper and fiber cabling, usually with copper connectivity and fiber uplinks. As micro data centers are sometimes located in more exposed or even ruggedized environments, cabling and connectivity should be robust and protected within the rack. These data centers may not have back-up power or the high levels of security, fire detection, or cooling that are all part of a centralized data center. Secure connectors and assemblies that lock into ports might be a greater priority, along with locking cabinets and additional security.

Ultimately, edge and micro data centers can end up having very different requirements than large data centers. These differences include the physical infrastructure, and there are numerous considerations you may encounter. Is there existing structured cabling that you are integrating into? Is it single-mode or multimode? Is trunking required? **Leviton has data center design experts and cabling systems to help you navigate this new edge data center frontier.**

Learn more at LevitonEMEA.com/DataCenter.

New 2021-2022 Network Solutions

Catalog Available

We've released an all-new 2021-2022 digital Network Solutions product catalog that includes the latest copper and fiber cabling systems for data center and enterprise networks. At nearly 200 pages, the EMEA catalog includes newly expanded lines of Cat 6A cable and connectivity, fiber cassettes, and pre-terminated cable assemblies.

See what's new!

High-Flex Patch Cords
Improve Density, Bend Radius, and Network Manageability

As data center managers work to maintain and increase network performance, they are also faced with the need to reduce space requirements and energy costs. Similarly, enterprise IT directors need to balance their increased bandwidth requirements with day-to-day needs like reducing clutter and accommodating tighter spaces. Flexible 28 AWG patch cords can address these needs. However, they do come with some design considerations, and these need to be understood by consultants, design professionals, and building owners in order to maintain the best network performance.

CONSIDERATIONS WITH 28 AWG CORDS

Under the ISO and TIA standards, using 28 AWG patch cords reduces the overall channel length from 100 meters to 96 meters, with a maximum of 6 meters of patch cords and a 90-meter permanent link. If greater lengths are required for the patch cords (up to 10 meters max), you must reduce the length of the permanent link to shorter than 90 meters.

Also, when using 28 AWG cords for remote powering, there are additional bundling requirements to ensure adequate heat dissipation. The limits on cables per bundle based on current per pair and ambient temperature, and limits bundles to 12 cables when delivering 30 watts and higher, with bundles spaced 1.5 inches apart. There are no bundle size limitations when 28 AWG cords are not being used to distribute power.

Leviton Small-Diameter High-Flex Cat 6A Patch Cords are an effective solution for areas with limited capacity for cable management, limited cabinet space, or minimal clearance for cable bend radius. The cords allow better airflow to active equipment in panels and racks by reducing the size of cable bundles.

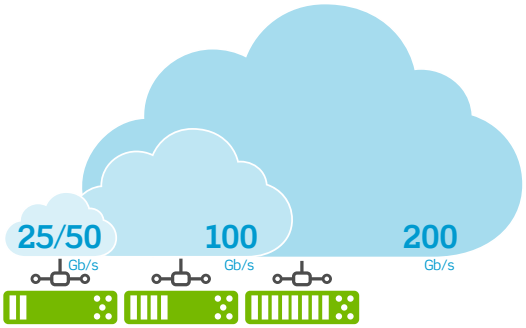
- Less space required for bend radius — The low-profile plug and boot reduces the amount of space required in applications with limited depth behind such as wireless access points (WAPs), back boxes, and furniture plates
- Better airflow to improve performance and reduce cooling costs — the small outside diameter of 4.7 millimeters reduces cable bulk in cable managers, pathways, racks, and cabinets. This increases airflow which helps reduce cooling costs.
- Availability around the world for consistent networks in multiple regions — Leviton Cat 6A Small OD High-Flex Patch Cords are dual-rated for Low Smoke Zero Halogen and CM applications, making them a single solution in all regions around the world.
- Versatile for different installation types — The metal wrap in the patch cord plug makes it appropriate for both shielded and UTP channels.

Learn more about Leviton Small Diameter High-Flex Cat 6A Patch Cords.

NEWS YOU CAN USE

INDUSTRY

CLOUD PROVIDERS are deploying more accelerated servers, according to market analyst Dell'Oro. These servers are densely packed with co-processors that are optimized for application-specific workloads such as artificial intelligence. While general purpose servers are connected at 25 or 50 Gb/s today, accelerated servers are commonly connected at 100 Gb/s, and Dell'Oro sees them doubling to 200 Gb/s in several years.



Total shipments of **100 GIGABIT ETHERNET (GBE) DATA CENTER SWITCH PORTS** increased more than 20% during 2020, according to Crehan Research Inc. The increase resulted in 100GbE surpassing 10GbE to become the most widely deployed data center Ethernet switch connection speed.

Increased Shipments by **20%**

YESTERDAY'S NEWS

1991 — 30 years ago, The World Wide Web (WWW) was introduced by British scientist Tim Berners-Lee. In August 1991, Berners-Lee launched the first website at CERN and announced the WWW software on internet newsgroups.

Photograph: Elise Amendola/AP

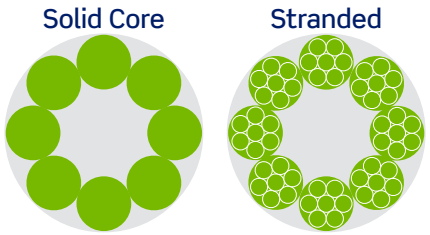
TECH TIPS

Stranded Conductor Versus Solid Conductor Cables

There are two primary types of twisted pair copper cables used in data cabling: stranded conductor and solid conductor. Each of these cables has its place depending on the application within the network infrastructure. First, we should define what we mean by solid and stranded conductor cables.

Solid conductor cables consist of 8 conductors, each made from a single solid piece of copper wire. The size of this piece of copper wire is defined by the gauge size, typically 24 or 23 AWG in data cabling applications.

Stranded conductor cables consist of 8 conductors, each made from multiple strands of smaller gauge wires wound together to form a single conductor, similar to a rope or braid. Stranded conductor size is represented using two numbers. For example, "7x32" indicates that there are 7 strands of 32 AWG that make up a single conductor, such as a 24 AWG conductor in a patch cord.



Both solid and stranded conductor cables come with many benefits and some disadvantages, depending on what applications they are being used in.

Solid conductors carry electricity more efficiently, so they may be used for applications with high levels of PoE in large bundles. The downside? Solid conductors can break when there is regular flexing or vibrations. They also have a larger bend radius and are less portable than cabling with stranded conductors. For these reasons, solid conductor cabling is often used in horizontal permanent links and applications where there is little manipulation or movement of the cable after installation. They might also be used in applications where there is little climate control, as they generally have a higher temperature rating.

Stranded conductors resolve many of the downsides of solid conductors: they can withstand flexing without fatigue and breaking, they allow for a smaller bend radius, and they're easier to route. At the same time, they have a higher DC resistance and may exhibit more attenuation than larger solid conductors. This makes them ideal for patching, used for equipment connections, cross connects, and work areas.

ASK THE EXPERTS

Q: Do you need more than 30 watt PoE for wireless access points?

A: Yes. Most wireless access points (WAPs) today require more than 30-watt PoE due to more signal processing and antenna configuration. In fact, some of the newer devices will require 60-watt PoE or higher.

Questions? Comments? Ideas?

We want to hear from you!
Email: crosstalk@leviton.com