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Open19 and Edge Computing: Building Our 5G Future ›

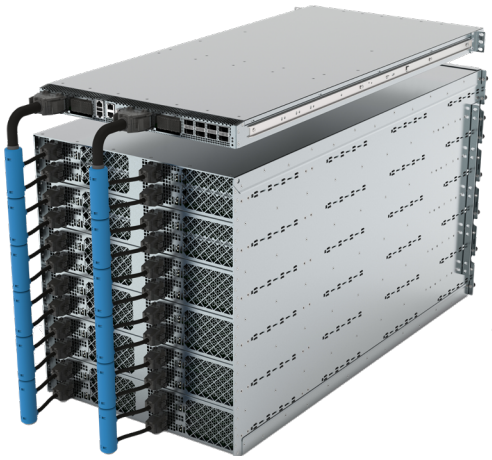
Large, centralized data centers have been the foundation of data-driven technology. However, 5G devices will consume immense amounts of data, and for applications such as autonomous driving, virtual reality, connected health and smart cities to live up to their potential, latencies must be as small as 10 to 20ms.

BUILDING OUR 5G FUTURE

In order to process the data tsunami 5G will produce while achieving miniscule latency, network computing capabilities must be closer to the end user. In other words, we are entering the age of edge computing.

Over time, edge computing servers will be ubiquitous—at the bases of cell towers, on factory floors, in stores, and at entertainment venues and sporting events. As 5G availability spreads and makes smart technology more widely available, edge computing servers will become commonplace.

In fact, instead of 30 or 40 large data centers, imagine 100,000 edge computing sites across the US. And further imagine some sites in remote places, such as the middle of a desert or mountainous region. The challenge presented by maintenance alone is staggering.



Impel Cable Assemblies in an Open19 Server Application

EVOLVING RACK-SCALE DESIGNS FOR AN EDGE COMPUTING FUTURE

The Open19 Foundation was formed to design a hardware platform around rack-scale architecture and to develop standards and designs that fit any 19-inch rack environment. By defining a common cross-industry server form factor, Open19 can mitigate some of the challenges inherent in the day-to-day operations of edge computing sites. **With the expected proliferation of edge computing data centers, making them fully automated or "lights out" is one of the goals of Open19 via two strategies:**

1. Hardware isolation inside the rack
2. Self-monitoring and self-healing provisioning systems

Eventually, there will be thousands of edge computing sites processing vast amounts of data with minimal latency, enabling the 5G applications that will make our smart cities, business analytics and autonomous vehicles a reality. And these sites will experience virtually no downtime due to predictive maintenance. Case in point: the person who delivers the new server brick also will pop it into the rack within seconds, and software will boot it up automatically. Or even more conveniently, a robotic arm might retrieve the server brick from storage and slide it into the rack. All done efficiently, economically and without a hiccup in data service.

This futuristic scenario relies on the common form factors and standards developed by the Open19 Foundation.

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OPEN19 IMPEL CABLE ASSEMBLIES: SNAP-IN, HIGH-SPEED CONNECTIVITY

Impel-to-zQSFP+ Open19 Cable Assembly

The biggest contribution Open19 has made to the development of edge computing is uniformity of designs, easing operational and maintenance efforts. For example, Open19's simple and uniform deployment of server bricks lessens maintenance time and costs. Each brick can be inserted and mated in only one direction, mitigating the risk of error. Additionally, there are no external Ethernet cables to plug in to the wrong port, and any available slot large enough for the brick can be populated. Operational complexity has been nearly eliminated.

Furthermore, Open19's cable-ized backplanes mean bricks can be developed to address several applications with varying power and network requirements while also resolving operational issues at scale. Molex, an Open19 Foundation partner, offers a plug-and-play solution that allows customers to connect 48 servers to one Open19 switch.

In order to facilitate easy and even automated implementation, Open19 has moved all cabling to the back of the rack. And Impel connectors and cable assemblies are designed with blind-mate features, enabling servers to easily slide into place.

In addition to improved signal integrity, this cabled backplane solution brings improved airflow and electrical performance. Delivering 56 Gbps per lane with headroom of up to 200G per server, Impel Cable Assemblies provide cost-effective connectivity. With broad-edge, coupled signal pairs in lead frames and fully shielded columns, Impel Backplane Connectors also deliver robustness and optimized signal integrity performance. And the snap-in feature of Impel Cable Assemblies means upgrading to faster speeds is, well, a snap. With the same form factor and the same back-panel cutout, Impel Connectors and Cable Assemblies can deliver a 112 Gbps differential pair solution for 400G servers, with a pathway to 800G and passive fiber.

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