

Street Edge Delivers Next-Gen Edge Compute, Networking Services

Colt builds Street Edge, an advanced edge point-of-presence comprised of telecom enclosures from CIN, edge operating platform from NodeWeaver, CPUs from Intel, and fiber and network services from Colt



Telecom service providers are increasingly investing in edge compute-based infrastructure services to address the demands of applications requiring low latency, real-time processing, localized data handling, and energy efficiency. According to Grand View Research, the global edge computing market is expected to grow at a CAGR of 36.9% during the period 2024-2030.¹

This growth is driven by the rise of technologies such as 5G, edge computing, artificial intelligence (AI), and video analytics. Unlike traditional cloud computing, edge computing enables data processing closer to the end user or device, reducing latency and bandwidth requirements while enhancing service reliability and scalability.



Enterprises and OTT providers can use edge infrastructure to offer enterprise and consumer services such as gaming and computer vision. Operators are leveraging edge infrastructure to enhance their core services, including Wi-Fi, 5G fixed wireless access (FWA), dark fiber connections, Ethernet connections and Internet access. Edge computing enables more efficient routing and local breakout of traffic, improving service performance.

Energy Efficiency



Sustainability is a major focus for telecom providers and edge computing minimizes the energy consumption associated with long-distance data transmission by processing data close to the source. Providers are also incorporating renewable energy sources and energy-efficient hardware in edge data centers to meet sustainability goals.

Multi-tenancy and orchestration are critical to edge infrastructure. Facilitating multiple tenants sharing edge resources securely and efficiently is why it's important to have an edge native virtualization platform that allows applications from multiple tenants to operate in their own protected environment on shared hardware. Advanced orchestration platforms, powered by AI, are being adopted to manage these multi-tenant environments, ensuring optimal resource allocation and performance.

Colt Technology Services and NodeWeaver, both of whom are Intel® Industry Solution Builders members, have teamed with Communications Infrastructure Networks (CIN) and created a pilot edge compute system called Street Edge that uses Intel® architecture technology for compute performance.

Street Edge is a new way to deploy services in urban areas based on the innovative Street Arc cabinet from CIN. Street Edge is configured to offer both edge compute for tenant applications and edge wireless network services, as well as fiber optic network access to the internet or to Colt's worldwide network.

Technology Providers Behind the Street Edge Pilot

The Street Edge pilot project is driven primarily by four industry leaders:

Colt Technology Services

Colt created the Street Edge solution and is managing the pilot deployment that has been installed outside of its London headquarters. Colt is a global digital infrastructure company with businesses spanning more than 40 countries, with over 6,000 employees and more than 80 offices. Colt’s customers benefit from the company’s wide digital infrastructure that connects 32,000 buildings across 230 cities, more than 50 metropolitan area networks, and more than 275 points of presence across Europe, Asia, the Middle East, Africa and North America.

NodeWeaver

NodeWeaver provides the project with a virtualization platform designed for edge applications. The company’s software-defined edge operating platform simplifies the deployment, management, and orchestration of infrastructure and applications at the distributed edge, at mass scale. The software runs on bare metal servers powered by a wide range of Intel® architecture processors. With NodeWeaver, a Street Edge deployment can deliver an edge-native experience with highly resilient, agile and scalable compute clusters capable of running multiple virtual machines and container-based workloads, reliably and cost-effectively. NodeWeaver’s design minimizes the total lifecycle cost of deploying, managing, and operating edge compute by addressing the main drivers of cost and complexity.

Communications Infrastructure Networks

The “edge” in the Street Edge project is a Street Arc enclosure (see Figure 1) from CIN. The company develops purpose-built, plug-and-play street-side telecommunications enclosures across the UK. CIN builds its assets to support mobile telecoms networks and edge computing.

Intel® Corporation

The innovative edge applications that run in the Street Edge solution utilize Intel® Xeon® Scalable processors. These processors are the foundation for powerful servers that deliver compute agility, scalability, and workload density. These CPUs benefit from decades of advancements for the most in-demand workload requirements and are part of a complete set of edge technology from Intel. Intel Xeon processors feature a balanced architecture that supports AI with built-in acceleration, high throughput packet processing, and hardware-based security features. Other features for modern edge compute network workloads target low latency, high throughput, deterministic performance, and high performance per watt.

Other Intel® technologies used by NodeWeaver in the Street Edge system include Intel® Distribution of OpenVINO™ Toolkit and Intel® Advanced Matrix Extensions (Intel® AMX), for accelerated CPU-native AI inference, Intel® oneAPI toolkit, a unified application programming interface (API) used across different computing accelerators, Intel® QuickAssist

Technology (Intel® QAT), cryptography accelerator, and Intel® Intelligent Storage Acceleration Library (Intel® ISA-L), a collection of software functions designed for storage optimization.



Figure 1. Street Arc enclosure from CIN.

How the Street Edge Works

Shown in Figure 2 is a high-level design of the pilot Street Edge system deployed near Colt’s headquarters in London.

For networking services, Street Edge can be outfitted with a fiber bundle that uses a fiber distribution patch panel for connection flexibility to Colt services or to dark fiber for building private fiber networks. In the pilot system, Colt has configured a connection to the Colt network, a 400Gbps global backbone network that connects more than 230 cities and 32,000 buildings.

The connection to the Colt network allows the Street Edge to support far edge compute alongside public and private 5G networks and Wi-Fi networks.

The Colt network enables a number of services such as internet access, point-to-point Ethernet, dedicated cloud access (DCA) and time synchronization, all of them powered by Colt’s On Demand network as a service (NaaS) platform.

The right side of Figure 2 shows the Street Arc cabinet and the servers and packet switches that went into the pilot iteration of the system. The Street Arc is configured with four bays complete with fans for server cooling. Three of the bays are designed to each support a complete 5G RAN. The Street Arc is configured to support a total of nine radios, with three

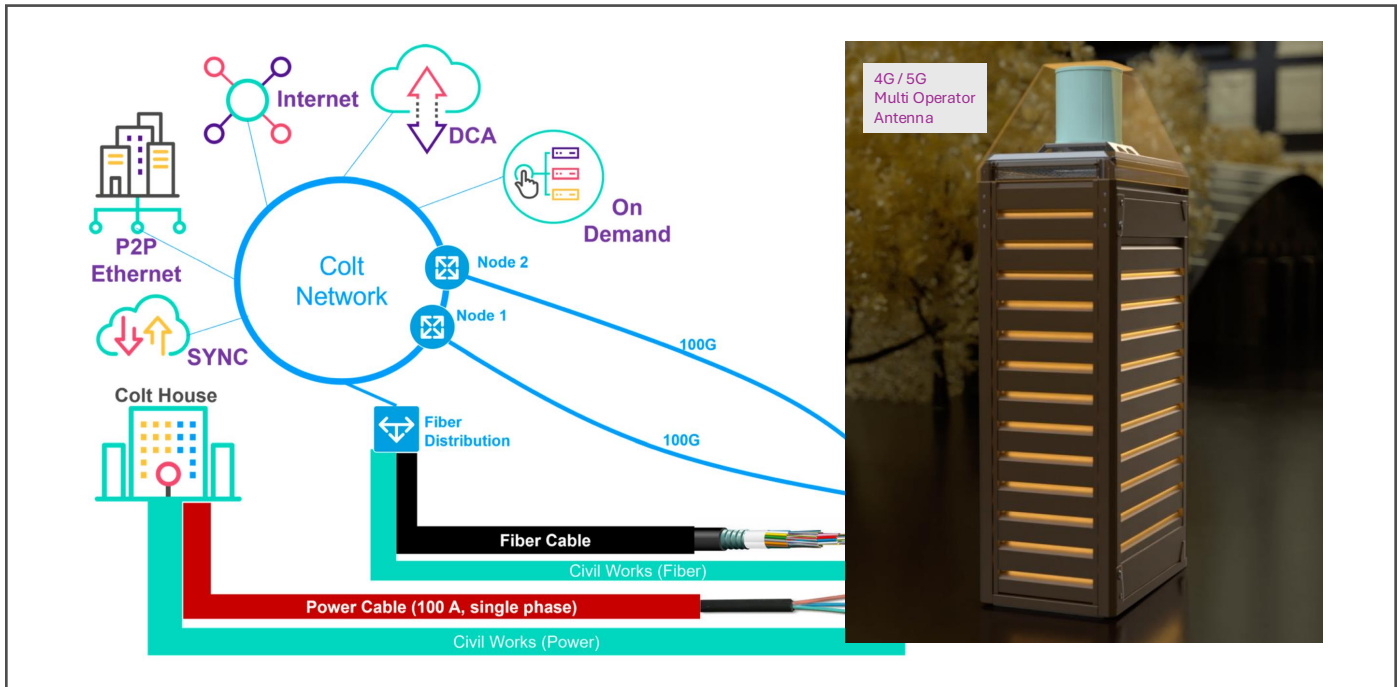


Figure 2. High-level design of the Street Edge system as configured for the London pilot deployment.

radios in each mobile network operator (MNO) bay. The peaked top of the cabinet includes a 4G/5G multi-carrier, 24-port antenna.

The last bay in the Street Arc cabinet supports Advantech FWA-5070 edge network appliances that are based on 24-core Intel® Xeon® Scalable Processors. The servers offer eight 10GbE ports for connectivity to the co-located Cisco Systems network switch which serves as an interconnect for the networked systems within the Street Edge.

Proven Street Edge Use Cases

As part of the Street Edge pilot project, Colt has successfully enabled several tenant applications and operator-based applications. Some of the demonstrated Street Edge use cases include:

Smart City: These services are based on the deployment of a 5G or an alternative low-powered WAN to connect indoor/outdoor edge sensors to a gateway. Can be used for energy monitoring, environmental, social and governance (ESG) reporting and other smart city use cases.

Wi-Fi Access Point: For OpenRoaming and offloading mobile traffic to improve an MNO’s 4G/5G connectivity and capacity challenges in dense urban areas.

Online Gaming: Improves player experience by extending the computing infrastructure and gaming application closer to the end user for lower latency.

Open RAN Private 5G: Supports both fixed wireless access (FWA) and smart office use cases.

Public 5G Connectivity: Street Edge provides a solution to mobile operators’ connectivity and capacity challenges in dense urban areas. Enables active engagement with potential partners for next-generation mobile infrastructure densification initiatives, including neutral host.

Street Edge Advantages

- **Geographical Scalability:** The Street Arc can be scaled across different locations to handle varying loads and support growing numbers of users without overwhelming central data centers.
- **Faster Compute Response Times:** Placing edge computing resources close to users minimizes the distance data must travel, significantly reducing latency. This leads to faster response times for applications and services.
- **Real-Time Processing:** For applications requiring real-time data processing (e.g., augmented reality, autonomous vehicles, and gaming), proximity to edge is a crucial advantage.
- **Reduced Dependency on Central Servers:** Localized edge computing ensures that critical services remain operational even if there are issues with the central cloud infrastructure.
- **Data Localization:** Sensitive data can be processed and stored locally, reducing the need to transmit it over the internet to servers in other countries.
- **Edge Integration:** Edge platforms are built for applications where devices collectively generate massive amounts of data that need to be processed locally for real-time insights and actions.
- **Energy Efficiency:** Localized processing can be more energy efficient, reducing the carbon footprint associated with data transmission and central processing.

Conclusion

Edge compute-based infrastructure is transforming the service delivery model for telecom operators, enabling them to address the demands of latency-sensitive, real-time applications. By integrating edge capabilities with 5G, offering localized processing, and prioritizing energy efficiency, telecom providers are positioning themselves as essential enablers of the next generation of digital services. Colt is innovating in edge computing with the first deployment of Street Edge.

Street Edge supports fiber connectivity and access to networking services, Internet access, cloud-native edge servers for tenant applications, and space and power to accommodate up to three 4G/5G base stations. And that's just what is configured in the pilot project. Street Edge is flexible enough to enable new opportunities for both operators and enterprises, driving advancements across industries.

Learn More

[Colt Global Network](#)

[Colt Edge Compute Services](#)

[CIN infrastructure](#)

[NodeWeaver Homepage](#)

[Intel® Xeon® Scalable processors](#)

[Intel® Distribution of OpenVINO™ Toolkit](#)

[Intel® Advanced Matrix Extensions \(Intel® AMX\)](#)

[Intel® oneAPI Base Toolkit](#)

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¹<https://www.grandviewresearch.com/industry-analysis/edge-computing-market>

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