The urgency of high-performance edge-to-data center connectivity

High-bandwidth, low-latency, edge-to-data-center connectivity is crucial for digital transformation and innovation in an evolving AI ecosystem.

The volume and mission-critical nature of traffic moving between data centers and edge locations are soaring as companies deploy new real-time applications that rely on processing data as close to the source as possible.

By 2025 more than 50% of enterprise-managed data will be created and processed outside the data center or the cloud, according to a Gartner Research report on edge computing.

That growth is driven by organizations extending their digital transformation efforts to the far reaches of their distributed enterprises in virtually all vertical industries. Examples include retailers digitizing their stores and manufacturers collecting and processing assembly line data from internet of things (IoT) sensors.

Then there's the artificial intelligence (AI) ecosystem. Organizations are building new applications that leverage machine learning (ML) and AI. On top of that, the software vendors that provide productivity, business process, security, and other types of applications to the enterprise are all embedding ML and AI into their offerings.

According to Gartner, 69% of CIOs have already deployed edge technologies or will deploy them by mid-2025. Use cases are evolving from those focused on simple digital pipelines and basic automation to richer edge AI and even generative AI at the edge.

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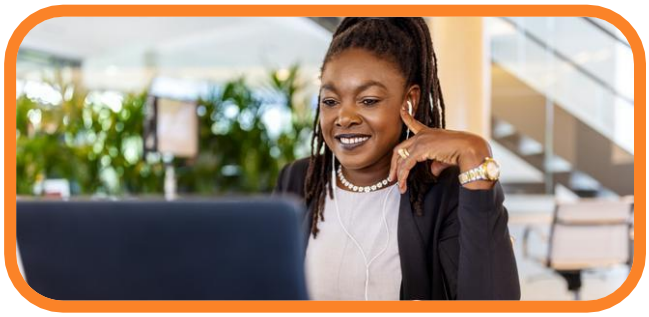
The evolving AI ecosystem

As more computation and data storage move to the distributed edges of the network, exciting new capabilities become possible but new challenges also arise. Foremost among them is the availability of secure, reliable, scalable connectivity between edge locations and the data center.



Lumen Senior Vice President James Feger says, "Connectivity to the data center from your facilities, your offices, and remote workers is critically important purely from an uptime, resiliency, speed-to-response, and speed-to-service perspective."

Providing high-bandwidth, low-latency, scalable, secure edge-to-data center connectivity is important not only for the performance of current business-critical applications but also AI-powered applications. Not having that capacity can prevent companies from successfully deploying new AI applications that are critical for driving digital transformation and providing competitive advantage.

For CIOs to deliver the underlying connectivity that supports digital transformation and innovation in an evolving AI ecosystem, a mindset shift is required. Traditional point-to-point or hub-and-spoke topologies are no longer adequate. Organizations need to leverage connectivity based on a fabric architecture. A fabric provides on-demand bandwidth and services that can automatically scale to meet the rapidly expanding requirements of the business and AI ecosystem.

Traditionally, organizations seeking to provide secure remote access for edge locations deployed software-defined wide area network (SD-WAN) and secure access service edge (SASE). Lumen CTO Dave Ward says, "SD-WAN and SASE have been a beautiful thing for the industry, simplifying IT, creating a fantastic user experience, and reducing the friction of moving IT workloads." But, he adds, "SD-WAN and SASE over general broadband links are not fit for purpose in the high-bandwidth world. Tying SD-WAN and SASE to an underlay, whether it's waves, Ethernet, or dedicated IP will provide the bandwidth control, the latency control, and the redundancy control through the elegant SD-WAN, SASE interface."

That underlay needs to be able to provide dynamic, flexible connectivity that aligns with the requirements of the business; examples include SD-WAN over public broadband for bandwidth needs in the 1–2Gbps range, Ethernet for use cases up to 10Gbps, and fiber optic waves for traffic that exceeds 10Gbps.

Lumen offers on-demand services such as internet, Ethernet, and IP virtual private network (VPN), enabling rapid, scalable, reliable edge-to-data center connectivity, all in a pay-as-you-go model. And, as organizations embrace AI, the demand for rapid data movement is unprecedented, requiring a network that can handle the load with agility and speed. Lumen offers a modular approach for designing a custom network architecture providing the scalability, flexibility, and security needed to meet the demands of AI.

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Visit Network Services | On-Demand | Lumen for more information about on-demand services.

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