

Preparing for the AI Bandwidth Surge:

FUTUREPROOFING ENTERPRISE WITH HIGHSPEED CONNECTIVITY

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GLOBAL ECONOMIES ARE NO LONGER JUST BUILT ON WEALTH OR COMMERCE, THEY'RE BUILT ON DATA. MORE SPECIFICALLY, THEY'RE BUILT ON THE EXCHANGE AND TRANSFER OF DATA, AND THE MORE EFFECTIVE A NATION IS IN THIS REGARD, THE MORE PROSPEROUS IT IS LIKELY TO BE. DATA-INTENSIVE APPLICATIONS LIKE ARTIFICIAL INTELLIGENCE (AI), GENERATIVE AI, LARGE LANGUAGE MODELS (LLMS), AND CLOUD COMPUTING, ARE DEMONSTRABLY TIED TO INNOVATION AND AN ECONOMY'S PROPENSITY TO GROW. THAT DATA NEEDS TO TRAVEL AT VOLUME AND SPEED, BUT IS OUR CONNECTIVITY INFRASTRUCTURE UP TO THE CHALLENGE?

According to Transport Networks Research, which has tracked long-haul networks and submarine cables since 1999, demand for bandwidth across the world tripled between 2019 and 2023 to reach a total of 5 petabits per second (Pbps). This demand, coupled with enterprises moving their workloads into the cloud, is so acute that the world is now experiencing what can only be described as a data centre crunch. In the US, for instance, our data reveals there is a total of 11,200 megawatts (MW) of installed data centre capacity, with a further 5,500MW under construction and another 12,600MW planned for construction – that's more than 160% data centre growth in the US alone in the coming years.

But is simply adding capacity enough to sate the demand for the high-speed, low-latency connectivity on which modern applications like AI modelling will depend? The answer, perhaps regrettably, is no. However, there are alternative solutions that data centres, carriers, operators and businesses themselves are now exploring, including the use of peering and the densification of Internet Exchanges (IXs) to improve not just bandwidth, but connectivity as a whole. We'll talk more about that shortly.

For now, suffice to say that building more data centres is only one piece of the puzzle. The push for faster, more reliable network connections also needs to accelerate, to take account of the massively growing volumes of data being sent across the ether. This will require a

strategic approach to network design that positions networks as a progressive business asset rather than a static piece of infrastructure.

AI applications, particularly those involving real-time inference, impose unique demands on network infrastructure. AI requires both high bandwidth for training large models and low latency for inference tasks, where immediate response times are critical. Meeting these demands involves establishing direct, high-capacity connections between data centres, cloud services and on-premise infrastructure to eliminate lag and ensure stable, low-latency performance.

IX PEERING AND DENSIFICATION

Latency can make or break the effectiveness of real-time applications, and with the rise of AI, IoT and cloud-based services, minimising it has become essential. Peering – creating direct connections between many separate networks via an Internet Exchange (IX) – significantly reduces the time it takes for data to move from point A to point B. This approach enables data to travel along the most efficient path, bypassing slower or congested sections of the public Internet.

For companies operating globally or in latency-sensitive sectors like finance, where milliseconds affect trading outcomes, peering offers a reliable way to maintain speed and responsiveness in digital operations. With ever-increasing amounts of data being sent to and

from clouds, AI models, IoT arrays and industry partners, enterprise networks need efficient pathways to manage this increased load without bottlenecks. Peering helps reduce the distance and number of intermediate networks that data must travel through, and it's this reduction in "hops" that minimises latency and allows the full potential of digital business models to be realised.

IX densification, for an enterprise network, means adding additional IX locations to the network in areas that are strategically important for the company, bringing network access points closer to end users and businesses. Here, there is no need for companies to be in the very centre of strategic hubs, as long as they are geographically close. By establishing direct interconnection via IXs with a substantial network community, in data centres on the outskirts of major urban centres, as well as in emerging regional hubs, businesses can serve their customers and users with reduced data travel times and fewer interruptions, while nonetheless avoiding contested and therefore expensive spaces in the inner cities.

What's more, a dense IX landscape enhances the potential for creating redundant connectivity, ensuring that if one pathway is compromised, data can seamlessly reroute through an alternative connection. This added resilience supports companies as they expand operations across multiple regions, safeguarding against unexpected slowdowns or disruptions.



FROM THE INDUSTRY

Regions that understand the value of this demonstrate the preference for neutral interconnection models, where IXs are operated independently of any specific data centre or carrier operator. This allows an IX to operate across multiple data centres and carriers within a region, rather than being bound to a single provider, unlocking more data pathways and a broader range of access points. According to our own research, 80% of IXs in the US are now neutral, replicating a trend that is already firmly established in Europe.

As the demands of real-time applications continue to grow, peering and IX densification are proving to be cornerstones of efficient, high-performance network infrastructure.

VIRTUALISATION AND AUTOMATION IN NETWORK OPERATIONS

This is all well and good, but it does make networks more complex and difficult to manage. That's where virtualisation steps in. Virtual Network Functions (VNFs) allow network operators to replace traditional hardware components with software-based solutions, enabling faster, more flexible deployment and scaling. This shift to virtualised networks helps enterprises adapt quickly to shifting needs, allocating resources where and when they're needed without the lead times associated with physical hardware. By abstracting network functions into software, organisations gain the agility to manage and optimise their networks in real time, so they can pivot to meet the demands of bandwidth-intensive and latency-sensitive applications like AI and Software as a Service (SaaS).

Automation takes virtualisation a step further by enabling networks to respond autonomously to traffic conditions and usage patterns. API-based automated interconnection and peering configurations help reduce manual processes, enabling flexible scalability for example to clouds and eliminating bottlenecks that often occur in traditional network setups. With automated routing and self-healing capabilities, networks can prioritise critical data, allocate bandwidth efficiently and ensure consistent performance throughout. Automation also supports faster fault detection and recovery, helping to maintain uptime and reliability. This combination of virtualisation and automation enables a more resilient network, capable of delivering reliable, high-quality performance in line with today's data-driven business requirements.

THE FUTURE OF CONNECTIVITY

With data centres under pressure and vacancy rates at an all-time low, investing in data centre infrastructure is critical. But computing capacity is only one piece of the connectivity puzzle. To keep pace with the data demands of an AI-driven, cloud-based future, network infrastructure as a whole must shift from being reactive to proactive, prepared to support seamless, high-speed connectivity for the most demanding applications. Peering, IX densification, network virtualisation and interconnectivity automation each represent building blocks for this next generation of connectivity, enabling network operators to overcome the challenges of unprecedented quantities of data needing to be transported in low latency across disparate IT resources. Together, they create networks that are not only capable of handling massive data flows, but that can adapt dynamically to connectivity challenges that we're yet to face.

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