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Connecting Continents: Bridging the Digital Connectivity Divide for Digital Transformation

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This has been an uncertain year for businesses. Geopolitical tensions, regional conflicts, economic volatility, and more than half of the world's population taking to the polls in the largest democratic exercise in history. This uncertainty created friction in the form of higher costs, surging interest rates, and tapering demand, with analysts toward the end of 2023 warning of a potential global recession. Yet businesses are nothing if not resilient, and many have found opportunity amid the uncertainty, with the OECD now projecting a 3.3 percent increase in global trade in 2025, up from just 2.3 percent in 2024.

Trade is a force to be reckoned with, and as the economy rebounds and businesses once again find their footing following a period of tumult and change, fresh emphasis is being placed on the role of digital infrastructure in bridging continents and supporting business expansion. The global economy relies on interconnected operations, to the extent that connectivity could reasonably be described as a company's — or a region's — most valuable asset. In a world where competitive advantage is tightly bound to connectivity, businesses require reliable, seamless data pathways to manage operations and deliver services efficiently across borders. Yet, despite the accelerating digital needs of international companies, significant infrastructure challenges stand in the way, curtailing the potential of global commerce. It's only now that trade has begun its steady rebound that these challenges are being given the attention they deserve.

Companies with operations spanning multiple regions and continents face hurdles that often go unnoticed but have far-reaching effects — from vulnerable undersea and terrestrial cables to escalating costs in global network management. Adding to this, the regulatory landscape in many regions imposes strict requirements around data localization, leaving companies navigating a

labyrinth of regional compliance. These issues not only increase operational costs but create a bottleneck in digital transformation efforts, impeding competitiveness and innovation, often on a national scale. The need to bridge these digital divides is more pressing than ever, calling for resilient, scalable solutions that can foster efficient cross-continent connectivity and support the global economy's next chapter.

From Borders to Barriers

There are several barriers reinforcing the digital connectivity divide. One primary barrier is the physical vulnerability of subsea and terrestrial cables. These essential data transit pathways are susceptible to damage from natural events like earthquakes and current abrasion, as well as human activities. Internet connectivity between parts of Asia, Africa, and Europe experienced a sudden slowdown earlier this year when three cables were damaged in the Red Sea – an international choke point for maritime trade – leading to headlines such as *Red Sea Cable Damage Reveals Soft Underbelly of Global Economy.*

Further, while submarine cables traverse oceans to connect continents, sometimes it's the land in between the coastlines that causes challenges. The high concentration of cable landing stations in a single location can represent a single point of failure for cross-continental connectivity. As network specialist Roderick Beck recently pointed out, this is a risk posed by the concentration of transatlantic subsea cables landing in Cornwall, England. Terrestrial connectivity between the cable landing stations and the hubs where the data traffic is destined for, not to mention the last mile, is the next piece of the puzzle.

Traditional IP transit services compound the problem through their lack of performance or security guarantees. Without control over routing paths or the number of network hops needed to get data traffic from A to B, companies frequently experience unpredictable latency and potential security vulnerabilities. Data packets often traverse inefficient routes, leading to delays and poor application performance. The lack of transparency in IP transit can leave businesses blind to these inefficiencies as they grapple with new AI-based deployments and operations.

Then there are the regulatory constraints. Most large economies enforce strict data protection laws that require information to be stored and processed within national borders or according to national policy. This requires the use of local cloud regions and localized routing for sensitive data, which, while important, can impede the flow of information across borders and add friction to operations. This may include leasing capacity, investing in redundant pathways to mitigate risks, and coordinating with various regional network providers to build and maintain a functional network. Even for businesses that see this as a viable option, the cost and sheer complexity of managing a global network in-house can be prohibitive and lead to further inefficiencies.

The Next Generation of Connectivity

We've established some of the key barriers to international connectivity, so what about the solutions? One idea is to use non-overlapping cable routes, which minimizes the risk of disruption by providing alternative paths if one connection is compromised. By prioritizing this form of "redundancy", businesses can safeguard themselves against the physical vulnerabilities of subsea and terrestrial cables. To ensure robust connectivity between the Americas and Europe, for

example, diverse paths and multiple destinations are needed — and here, Southern Europe, with its wealth ofcoastal connectivity hubs like Lisbon, Barcelona, and Marseilles, offers an excellent alternative for optimized subsea connectivity to the west, south, and east. North American data traffic can thus reach the continental Europe via the shortest path, reducing latency considerably, with secondary submarine connectivity following a pathway further north into Europe. A robust set of international terrestrial cables connect Southern Europe to the rest of Europe, ensuring the availability of redundant routes here as well. But this is only one piece of the puzzle.

What's needed is a multi-layered approach to solving the connectivity conundrum. One such layer is satellite connectivity, specifically Low Earth Orbit (LEO) networks, which can be used to increase redundancy in global networks. With lower latency than traditional satellite networks, LEO constellations are well-suited to handle time-sensitive communications or transactions between remote locations, bypassing traditional terrestrial routes and the hazards they are exposed to. With current advances enabling satellite to mobile phone connectivity, this can also solve some last-mile challenges in areas where the rollout of fiber is not feasible. But more than that, LEO satellite connectivity offers a redundant backbone in space for critical use cases, an opportunity that not only enterprises but also governments are exploring. LEO satellites can already provide speeds that rival most terrestrial connections — Starlink Maritime offers 350Mbps as standard, OneWeb's LEO network has a total usable capacity of more than 1.1 Tbps, and Amazon's ambitious Project Kuiper is promising dynamic bandwidth allocation that will cover some of the Earth's most remote regions.

Yet, there are still technical challenges. LEO satellites have a shorter service life due to their comparatively low altitude and the impact of atmospheric drag. Maintaining uniform signal conditions is another challenge, with weather and power consumption adding complications, particularly when servicing indoor areas. While LEO satellites will be an essential component in the next generation of connectivity, adding redundancy and resilience for mission-critical applications, they are far from a catch-all solution.

To address international connectivity comprehensively, we need to constantly track back to the idea of a multi-layered approach – and those layers will require collaboration, partnership, and communication. By forming alliances with submarine cable operators, terrestrial connectivity providers, and neutral Internet Exchanges (IXs), businesses can take advantage of aggregated access to the infrastructure required to maintain cross-continental reach. Internet Exchanges allow different networks to connect and exchange traffic directly, bypassing third-party networks and reducing the number of "hops" required to get data from A to B. Neutral IXs, quickly becoming the standard, aren't bound to any single data center or carrier, opening up more connectivity pathways for even greater redundancy. A recent study revealed that IX deployments in the US had surged by more than 600 percent in the past decade, and more than 80 percent of all IXs in the region are now data center and carrier neutral.

The Strategic Imperative of Interconnection

Connectivity is about more than cables and data centers; it's about orchestration. Network-as-a-Service (NaaS) architecture and remote peering via IXs are already being used to maintain secure, low-latency connections between countries and across continents. With direct access to regional IXs, enterprises can achieve direct end-to-end connectivity that overcomes the limitations of

traditional IP transit, enhancing performance, strengthening security, and reducing the number of hops needed to send or receive data.

This strategic approach to interconnection will become increasingly important as AI evolves. Advanced AI models require low-latency connections to process data from multiple sources and deliver insights or services in real-time. To meet these needs, providers are beginning to explore the concept of an "AI Exchange," a dedicated interconnection model that could provide the performance required to handle AI workloads more efficiently. With an AI Exchange in place, businesses would have direct access to high-speed, reliable connections that support the data-intensive requirements of AI and AI modeling.

What Now?

Economies were once built on production; now it could be argued that they're built on *connectivity.* The challenges to overcoming the international connectivity divide aren't singular or static. They span physical vulnerabilities, regulatory pressures, the escalating costs of managing and powering global networks, and how the flow of data is orchestrated. Overcoming these challenges and closing the divide demands a layered and strategic approach, one that combines robust terrestrial cable and mobile networks, advanced LEO satellite constellations, the efficient running of data centers, and dynamic interconnection models with built in redundancy to ensure that digital pathways are as efficient as possible.

Progress will depend on embracing redundancy and resilience, while forging collaborations across connectivity providers, data center operators, and neutral IXs. These partnerships can create a stable foundation for the global data economy, supporting innovation and future-proofing businesses against the inevitable uncertainties that still lie ahead. The solutions are within reach. The real question now is how quickly the industry can come together to implement them.