DE CIX

EXECUTIVE SUMMARY

The Iberian Peninsula: A next-generation regional mega hub

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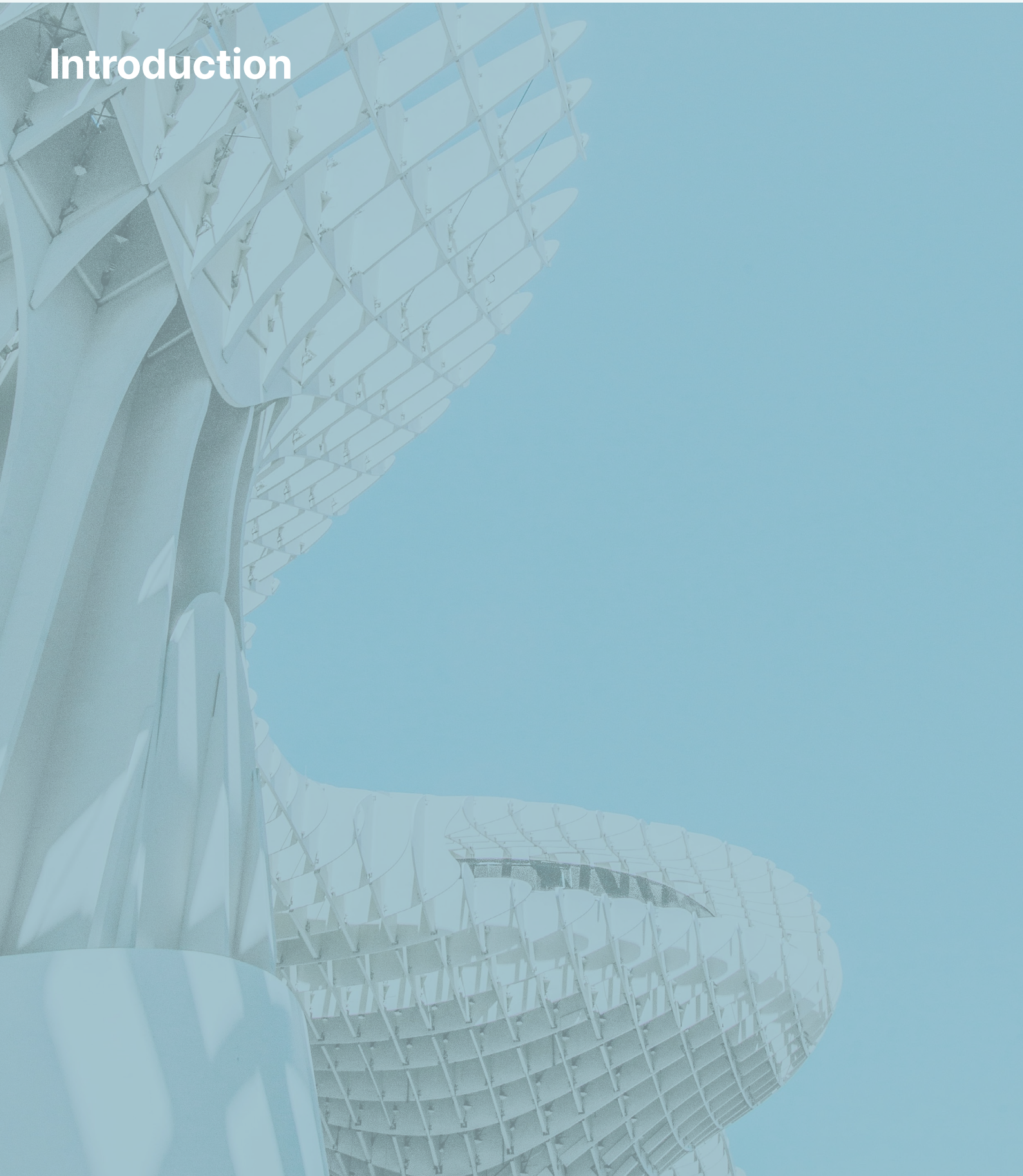
Introduction



In this paper, we investigate whether the Iberian infrastructure is fully prepared to adapt and evolve with the new demands associated with emerging technologies and stands to play a significant role in future global traffic flows.

Is the Iberian Peninsula capable of addressing the demands of both international and local data flows to enable emerging applications and meet the needs of network operators and enterprises alike? Can it support the digitalization of high-density urban populations in its local markets? Does the region offer the required resiliency, redundancy, and geographical diversity necessary to ensure the security and robustness of future data flows and data processing? Has it developed the required infrastructure density and distribution to function as a regional mega hub? And to what extent are infrastructure providers seeing the region as an opportunity for investment?

The transatlantic data route is the busiest and most competitive worldwide. Traditionally, dataflows across the Atlantic to Europe have headed to one of the FLAP (Frankfurt, London, Amsterdam, or Paris) markets. But with the advent of increasingly latency-sensitive applications – from digital entertainment and the cloud to AI, financial services, telemedicine, and autonomous driving – these four hubs cannot hope to serve the needs of Europe alone. As a result, we have seen digital infrastructure extending into the regions, getting closer to businesses and individual end users throughout Europe. And we have seen the need for data flows to be optimized at every level – from the local Internet service provider to the major cross-continental links.

The Iberian Peninsula is uniquely positioned to act as a digital gateway between Europe and the world. Strategically located on the shores of both the Atlantic and the Mediterranean, the peninsula offers the shortest routes, both from the perspective of the transport of people and goods and in terms of data flows, to North and South America, Africa, and across to the Middle East and beyond. Iberia, which has always been at the center of the world's trade pathways, is also at the center of the world's digital infrastructure pathways. Geographically, it can even be seen as the center of the world.

The Iberia Peninsula, with its geographical centrality, offers an alternative route for international data flows to enter Europe, but it also offers more: An opportunity for network operators and enterprise to optimize their global data flows. It offers an interesting, diverse, and distributed

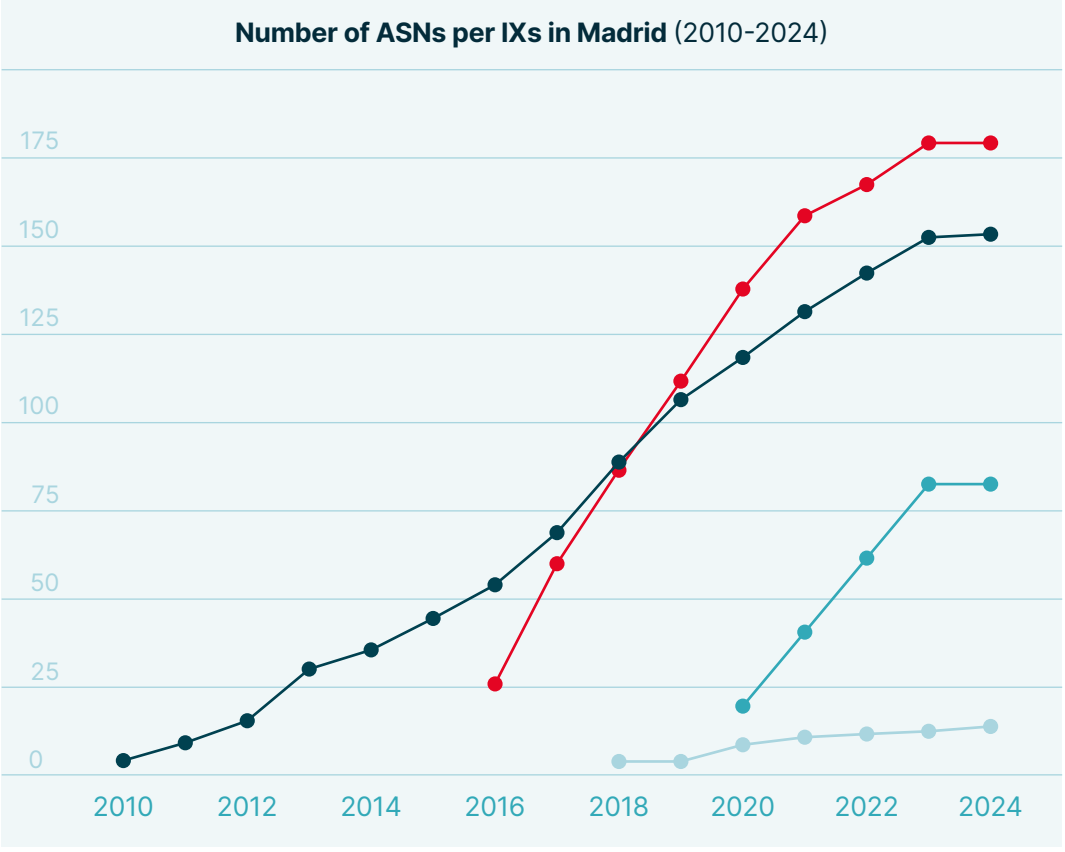
local market, where enormous growth in both digital infrastructure and the settlement of international corporations has occurred over the last decade and where strong future growth can be forecast. The peninsula's major digital hubs – Madrid, Lisbon, and Barcelona – are leading European cities, each with its own individual strengths based on their economy and geography. With DE-CIX present in all three of these locations, as well as across the border in Marseille, in southern France, an interconnected ecosystem has emerged that increasingly attracts more players into the market, establishing these cities as critical hubs for the region. The region is supported in its quest for recognition as a regional mega hub by further Iberian markets, including strategically located infrastructure markets like Bilbao, Malaga, Sines, and Valencia, and regions such as Aragon.

Case Study: Madrid – a digital hub at the heart of the Iberian Peninsula

Madrid, a city renowned for its rich history, vibrant culture, and dynamic economy, is now gearing up for a new phase of digital transformation. This capital city is transitioning further in the digital age, embracing innovation and technology to redefine its landscape and societal norms.

Madrid's digitalization journey is not just about adopting new technologies; it is about leading change and encouraging innovation to create a future that is sustainable, efficient, and prosperous. Examining the results of Madrid's ambitions, we look through the lens of the five pillars of a digital hub. As we delve into the digital era, how does Madrid measure up as a beacon of progress in Europe?

A look at Madrid's Internet Exchange (IX) infrastructure serves as a first glimpse at the growth in the city. Not only does the ecosystem in 2024 show significant options for redundancy and optimized data flows, but also reflects the enormous growth in networks – local, regional, and global – interconnecting in Madrid in 2024.



← **Figure 1:**
Number of ASNs connected to IXs in Madrid from 2010 to 2024

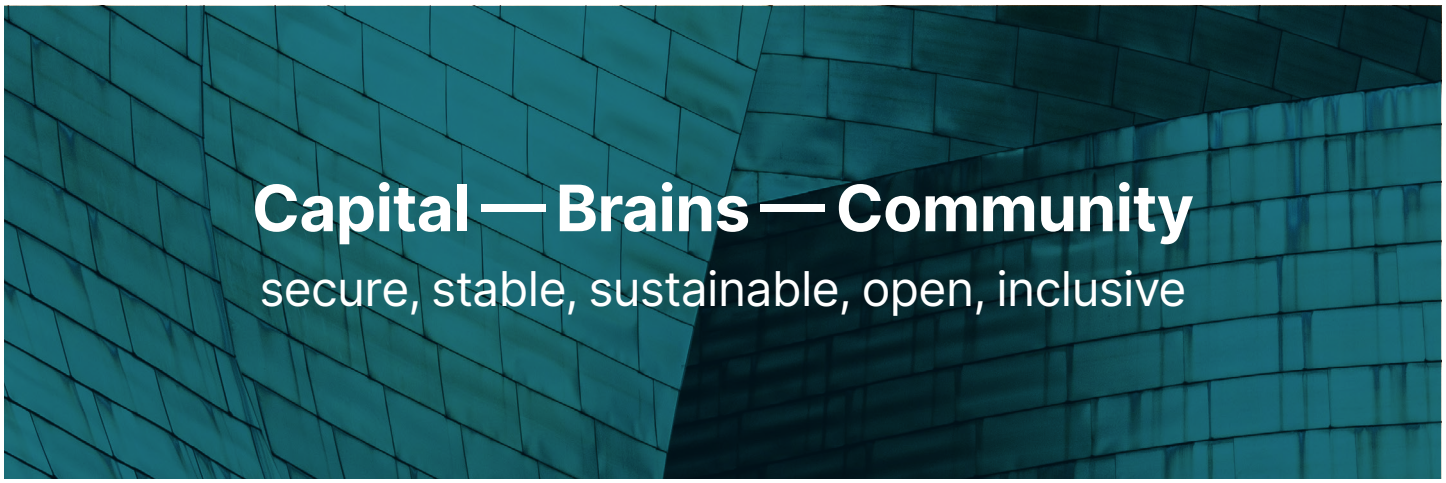
What is a regional mega hub?

The digital infrastructure ecosystem on which a digital hub is built comprises three main types of interdependent infrastructure: data centers, networks, and Internet Exchanges. Data centers enable the processing and storage of data and provide a home for other infrastructure, while Internet Exchanges enable data traffic to be exchanged between networks. All three components are essential for the provision of any kind of digital application or service.

In this paper, we define a digital hub as a city or metropolitan region with a leading digital economy based on a healthy and growing digital infrastructure ecosystem and the successful interplay of the five foundational pillars: 1. Internet Infrastructure; 2. Business & Organizations; 3. People & Community; 4. Regulatory Environment; and 5. Capital.

↑ Figure 2:
Five fundamental pillars of a digital hub

Digitalization should combine investment, talent, and community, while providing an enabling environment that is secure, stable, sustainable, and open, and at the same time embracing diversity, equity, and inclusion.

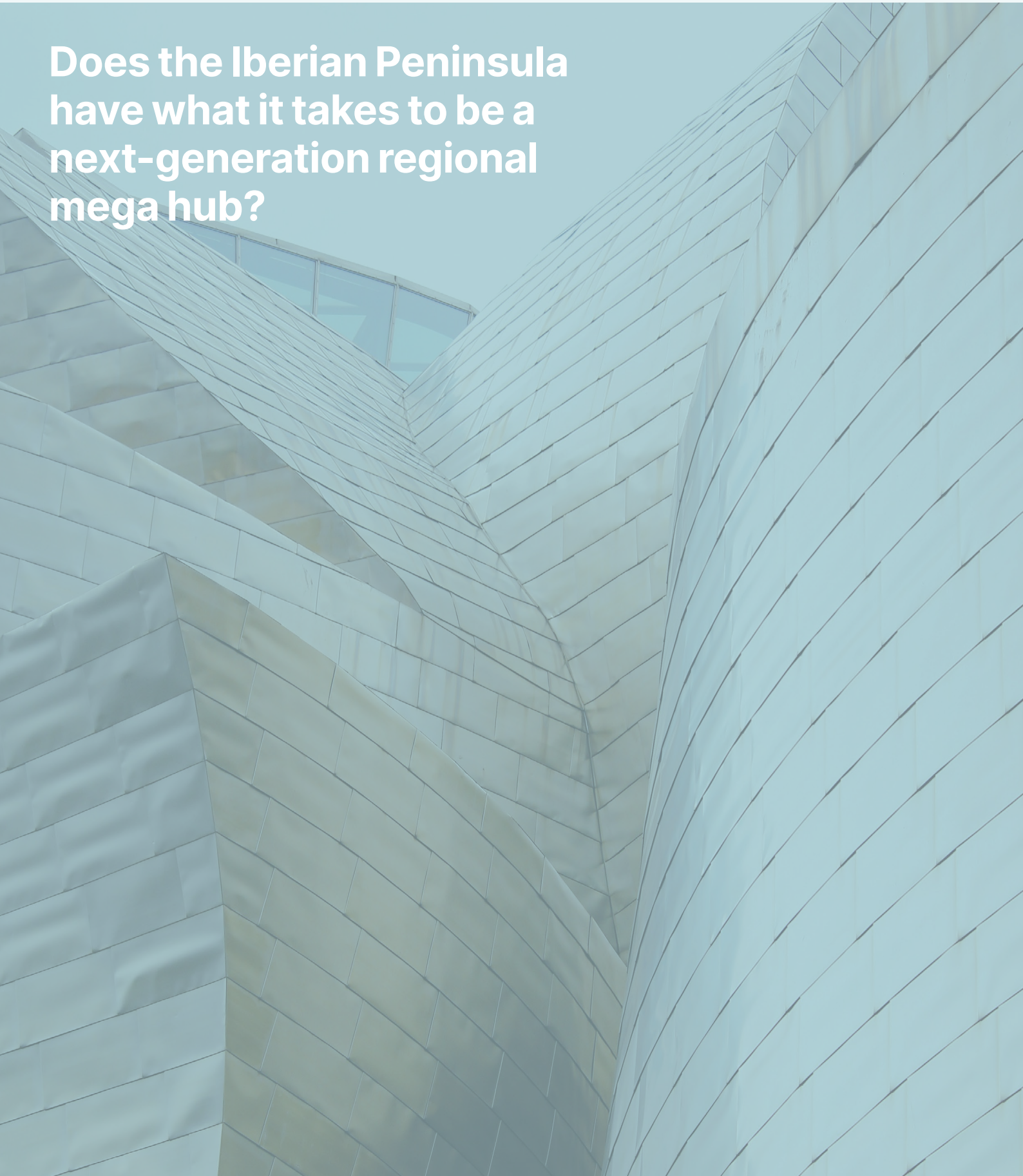


The emergence of digital hubs in new locations is symptomatic of the growing need for Internet infrastructure to get closer to "the edge" – as near as possible to end users and businesses. We see a dual evolution of digital infrastructure, sometimes referred to as "glocalization": Firstly, there is the need to get closer to end users to serve clouds, content, and services in low latency; secondly there is the need to bring together global infrastructure players and global networks and enable unhindered data traffic flow between countries and continents.

As a result, there is a growing need also for regional Internet infrastructure hubs, looking beyond the boundaries of individual cities and aggregating a region's infrastructure in an optimally interconnected manner, to become a regional mega-hub.

A regional mega hub is thus an aggregation of infrastructure centered around one or more digital hubs, bringing together the strengths of multiple neighboring hubs and infrastructure markets through interconnection. The regional mega hub can therefore bring aggregated infrastructure closer to the edge, supporting next-generation low-latency use-cases, and embracing next generation technologies throughout the region. It demands a collaborative approach from infrastructure providers, business, and government.

Does the Iberian Peninsula have what it takes to be a next-generation regional mega hub?



The Iberian Peninsula has abundant digital infrastructure, plenty of space, and great projects being developed for the generation of renewable energy. With high-performance interconnection solutions provided by IXs across the peninsula to support traffic flows, the question remains as to whether the region can attract further investment in high-grade infrastructure to serve its own valuable markets with low-latency cloud services, content, and applications, as well as serving as an important gateway between Europe and the rest of the world, making it a central location for multinational and global business. It is home to three complementary and interconnected digital hubs within a single economic area, forming – together with further Iberian infrastructure markets – a formidable cluster.

↓ Figure 3:
The bundled power of the Iberian ecosystem

Iberian Peninsula

13 IXs	723 Aggregated ASNs at IXs	35 Submarine cable systems **connections to 5 continents**
20 Cable landing stations	100+ Data centers	~1000 Megawatts (MW) of installed IT capacity

Staying ahead of the digital curve of the future will require looking beyond the boundaries of a single hub. With all elements at play and a spirit of collaboration, we ask whether the Iberian Peninsula is emerging as a next-generation regional mega hub, to serve the needs of local and global markets alike.

About DE-CIX

As the leading Internet Exchange operator and interconnection provider, we help companies to realize new opportunities and future-proof their connectivity needs to manage growing data volumes and new applications. From easy and secure cloud connection to creating interconnection ecosystems, we make interconnection easy. Anywhere.

Find out more at de-cix.net.

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