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EllaLink – how a submarine cable does more than just connect

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After the transatlantic fibre optic telecommunications cable Atlantis-2, EllaLink (Europe Link with Latin America or Ella) is only the second submarine cable to connect South America and Europe. Atlantis-2 has been active since 1999 and is considered to be very outdated and, with a speed of 40 gigabits per second, no longer able to cope with today's data transmission requirements. Atlantis-2 is now only used for conventional telephone calls.

EllaLink is different: With capacities of 100 terabits per second via four fiber pairs between Brazil and Portugal, the cable offers a secure, high-performance connection and has been active since June 2021.[1] The capacity enables the transmission of enough data per second to stream over 90,000 hours of Netflix.

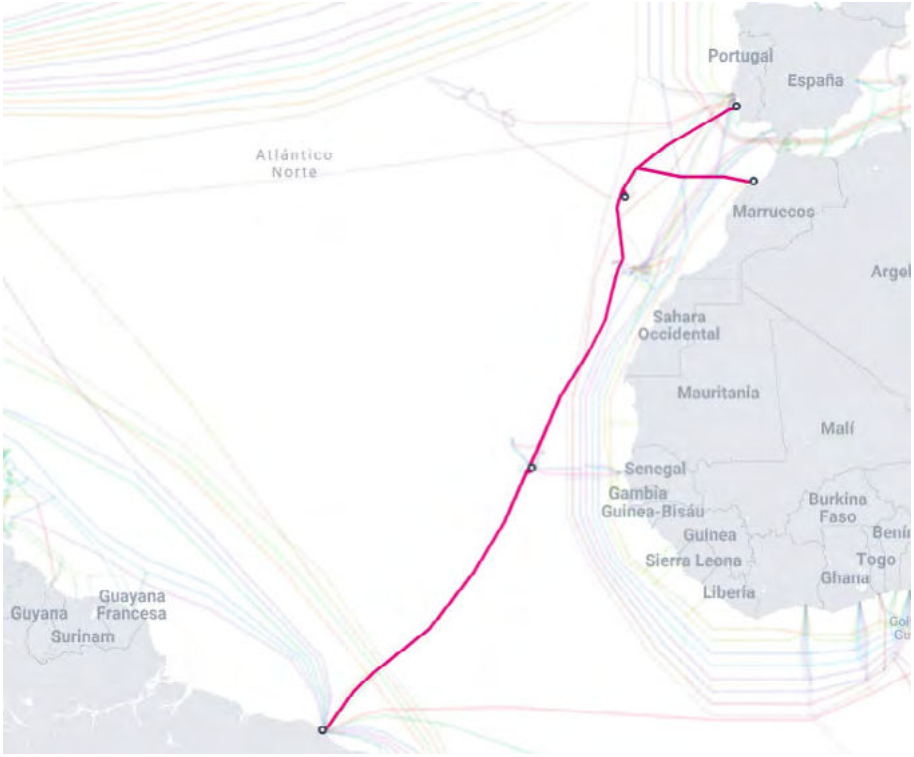
At 60 milliseconds, the latency, i.e. the time it takes to transport data packets between Portugal and Brazil, is negligible.

So far, there are five landing points (Fortaleza, Praia, Funchal, Casablanca and Sines). The 6,200 kilometer cable not only connects South America and Europe, but it provides a direct data link between Barcelona, Fortaleza, Funchal, Lisbon, Madrid, Marseille, Casablanca, Praia, São Paulo, Sines and Rio de Janeiro. Further landing points in the

1 Eurpean Commission: EllaLink – connectivity between Europe and Latin America,https://digital-strategy.ec.europa.eu/en/library/ellalink-connectivity-between-europe-and-latin-america.

Canary Islands, French Guiana, Mauritania and southern Brazil are to follow in the future.

FIGURE 1. EllaLink



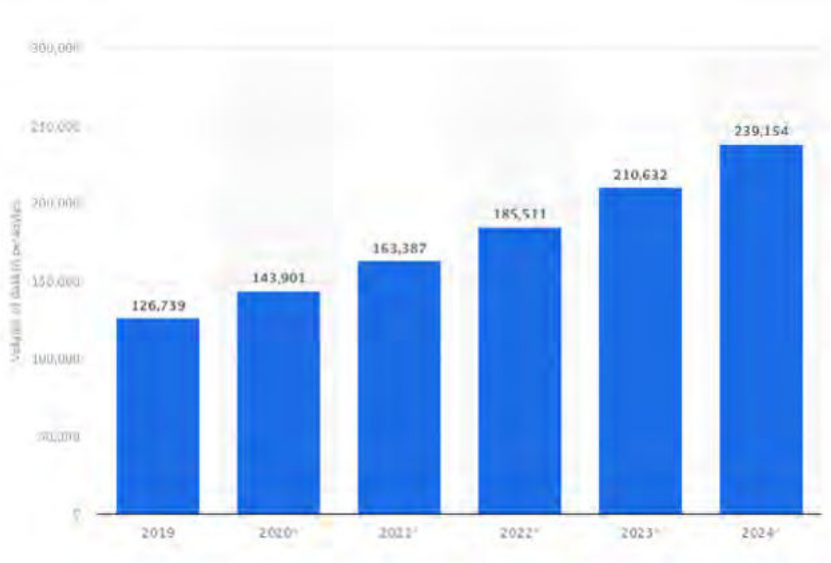
Source: TeleGeography – Submarine Cable Map.

Demand for data transmission will continue to rise in Latin America in the future

Data is largely transported worldwide through the oceans via submarine cables. Around 95% of international data traffic is transmitted underwater via the cable infrastructure, which is then redistributed ter-

restrially via landing points.[2] This involves financial transactions totaling more than ten trillion US dollars every day.[3] The demand for data worldwide and in Latin America will not diminish in the coming years. The amount of data transmitted across the Atlantic is estimated to double every two years and there is no sign of stagnation. Brazil already has around 181.8 million internet users (as of January 2023), more than Argentina and Mexico combined.

FIGURE 2. Data traffic over telecommunication networks in Latin America from 2019 to 2024



Source: Statista 2023.

2 Gollmer, Philipp): Russische U-Boote sich interessieren für das Nervensystem des Internets, in: Neue Züricher Zeitung, 28.04.2022. Submarine cables: Suspicious activities of Russian submarines (nzz.ch); The remaining data traffic takes place via satellites.

3 Nadia Schadlow/ Brayden Helwig: Protecting undersea cables must be made a national security priority, https://www.defensenews.com/opinion/commentary/2020/07/01/protecting-undersea-cables-must-be-made-a-national-security-priority/.

In addition, more and more institutions are digitalizing their processes, data centers are being expanded, cloud services are increasing, the 5G network is being expanded worldwide and planning for the 6G expansion has already begun.

Brazil and Europe react to the advance of Big Tech from the USA and China

EllaLink is not only a response to these developments, but also to the ever-increasing control of Big Tech companies from the USA and China. While large consortia of state-owned telecommunications providers built and maintained the submarine cable infrastructure for decades, the enormous costs and increased demand for data from Big Tech companies are leading Alphabet, Apple, Meta and Microsoft to invest more and more in the infrastructure. Between 2016 and 2022, they collectively invested around two billion US dollars (equivalent to around 15 per cent of global investment) in cable infrastructure.

A further USD 3.9 billion is expected to follow by 2025. The Chinese company HMN Tech, which took over Huawei's submarine cable division in 2019, is also increasingly pushing into the market and trying to establish itself as a manufacturer with low-cost products. By building newer and faster lines, the tech companies are ensuring that the old and slow cable connections are no longer suitable for the transmission of data packets and are only used for ordinary telephone connections – as is the case with Atlantis-2. According to forecasts, the ownership share of the big tech companies from the USA could grow to 80 per cent by 2027. The aim of EllaLink is to reduce dependency on the big tech companies for data transmission.

EllaLink is part of the EU's Global Gateway Strategy

Planning for the EllaLink submarine cable project began in 2012. Five years after EllaLink was founded, the supply contract was awarded

to Alcatel Submarine Networks before cable production began in 2019.[4] The investment for the cable project totaled around EUR 150 million. EllaLink was financed by a consortium consisting of Consortium Bella, the telecommunications companies Cabo Verde Telecom and EMACOM, and the pan-European infrastructure fund Marguerite II[5].[6]

The Bella consortium is particularly important here in order to understand the scope and direction of EllaLink. Bella stands for "Building the Europe Link to Latin America" program and is considered the flagship initiative of the European Union's Global Gateway strategy.

The Bella Consortium was set up for the Bella program and over EUR 53 million were made available through a public-private partnership. The European Union is the largest investor in this initiative. The consortium is made up of 11 European and Latin American research and education networks from Germany, Portugal, Italy, Spain, Ecuador, Chile, Brazil and the regional networks RedCLARA and GÉANT.[7]

Bella is to create European-Latin American research area

Among other things, the Bella program aims to strengthen secure digital connections and promote education and research systems. The aim is to create a common research area between the European Union and Latin America. Bella will benefit up to 12,000 institutions and over

4 EllaLink: Our Story, https://ella.link/project-timeline/.

5 European Investment Bank, Projects to be financed, https://www.eib.org/en/projects/pipelines/all/20160631.

6 EllaLink's transatlantic submarine cable docked in Portugal, https://www.incode2030.gov.pt/en/2021/01/21/ellalinks-transatlantic-submarine-cable-docked-in-portugal/

7 European Commission: BELLA – Building the Europe Link to Latin America, https://international-partnerships.ec.europa.eu/policies/programming/programmes/bella-building-europe-link-latin-america_en.

65 million students and promote the exchange of knowledge between them.

The program is made up of two pillars, Bella-S and Bella-T. While Bella-S comprises transatlantic data transmission with EllaLink, Bella-T focusses on the academic research network in Latin America. Terrestrial data links will connect the research centers in Brazil via Fortaleza, Sao Paulo and Porto Alegre, Argentina via Buenos Aires, Chile via Santiago, Ecuador via Guayaquil, Colombia via Bogotá and Cúcuta to the border with Venezuela, and Colombia via Cartagena.

FIGURE 3

Source: Graphic European Union.

This digital interconnectivity between Latin American countries will contribute to regional and interregional integration and support the partnership between the European Union and the Community of Latin American and Caribbean States (CELAC) by strengthening cooperation in the fields of science, research, innovation, technology, and higher education.

Financial trading, the tech industry and aerospace can also benefit

EllaLink almost halves the latency between Latin America and Europe from just over 100 milliseconds to 60 milliseconds.

The low latency is a great advantage for financial trading between Europe and Brazil. In high-frequency and algorithmic financial trading, milliseconds can significantly influence the position of the trade. Low latency can therefore make real-time trading much more attractive, as even the smallest delays in the millisecond range can affect the profit margin of trades.

In addition, the operators of EllaLink have already concluded partnerships with the telecommunications provider IP Telecom and the world's leading Internet node operator DE-CIX. Each of the three partners fulfils its own tasks. While EllaLink ensures data transport, IP Telecom provides the connections from companies in Brazil and Europe to the DE-CIX Internet hubs.

DE-CIX will provide access to the largest Southern European data center ecosystem via its nodes in Lisbon, Madrid, and Marseille. EllaLink connects strategic data centers with each other. It provides transmission power to Equinix International Business Exchange (IBX) and the data centers SP4 in São Paulo, LS1 in Lisbon and MD2 in Madrid.

Access to the ecosystem in conjunction with fast transatlantic transmission is of particular importance for content providers (games, video and streaming service providers) and cloud companies.

Booming digital services and new cloud and software solutions are creating opportunities to set up joint technology hubs, particularly in the research centers in Portugal and Brazil. Start-ups and IT companies can establish themselves directly on site thanks to the ideal conditions for fast data transmission.

The European Union has also announced that the cable connection will also have an impact on the European Copernicus earth observation

program. It will ensure the faster exchange of earth observation data in larger data packages. Brazil also hopes that this will enable it to participate in the European space program.

Spying opportunities are restricted and data protection is strengthened

According to the Brazilian government, another aspect played an enormous role in the endeavors to establish a "dedicated cable connection" from Latin America to Europe. EllaLink ensures the neutrality of data traffic and prevents possible surveillance by US intelligence services. Since the Cold War, it has been common practice for US intelligence services to tap into submarine cables to intercept communications and capture data traffic.[8]

From Brazil's perspective, it was previously not possible to transmit data via a node in the USA – neither across the Atlantic nor across the Pacific. This is now changing thanks to EllaLink, which, in addition to the connection across the Atlantic to Europe and Africa, also enables the USA to be directly excluded from the transmission and restricts the USA's ability to control data traffic.

In addition, the secure transport of data between Europe and Brazil is guaranteed and considers the high requirements of European data protection law. This is particularly important for sensitive data transport, as is the case in the e-health sector.

8 Blitz, Matt: Secrets hunt the still-classified Operation Ivy Bells, a daring Cold War wiretapping operation conducted 400 feet underwater. How-Secret-Underwater-Wiretapping-Helped-End-the-Cold-War.pdf (ussvirginiabase.org)

EllaLink can accelerate the resumption of bi-regional dialogue between the EU and Latin America

With the EllaLink, Brazil and the Latin American countries as well as Portugal and the European Union are meeting the growing demand for data transmission and responding to geopolitical developments.

With the Global Gateway Initiative, the European Union is not only countering the Chinese advance through the Belt and Road Initiative with its own approach but is also sending a first small signal to the big tech companies from the USA and China in the competition for submarine cable infrastructures.

With the high-speed connection, this cable infrastructure is competitive with comparable cable projects such as PEACE, Bifrost or SEA-H2X. Spain and Portugal in particular represent an important hub for other European markets to South America and Brazil.

The increasing networking between the EU and Latin America resulting from the Bella program, but also among the Latin American countries themselves, offers a great opportunity in the course of the bi-regional dialogue between the EU and the Community of Latin American and Caribbean States (CELAC), which was resumed in Brussels in July of this year. While joint conferences were held every two to three years between 1999 and 2015, the dialogue has now been interrupted for some time.

In recent years, the European Union has lost influence and significance as a result.

However, the targeted orientation of the Bella program towards a common research area, among other things, is proving to be a targeted and specific form of cooperation that could revitalize the dialogue format and make Europe more attractive again. The countries of Latin America are by no means dependent on the European Union in view of China's continued advance on the continent. When it comes to trade and investment, China has overtaken the EU. Especially as many Latin

American countries are more reluctant to make far-reaching offers of cooperation in order to continue working with other countries. In the field of education and research, however, the situation is different. EllaLink, for example, is creating a joint research network and contributing to a common research area, regardless of whether there are thousands of kilometers between Europe and Latin America.

In any case, the far-reaching planning, the partnerships that have been forged and the focal points of the cooperation during the cable project show that EllaLink is not just a mere cable link between two continents across the Atlantic. It is designed to bring two continents closer together (again) scientifically, economically, and culturally and to revive a dialogue that has been neglected for some time.

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