

Undersea Communications Infrastructure: Risks, Opportunities, and Geopolitical Considerations

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Abstract : Today's high-speed data connectivity depends on a vast global network of infrastructure across space, air, land, and sea, with undersea cable infrastructure (UCI) serving as the primary means for intercontinental and 'long-haul' communications. The UCI landscape is changing and includes an increasing variety of state actors, such as the growing economies of Brazil, Russia, India, China, and South Africa. Non-state commercial actors, such as hyper-scale content providers including Google, Facebook, Microsoft, and Amazon, are also seeking to control their data and networks through significant investments in submarine cables. Active investments by both state and non-state actors will invariably influence the growth, geopolitics, and security of this sector. Beyond these hyper-scale content providers, there are new commercial satellite communication providers. These new players include traditional geosynchronous (GEO) satellites that offer broad coverage, high throughput GEO satellites offering high capacity with spot beam technology, low earth orbit (LEO) 'mega constellations' – global broadband services. And potential new entrants such as High Altitude Platforms (HAPS) offer low latency connectivity, LEO constellations offer high-speed optical mesh networks, i.e., 'fiber in the sky.' This paper focuses on understanding the role of submarine cables within the larger context of the global data commons, spanning space, terrestrial, air, and sea networks, including an analysis of national security policy and geopolitical implications. As network operators and commercial and government stakeholders plan for emerging technologies and architectures, hedging risks for future connectivity will ensure that our data backbone will be secure for years to come.

Keywords : communications, global, infrastructure, technology

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