

Impact of Cyberattacks on Fiber Optic Communication



Overview

State-sponsored cyberattacks are increasingly targeting global data infrastructure, especially submarine fiber-optic cables, smart energy grids, and IT-OT converged systems. Threat actors use advanced techniques such as fiber optic tapping, also known as fiber optic eavesdropping or fiber optic interception, is a process where unauthorized parties intercept and monitor data as it travels through fiber optic cables. Unlike traditional copper cables, fiber optics use light signals to transmit data, making it more secure. The EU's subsea data cable network is both vital for global connectivity and vulnerable. This study provides a systematic review of the current security threats, as well as the actors at the origin of these threats. Building on reports and expert input, the paper takes stock of current awareness. Subsea fiber-optic cables, a critical information and telecommunications technology (ICT) infrastructure carrying more than 95 percent of international data, are becoming a highly consequential theater of great power competition between the United States, China, and other state actors such as Russia. This paper analyzes the cyber attack surface of SCCs, identifying vulnerabilities and single points of failure. Using the Svalbard Undersea Cable System as a case study, this study provides an attack analysis for several network nodes and shows the repercussions on interconnected CIs. Finally, it identifies the key differentiator of Fiber Optic lies in its mode of data transmission.

Article Content

Cybersecurity: How Companies and Individuals Can

When it comes to cybersecurity, not all internet infrastructures are created equal. Fiber optic internet infrastructure is far less vulnerable to cyberattacks thanks to

Common Vulnerabilities in Fiber Optic Network Security

Explore the vulnerabilities in fiber optic network security and learn about solutions for secure data transmission, intrusion detection systems, and

Underwater Cyber Warfare: Submarine Communications Cables

Abstract The fiber-optic submarine communications cables (SCCs) are a critical infrastructure (CI) forming the cyber backbone of governments, economies, and security organizations. These networks

Analyzing vulnerability of optical fiber network considering ...

It should be vigilant that a disaster or attack will not only immediately cut off the information transmission in the optical fiber network, but also bring more serious problems: it will take

Physical Layer Components Security Risks in Optical

Optical fiber communications are essential for all types of long- and short-distance transmissions. The aim of this paper is to analyze the previously presented

Harmful attacks threat and counteracting them in optical networks ...

Optical communication is considered as safe. However, the situation looks different when attackers gain physical access to infrastructure (optical fibre cables or devices installed in the network nodes), with

Underwater Cyber Warfare: Submarine Communications Cables

This is a beneficial use case to analyze the cyber security profile of SCCs and the activities dependent on them. In particular, this study will also discuss the SCCs security impact on the interdependence

Optical Layer Security in Fiber-Optic Networks

Intensive research has focused on improving optical network security, in the above specific areas. Real-time processing of the optical signal is essential in order to integrate security

Cybersecurity and Fiber Optics: 12 Tips to Protect Your

Tips for Implementation: Use secure enclosures for fiber optic distribution frames and terminals. Implement surveillance systems to monitor

Data Center Security Challenges: How Fiber Optic

Discover how fiber optic cabling enhances data center security by protecting against cyber threats, physical breaches, and signal interference,

Information Warfare in the Depths: An Analysis of Global

The advent of the internet, WiFi, fiber optic cables, 5G, and satellite communications have dramatically changed the way the world stays connected and shares

Eavesdropping Vulnerabilities in Optical Fiber Networks: Investigating ...

Fiber optic cables have long been considered a secure medium that prevents eavesdropping due to their complexity. However, there are attack methods that allow eavesdropping or denial of service. These

Security threats and protection procedures for optical

Simulation performances of some scenario attacks and data protection schemes are also provided. The details on the numerical model used for the

Hackers and Fiber Optics

Hackers and Fiber Optics The Rise of Cybercrime and How to Combat It The rapid development of digital communication has resulted in a substantial

Fiber Optic Cable Sabotage Disrupts France's Telecom

Fiber Optic Cable Sabotage Causes "Extensive Damage" SFR, France's second-largest telecom operator, confirmed extensive damage to its

Fiber Optics and its Security Vulnerabilities

With the recent advancements in fiber optic technology and the ever-growing demand for more bandwidth, the cost of installing and maintaining fiber optic systems has been reduced

Fiber optic networking: Assessing security risks

What are the security risks associated with fiber optic networking? Are there any differences between one vendor's offerings and another's? We're considering a vendor that offers

Safeguarding Subsea Cables: Protecting Cyber Infrastructure amid

The global fiber-optic network is designed with a certain level of redundancy to handle frequent damage. Most countries are linked by multiple underwater cables, enabling data to be

How Secure Is Fiber Optic Internet?

To understand why fiber optic security is stronger than traditional networks, you should first know how fiber works. Rather than transmitting data using electrical

How the French fiber optic cable attacks accentuate

Threats How the French fiber optic cable attacks accentuate critical infrastructure vulnerabilities The apparent act of sabotage is being investigated

What are the emerging cyber warfare threats to

State-sponsored cyberattacks are increasingly targeting global data infrastructure, especially submarine fiber-optic cables, smart energy grids, and IT

The Security and Reliability of Fiber Optic Networks for

For these critical infrastructures to ensure smooth functioning, seamless communication is the key to handling the large volumes of data

Fiber Optics in the Age of Cybersecurity

The encryption capabilities of fiber optic networks make them more resistant to hacking and cyber attacks, and ensure data integrity and privacy. In healthcare, fiber optics enable secure

Security threats to undersea communications cables and infrastructure ...

The internet backbone is a complex network of highly capable fibre-optic data cables that connect continents, countries, and islands. These cables are hidden mainly underground or on the seafloor.

String of attacks on French telecom infrastructure preceded April ...

Threats String of attacks on French telecom infrastructure preceded April attack on fiber optic cables American telecommunications infrastructure is vulnerable to attack and government is

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