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SECURING EARTH OBSERVATION AND RADIO FREQUENCY SATELLITES: CHALLENGES AND STRATEGIES

Abstract

Earth Observation (EO) and Radio Frequency (RF) satellites are critical components of modern infrastructure, providing essential services such as communication, navigation, and environmental monitoring. However, their reliance on network connectivity makes them vulnerable to cyber attacks. This paper examines the challenges and strategies for securing EO and RF satellites against cyber threats.The paper begins by discussing the evolving threat landscape for satellite systems, highlighting the increasing sophistication of cyber attacks targeting these platforms. It then explores the specific vulnerabilities of EO and RF satellites, including potential attack vectors and their impact on satellite operations.Next, the paper presents a range of strategies for enhancing the cybersecurity of EO and RF satellites. These include the implementation of secure communication protocols, encryption techniques, and intrusion detection systems tailored for satellite networks. The paper also discusses the importance of collaboration between satellite operators, government agencies, and cybersecurity experts in addressing these challenges.Finally, the paper examines the legal and regulatory frameworks needed to protect EO and RF satellites from cyber threats. It concludes by emphasizing the importance of ongoing research and development in cybersecurity to ensure the resilience of satellite systems in an increasingly hostile environment.