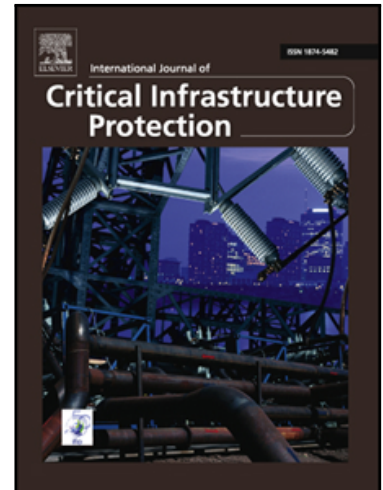


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Analysis of vulnerabilities, attacks, countermeasures and overall risk of the Automatic Dependent Surveillance-Broadcast (ADS-B) system

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Abstract

The U.S. Federal Aviation Administration has mandated the use of the Automatic Dependent Surveillance-Broadcast (ADS-B) system by January 2020 as a key component of the NextGen Project, which is intended to upgrade the air traffic control infrastructure and operations. The ADS-B system seeks to replace legacy approaches such as primary and secondary radars by employing global satellite navigation systems to generate precise air pictures for air traffic management. The security of ADS-B is a major concern because the system broadcasts detailed information about aircraft, their positions, velocities and other data over unencrypted data links, making it easy to launch eavesdropping, jamming and message modification attacks on aircraft in flight. This paper discusses ADS-B vulnerabilities and attacks that leverage the ADS-B protocol stack. The paper also presents the security requirements, state-of-the-art attack detection techniques and countermeasures, along with an overall risk analysis of the ADS-B system.

Keywords

Air Traffic Control; Automatic Dependent Surveillance-Broadcast (ADS-B); Vulnerabilities; Attacks; Countermeasures; Risk Analysis

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