Air Traffic Management Security: ADS-B as an Example

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Air Traffic Management is an ecosystem encompassing several systems, such as air traffic control (ATC), that assist every aircraft throughout its journey. In particular, Automatic Dependent Surveillance Broadcast (ADS-B) is a novel protocol that has revolutionized ATC thanks to its numerous benefits, especially when compared to traditional surveillance technologies. Notably, ADS-B offers improved location accuracy from its use of GPS while reducing operational and maintenance costs.

It also constitutes the central piece in the Next Generation Air Transportation System (NextGen) project in the US. Despite these advantages, ADS-B's open broadcast of clear-text messages resulted in several vulnerabilities that negatively affected its widespread usage. In this presentation, I will describe the ADS-Bsec framework that leverages technologies such as cryptography, location verification and artificial intelligence to address the core of ADS-B vulnerabilities while keeping compatibility with the original protocol. I will elaborate in detail on its key components followed by an overview of the evaluation results performed on a test bed that mimics as much as possible real flight conditions.