

Title: Blockchain Integration in UAV Networks: Performance Metrics and Analysis

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Abstract: Blockchain technology has revolutionized the management of Unmanned Aerial Vehicle (UAV) networks by enhancing security, enabling decentralized control, and improving operational efficiency. This study assesses the efficiency of private blockchain architectures in UAV networks, specifically examining important performance metrics such as throughput, latency, scalability, and packet size. Furthermore, we evaluate the effectiveness of UAV networks when integrating private blockchain technologies, focusing particularly on key performance indicators such as area, altitude, and data rate. The scope of our work includes extensive simulations that employ a private blockchain to assess its impact on UAV operations. In the blockchain network, throughput decreased as the number of UAVs and transactions increased, while delay remained constant up to a certain point. In contrast, the UAV network saw improved throughput but increased delay with more UAVs and transactions. Changes in area and altitude had little impact on the blockchain network but increased delays in the UAV network. Higher data rates enhanced the UAV network by reducing latency and improving throughput, though this effect was less pronounced in the blockchain network. The aforementioned results highlight the potential and limitations of private blockchains in enhancing the durability and efficiency of UAV networks.

Keywords: UAV; blockchain; throughput; latency; scalability; packet size

<https://www.mdpi.com/14248220/24/23/7813#:~:text=Integration%20of%20blockchain%20into%20UAV,%2C%20latency%2C%20and%20resource%20consumption.>