

Blockchain's Feasibility in Military Data Networks

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Abstract : Communication security is of particular interest to military data networks. A relatively novel approach to network security is blockchain, a cryptographically secured distribution ledger with a decentralized consensus mechanism for data transaction processing. Recent advances in blockchain technology have proposed new techniques for both data validation and trust management, as well as different frameworks for managing dataflow. The purpose of this work is to test the feasibility of different blockchain architectures as applied to military command and control networks. Various architectures are tested through discrete-event simulation and the feasibility is determined based upon a blockchain design's ability to maintain long-term stable performance at industry standards of throughput, network latency, and security. This work proposes a consortium blockchain architecture with a computationally inexpensive consensus mechanism, one that leverages a Proof-of-Identity (PoI) concept and a reputation management mechanism.

Keywords : blockchain, consensus mechanism, discrete-event simulation, fog computing

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