The Role of Blockchain Technology in Modern Network Security Solutions

ABSTRACT

The rapid growth of the Internet, the issue of network information security has become more serious. Traditional security methods rely on centralized systems, making them vulnerable to attacks and data tampering. Blockchain technology, being decentralized and resistant to tampering, offers a promising solution for enhancing network security. The project explains the basic principles and security features of blockchain, explores how it can be used to protect network information, and looks at its applications in areas like identity protection, food supply chains, and online-to-offline (O2O) services. The research first establishes blockchain's foundational principles, highlighting its distributed ledger architecture where data is maintained across multiple nodes, each containing a complete copy of the information. This structure is reinforced by consensus mechanisms such as Proof of Work and Proof of Stake, which ensure data consistency and validity across the network.

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