Team 3

VeriCloud: Blockchain-Aided Bloom Filter Verification System for Secure Cloud Storage

Abstract

In today's cloud-driven world, ensuring the integrity and authenticity of data stored on cloud platforms has become a growing concern — especially in environments where the service provider cannot be fully trusted. Traditional integrity verification techniques are often resource-intensive and unsuitable for lightweight or distributed systems.

This project proposes a novel, efficient, and trustless solution by combining Bloom filter-based data verification with blockchain technology. The system generates a Bloom filter from the uploaded data blocks, which serves as a compact verification index. A cryptographic hash of this Bloom filter is then stored on a public blockchain, providing an immutable and tamper-proof proof-of-integrity. During any future verification, the system regenerates a Bloom filter from the current cloud data and compares its hash with the original blockchain-anchored version. Any mismatch indicates unauthorized modifications. This approach ensures lightweight, fast, and public verification without relying on a trusted third party.

Keywords - Cloud Storage, Bloom Filter, Blockchain, Trusted Computing, Data Integrity

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