Relay Mining: Verifiable Multi-Tenant Distributed Rate Limiting

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Abstract : Relay Mining presents a scalable solution employing probabilistic mechanisms and crypto-economic incentives to estimate RPC volume usage, facilitating decentralized multitenant rate limiting. Network traffic from individual applications can be concurrently serviced by multiple RPC service providers, with costs, rewards, and rate limiting governed by a native cryptocurrency on a distributed ledger. Building upon established research in token bucket algorithms and distributed rate-limiting penalty models, our approach harnesses a feedback loop control mechanism to adjust the difficulty of mining relay rewards, dynamically scaling with network usage growth. By leveraging crypto-economic incentives, we reduce coordination overhead costs and introduce a mechanism for providing RPC services that are both geopolitically and geographically distributed.