Cross-Chain Block Time and Reorganization Analysis

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1 Introduction

This document provides an analysis of block times, chain reorganizations, and timelocks across Cardano, Ethereum, and BNB Chain.

2 Block Times

- Cardano: Approximately 20 seconds
- Ethereum: 12-14 seconds
- BNB Chain: Approximately 3 seconds

3 Chain Reorganizations

The frequency and depth of chain reorganizations are affected by block times:

- BNB Chain: More frequent but shallow reorgs due to faster block times
- Ethereum: Balanced between frequency and depth of potential reorgs
- Cardano: Less frequent but potentially deeper reorgs due to slower block times

4 Timelocks and Cross-Chain Operations

A 1-minute timelock translates differently across chains:

- Cardano: Approximately 3 blocks
- Ethereum: 4-5 blocks
- BNB Chain: About 20 blocks

This disparity can lead to synchronization challenges, different levels of finality, and increased complexity in cross-chain operations.

5 Visual Representation

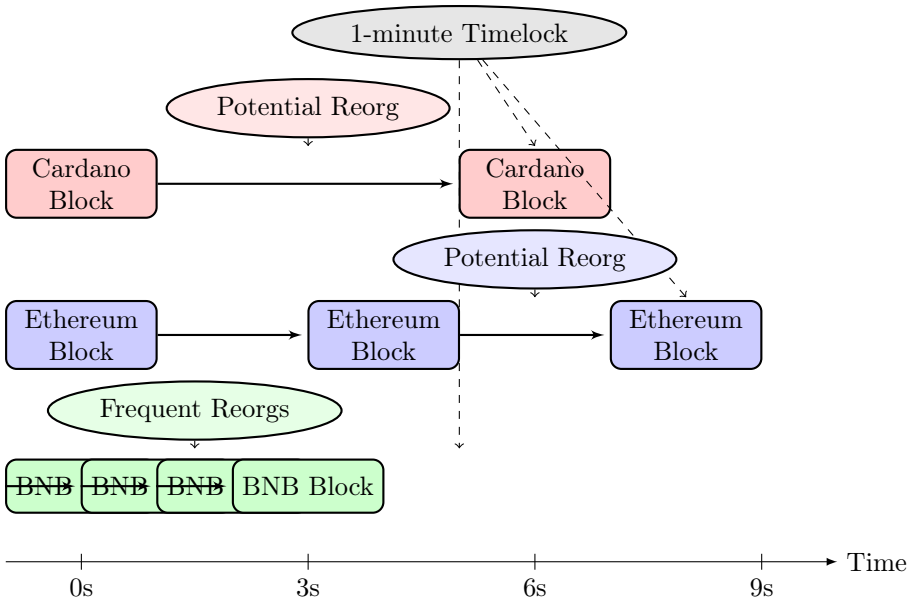

Figure 1: Block Times and Reorganization Risks Across Chains

6 Conclusion

The varying block times across Cardano, Ethereum, and BNB Chain present significant challenges for cross-chain operations, particularly in terms of synchronization, finality, and timelock management. Careful consideration of these factors is crucial when designing cross-chain protocols and operations.