RPC Endpoint Testing Report

Summary

This report details the results of testing various RPC methods against the provided endpoint: **https://mainnet.ethernitychain.io/**. The tests aimed to verify the functionality, responsiveness, and stability of the RPC interface.

Test Results Overview

Test Name	Status	Response/Details
test_connection	PASSED	Connection to the RPC endpoint was successful.
test_eth_blockNumber	PASSED	Successfully fetched the block number: 4462406.
test_eth_getBlockByNumber	PASSED	Block data successfully retrieved. Key attributes include: - baseFeePerGas: 1030 - difficulty: 0 - gasUsed: 43902 - transactions: 1 transaction included.
test_eth_getTransactionByHash	PASSED	Successfully fetched transaction details. Attributes include: - blockHash: 0xf3d503f8b... - from: 0xC7694D6... - to: 0xd70495B3... - gas: 46373.
test_eth_getTransactionReceipt	PASSED	Transaction receipt retrieved. Status: 1 (success). Key attributes: - cumulativeGasUsed: 89833 - logs: 1 log retrieved. - effectiveGasPrice: 1001030.
test_eth_estimateGas	FAILED	Error: {'code': -32000, 'message': 'insufficient funds for gas * price + value'}. The specified address did not have sufficient funds to cover the gas fees for the transaction.
test_eth_call	PASSED	Successfully executed a simulated contract call.
test_eth_getLogs	FAILED	Error: HTTPSConnectionPool: Timed out while retrieving logs. This could indicate performance issues or network instability when handling log queries.
test_eth_getBalance	PASSED	Successfully fetched the balance: 0.00028028225429964 ETH.
test_invalid_method	PASSED	Correctly identified an invalid RPC method. Error: 403 Client Error: Forbidden.

Detailed Observations

Connection Stability

The endpoint demonstrated reliable connectivity, confirming its availability and response to web3.is_connected() queries.

Blockchain Data Retrieval

- Block-related methods (test_eth_blockNumber, test_eth_getBlockByNumber) performed as expected, delivering accurate and detailed blockchain data.
- Transaction methods (test_eth_getTransactionByHash, test_eth_getTransactionReceipt) provided comprehensive details for the specified hash.

Gas Estimation

The test_eth_estimateGas function failed due to insufficient funds in the specified address. This is a configuration issue and not an indication of endpoint failure.

Log Retrieval

The test_eth_getLogs function timed out, suggesting potential performance bottlenecks or server-side configuration issues for handling large log data requests.

Balance Check

The balance retrieval function performed correctly, confirming that the endpoint can access account balances accurately.

Error Handling

- Invalid RPC method requests returned appropriate error messages, indicating robust error handling mechanisms in place.
- A 403 Forbidden error was correctly returned for unauthorized requests.

Recommendations

Performance Tuning

Investigate and address the timeout issue in the `test_eth_getLogs` function. This may require:

- Increasing server capacity to handle high-volume log queries.
- Optimizing the timeout duration in the RPC server configuration.

Error Reporting Improvements

Consider implementing more descriptive error messages for certain failure cases, such as gas estimation errors, to improve debugging and user experience.

Security Enhancements

- The `403 Forbidden` response to invalid methods is a good security measure. Continue monitoring for unauthorized access attempts.
- Regularly review and update access controls to prevent misuse or exploitation.