

# Node Tracing / JSON RPC Requirements

## Standard JSON RPC Requirements

- Archive node with JSON RPC interface should strictly follow input/output interface described in <https://ethereum.github.io/execution-apis/api-documentation/>
- WebSocket interface (optional/highly recommended to enable) is used to subscribe to new block heads. Otherwise, Blockscout will trigger new blocks fetching by periodical polling the JSON RPC eth\_blockNumber
- method.
- Support for the following standard Ethereum JSON RPC methods (documented at <https://ethereum.github.io/execution-apis/api-documentation/>)
- )
- - eth\_blockNumber
- - eth\_call
- - eth\_getBalance
- - eth\_getCode
- - eth\_getBlockByHash
- - eth\_getBlockByNumber
- - eth\_getTransactionByHash
- - eth\_getTransactionByBlockHashAndIndex
- - eth\_getTransactionByBlockNumberAndIndex
- - eth\_getTransactionReceipt
- - eth\_getUncleByBlockHashAndIndex
- - eth\_getLogs

## Fetching Pending Transactions

Client Method Erigon Nethermind OpenEthereum parity\_pendingTransactions Geth txpool\_content

## Enable Tracing to Fetch Internal Transactions

Client Method Erigon Nethermind OpenEthereum \* trace\_replayBlockTransactions \* (fetching of internal transactions) \* trace\_block \* (fetching of block rewards) \* Geth \* debug\_traceBlockByNumber \* ordebug\_traceTransaction \*

callTracer is used by default, starting from the Blockscout 5.1.0 release. To switch to a custom JS tracer, the Blockscout maintainer should set the export INDEXER\_INTERNAL\_TRANSACTIONS\_TRACER\_TYPE=js environment variable. Prior to the 5.1.0 release, js tracer was a default option.

## JSON RPC Performance Benchmarks

Time measures for response time of crucial JSON RPC methods for indexing in Blockscout [Ways to improve speed](#).

1. eth\_getBlockByNumber
2. without transaction receipts for a block with 15 transactions: Desired response time is < 0.5s. For instance, in case of the Gnosis chain archive node, the response time for the block with ~20 transactions is ~0.4s.
3. eth\_getTransactionReceipt
4. for random transactions desired response time is < 0.5s. For the Gnosis chain archive node the response time is ~0.3 - 0.4s.
5. Batched eth\_getTransactionReceipt
6. for 15 transactions acceptable response time is Less than 1s. For the Gnosis chain archive node, it is ~0.6 - 0.7s
- 7.

## Rate Limit

The desired rate limit for RPC endpoint is 200 req/sec for the indexing phase and 100 req/sec for the indexed chain.

## EVM Requirements & Clients

- All EVM chains must [define these variables](#)
- during configuration.
- BlockScout currently supports Erigon, Geth, Nethermind, Hyperledger Besu, and Ganache clients. Define the node variant using the `ETHEREUM_JSONRPC_VARIANT`
- environment variable. [More information](#)
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