

# RPC Requirements

## What are the RPC requirements for the Transaction Service?

To run the Transaction Service in tracing mode you will need a tracing compatible node:

- [Erigon](#)(opens in a new tab)
- node (recommended).
- Deprecated [OpenEthereum](#)(opens in a new tab)
- node with tracing enabled (--tracing flag) if it's still supported on your network.
- [Nethermind](#)(opens in a new tab)
- (archive mode so tracing is enabled).
- Any RPC that supports eth\_getLogs
- if using the Safe L2 Version.
- From Safe v1.3.0
- there's an alternative and recommended way
- to avoid using tracing, the L2 Safe version
- ([https://github.com/safe-global/safe-deployments/blob/main/src/assets/v1.3.0/gnosis\\_safe\\_l2.json](https://github.com/safe-global/safe-deployments/blob/main/src/assets/v1.3.0/gnosis_safe_l2.json)(opens in a new tab)) that emits events, so no tracing node is required. This is the approach used in networks like Polygon or Binance Smart Chain
- where fees are cheap and emitting events don't impact the user: \* A Transaction Service configured with a tracing
  - node can index L2 and non L2 versions of the Safe contracts.
- - A Transaction Service configured without a tracing
- - node can only index L2 versions of the Safe contracts. Indexing mode shouldn't be changed after initializing the service, as the database could become corrupted, so if a tracing node wasn't set up it shouldn't be added later. The opposite is also problematic.

## What RPC methods are used?

For indexing, basic RPC methods are required, and the service uses batching to query the RPC:

- eth\_getTransactionByHash
- eth\_getBlockByNumber
- eth\_getTransactionReceipt
- eth\_getLogs
- (for indexing ERC20/721 transfers)
- eth\_chainId
- (just called once and cached)
- ...

For the regular version of the Safe (not L2), tracing endpoints are used:

- [trace\\_filter](#)(opens in a new tab)
- : For quick sync, but it could be disabled setting the configuration parameter ETH\_INTERNAL\_NO\_FILTER=False
- . Be careful, it will make the service really slow when syncing from scratch.
- [trace\\_block](#)(opens in a new tab)
- [trace\\_transaction](#)(opens in a new tab)
- [trace\\_block](#)(opens in a new tab)

For the L2 version of the Safe, no special RPC methods are used. The most demanding one will be [eth\\_getLogs](#)(opens in a new tab) to get the Safe events.

## How many queries will the Transaction Service do to the RPC?

That's not written in stone. Transaction Service has some environment variables that can be configured to set a limit on the number of blocks that are processed together (ETH\_EVENTS\_BLOCK\_PROCESS\_LIMIT\_MAX), but the default behaviour is trying to detect the best configuration for every network similar to how [TCP congestion control](#)(opens in a new tab) works. Indexer tries to process a low number of blocks (currently 50). Depending on that:

- If the request takes less than 1 second
- , the node can process more. The number of blocks to fetch is duplicated for the next request.

- If the request takes less than 3 seconds
- , the number of blocks to process is incremented by a small amount (currently 20).
- If the request takes more than 20 seconds
- , the number of blocks to process is decremented by a small amount (currently 20).
- If the request takes more than 30 seconds
- , the number of blocks to process is halved.
- If there is an exception
- when requesting the information (I/O error) number of blocks to process is reset to the minimum number of blocks (currently 1).
- All this happens in every request to the node used for indexing (safe transactions, ERC20/721 events...).

Be careful, some nodes like Binance Smart Chain public nodes have a hard-coded limit of blocks they can process (5000 in the case of BSC). Set `ETH_EVENTS_BLOCK_PROCESS_LIMIT_MAX` to prevent the algorithm from trying to process more blocks and raise errors all the time

## RPC Provider expectations

For RPC providers we expect communication on every update and configuration change as it could impact our indexers:

- Timeout
- for the requests.
- Number of
- batch requests
- allowed in the same HTTP request.
- Block range
- that can be queried in queries like `eth_getLogs`
- `trace_filter`.
- Results limit for endpoints
- (for example some providers implement a limit to the number of results of queries like `eth_getLogs`
- ). Indexer is expecting a failure and not getting capped results.

### [Safe Transaction Service Supported Networks](#)

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