

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 (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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