RPC Requirements

What are the RPC requirements?

To run the Transaction Service intracing mode , you will need a tracing-compatible node:

- Erigon(opens in a new tab)
- node (recommended).
- DeprecatedOpenEthereum(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 supportseth_getLogs
- if using theSafe L2 Version.
- From Safev1.3.0
- there's an alternative andrecommended way
- to avoid using tracing, theL2 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 likePolygon
- orBinance Smart Chain
- where fees are cheap and emitting events don't impact the user:* A Transaction Service configuredwith a tracing
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    - node can index L2 and non-L2 versions of the Safe contracts.
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    - A Transaction Service configuredwithout a tracing
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    - 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 usesbatching 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:

- âtrace_filter(opens in a new tab)
- : For quick sync, but it could be disabled setting the configuration parameterETH_INTERNAL_NO_FILTER=False
- . Be careful, it will make the service really slow when syncing from scratch.
- âtrace_block(opens in a new tab)
- â
- âtrace_transaction(opens in a new tab)
- â

No special RPC methods are used for the L2 version of Safe. The most demanding one will beeth_getLogs(opens in a new tab) to get the Safe events.

How many queries will the Transaction Service send to the RPC?

The number of queries sent may vary depending on the network. The 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 behavior is trying to detect the best configuration for every network similar to howTCP congestion control(opens in a new tab)works.

The indexer tries to process a low number of blocks (currently 50), and depending on that:

- If the request takesless than 1 second
- , the node can process more. The number of blocks to fetch is duplicated for the next request.
- If the request takesless than 3 seconds
- , the number of blocks to process is incremented by a small amount (currently 20).
- If the request takesmore than 20 seconds
- , the number of blocks to process is decremented by a small amount (currently 20).
- If the request takesmore than 30 seconds
- , the number of blocks to process is halved.
- If there isan 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, likeBinance Smart Chain public nodes, have a hard-coded limit of blocks they can process (5000 in the case of BSC). SetETH_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 likeeth_getLogs
- ortrace_filter
- .
- Results limit for endpoints
- (for example, some providers implement a limit to the number of queries likeeth_getLogs
-). The indexer expects failures and not capped results.

Running the Safe Transaction Service FAQ