

Cardano SL Wallet

Web API Benchmarking

API v0

Middleware Team

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Benchmark Environment

User Story

Issue	Owner	Sprint
CBR-23	Denis Shevchenko	Cardano #57: Novaya Nadezhda

Computer

OS	CPU	RAM
Debian Linux 9.3 (64bit)	Core i7-7500U @ 2.70GHz	16 GB DDR4 2133 MHz

Bench Tool

Package	Version
gauge	0.2.1

Code

Feature Branch	Base Branch	Commit
feature/cbr23-wallet-bench	master	e66d16bbf

Build

Script	RTS Options	Use Nix
build/cardano-sl.sh	-N2	No

Launch

Script	Number of nodes	Connect to Mainnet
launch/demo-with-wallet-api.sh	4	No

Benchmark Launch

Launch Command

Example of complete command:

```
$ stack bench cardano-sl-wallet --benchmark-arguments \
  "--tls-pub-cert=$PWD/scripts/tls-files/ca.crt" \
  "--tls-priv-key=$PWD/scripts/tls-files/server.key" \
  "--wal-conf=$PWD/wallet/bench/config/Wallets.yaml" \
  "--ep-conf=$PWD/wallet/bench/config/Endpoints.csv"
```

Run:

```
$ stack bench cardano-sl-wallet --benchmark-arguments "--help"
```

to see description of supported arguments.

Configuration

There are two different configuration files:

1. `Wallets.yaml` Contains wallets, accounts and addresses we are using during benchmarking.
2. `Endpoints.csv` Contains a list of Wallet Web API endpoints we want to benchmark. By default all listed benchmarks will be launched sequentially, one by one.

Preparing

To make benchmarking more realistic, wallet database was generated, using `dbgen` tool. Please follow these instructions¹ to reproduce it on your local computer.

As a result we have 1 wallet with 80k addresses in it. Most of these addresses contains constant amount of money.

Measurements Explanation

Package `gauge` returns an output with basic measurements, for example:

¹<https://iohk.myjetbrains.com/youtrack/issue/CSL-2249#comment=93-17408>

```
benchmarking GetHistoryBench ... took 61.18 s, total 56 iterations
benchmarked GetHistoryBench
time                1.069 s      (986.0 ms .. 1.174 s)
                   0.985 R2    (0.966 R2 .. 0.996 R2)
mean                1.121 s      (1.082 s .. 1.179 s)
std dev             80.42 ms     (47.68 ms .. 128.8 ms)
variance introduced by outliers: 19% (moderately inflated)
```

where:

1. Value of time corresponds to **Time, ms** in tables below.
2. Value of mean corresponds to **Mean, ms** in tables below.
3. Percentage of variance introduced by outliers corresponds to **Variance, %** in tables below.
4. Number of iterations is an actual number of requests sent to endpoint. All benchmarks took from 56 to 211 iterations.

GetHistory

Empty tx history

Wallets	Accounts	Addresses	Time, ms	Mean, ms
1	1	1	101.1	101.8
1	2	80k	637	641.2

Non-empty tx history, 81k addresses

Wallets	Accounts	Transactions	Time, ms	Mean, ms	Variance, %
1	2	435	691.3	882.5	29
1	2	1.7k	1106 (1081 .. 1129)	1091 (1062 .. 1109)	19

GetWallet

Empty tx history

Wallets	Accounts	Addresses	Time, ms	Mean, ms
1	1	1	126.9	126.1
1	2	80k	3641	3407

Non-empty tx history, 80k addresses

Wallets	Accounts	Transactions	Time, ms	Mean, ms	Variance, %
1	2	435	3625	3435	none
1	2	1.7k	4521 (3894 .. 5412)	3892 (3688 .. 4298)	38
1	2	1.8k	3588 (3475 .. 3761)	3513 (3432 .. 3593)	none

GetWallets

Empty tx history

Wallets	Accounts	Addresses	Time, ms	Mean, ms
1	1	1	124.9	125.2
1	2	80k	3115	3256

Non-empty tx history, 81k addresses

Wallets	Accounts	Transactions	Time, ms	Mean, ms	Variance, %
1	2	435	3485 (3390 .. 3574)	3488 (3435 .. 3546)	none
1	2	1.7k	3924 (3271 .. 4469)	3623 (3438 .. 3883)	29

IsValidAddress

Empty/non-empty tx history

Wallets	Accounts	Addresses	Time, ms	Mean, ms	Variance, %
1	1	1	91.61 (76.87 .. 100.8)	93.27 (87.16 .. 110.9)	58
1	2	80k	92.46 (85.07 .. 100.6)	86.66 (83.95 .. 91.42)	17
1	2	81k	93.64 (81.87 .. 101.6)	94.77 (90.11 .. 103.8)	38

NewAddress

Empty/non-empty tx history

Wallets	Accounts	Addresses	Time, ms	Mean, ms	Variance, %
1	1	1	139.2 (129.8 .. 149.5)	144.7 (138.7 .. 161.1)	38
1	2	80k	141.2 (137.0 .. 146.1)	141.7 (136.6 .. 144.8)	none

GetSyncProgress

Empty/non-empty tx history

Wallets	Accounts	Addresses	Time, ms	Mean, ms	Variance, %
1	1	1	84.95 (78.53 .. 92.20)	94.46 (90.79 .. 101.1)	28
1	2	80k	91.11 (88.56 .. 94.92)	87.76 (85.73 .. 89.47)	none

NewPayment

Empty tx history before starting

Wallets	Accounts	Addresses	Time, ms	Mean, ms
1	2	80k	7680	8115

Non-empty tx history, 80k addresses

Wallets	Accounts	Transactions	Time, ms	Mean, ms	Variance, %
1	2	435	8142 (8081 .. 8212)	8171 (8109 .. 8245)	none
1	2	1.2k	8487 (8294 .. 8715)	8643 (8502 .. 8947)	19
1	2	1.7k	8593 (8253 .. 8871)	8160 (8017 .. 8443)	19
1	2	1.7k	9242 (8165 .. 1048)	8382 (8193 .. 8813)	33