

Intro

Bitcoin Cash
(BCH)
Mainnet Cash
Batteries
included

Ways to use
mainnet-js

Javascript
Unstable REST
Docker image
RegTest Stack

Warning

Not the way

Manuals

State of
mainnet.cash

Using Bitcoin Cash from mainnet.cash

A QuickStart

2qx - github.com/2qx

2023-10-21 10h EDT BlockHack Hackathon

Outline

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1 Intro

- What is Bitcoin Cash?
- What is Mainnet Cash?
- What's in the box?

2 Ways to use mainnet-js

- Running mainnet-js Bundled Script
- Using mainnet.cash service
- Using the mainnet.cash Docker image
- Spin-up a Full Service Stack in Regtest

3 Warning

- Nothing is impossible, it's just not the way

4 Manuals

5 State of mainnet.cash

bitcoin (cash): a p2p payment network

with a hidden scripting language

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Listen to radio silence.

- Rule 1 of Disinformation: Hear no evil, see no evil, speak no evil. Regardless of what you know, don't discuss it – especially if you are a public figure, news anchor, etc. If it's not reported, it didn't happen, and you never have to deal with the issues.
- Bitcoin: A Peer-to-Peer Electronic Cash System

Mainnet Cash is a Specification

First and foremost.

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Mainnet Cash is a tool for developers to access common Bitcoin Cash functions, utilities and the network itself.

- A written contract for how a service will be provided.
- Implemented in typescript.
- Specified in OpenAPI3 (Swagger): [api.yml](#)
- A generated API is then implemented with the typescript library.

Visual Explanation

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mainnet.cash



mainnet-js



(λ)



Libauth



mainnet.cash is wasm wrapped in typescript, then
candied, cured with REST & shipped with docker

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- [@bitauth/libauth](#) functional bitcoin library.
- mainnet-js: defacto reference wallet implementation.
- mainnet.cash an API specification implemented with mainnet-js.
- End Goal:
 - Developers can use common BCH functions from REST.
 - Developers get a similar interface in the browser.

Other tools included

-

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- Automatic network providers for different networks (bitcoincash, chipnet, regtest)
- [CashTokens](#) & [BitcoinCash Metadata Registries \(BCMR\)](#) built in.
- BIP39/BIP44 Mnemonic seed wallets and xpub derivation.
- Caching interface to the CoinGecko USD spot API.
- Available plugin for [CashScript](#).
- Available storage plugins for browsers (IndexedDB) or nodejs (postgres)

RE: mainnet.cash is a contract

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```
1 from future import print_function
2 import mainnet
3 import math
4 from mainnet.rest import ApiException
5 from pprint import pprint
6
7 # Defining the host is optional and defaults to https://rest-unstable.mainnet.cash
8 # See configuration.py for a list of all supported configuration parameters.
9 configuration = mainnet.Configuration(
10     host="https://rest-unstable.mainnet.cash"
11     #host="http://localhost:3000"
12 )
13
14 configuration.access_token = None
15
16 decay = 100
17 executorFee = 5460
18
19 # Enter a context with an instance of the API client
20 with mainnet.ApiClient(configuration) as api_client:
21     # Create an instance of the API class
22     api_instance = mainnet.ContractApi(api_client)
23
24     contract_init = {
25         "network": "mainnet",
26         "script": "pragma cashscript >= 0.7.1;contract Perpetuity(int period,bytes recipientLockingBytecode,int ex
27         "parameters": [
28             4000,
29             "76a914ebdeb6430f3d16a9c6758d6c0d7a400c8e6bbe488ac",
30             executorFee,
31             decay
32     ]
```


Run the packages from a Browser

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When developing from a [jsfiddle](#) or codepen...

```
<!-- mainnet-js -->  
<head>  
  <script src="https://cdn.mainnet.cash/mainnet-2.2.5.js"  
    integrity="sha384-RrFMKtXQroWNZV6mP8XFAV2FOIFsEPSAfzd5e7V1H1qSnLg8ww02bkLb5URN0v+k"  
    crossorigin="anonymous"></script>  
</head>
```

Get the answer

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Using a plain text file and firefox

```
<!DOCTYPE html>
<html>
<head>
  <script src="https://cdn.mainnet.cash/mainnet-2.2.5.js"
    integrity="sha384-RrFMktXQroWNZV6mP8XFAV2FOIFsEP5Afzd5e7V1H1qSnLg8ww02bkLb5URN0v+k"
    crossorigin="anonymous"></script>
  <script src="https://cdn.mainnet.cash/contract/contract-2.2.5.js"
    integrity="sha384-0+mqQ/sJ3NSWb6rJWjknNirr8TvHU3dEJyHvHmmlZfNVytR32mGDZnh+2E1DQUcvc"
    crossorigin="anonymous"></script>
  <script>
script=`
pragma cashscript ^0.8.0;

contract LifeTheUniverseAndEverything() {
  function get_answer(int answer) {
    require(answer==42);
  }
}

document.addEventListener("DOMContentLoaded", async (event) => {
  globalThis.exports = globalThis.exports || {};
  Object.assign(globalThis, await __mainnetPromise);
  Object.assign(globalThis, await __contractPromise);

  let a = new Contract(script, []);
  console.log(await a.getDepositAddress());
  console.log(await a.getUtxos());
  console.log(await a.getBalance());
  //let getAnswer = a.getContractFunction("get_answer")
  //console.log(await getAnswer(42n).to("bitcoincash:qqad5sy4jml3f6vcpl246dulsem04wp48wq23d35rge", 1000n).send
));
</script>
</head>
<body>
</body>
</html>
```

Do you want to develop an app?

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we have the webapps...

- [Demo Folder](#).
 - libauth, and now mainnet-js are ESM modules.
 - Expect there to be a slight issue with top-level awaits.
 - Tree shaking is possible, but no on our end.
 - If you get a working configuration in the hip new web framework, consider a PR to the demo list.
-

Try a demo version of mainnet.cash REST

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from REST

Verify a signed message via REST

```
curl -X 'POST' \
  'https://rest-unstable.mainnet.cash/wallet/signed/verify' \
  -H 'accept: application/json' \
  -H 'Content-Type: application/json' \
  -d '{
    "walletId": "watch:mainnet:qqad5sy4jml3f6vcp246dulsex04xp48wq23d35rqe",
    "message": "2qx#72497 lucky_guava_52595 discord",
    "signature":
      "H+090z+9FFdaA9UCzTidbVh0CvWcrGduTRFCQnDifEKVRz3Fk1KFyZa88XSLmfGAVB/g1P80FRJqSatZtzo8h9I="
  }'
```

Starting your own mainnet.cash

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To start your own mainnet.cash REST service

```
# get the image from docker
docker pull mainnet/mainnet-rest

# start the image, with one process,
# exposing locally at 3000 to the container's port 80
# & pass it details of the regression configuration
docker run -d --name Mainnet --env WORKERS=1 \
  -p 127.0.0.1:3000:80 \
  --env-file .env.regtest \
  mainnet/mainnet-rest
```

Stopping your own mainnet.cash

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Just in case something goes wrong...

```
# checking logs, to find the issue  
docker logs -f Mainnet
```

```
# restarting, stopping, forcefully stopping.  
docker restart Mainnet  
docker stop Mainnet  
docker kill Mainnet
```

```
# if your machine is paging memory or sounds like a jet plane  
sudo killall node  
# kills all docker processes  
docker stop $(docker ps -a -q)
```

assuming your container was given the name "Mainnet".

More Usage Samples and Configuration Information

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- There's more at: mainnet.cash/tutorial/running-rest.html
 - Including a full list of [configuration variables](#).
 - This is an [unstable public instance](#) of the REST service for testing and educational purposes
-

Running a RegTest Stack

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The mainnet-js source code contains a full RegTest Stack, deployed with docker compose.

```
# To start a regtest stack,  
# from the mainnet-js source directory...  
yarn regtest:up
```

```
# reset everything  
yarn regtest:down; yarn regtest:up
```

There's more in the [docs](#).

Having your own private networks allow for better tests, testing in time, testing with a RegTest Bitcoin Cash chain.

Note: the docker images for the stack took about 6 min to download over wifi.

The RegTest Secrets

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One of the advantages of RegTest is reusing and sharing secrets

```
ADDRESS="bchreg:qpttdv3qg2usm4nm7talhxl105mlhms3ys43u76rn0"  
ADDRESS_TOKEN="bchreg:zpttdv3qg2usm4nm7talhxl105mlhms3ysjm0q59vu"  
ADDRESS_LEGACY="18uVyRcvE7RdR9WFLyD1kMPjehKxyE91in"  
PRIVATE_WIF="cNfsPtqN2bMRS7vH5qd8tR8GMvgXyL5BjnGAKgZ8DYEiCrCCQcP6"  
ALICE_ID="wif:regtest:cNfsPtqN2bMRS7vH5qd8tR8GMvgXyL5BjnGAKgZ8DYEiCrCCQcP6"  
BOB_ID="seed:regtest:divide battle bulb improve hockey favorite charge save merit fatal frog cag"
```

mainnet-js currently needs wasm

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Webassembly is currently a core requirement, given the state of libauth. This means the only environments where mainnet-js can't be used are places that can't satisfy that requirement.

- webassembly is **NOT** supported in React Native,
- ... because Google, Apple and Meta.
- Mainnet-js also won't work with [IE](#), [Opera Mini](#) or [KaiOS 2.5](#)

browser wallets

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Not every user has your browser.

- Be very careful expecting a user's browser to have persistent storage.
 - Consider the cross-browser experience, wallet recovery, potential loss of seed and funds if browser storage doesn't persist.
-

Where to get more information

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Where to get more information

- Javascript walk-thrus at for mainnet-js
- Correlate walk-thrus for the REST service
- Demo webapp configurations
- mainnet.cash Swagger REST interface
- Every feature should also have test coverage, if/when documentation is incomplete.
- If you graduate to libauth, remember the reference implementation.

Committed to Adoption

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Mainnet Cash is built to last, but...

- The project is in a **stable alpha**.
- libauth v2 is also (technically) in alpha.
- Currently in a **feature freeze**.
- Seeking **broad adoption**, and usage.
- An independent **security audit** needed before warnings are removed.

Committed to Adoption

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That said...

- mainnet.cash (REST API) handled roughly \$2.2T of transactions in 2021 as the BCH backend software for noise.cash.
- Used for early prototyping of [early hop.cash](#) and [selene.cash](#).
- Used by the [Cashonize](#) CashToken web wallet.
- Used extensively for regression testing of [unspent/*](#).
- Second library to market for CashTokens and first BCMR library to market (?).
- Mainnet.cash is almost three years old in javascript land.

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The Future

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Mainnet Cash was built to be maintained.

- Really conservative and maintenance oriented design choices from the start.
- Extensive investment in testing and a testing harness
- These values are also apparent in supporting libraries.
- Outlook
 - **@bitauth/libauth** has a nice upgrade in the works.

Contact

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- More documentation at mainnet.cash
- Please report [Bugs on Github](#).
- Join our [mainnet.cash Telegram Channel](#) for support.

Any Questions?

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