

chains WS

"blockchain.info API"

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ISHII 2bit

node.js digest
in a few minutes

what's node.js?

- Server side JavaScript runtime
 - uses V8 JavaScript engine
- Event driven
- Non-Blocking I/O
- Open source

what's node.js?

- Large ecosystem "npm"
- Strong ES6 compatibility
 - Current stable version: v8.9.4 (2018/01/19)
- Electron

npm

- Too many package on npm
- You can find on npmjs.com
- Easy to publish your package to world
- Possible to use github's repository directly as well
- Simple setup with ``$ npm install``

ES6

- Modern syntax of JavaScript
 - class syntax
 - arrow function (bind `this` when define)
 - simple variadic arguments
 - block scope variable: const, let
 - promise
 - etc, etc...

Electron

- Electron: (atom shell)
 - = chromium + node.js
 - Write app with html + css + node.js on browser
 - WebGL, WebAudio, WebSocket, Web...
- current version of "chains" is built on Electron

blockchain.info

blockchain.info

- Web service around Bitcoin
 - Bitcoin wallet
 - Bitcoin store
 - Bitcoin statistics
 - Blockchain explorer

API what we use

- WebSocket API
 - Unconfirmed Transaction
 - Block
- Public API (HTTP GET Request)
 - Ticker

Unconfirmed Transaction

- Receive from realtime WebSocket API
- Send packet over OSC
- transaction index is given on blockchain.info

```
{
  "lock_time": 0,
  "ver": 1,
  "size": 372,
  "inputs": [
    {
      "sequence": 4294967295,
      "prev_out": {
        "spent": true,
        "tx_index": 323858986,
        "type": 0,
        "addr": "1415PNbWigvedAubjN4Z37xkPCYViCM4Zy",
        "value": 828466,
        "n": 1,
        "script":
"76a91420ec09d2e44098939dba8843ba8a6d9994662fed88ac"
      },
      "script":
"483045022100e327dfb8ecedee784844c2d244d7a1dcc08ac4f20
d1de1e4a25cf09b294d72102207a04036725f81dcf54882e987a44
63f324b555468e927f58284b8b6bf594c4b90121023df3c1ed5bb3
67f45fe5ca6e73a8e48b5d94cb1ef7adc1f30569fbcfd126823a"
    },
    ...
  ],
  "time": 1516448926,
  "tx_index": 325603216,
```

```
  "vin_sz": 2,
  "hash":
"237453756af7f36a1507aab018d227afacd02d2ca227842e4d266c
35a455b911",
  "vout_sz": 2,
  "relayed_by": "127.0.0.1",
  "out": [
    {
      "spent": false,
      "tx_index": 325603216,
      "type": 0,
      "addr": "1Cj25JHXhfkZaJtSNvZoCeNL2iVZnGM5pg",
      "value": 548948,
      "n": 0,
      "script":
"76a914809bc02981e9937218099ab610ae3460ef433db488ac"
    },
    ...
  ]
}
```

Unconfirmed Transaction response

Data today we will use

- timestamp
- transaction index (is given on blockchain.info)
- sum of input values
- sum of output values
- size of transaction

Block

- Receive from realtime WebSocket API
- Send over ZeroMQ with json format string

Raw Block response

```
{
  "txIndexes": [
    273963000,
    273962177,
    ...,
    273820016
  ],
  "nTx": 1703,
  "totalBTCSent": 3515806519938,
  "estimatedBTCSent": 180594085224,
  "reward": 0,
  "size": 999113,
  "blockIndex": 1612709,
  "prevBlockIndex": 1612708,
  "height": 479899,
  "hash": "00000000000000000001bb7583189e7b2cc56cca9f23af1b884971e148fc981a1",
  "mrklRoot": "6fbbf8280268202dcd69f5e7658c3fa33de7f6cc6efe9faa3fd71d162128538",
  "version": 536870930,
  "time": 1502341865,
  "bits": 402731232,
  "nonce": 2316799973,
  "foundBy": {
    "description": "BW.COM",
    "ip": "0.0.0.0",
    "link": "https://bw.com/",
    "time": 1502341865
  }
}
```

Data today we use

- transaction indices (are given on blockchain.info)
- total BTC sent
- estimated BTC sent
- size
- block index (is given on blockchain.info)
- previous block index (is given on blockchain.info)

Data today we will use

- block height
- hash
- root of "merkle tree"
- timestamp
- bits
- nonce

Ticker

- Get data per 10sec with http/GET
- List of 1 BTC price for some currencies
- Update frequency is not frequent
- Send separated packet per currency over OSC

```
{
  "USD": {
    "15m": 12281.36,
    "last": 12281.36,
    "buy": 12285.02,
    "sell": 12277.7,
    "symbol": "$"
  },
  ...
  "JPY": {
    "15m": 1377838.69,
    "last": 1377838.69,
    "buy": 1378093.73,
    "sell": 1377583.65,
    "symbol": "¥"
  },
}
```

```
"KRW": {
  "15m": 13109737.73,
  "last": 13109737.73,
  "buy": 13113644.6,
  "sell": 13105830.87,
  "symbol": "₩"
},
...
"TWD": {
  "15m": 360519.32,
  "last": 360519.32,
  "buy": 360626.76,
  "sell": 360411.88,
  "symbol": "NT$"
}
}
```

Raw Ticker response

Data today we will use

- currency name
- lowest price to buy
- highest price to sell
- last trade price
- latest trade price on 15min ago