



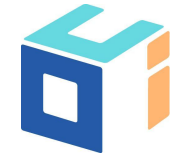
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Building Apps With EOS.IO

April 26, 2018

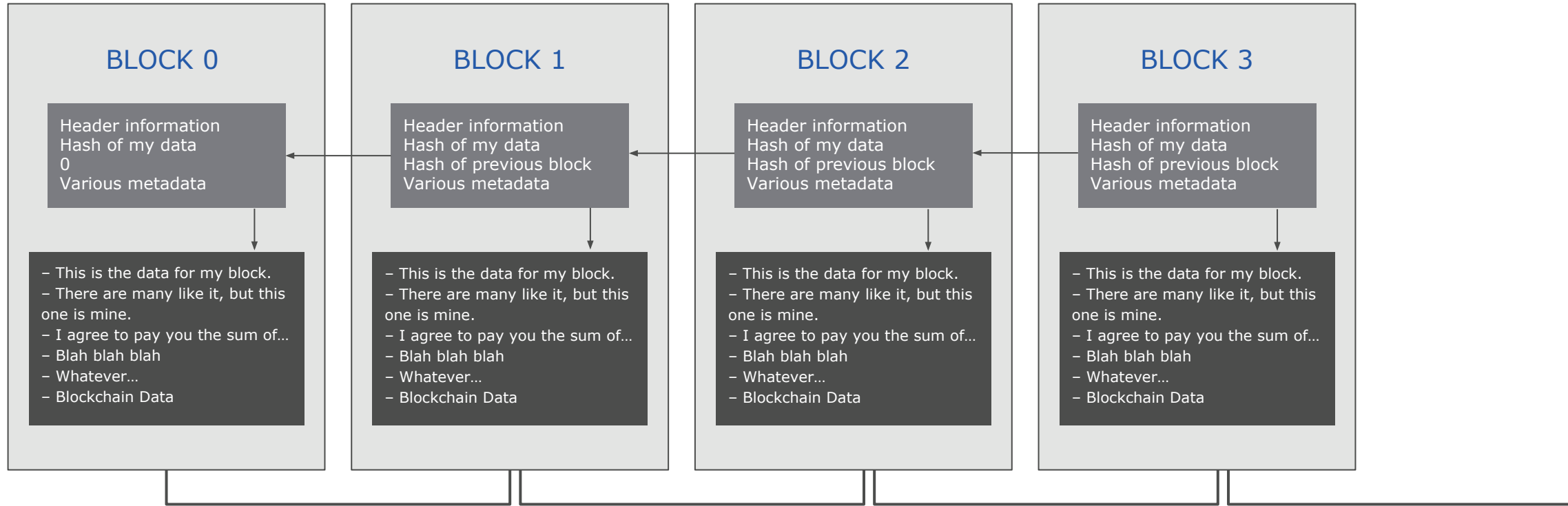
Complimentary Workshop

A CHAIN OF BLOCKS...



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BLOCK PRODUCTION



- Blocks contain transactions
- Transactions are records of individual actions
- Actions are the behavior of contracts

SMART CONTRACTS



- The business logic of decentralized apps
- Smart contracts are composed of actions and data definitions
- Invoking a smart contract action yields transactions to be archived in a block

USING SMART CONTRACTS



- EOS.IO contracts present an interface represented as an ABI
- Application code triggers a contract by supplying a JSON data structure via HTTP - think REST
- EOS.IO provides a command-line interface for testing or simple scripting of contracts

INTRO SMART CONTRACTS



- EOS.IO smart contracts execute as WebAssembly (WASM)
 - Emerging web standard
 - Currently generated from C/C++ using clang/llvm
 - Possible other languages in the future

INTRO SMART CONTRACTS



- **Transaction** - A collection of one or more Actions to execute
 - Any one Action fails the entire Transaction fails and is “rolled” back (not applied)
- **Action** - High level function to execute on the smart contract
 - Includes payload (struct) for sending data to the contract

Transaction

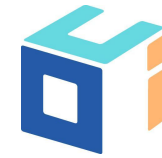


- Send Transaction to nodeos using cleos

```
./cleos --wallet-port 8899 create account --json  
--dont-broadcast eosio workshop
```

```
EOS7DuJuKUhtFyohXAijUGr9EeW1T5kSeshT4gLKa6WCwfMkWJ4zv  
EOS7DuJuKUhtFyohXAijUGr9EeW1T5kSeshT4gLKa6WCwfMkWJ4zv
```





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Transaction JSON

```
{ "expiration": "2018-04-21T21:38:53",  
  "region": 0,  
  "ref_block_num": 7864,  
  "ref_block_prefix": 2825010178,  
  "max_net_usage_words": 0,  
  "max_kcpu_usage": 0,  
  "delay_sec": 0,  
  "context_free_actions": [],  
  "actions": [ ... (next slide) ],  
  "signatures": [ "EOSJzL ... zdu" ],  
  "context_free_data": [] }
```

Action JSON



```
"actions": [{
  "account": "eosio",
  "name": "newaccount",
  "authorization": [{
    "actor": "eosio",
    "permission": "active"
  }
],
  "Data": "0000000000ea305500 ... 000a8ed32320100"
}
```

START NODEOS - EOS.IO Production Node



- From fresh checkout and build
 - cd programs/nodeos
 - ./nodeos --config-dir config --data-dir data
 - Creates config/config.ini file
 - Edit config/config.ini file
 - Add: **producer-name = eosio**
 - Add: **plugin = eosio::chain_api_plugin**
 - ./nodeos --data-dir data --config-dir config --plugin eosio::chain_api_plugin --enable-stale-production --producer-name eosio

START KEOSD - EOS.IO Wallet



- From fresh checkout and build
 - `cd programs/keosd`
 - `mkdir data`
 - `./keosd --http-server-address localhost:8899 --data-dir data`
 - Does not currently create data-dir

CLEOS - EOS.IO Command Line Tool



- Setup keosd via cleos
 - cd programs/cleos
 - ./cleos --wallet-port 8899 wallet create
 - Now automatically imports eosio private key
 - Echos a password needed to unlock wallet in future

EOS.IO Contracts






- ../contracts - EOS.IO example contracts
- ../contracts/eosiolib - EOS.IO provided libraries
- ../contracts/eosiolib/contract.hpp - Base type use with EOSIO_ABI macro
- ../contracts/eosiolib/eosio.hpp - Includes a number of common includes
 - types, action, print, math, multi_index, etc.
- ../contracts/libc++/* - C++ stdlib and STL
 - algorithm ... vector



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CONNECT WITH US

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REFERENCES



- [Eos.io](https://eos.io) – the main project website
- <https://github.com/EOSIO/eos> – the source code & wiki docs
 - Branch april-26-workshop for example code

