

Dapp Frameworks

The Ethereum-like Blockchain App Development Landscape

Chris Hitchcott
22nd February 2015

Follow the code at df.hitchcott.com

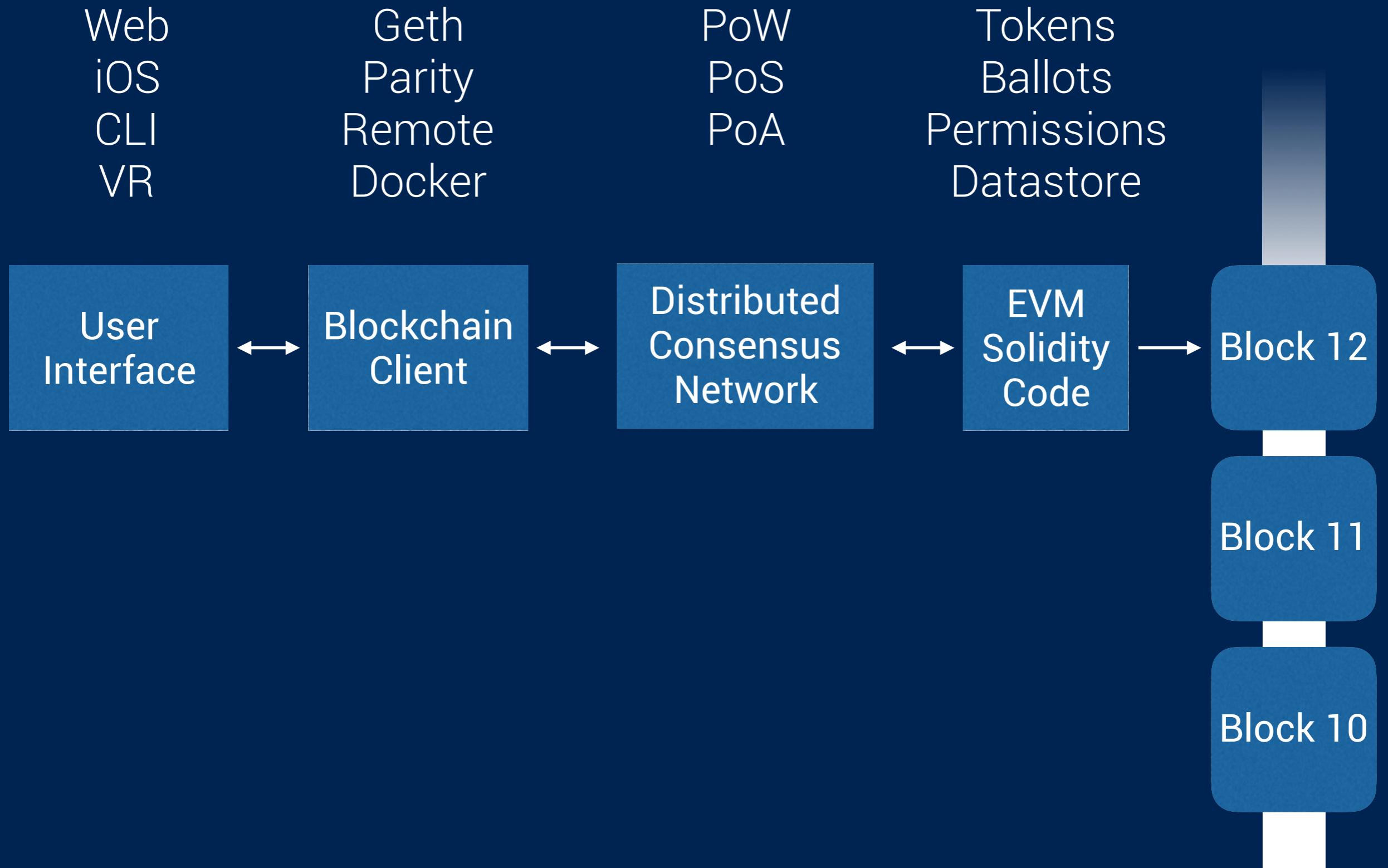
Hi

- My name is Chris
- I work at Ethcore
- I'm a Web Developer turned Ethereum Zealot

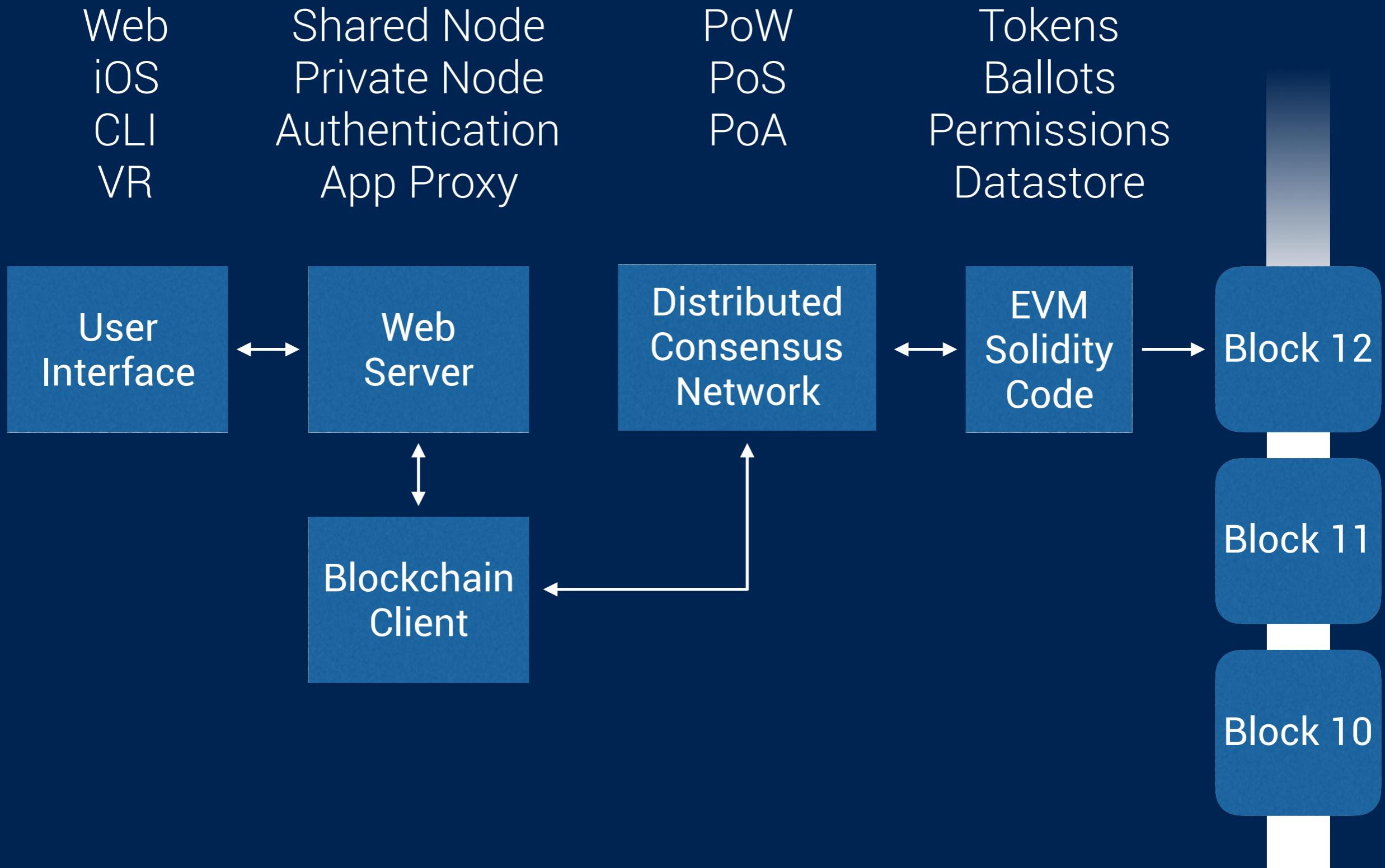
Agenda

- Quick overview of Dapp Development
- Intro and Demo the Frameworks
- Comparisons and Recommendations

Anatomy of a basic Decentralised Application



Anatomy of a basic Decentralised Application



What can a Dapp do?

What can a Dapp do?

Wallet

What can a Dapp do?

Voting Protocol

What can a Dapp do?

Virtual Casino

What can a Dapp do?

Asset Tracker

What can a Dapp do?

Insurance Market

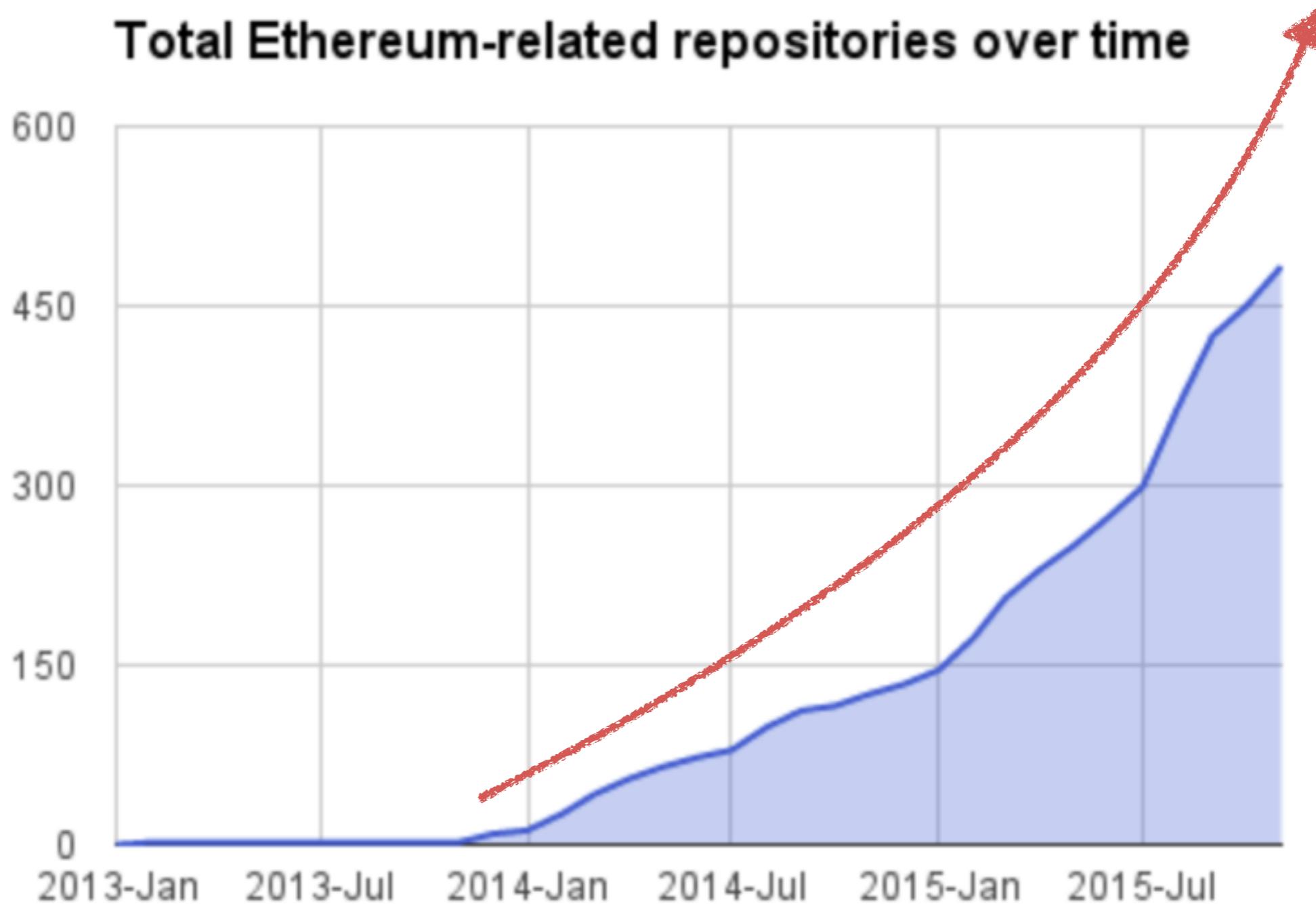
What can a Dapp do?

Currency Exchange

What can a Dapp do?

Prediction Market

Total Ethereum-related repositories over time



Framework Features

- Build Pipeline with Contract Deployment Manager
- Contract Management
- Chain Provisioning and Chain Hosting
- More to come in the future

dc59dd05...: 175.41 ether [5]

Owned Accounts



To

From

TTL

5 seconds

Work to Prove

50 ms

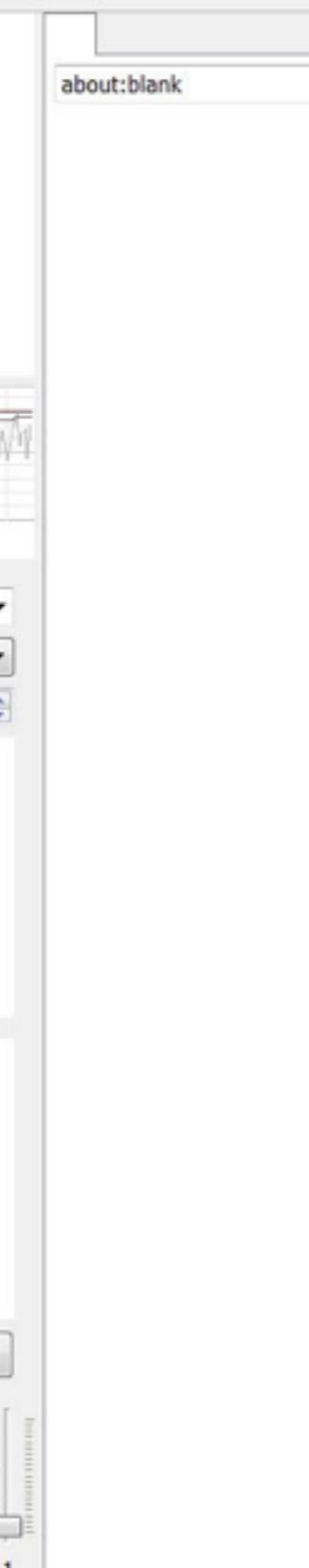
Topic

Data

Post

```
*N* [ 17:00:32 | main ] IP Address: 192.168.0.195 = [LOCAL]
*N* [ 17:00:32 | main ] IP Address: 192.168.56.1 = [LOCAL]
*N* [ 17:00:32 | main ] Id: 71fd2aea45081a64e37da6b76962edf6598adbb166c
*** [ 17:00:33 | main ] Opened blockchain DB. Latest: f7bc2f8633ceceb3b30c
*** [ 17:00:33 | main ] Opened state DB
```

JavaScrpt



Accounts

Filter...

#115 67ab7b5b...

dc59dd05... *> d372e371...: 0 wei

#114 9e7905de...

#113 03b084a6...

dc59dd05... +> d372e371...: 0 wei

#112 125dcafb...

#111 fe9cea81...

d372e371...: 0 wei [0]

@0x506543316c6448f6fa2ac869c12af901c8693fb84b49eb29a3f654aa6e14bcdd500 (0x1f4)

@0x84816e156f60d81b4b394b8901d4d6b7cd3c6898b946b081497e46889bd77d549500 (0x251c)

Body Code (bc2adcc8...)

Contracts

Pending

BlockchainDB

Nodes

Active Whispers

No Framework

A Bare Minimum Dapp

No Framework

One no-frills approach from the eyes of a Web Developer

- Whatever IDE
Sublime, Atom, Vim, Emacs, Mix, Notepad
- RPC-Enabled Ethereum Client
Let's use geth
- One library: web3.js
- In-browser compile and deployment
- End users deal with their own client
- Simple client-only web app no application server logic
- Hosting up to you S3, GitHub, IPFS, TOR, Smoke Signal, etc.

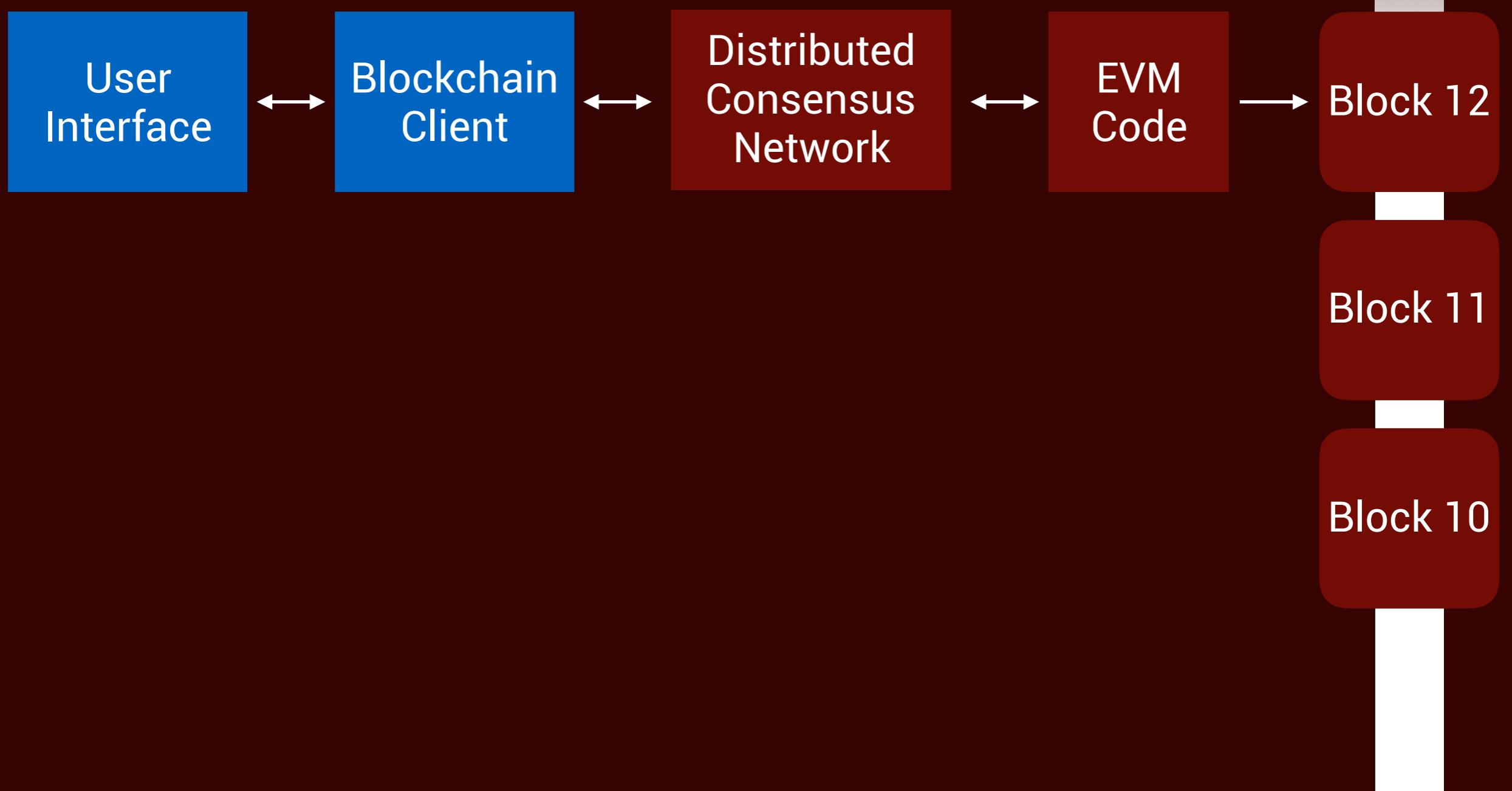
No Framework Demo

A note about Contract Deployment

- Pre-deployed public-use contracts
- Deploy once before release
- User-deployed
- Complex to interplay

So why do we need a framework?

- Pre-Configuration
- Automation
- Opinionation
- Simplified Complexity
- Standardisation
- In other words better and faster development





Embark

[iurimatias/embark-framework](#)
188 Stars : 15 Contributors

MIT : Node JavaScript

Latest : 1.0.2 : 13/09/15
First : 0.1.0 : 25/05/15

Embark is a framework that allows you to easily develop and deploy DApps

Embark

The original fully featured beast of late 2015 dapp development

- Blockchain Manager
geth only
- Clever Minining Script
- Deployment Manager
- Simulator (Limited)
- IPFS Deploy
- Solidity and Serpent
- Customisable Grunt Pipeline
- JS Test Runner using Simulator
- Web Server
- File Watcher
- Live Reload

Embark Demo

Quick Tip

```
~/.embark-blockchain
```

```
alias geth-test
```



Truffle

ConsenSys/truffle

130 Stars : 10 Contributors

MIT : Node JavaScript

Latest : 0.3.1 : 08/01/16

First : 0.0.11 : 24/07/15

Truffle is a development environment, testing framework and asset pipeline for Ethereum, aiming to make life as an Ethereum developer easier.

Truffle

The Slick and Clean Deploying Machine

- No Blockchain Manager
- Proprietary (but extensible) pipeline
 - JavaScript Testing
 - Web Server
 - File Watcher
- Pudding
- Multi Environment App Builds

```
meta.getBalance.call(account_one).then(function(balance) {  
    account_one_starting_balance = balance.toNumber();  
    return meta.getBalance.call(account_two);  
}).then(function(balance) {  
    account_two_starting_balance = balance.toNumber();  
    return meta.sendCoin(account_two, amount, {from: account_one});  
}).then(function() {  
    return meta.getBalance.call(account_one);  
}).then(function(balance) {  
    account_one_ending_balance = balance.toNumber();  
    return meta.getBalance.call(account_two);  
}).then(function(balance) {  
    account_two_ending_balance = balance.toNumber();
```



Populus

[pipermerriam/populus](#)
19 Stars : 3 Contributors

MIT : Python

Latest : 0.7.2 : 01/01/16
First : 0.1.2 : 19/08/15

Populus is a framework for developing applications for Ethereum

Populus

If you only know Python, give it a bash

- Python-Centric
- Python RPC Client
- Python Test Framework + Fixtures
- `populus attach` gives you a python REPL with contract interaction
- Blockchain Manager, but no Clever Mining
- Web Server, File Watcher



Meteor-Embark

[hitchcott/meteor-embark](#)
19 Stars : 1 Contributor

MIT : Meteor CoffeeScript

Latest : 0.6.4 : 01/03/16
First : 0.5.0 : 06/09/15

*Streamlined Ethereum
Integration for Meteor*

Meteor Embark

Zero Config Dapp Development, the Meteor Way

- So easy my Nan could use it
`meteor add hitchcott:embark`
- Development Only
- Access to the Meteor Ecosystem
 - Community Build Plugins
 - Server and Client
 - TODO: `implement EVM simulator`
 - Official Ethereum Packages
`ethereum:dapp-styles, :accounts, :elements, :blocks, :tools`

Mist

GO TO NEW APP

WALLET DAPP ethereum-dapp-wallet.meteor.com

ETHEREUM

BALANCE 348,000.00 finney

RECEIVE SEND

Wallet Dapp 348,000.00 finney

Miner Mining @ 0/Khash

Send money

FROM You

TO 0x000000..

Choose from which wallet and to where it will go.
Addresses can be picked up by using the clipboard, the camera, clicking a link or searching visible devices in the vicinity.

DEBUG

New Transaction

Whisper Chat Dapp

Howdenshire - Wikip...

Block Chain

AMOUNT 0.0 finney

Currency in the ethereum network is transmitted using the equivalent in Ether, the internal unit of value.

Pending Transactions

You want to send 0 finney.

Debug Info

CHOOSE A FEE

This is the most amount of money that might be used to

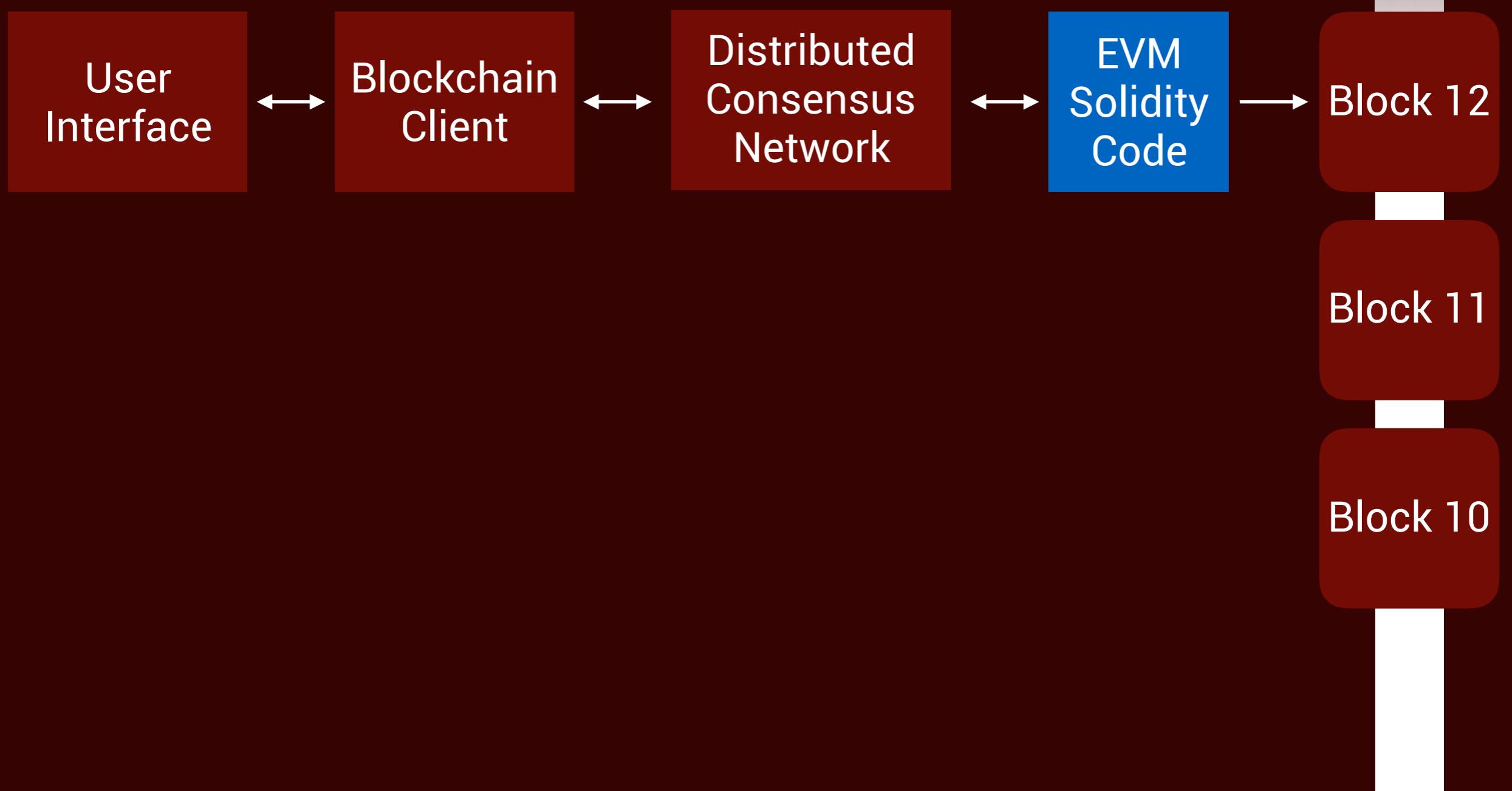
meteor-build-client

Meteor Embark

Check out what we don't need to think about anymore

- Blockchain Manager
- Deployment Manager
- Clever Minining Script
- Simulator (Limited)
- ~~IPFS Deploy~~
- Solidity and Serpent
- ~~Customisable Grunt Pipeline~~
- ~~JS Test Runner~~
- ~~Web Server~~
- ~~File Watcher~~
- ~~Live Reload~~

Meteor Embark Demo



Dapple & Dappsys

[nexusdev/dapple](#)

23 Stars : 7 Contributors

JavaScript, Python, Solidity

Latest : 0.2.1 : 16/02/16

First : 0.1-rc : 11/10/15



NEXUS

Dapple is a tool for Solidity developers to help build and manage complex contract systems on Ethereum-like blockchains.

Dapple

The Future of Smart Contract Package Management

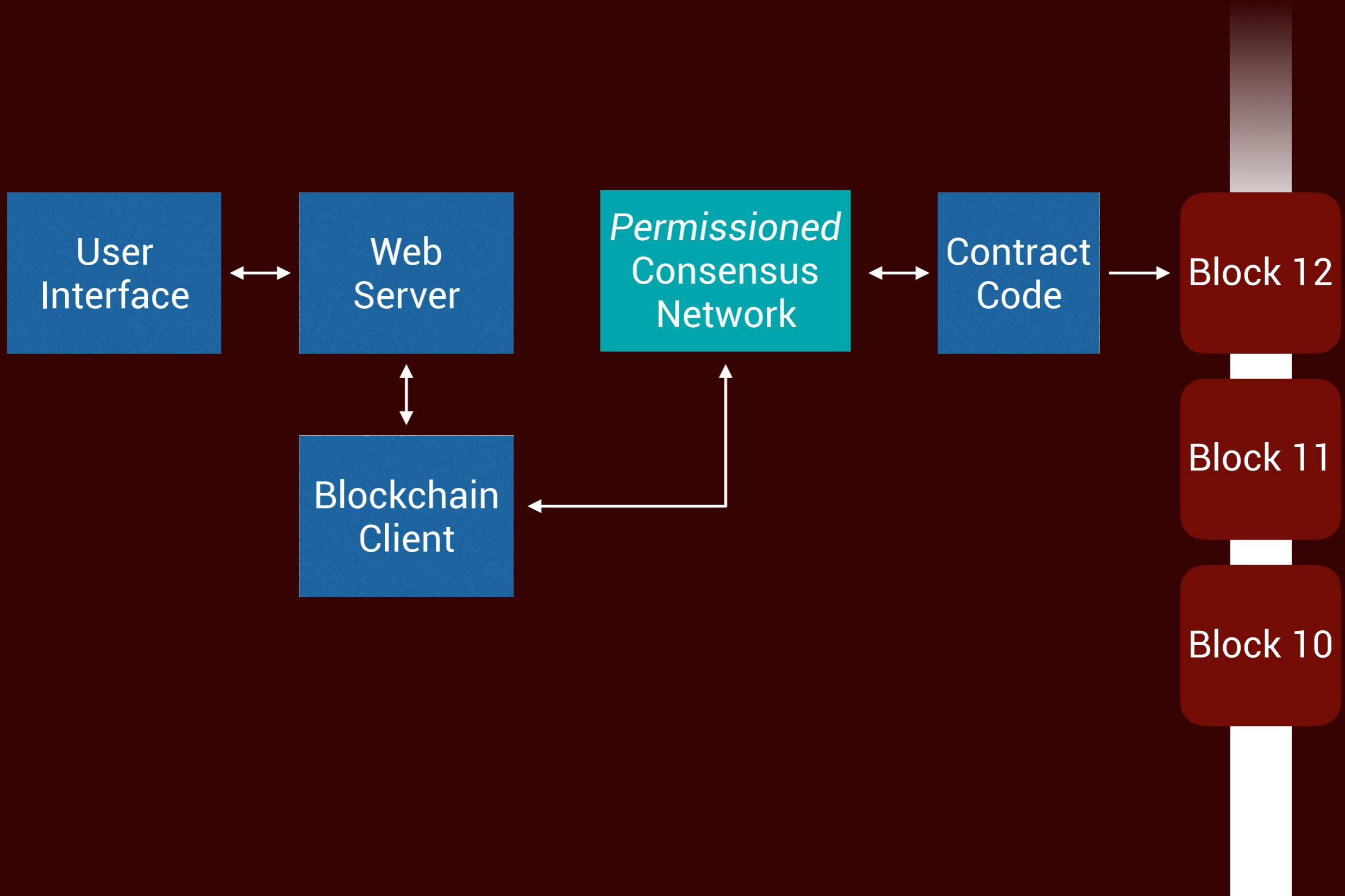
- Created by NexusDev
MakerDAO
- Tests *within* EVM using actual contracts
Deeper, client-agnostic
- Package Registry (decentralised npm)
- `dapple install amazon/droneFleet`
- Basically no docs at the moment

Dappsys

A Growing Collection of Reusable Contracts

- Authorization Patterns
- Data Stores
- Standardized Tokens
- Test Fixtures & Assertion Contracts
- `~/.dapplerc`

Dapple Demo



Hosted Node

- Frictionless at the point of use
- Slow Hardware / IoT Friendly
- Extra Latency
- More Expensive
- Centralized (but that might not matter)

Permissioned Chains

- A lot more control
- A lot more efficient (PoA)
- Not really decentralised
- Some say 'as useful as a non regular database'



Eris

[eris-ltd/eris-cli](#)

49 Stars : 9 Contributors

GPL3 : GoLang, Docker

Latest : 0.11.2 : 12/02/16

Eris is a platform for building, testing, maintaining, and operating distributed applications with a blockchain backend. Eris makes it easy and simple to wrangle the dragons of smart contract blockchains.

Eris

- Tendermint,
Ethereum,
Bitcoin
- Good tooling for setting
up custom permissions
- Package Manager
'Jobs' Concept
- Tendermint (PoS),
Ethereum, Bitcoin
- Docker
- Assert Job (YAML based
testing)
- `eris-contracts` not
Web3
- Excellent docs
- Relatively complicated
setup



Blockapps

[blockapps/bloc](#)
37 Stars : 8 Contributors

JavaScript, Haskell

Latest : 0.? : 20/02/16

BlockApps STRATO is a scalable Ethereum compliant platform for rapid development, deployment and management of enterprise blockchain applications. Our platform enables enterprises to develop early Proof of Concepts (PoCs) and scales all the way to full production systems.

Blockapps

- Easy to get going with `bloc`, free test server with faucet
- Don't need to install / configure a local client
- Gulp Pipeline
- Custom Web3 Library
- MultiTX Trick
- STRATO & EthereumH
- Docs aren't great, but they released a new site TODAY

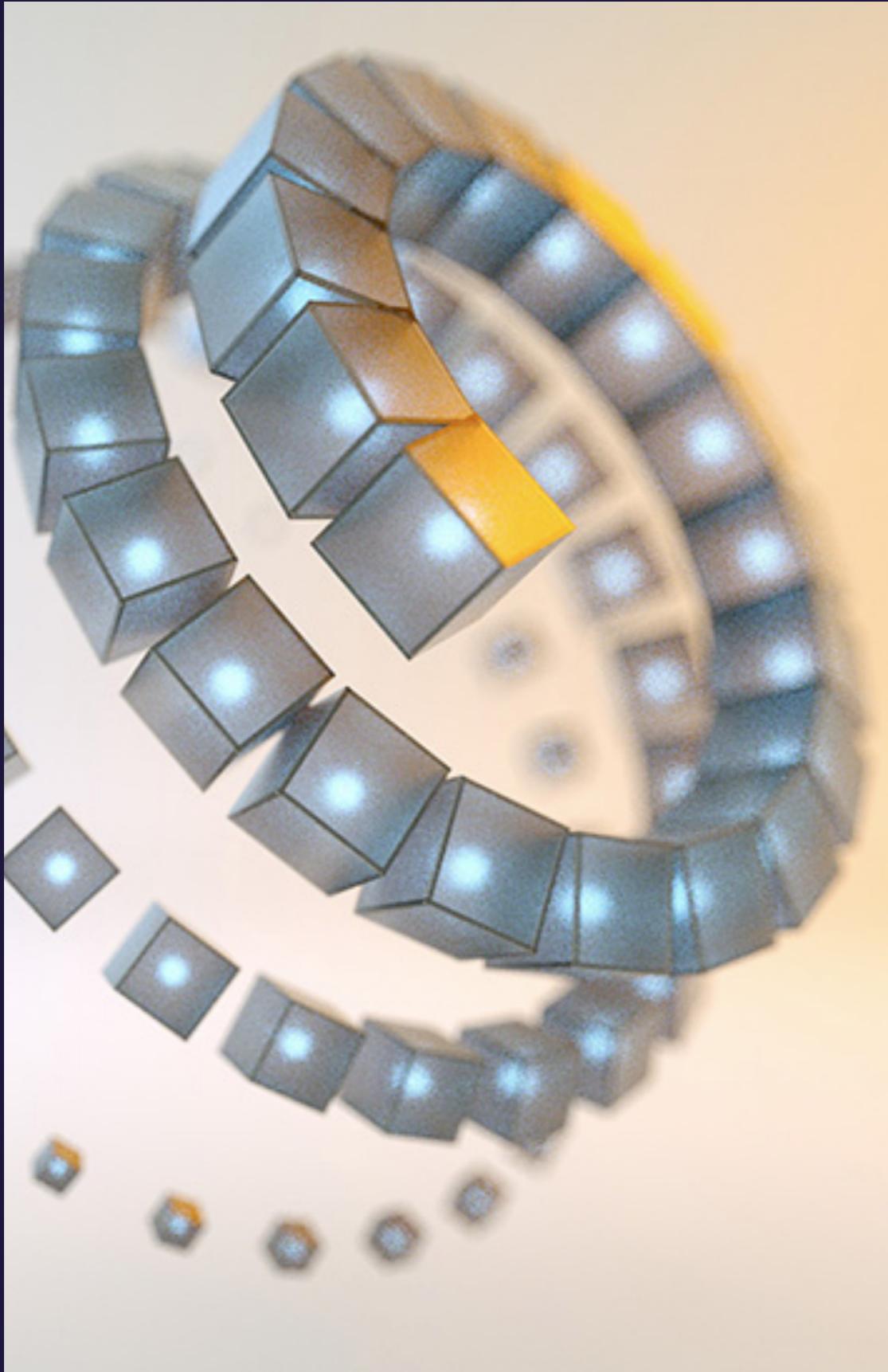
**NEW CHALLENGER
APPROACHING!**

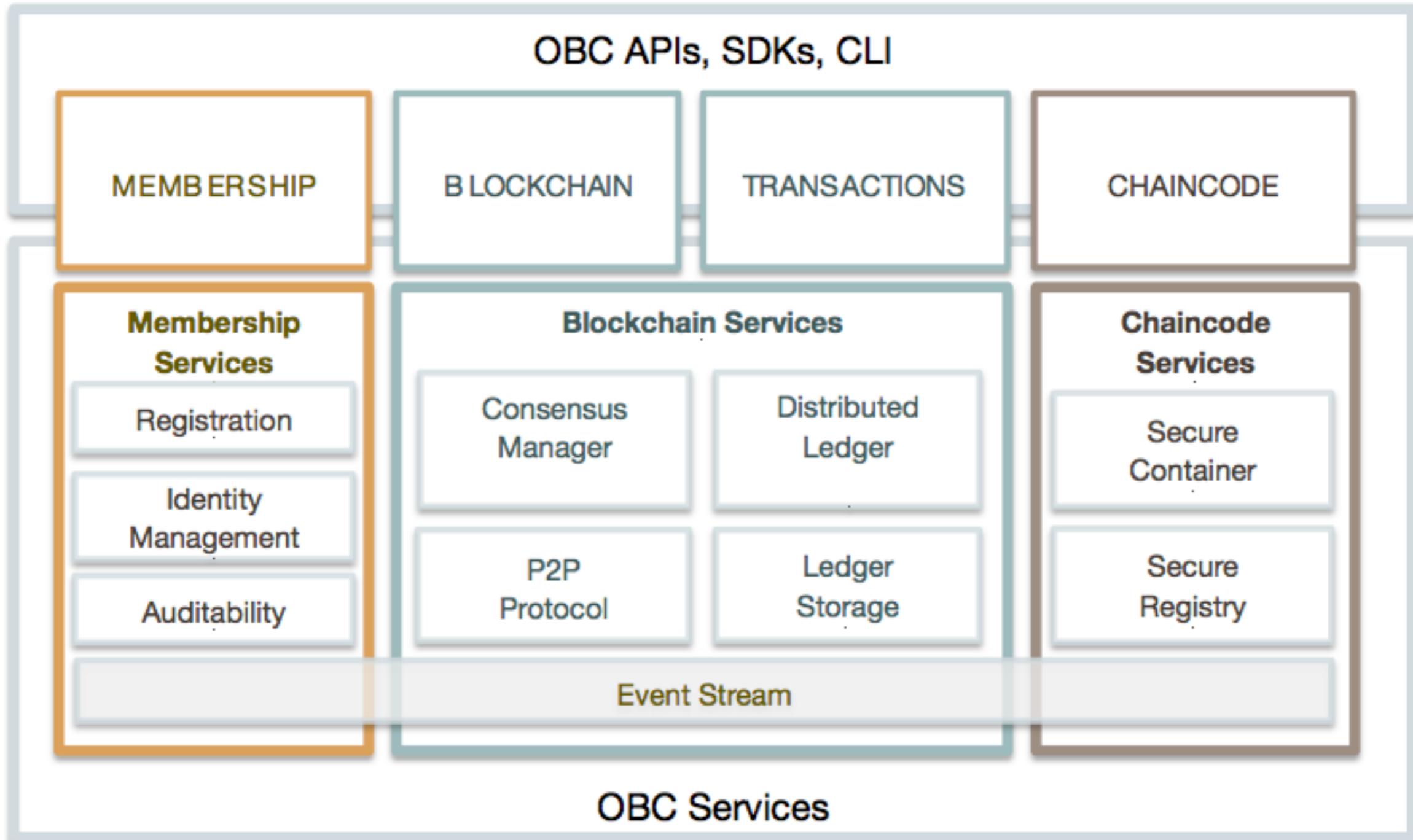
IBM Blockchain

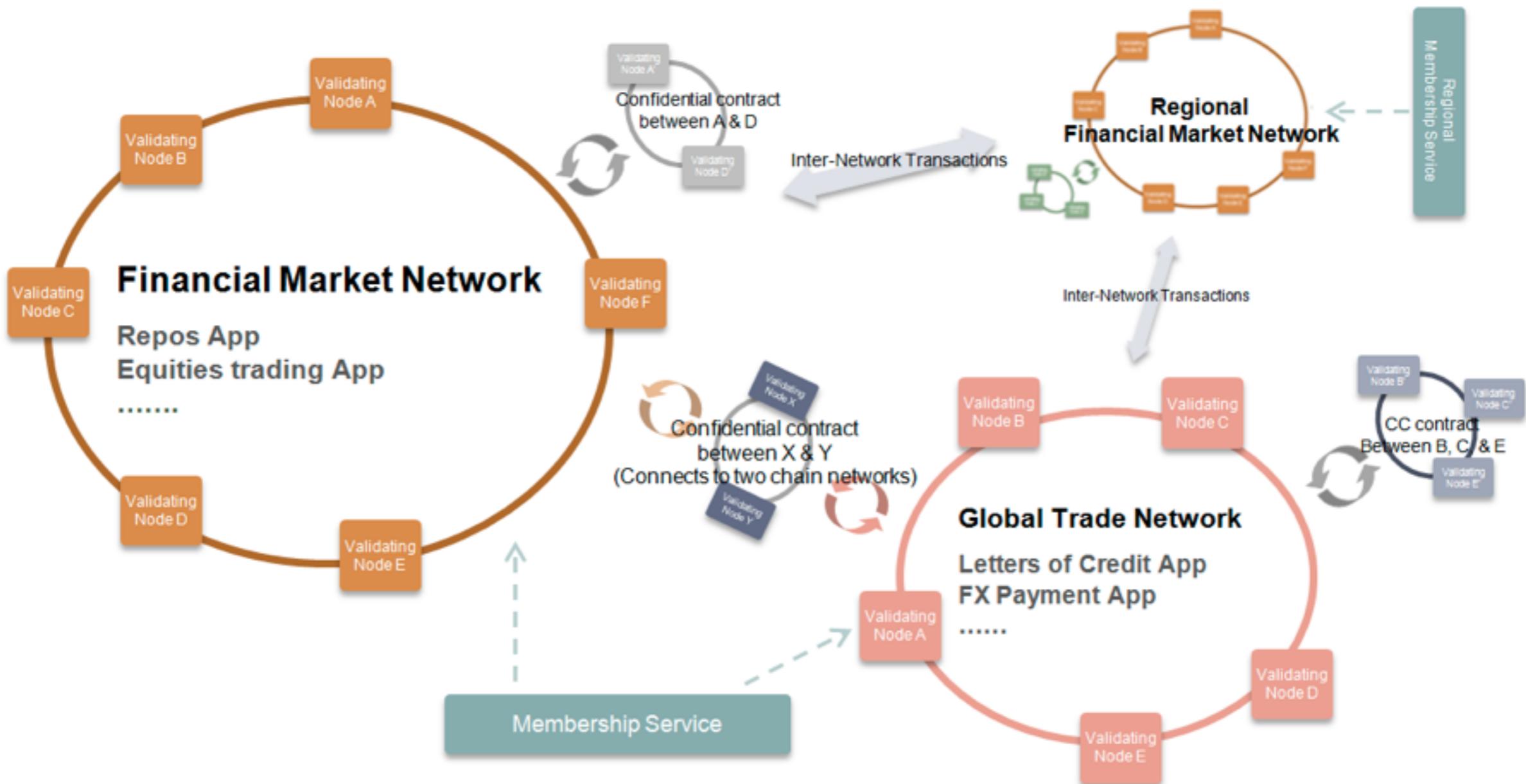
[openblockchain/obc-peer](#)
351 Stars : 20 Contributors

Latest : 0.1.0 : 15/02/16

*The openblockchain project
is IBM's proposed
contribution to the Linux
Foundation's Hyperledger
project.*







“A world of many blockchains”

IBM's openblockchain

- Permissioned
- Container-based
- Uses Golang for Contracts ('Chaincode')
- One Click Deploy with Git Integration (\$)

Deploy this application to Bluemix

Deploying this app will create a private DevOps Services project for you. [Learn more.](#)



MARBLES

GIT URL: <https://github.com/ibm-blockchain/marbles.git>

GIT BRANCH: master



Creating project...

Cloning repository...

Configuring pipeline...

Deploying to Bluemix...

Summary Chart

Embark New to Ethereum Web Developer

Truffle Ethereum Savvy Web Developer

Populus Mostly comfortable with Python

Meteor Embark Familiar with Meteor or new to Web Development

Dapple Solidity Samurai

Eris Corporate In-House Blockchain System

Blockapps Frictionless Ethereum Blockchain as a Service

IBM OBS Bleeding Edge Corporate Consortiums

Future

- If you thought JavaScript fatigue was bad...
- Increasingly Healthy Ecosystem
- New App Architectures
- Cached Blockchain Databases
- Visualisation Tools
- Solidity sugar, DSL, text editor plugins
- More deployment options

Quick shout-out



to some Crypto-Allies

Thanks!

