



HYPERLEDGER

BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

Project Overview

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Presentation Structure

- Problems with the Bitcoin Blockchain
- On Hyperledger
- What is “*Blockchain*”?
- Dev Landscape



Problems with the Bitcoin Blockchain



S. Matthew English



S. Matthew English is a research scientist specializing in blockchain technologies and linked open data. Matthew holds a BA in Political Science from New York University (NYU), and MSc in Computer Science from the University of Hong Kong (HKU), and is currently pursuing a PhD from the Rheinische Friedrich-Wilhelms-Universität Bonn in Germany.



by S. Matthew English

DEC 05, 2016

Smart Money, Dumb Contracts: How Fat Cats Can Eat Blind Mice



HYPERLEDGER PROJECT

Transactions (Oldest First)

Filter

9b88131c02bea9444e05ecdd581101dee14154a1198bb4ad94616c453e675c65		2016-12-12 17:23:20
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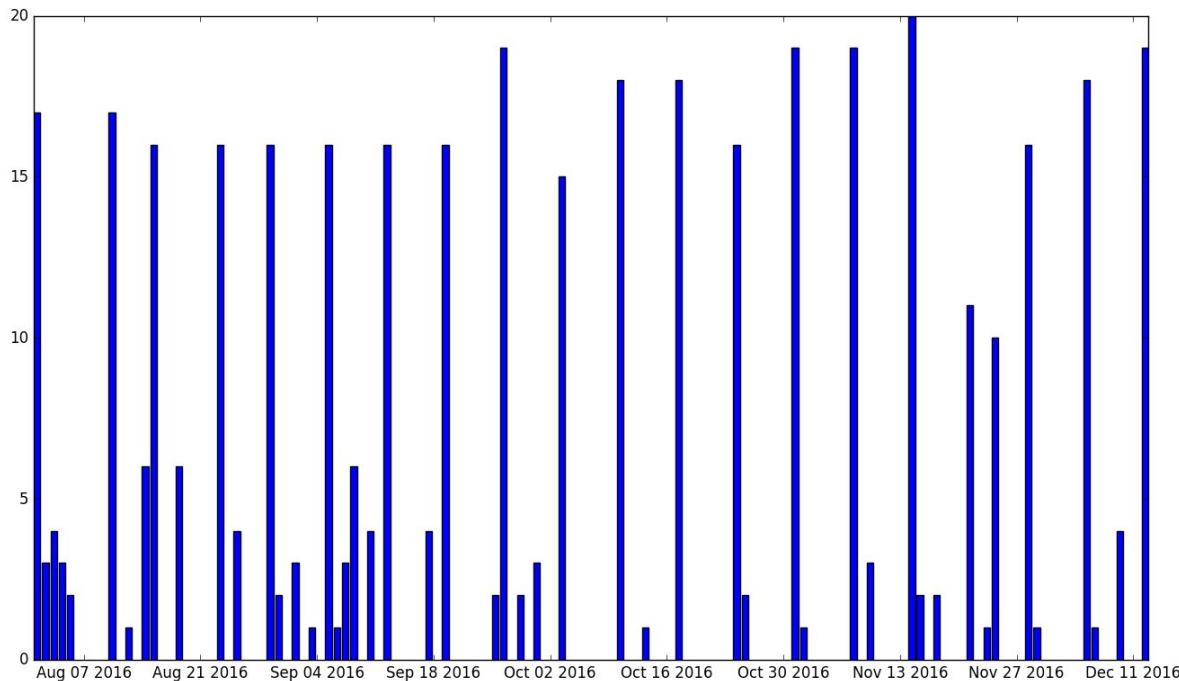
Transactions (Oldest First)

▼ Filter ▾

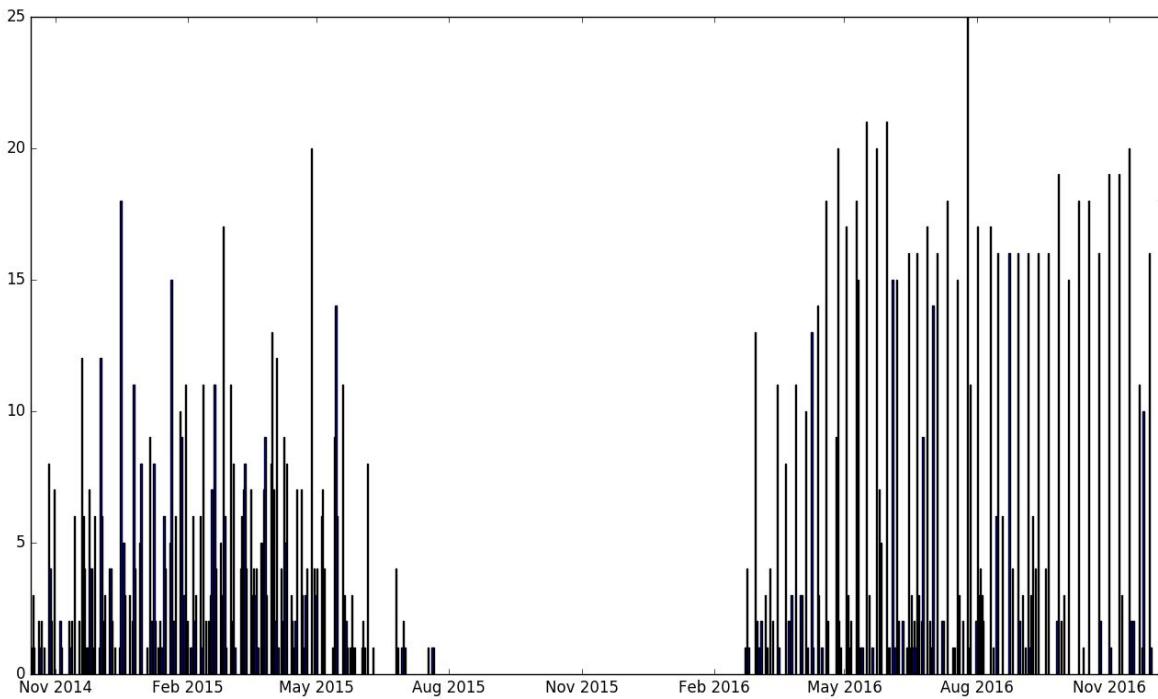
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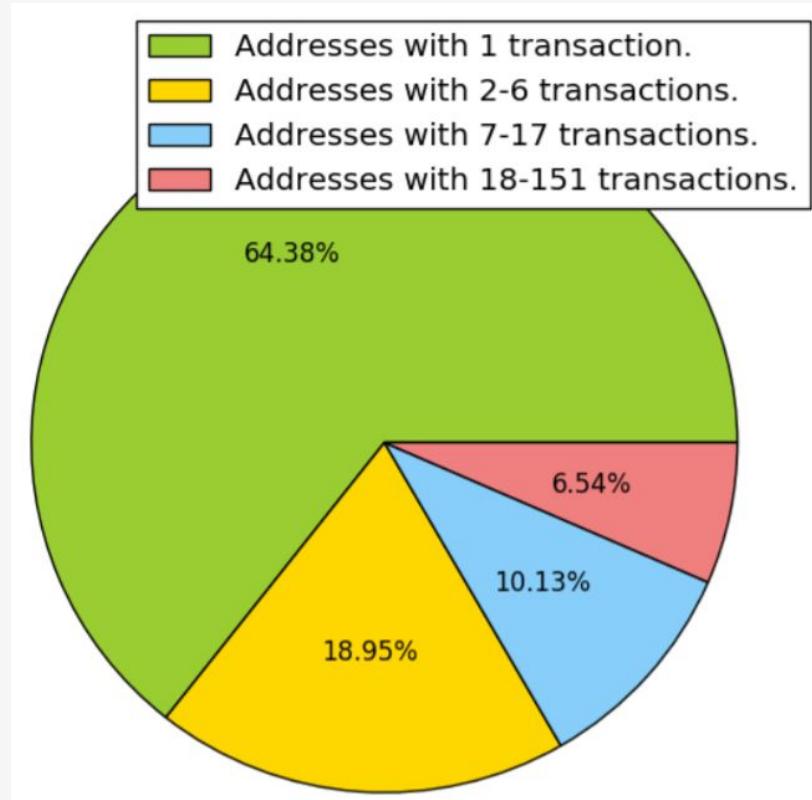
Periodicity of Payments



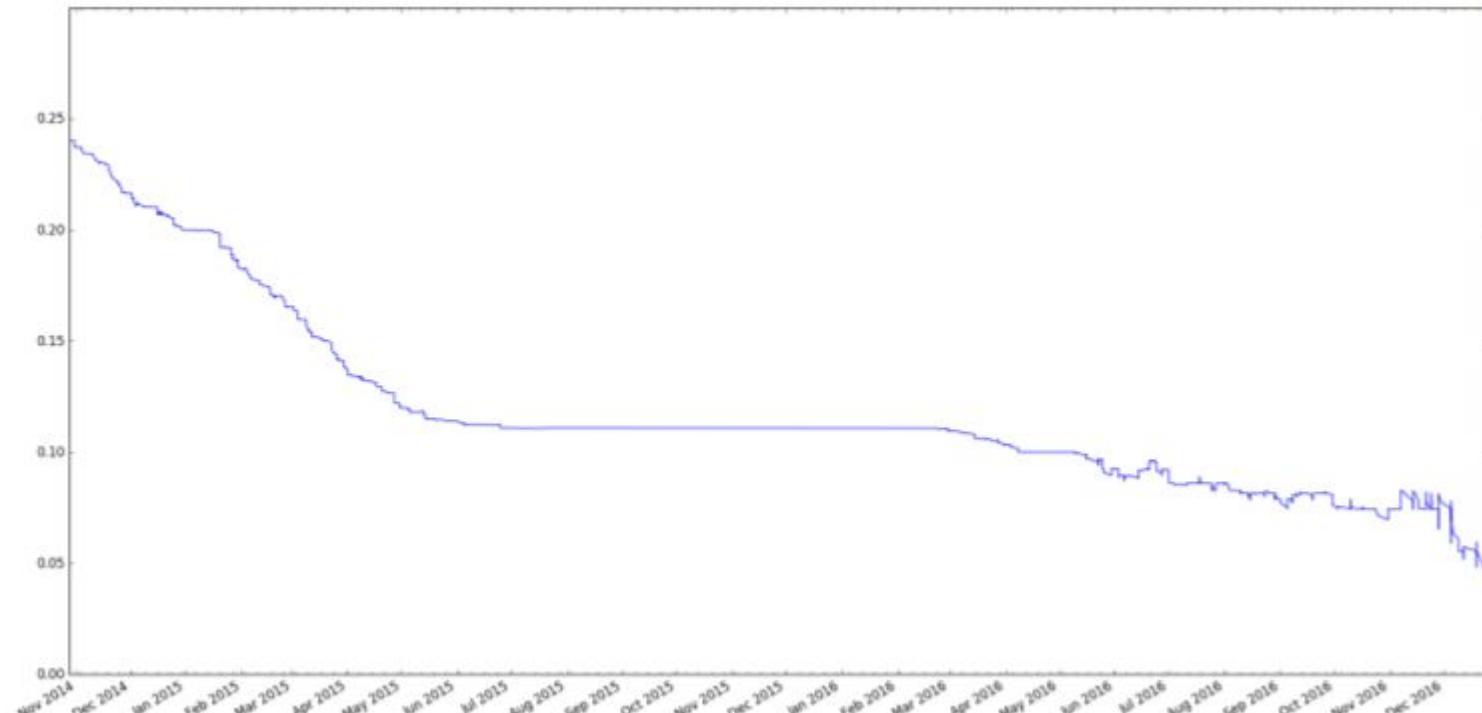
Periodicity of Payments (Lifetime)



Security Best Practices



Payments Track USD





A new kind of hedge fund built by a network of data scientists.

[Learn more](#)

NEW DATASET IN 1D 5H 17M 08S

33,064,136,730 PRICE PREDICTIONS

ANNUAL RATE

CAREER EARNINGS

LOGLOSS

META MODEL RANK

\$54,000.00

 AFRODITA

\$22,704.00

 ATENEA

\$12,650.00

 EUPHIA

\$0.00

00000

1

\$0.00

0.006

2

\$0.00

0.070

3



On Hyperledger



Introducing Hyperledger

Open source collaborative effort to advance cross-industry **blockchain technologies.**

Hosted by
The Linux Foundation.

Global collaboration spanning finance, banking, IoT, supply chains, manufacturing and technology.



Standardization





CLOUD **FOUNDRY**



HYPERLEDGER PROJECT

Hyperledger By The Numbers

95

Members

100+

Contributors

6

Projects

5X

More requests than
next largest in LF
history

6

Hackfests

8

Community Working
Groups

<\$6M

Membership
Investment



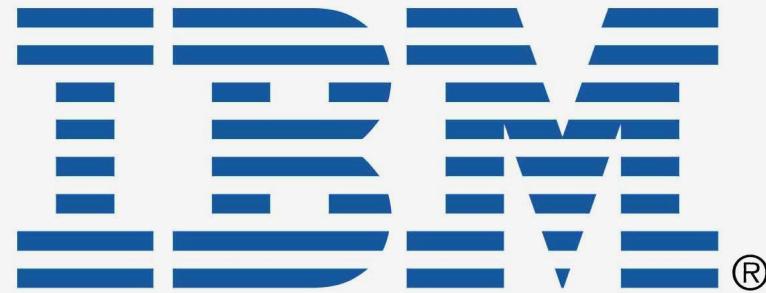
Brian Behlendorf, Executive Director

Behlendorf was a primary developer of the *Apache Web server*, the most popular web server software on the Internet, and a founding member of the Apache Software Foundation.



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Hyperledger Goals

Create an enterprise grade, open source distributed ledger framework and code base, upon which users can build and run robust, industry-specific applications, platforms and hardware systems to support business transactions.

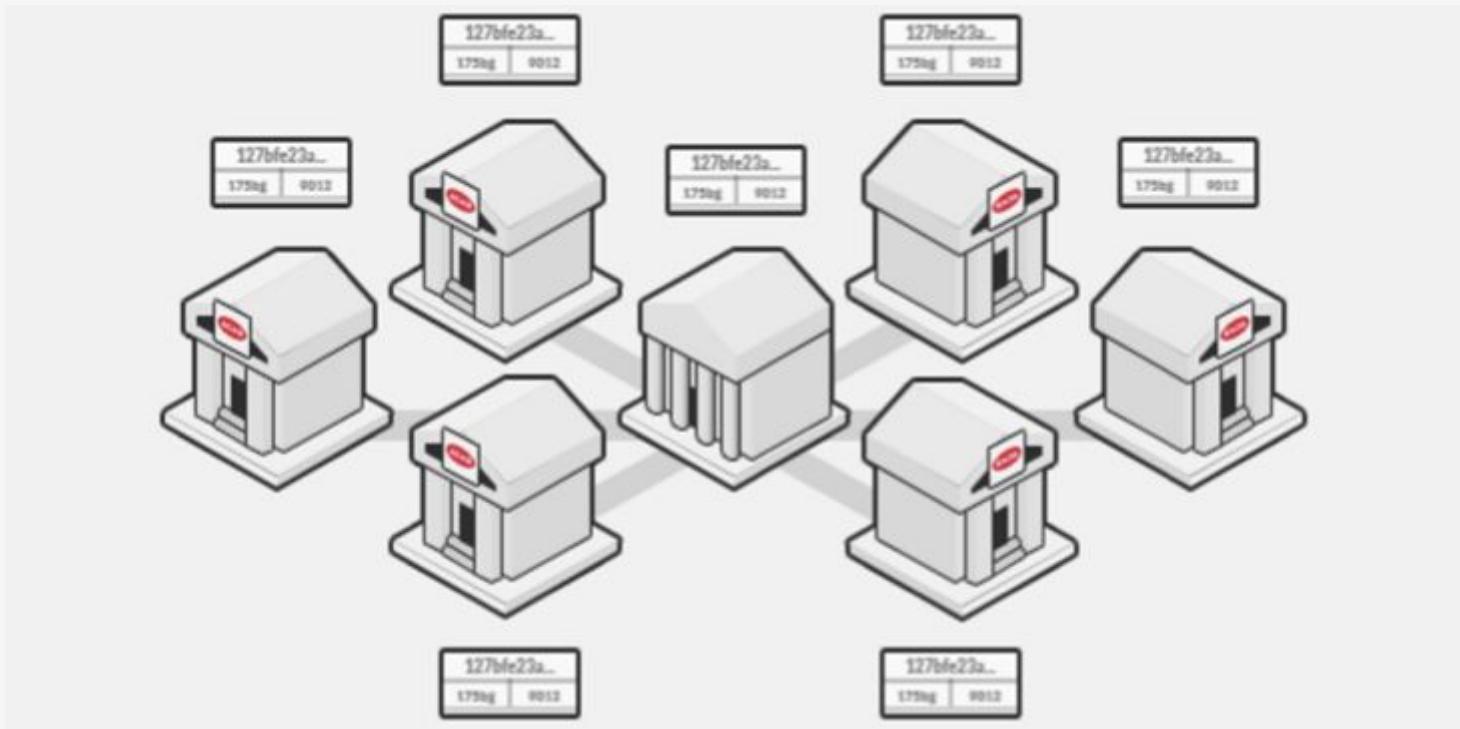
Build an open source, technical community to benefit the ecosystem of Hyperledger solution providers and users, focused on blockchain and shared ledger use cases that will work across a variety of industry solutions.

Promote participation of leading members of the ecosystem, including developers, service and solution providers and end users.

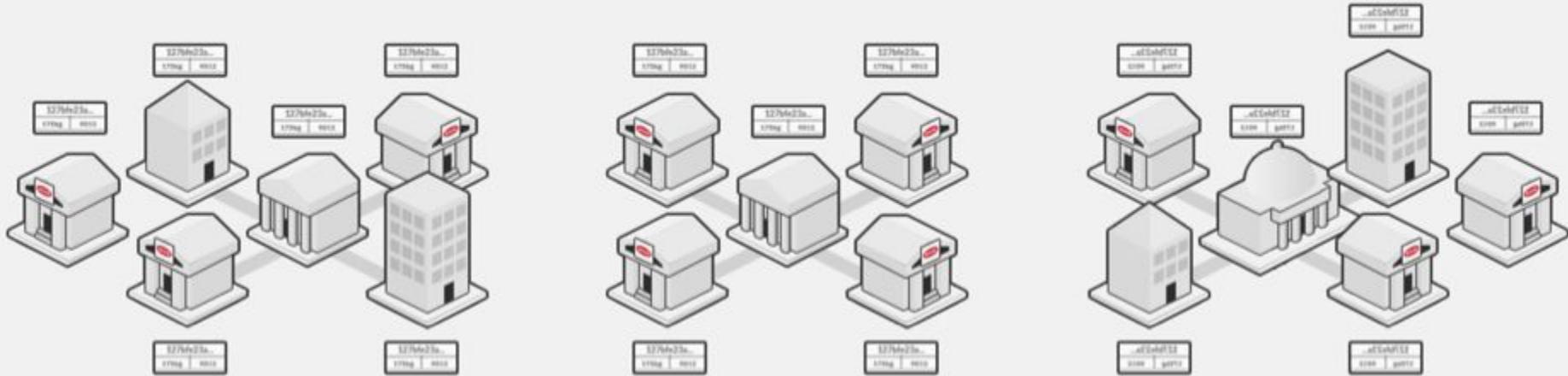
Host the infrastructure for Hyperledger, establishing a neutral home for community infrastructure, meetings, events and collaborative discussions, and providing structure around the business and technical governance of Hyperledger.



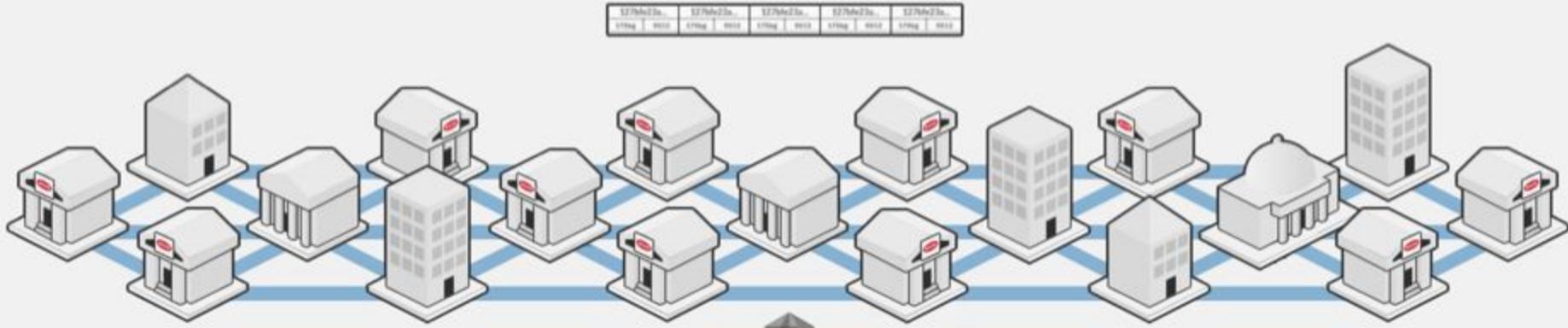
The Problem with Traditional Databases



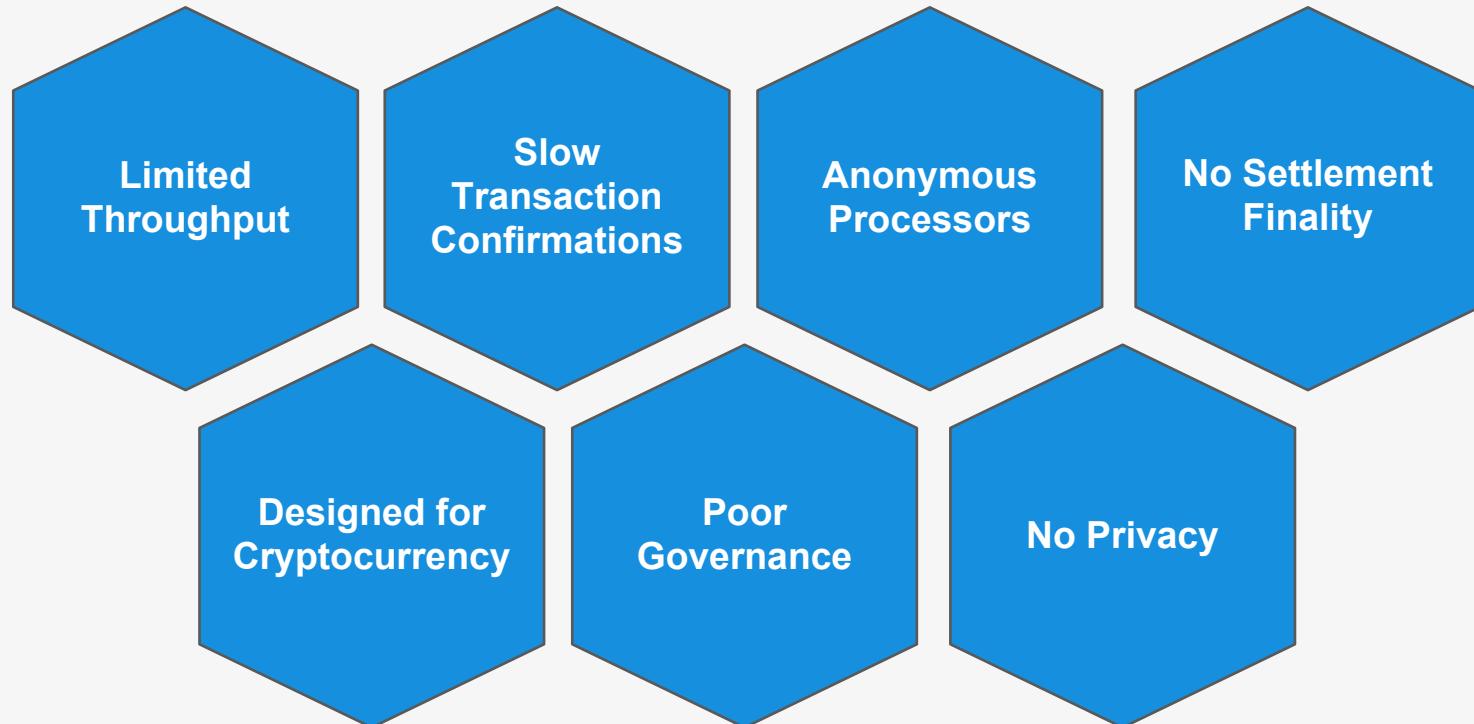
The Problem with Traditional Databases



The Blockchain Solution



Existing Blockchains



Modular “Umbrella” Approach

Requirements for blockchains vary greatly across different use-cases. There will not be a one-size-fits-all solution.

Hyperledger serves as home and incubator for multiple implementation efforts, with a consistent approach to intellectual property, community collaboration standards, overall branding (“Hyperledger ____”) and an encouragement to either work together or usefully differentiate.



Hyperledger Projects

1

Fabric: Blockchain Implementation intended as foundation for developing applications or solutions. Modular architecture allows components, such as consensus and membership services, to be plug-and-play

2

Iroha: Distributed Ledger Project designed to be simple and easy to incorporate into infrastructural projects requiring distributed ledger technology.

3

Sawtooth Lake: Distributed Ledger Technology with potential in many fields, from IoT to Financials and an architecture that recognizes the diversity of requirements across that spectrum. Support for both permissioned and permissionless deployments.

For complete list of Blockchain Framework projects in incubation, including sub-projects, visit www.Hyperledger.org/community/projects.



HYPERLEDGER PROJECT

Community Working Groups

**Technical Steering
Committee (TSC)**

**Requirements
Working Group**

**Identity
Working Group**

**Architecture
Working Group**

**Whitepaper
Working Group**

**Protocol
Working Group**



TSC

Elected by committers

Technical heart and soul and governance of the project

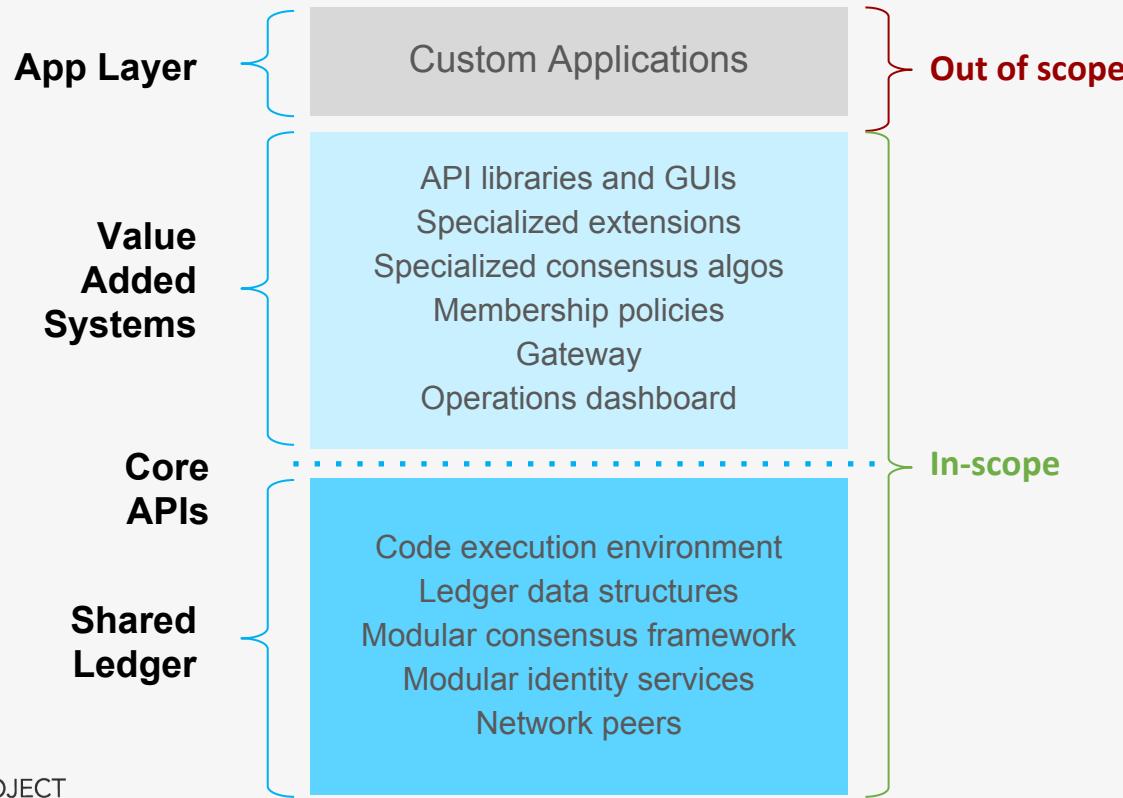
New code bases that get brought to HL and approved/reviewed by this group

Meet once a week

Public meetings/mailing lists



Project Scope



Community and Ecosystem Engagement

Brian Behlendorf keynoting multiple events across the globe with Hyperledger exhibition at key events in 2016.

hyperledger.org/news/events

Global Meetup structure to launch in 2H '16 to organize grass-roots engagement.

Active engagement with technology and finance journalists and analysts to continue educating the market on Hyperledger.

hyperledger.org/news

Technical Steering Committee hosts regular online and face-to-face hackathons – join our mailing lists to learn about these and other technical activities. hyperledger.org/community



Hyperledger In The News

WIRED

THE WALL STREET JOURNAL

FINANCIAL NEWS

FORTUNE

[Tech and Banking
Giants Ditch Bitcoin
for Their Own
Blockchain](#)

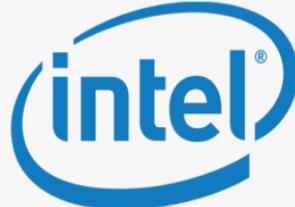
[How Blockchain Will
Save Your Life](#)

[Another day, another
blockchain consortium
update –
this time from the
Hyperledger Project](#)

[IBM, J.P. Morgan, and
Others Build a New
Blockchain for
Business](#)



Hyperledger Premier Members



J.P.Morgan



Hyperledger General Members



Hyperledger Members Based in APAC

Premier Members:



General Members:



Associate Member:



Hyperledger Associate Members



Join Us!

Ensure the strength and longevity of a core technology to your business.

Publicly proclaim your leadership in the blockchain space.

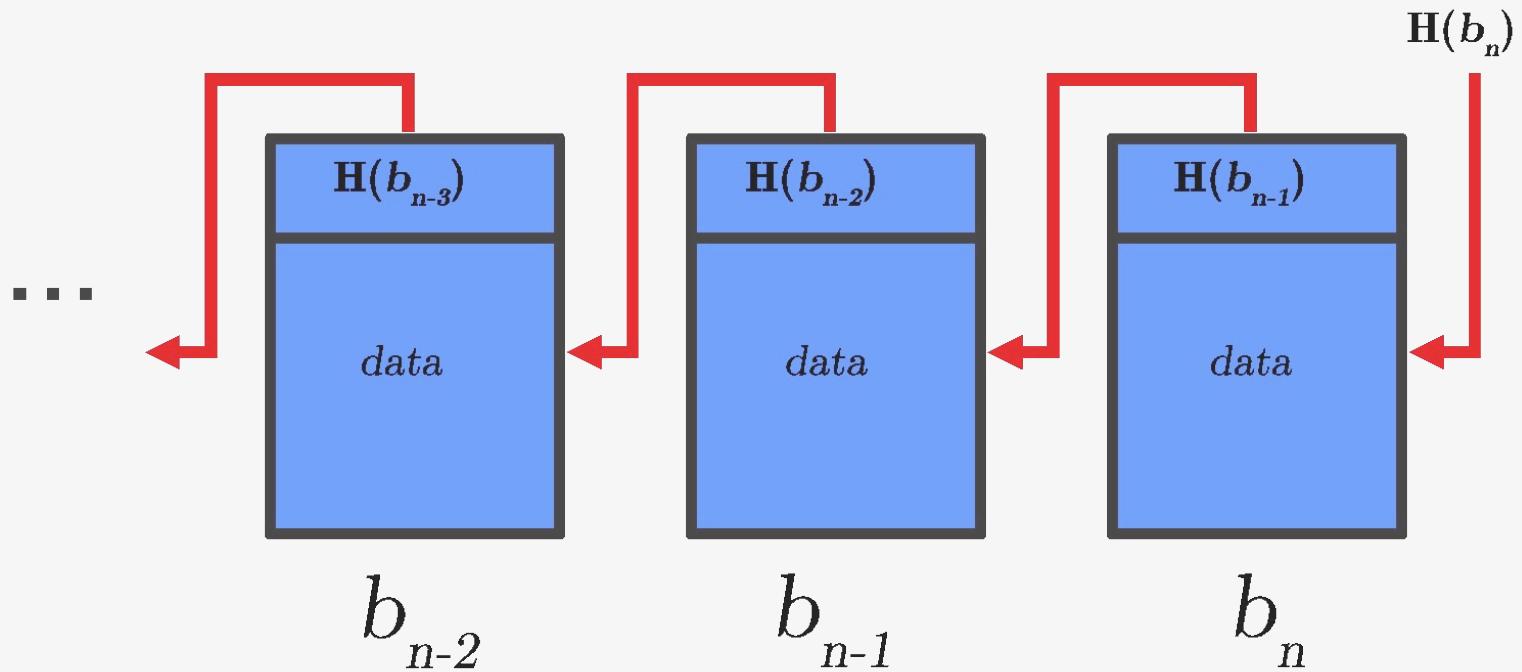
Work with other blockchain leaders to develop and promote Hyperledger.

Visit hyperledger.org/about/join
or email info@hyperledger.org.



What is “*Blockchain*”?





Design Principles, Data Structures & Incentive Mechanisms

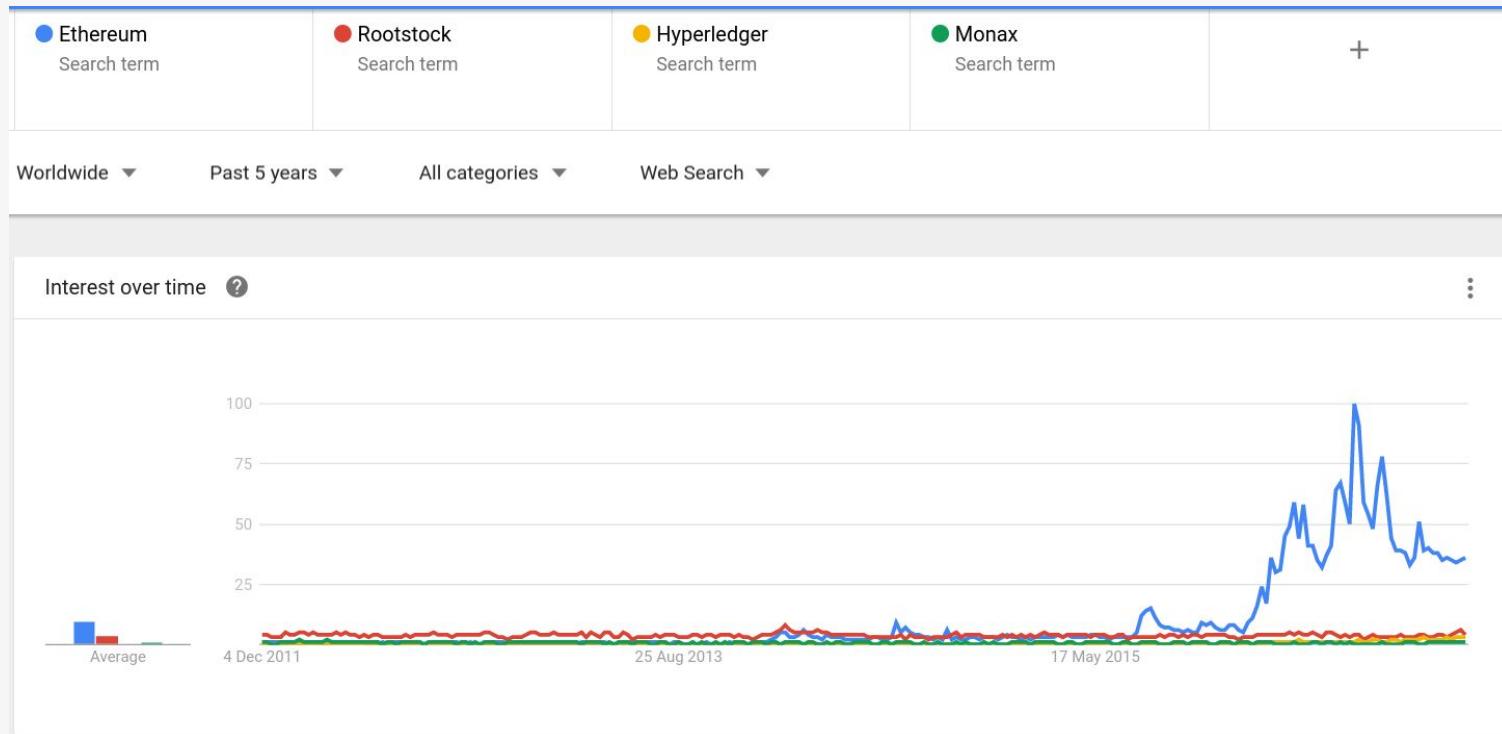
- Pseudo-Anonymity
- Data Replication
- Distributed Consensus
- Data Provenance
- Proof-of-Work

...



Dev Landscape

Smart Contract Platforms of the World



Hyperledger

Cons:

- * Lack of documentation
- * Community cleavage between Fabric and Sawtooth Lake

Pros:

- * Strong industry backing
- * Flexibility for private blockchains



Rootstock

Cons:

- * Latest system, newest release, completely untested
- * Lack of robust development community
- * Dearth of comprehensive documentation

Pros:

- * Incorporates latest ideas and insights from the forefront of the Bitcoin/blockchain research community.
- * Tight interoperability with bitcoin



Ethereum

Cons:

- * The community is undergoing a period of divisiveness, as described by the recent “*fork(s)*”
- * Trajectory of the platform is subject to the influence of the Ethereum Foundation
- * Outstanding questions about sustainability (*uncertain degree of subsidization in the market for computation*)

Pros:

- * Largest and most stable platform, relative to others
- * Most mature development community, documentation, tools
- * Third party organizations invested in the health of the environment, building services on top of it



Ethereum

Tools:

- * [Ether pudding](#) : Seems to solve large part of what we call the “smart contract platform adaptor”
- * [TestRPC](#): Blockchain “simulator” to massively speed up manual and especially automated testing
- * [Truffle](#): development pipeline: project templates, instant contract compilation, automated builds, test automation... tight integration with the tools above
- * [Solidity for VisualStudio](#)
- * Blockchain [explorer](#) and [statistics](#)



Comparison Matrix

	Ethereum	Ethereum + Monax	Hyperledger Fabric (IBM)	Hyperledger Sawtooth (Intel)	Rootstock (RSK)
Developer Tools	7	?	4	2	?
Documentation	8	?	4	2	1
Community	10	?	3	2	?
Libraries	7	?	5	?	?
Public Net available	7	7	0	0	2
Platform compatibility	9	9	6	?	?

