HYPERLEDGER

BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

Hyperledger!

Hong Kong Meetup
June 22, 2018

Shenzhen Meetup
June 23, 2018

Hyperledger @ The Linux Foundation

For the last 16 years, The Linux Foundation® has provided unparalleled support for open source communities through financial and intellectual resources, governance structure, IT infrastructure, services, events, and training.

Dedicated to building sustainable ecosystems around open source projects, The Linux Foundation is working with the global technology community to solve the world's hardest problems through open source and **creating the largest shared technology investment in history**.

The Linux Foundation is the umbrella organization for **more than 60 open source projects** accelerating open technology development and commercial adoption. Some of the game-changing initiatives hosted by The Linux Foundation include:

The Linux Foundation is Much More than Linux

Security

We are helping global privacy and security through a program to encrypt the entire Internet.

Networking

We are creating ecosystems around networking to improve agility in the evolving software-defined datacenter.

Cloud

We are creating a portability layer for the cloud, driving de facto standards and developing the orchestration layer for all clouds.

Automotive

We are creating the platform for infotainment in the auto industry that can be expanded into instrument clusters and telematics systems.

Blockchain

We are creating a permanent, secure distributed ledger that makes it easier to create cost-efficient, decentralized business networks.

Web

We are providing the application development framework for next generation web, mobile, serverless, and IoT applications.

Let's Encrypt

ONAP

CLOUD NATIVE COMPUTING FOUNDATION

AUTOMOTIVE GRADE LINUX

HYPERLEDGER

node JS

We are regularly adding projects; for the most up-to-date listing of all projects visit tlfprojects.org

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Hyperledger's "Greenhouse" Approach

Infrastructure

Technical, Legal, Marketing, Organizational

Ecosystems that accelerate open development and commercial adoption

THE LINUX FOUNDATION

Cloud Foundry | Node.js | **Hyperledger** | Open Container Initiative

Frameworks

Meaningfully differentiated approaches to business blockchain frameworks developed by a growing community of communities

Hyperledger **Fabric** | Hyperledger **Sawtooth** | Hyperledger **Iroha** | Hyperledger **Indy** | Hyperledger **Burrow**

Tools

Enable accelerated dev and deployment of frameworks

Hyperledger **Composer** | Hyperledger **Cello** | Hyperledger **Explorer** | Hyperledger **Quilt** | Hyperledger **Caliper**

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Hyperledger Momentum

2
years since launch

47k
Commits

5
Tools

5
Frameworks

2
Production 1.0 Releases

250
Members
(50+ in China)

12
Active Community Working Groups

100+
Meetup Communities Worldwide

28k+
Meetup Participants

1.5K+
Media Clips Per Month in 2018

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Hyperledger Premier Members

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Hyperledger General Members

1WorldBlockchain
8base
8Common

ABN Amro
Aetna
Agavon

AlphaPoint
Altoros Americas LLC
Aktsiaselts Eurostep Digital
AMIHAN Global

ANNE
ANZ
ArcBlock
B9lab

BBVA
Beijing Botuzongheng Science & Technology Co., Ltd.

Beijing RZXT Technology Development
Beijing Xiaomi Mobile Software
Belink Technologies
Bitmark
BitSE

Blockchain
Blockchain Training Alliance
BLOCKO Inc.
Bloq

BNP Paribas

Broadridge Financial Solutions
BTS
CA Technologies
Calastone

Capgemini
Centra Tech
Chain Connected

ChainNova
China Merchants Bank
China Minsheng Bank
CITIC

Clause, Inc
Cloudsoft Corporation Ltd.
CLS Bank International

CME Group
Cognition Foundry
Coinplug
CollectorIQ Inc.

Cuscal Limited
Data Deposit Box
Dealer Market Exchange

Deloitte Consulting LLP
Deutsche Börse Group
DLT Labs
Easy Visible Supply Chain Management
EBPI BV
Elementrem

Eli Lilly & Company

Embleema
Energy Blockchain Labs
Ernst & Young
Factom Foundation

Filament
FORFIRM
ForgeRock

FZG360 Network Co. Ltd
GameCredits
Gem
Gibraltar Stock Exchange (GSX)
Global Blockchain Technologies
Global Peersafe Technology Corp.
GM Financial
Guardtime
GXChain

Hangzhou Fuzamei Technology
Hashed Health

Huawei
Hyperchain Technologies
Information Builders
Inspur

IntellectEU
Kaiser Permanente
Korea Exchange

Korea Security Depository

Koscom
KrypC Corp
LedgerDomain
Libra

Loyyal Corporation
Lykke
MadHive

Majid Al Futtaim
Medicalchain
MetaX
MIRACL UK Limited

Monax Industries Limited
MonetaGo
Moscow Exchange
Murphy & McGonigle, P.C.
National Stock Exchange of India
New H3C Technologies

NEX Optimisation
Nexiot
Norbloc

NTT Data
Oracle
Orange Magic Cube
Patientory

Paxos
PetroBloq
PDX Technologies

Pravici

PwC
R3
RadarWin Cyber Technology

Red Hat
Revelry Labs
Robert Bosch

Samsung SDS
Sberbank
ScanTrust SA
Schroder Investment Management Limited
SecureKey Technologies
~sedna GmbH
Sempre IT

Shanghai Ginkoo Financial Technology
Shanghai Onechain Information Technology
Shenzhen Forms Syntron Information Shenzhen

Sinolending Ltd
Smart Block Laboratory
Smartchains
Smart Link Lab

Soramitsu
State Street
SWIFT

Swisscom AG

Tai Yi Yun
Tencent Cloud
Thales
Thomson Reuters

TMX Group Limited (TSX)
TradeIX Limited
Turkcell

United Traders
VitalHub Corp.
VMware
Wipro

Xinguodu Technology CO., LTD
YDreams Global
Yuphant Blockchain

Zhejiang Shuqin Technology
Beijing Smart Card Technology Research Institute
Ziggurat Technology

Hyperledger Greater China members

Premier member:

General member:

Hyperledger Associate Members

We Are Builders

The way internet technologies tend to get developed is a partnership between three organizations: standards bodies, global governance organizations, and implementers, like Hyperledger.

If Hyperledger could help not only forge common ground between different software development efforts, but also encourage a gradual detachment between standards, implementations, and global governance (whether that's around currencies or other use cases), then we will also accelerate adoption of blockchain technologies widely and further reduce needlessly duplicated engineering and hardening efforts.

Public, Private, Permissioned and -less

Permissionless Public	**Permissionless Private**	**Permissioned Public**	**Permissioned Private**
Bitcoin, Ethereum	Public Polls	Land titles, University degrees	Medical records

Public vs. Private: Who can read from a blockchain (visibility)
Permissioned vs. Permissionless: Who can write to a blockchain (accessibility)

A Network of Ledgers

Financial Services

Bank wires. Equity trading. Mortgage underwriting. KYC/AML. P2P Lending. Collateral trades. Insurance and reinsurance.

Supply Chain

Provenance tracking. Trade Finance. Cutting bureaucracy at ports and customs. IoT to detect poor shipping conditions. Title tracking for high value goods.

Healthcare

Provider directories and certification. Patient-driven health record sharing. Insurance claims processes. Pharma supply chain.

Cross-Border Payments

Transferring money across international borders is still complicated, time consuming and expensive. Payments routed abroad can take several days to get settled.

Existing money transfer systems suffer furthermore from long lines, exchange rate losses, counter-party risks, bureaucracy and extensive paperwork. Cross-border payments have become a critical part of millions of lives as we moved towards a more globalized world and multicultural societies.

After just a few months of work, a global team of developers completed a cross-border POC built with Hyperledger Fabric. Designed to test whether moving member bank accounts to a distributed ledger could help the inter-bank payments platform Swift reconcile in real time, the blockchain trial is now ready for its next phase of testing.

Hyperledger Fabric enables real-time visibility on the liquidity of Nostro accounts, easing reconciliation and allowing liquidity savings while meeting key industry requirements such as governance, data privacy, standardisation, and identity.

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SWIFT ANZ WELLS FARGO

BNY MELLON BNP PARIBAS

Read about the POC in Coindesk.

Hear about the collaboration in the ANZ Community Spotlight video.

Global Trade Finance

- we.trade is a blockchain-based international trading system for a consortium of major world banks including:

  Deutsche Bank, HSBC, KBC, Natixis, Rabobank, Société Générale, Santander, UniCredit and Nordea
- Enables accurate trading posture information, order to settlement control, risk coverage, track and trace options
- Near-real time exchange of information on a secure platform that digitizes transactional financing and other complex processes
- Continual business and compliance readiness in any regulatory environment
- Scalability that allows for rapid international expansion as business, regulatory, and security opportunities converge

we.trade
more trust. more trade.

Diamond Supply Chain

In 2003, the Kimberley Process Certification Scheme (KPCS) was established to prevent conflict diamonds. Purchased diamonds now come with a certificate to prove the distributor did not obtain the diamond from rebels, that the mine has been audited, etc. The idea is that paperwork can confirm provenance; however, the process is lengthy and there is a history of fraud from missing paperwork.

To keep blood diamonds from entering the supply chain Hyperledger Premier members SAP Ariba and IBM are collaborating with Everledger to pilot a distributed ledger diamond track and trace system using Hyperledger Fabric v1.0 that everyone in the industry can write to from miners, to distributors, to retailers.

Holding a diamond to light creates a unique pattern that may be used to create an ID. When a bag of diamonds changes hands in the supply chain, it forms two entries in the chain: the diamond IDs present upon sending and receipt. Once a diamond ID number is inside the system it provides integrity as any stakeholder can then query and instantaneously verify a diamond's provenance.

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SAP IBM everledger

This system is empowering organizations to get specific on tracking where conflict diamonds are entering the supply chain and preventing them from entering the market.

Read about the Hyperledger Fabric pilot in *International Business Times*.

Seafood Tracking

Blockchain technologies are being used in the fishing industry to drive fish catch towards more ethical practices, obstructing pirate fishing fleets and keeping fish that are caught outside of legal fishing areas and international treaty quotasfrom being sold.

Intel is collaborating with the seafood industry to implement a modern approach to supply chain traceability. Leveraging the Hyperledger Sawtooth framework, provenance of fish can now be recorded from ocean to table.

IoT sensors can be attached to any object (like fish) for transport, with trackable ownership, possession, and telemetry parameters such as location, temperature, humidity, motion, shock and title. The final buyer can access a complete record of information and trust that the information is accurate and complete.

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intel

Intel has revealed a public demo that finds it showcasing how a seafood supply chain can be built using Hyperledger Sawtooth.

Watch the explainer video and read the full case study on the Hyperledger Sawtooth project page.

Read about the demo in CoinDesk.

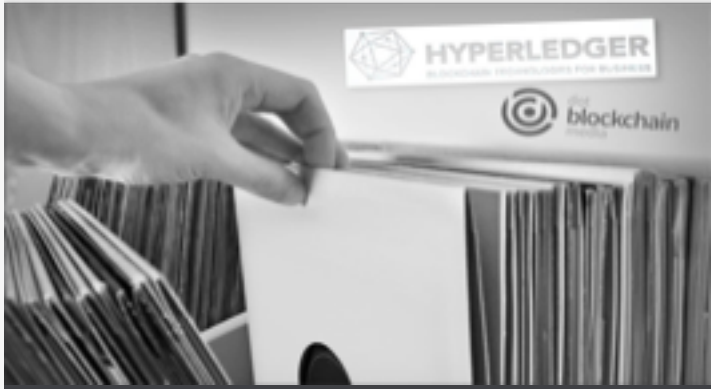
Music and Media Rights

Dot Blockchain Media (dotBC) is building a music content rights registry that will help musicians express their rights and wishes for commercializing their art in an interoperable file format. Data is maintained across a distributed network that utilizes Hyperledger Sawtooth.

dotBC's blockchain implementation is a foundation for music and media rights expression into the works themselves. It creates a fair and transparent method for music composers, artists, publishers and rights holders to express their rights and wishes for commercializing their art into a modern and interoperable file format. dotBC maintains partnerships and connections in the music and wider media industries to enable seamless data exchanges between more than 63 million globally recorded works from independent and major label artists and the dotBC ecosystem.

"Hyperledger Sawtooth will enable us to scale rapidly and customize transaction processors specifically for ingesting rights data. We look forward to delivering a strong and lasting solution, anchored on a sophisticated and secure blockchain foundation, for the music and media industries with Intel."

– Benji Rogers, dotBC CEO



dot blockchain media

dotBC is able to leverage the open source Hyperledger Sawtooth platform for recording its content rights registry for the media industries.

Read the full story in *Crypto Ninjas*.

KYC and National Identity

As of 2017, only 44% of Filipinos were utilizing bank accounts, a metric that is quickly increasing thanks to rapid economic growth in the Philippines, but is still hampered by inefficient mechanisms for checking the identity and history of new account applicants. “Know Your Customer” laws require asking for the same data over and over, much of which is not available in digital or verifiable form.

To solve this, the Bankers Association of the Philippines (BAP) in partnership with Hyperledger member and technology consulting company Amihan, and a coalition of major banks undertook a proof-of-concept exercise to build a prototype that implements self-sovereign identity using Hyperledger Indy.

The platform streamlines onboarding of new accounts, by allowing consumers to enter information once in a privacy-preserving way, and re-use that data for new account opening. The bank can trust that the history of that data is solid. If successful, this could serve as a test for a nation-wide self-sovereign ID system.

HYPERLEDGER INDY

AMIHAN

*Read more about the Amihan use case for the Hyperledger Indy framework in *The Manila Times*.

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Hyperledger Fabric

Business Blockchain Framework

- 1.0 release July 2017; 1.1 release candidate available now.
- 100+ devs across 50+ companies contributing.
- Reports of 400+ customer PoCs, pilots and production.
- Ordering nodes can be separated from broader endorser/submitter nodes.
- Validation/business logic called “chaincode” written in Golang, Java (in test) and Javascript (in 1.1), and run in secure Docker containers.
- Private channels subset the ledger for groups of nodes, for confidentiality.

Hyperledger Sawtooth

Business Blockchain Framework

- Hyperledger's second project, released as 1.0 in January 2018.
- Supports both permissioned and permissionless deployments.
- Includes a novel consensus algorithm, Proof of Elapsed Time (PoET), which aims for the public properties of proof of work without energy consumption.
- Uses the secure enclave on a chip to provide a random wait timer to each of the validators (nodes) on the network.
- Supports on-chain configuration tracking and consensus mechanism switch.
- Supports Solidity/EVM smart contracts by linking with Hyperledger Burrow.

Hyperledger Indy

Blockchain Identity Framework

- Contributed originally by the Sovrin Foundation and Evernym
- Focuses on identities rooted on blockchains, by providing pairs of DID's (Distributed Identifiers) revealable only by the user, to fight correlateability.
- Utilizes zero-knowledge proofs to provide verifiable claims
- In production today on the Sovrin network, with credit unions and the GSA
- These verifiable claims can be used to prove something about the identity without providing access to the underlying data

Hyperledger Burrow

Business Blockchain Framework

- Initial contribution from Monax, now more companies and devs involved
- The first permissioned ledger with support for the Ethereum Virtual Machine (EVM)
- Only Apache-licensed EVM
- Uses Tendermint as its default consensus mechanism, but has also been ported to Sawtooth, and experimental support exists for Fabric

Hyperledger Composer

Business Blockchain Tool

- Initial contribution from IBM and Oxchains, now multiple developers
- Suite of tools to quickly develop your blockchain business networks
- Modeling language allows you to have your business people specify the participants, assets, and transactions
- Developers write transaction logic in JavaScript
- Ability to generate a REST API and Angular application from the model

Hyperledger Quilt

Business Blockchain Tool

- Contributed by NTT Data and Ripple
- Java implementation of the Interledger protocol
- Interledger protocol provides:
  - atomic swaps between ledgers (even non-blockchain or distributed ledgers)
  - a single account namespace for accounts within each ledger

Technical Steering Committee

The TSC is the technical governance heart and soul of the project. As new code bases get contributed to the project they get reviewed and approved by this committee.

Committing members appoint and vote the TSC Chair annually.

Meets weekly on Thursday, 10:00 AM to 11:30 AM ET

All are invited to attend these calls and encouraged to join the TSC mailing list for more information:

https://lists.hyperledger.org/mailman/listinfo/hyperledger-tsc

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Chris Ferris

TSC Chair

IBM Distinguished Engineer and CTO Open Technology in the IBM Cloud organization

Involved in the **architecture, design, & engineering of distributed systems** for most of his 36+ year career

Actively engaged in open standards and open source development since 1999

Overall technical responsibility for all of IBM's strategic open technology initiatives, including **OpenStack, Cloud Foundry, Hyperledger Project, Open Container Initiative, Cloud Native Computing Foundation, Mesos, Node.js, Docker**, and more

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A primer to blockchain and distributed ledger technologies. Learn how to start building blockchain applications with Hyperledger frameworks.

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WHO WILL YOU
TRUST
WITH YOUR TRUST NETWORK?
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