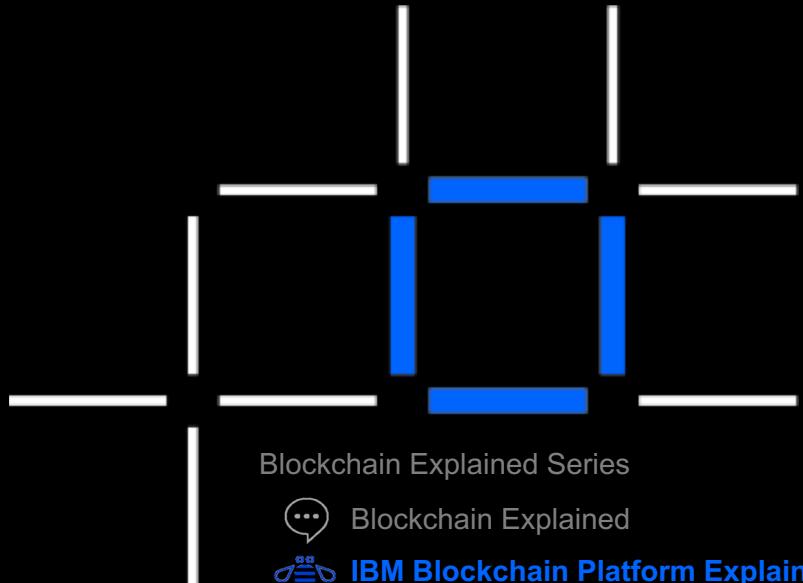


IBM Blockchain Platform Explained

An Introduction to the IBM Blockchain Platform

Jin VanStee
NA Blockchain Transformation Architect

Austin Grice
NA Blockchain Technical Leader



Blockchain Explained

IBM Blockchain Platform Explained

Solutions Explained

Garage Explained

Next Steps



IBM Blockchain Platform Overview

What you need to know



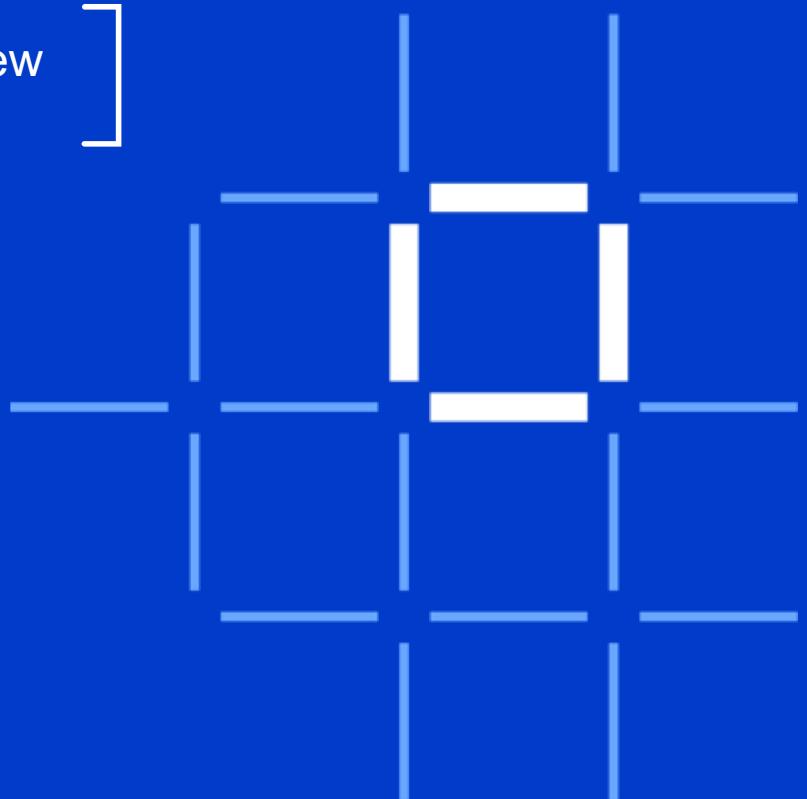
Roadmap

IBM's blockchain strategy and where the platform is going



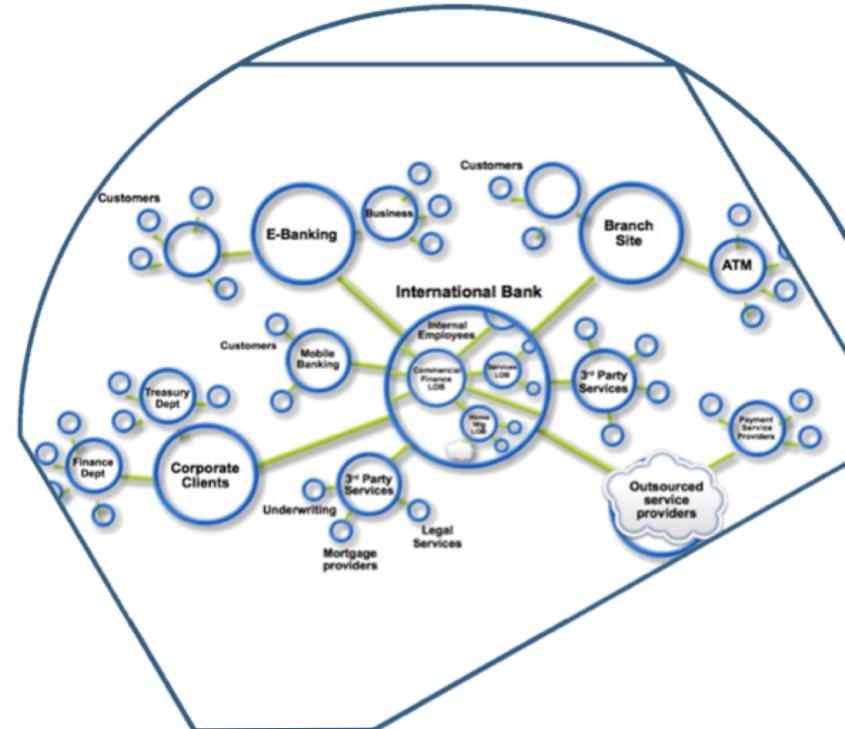
IBM Blockchain Platform Demo

Making blockchain real



Blockchain Recap

- Blockchain is a shared, replicated ledger
 - Permissioned blockchains bring trust to business networks through consensus, provenance, immutability and finality
- Linux Foundation Hyperledger is a collaborative effort created to advance cross-industry blockchain technologies for business
 - Hyperledger Fabric is a blockchain providing implementation of a ledger, smart contracts, privacy and consensus
 - Hyperledger Composer is a suite of tools that make it easy to develop blockchain applications



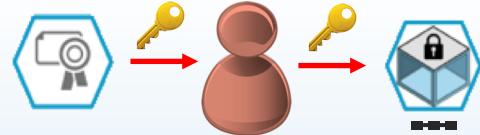
Blockchain Technical Concepts



Peers are the networked services that maintain ledger state and run smart contracts



Channels are defined subsets of the peer network that share a single ledger



Certificate authorities provide identity services to participants on the network



Smart contracts constitute the transaction logic whose output is agreed by the peer network

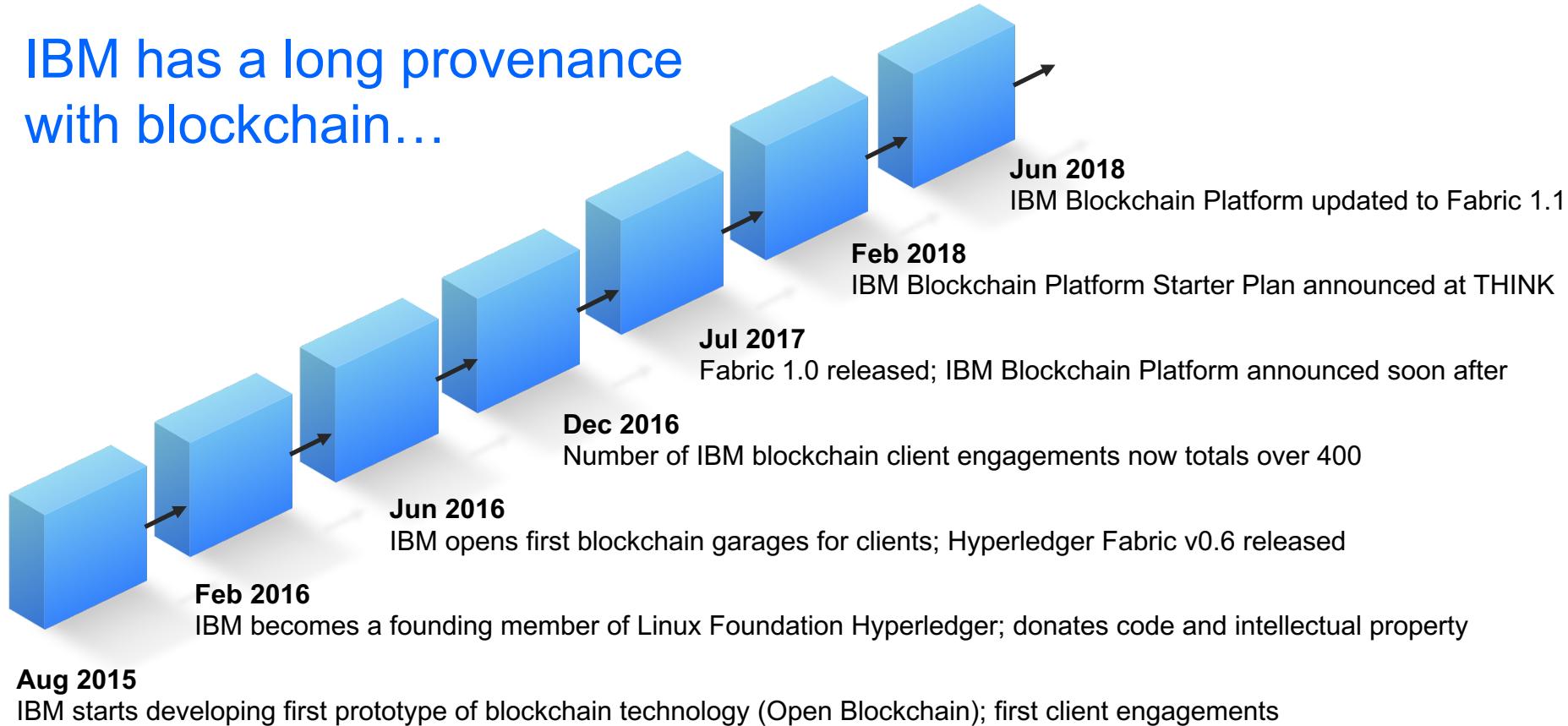


The **Ordering Service** agrees transaction sequence and distributes blocks to peers



Consensus is the process by which agreement is obtained on the peer network

IBM has a long provenance with blockchain...



IBM Blockchain Strategy

Drive the development of **applications** for specific business use-cases, to be deployed to active **blockchain networks**



Services

Collaborate
with services
teams from
ideation all the
way to
production



Ecosystem

Tap into our diverse ecosystem to develop strategic partnerships and create your competitive advantage



Solutions

Solve critical industry challenges by building and joining new business networks and applications



Platform

Develop, govern and operate enterprise blockchain networks with speed and security



HYPERLEDGER

A founding, premier member of Hyperledger, IBM is committed to open source, standards & governance

Platform Value: *Simplicity in the face of overwhelming complexity*

	IBM Blockchain Platform	Community Code Deployment
Inviting members	5 seconds	20 minutes per instance
Installing and instantiating smart contracts	Single click installation	10 minutes per smart contract per peer
Deployment	Specify network parameters and automatically launch ordering service	Not available
Network alterations and additions	Add new members, channels and smart contracts through single clicks, text box or drop down via the UI	CLI driven, and more advanced skills required
Support	Complete support from the HW stack through the blockchain code base included	IBM support options available
Security	Secure container and highest level of security provided	Custom
Migration	Rolling migration and 99.999% availability provided under the covers	Not available

"IBM provides us with the easiest way to develop prototype blockchain applications for our clients. Thank you!"

-- Global consulting firm

"IBM has enabled our team to develop our blockchain demo with minimal hassle and gives us a clear path to scale with the tools to manage it"

-- Series backed start-up

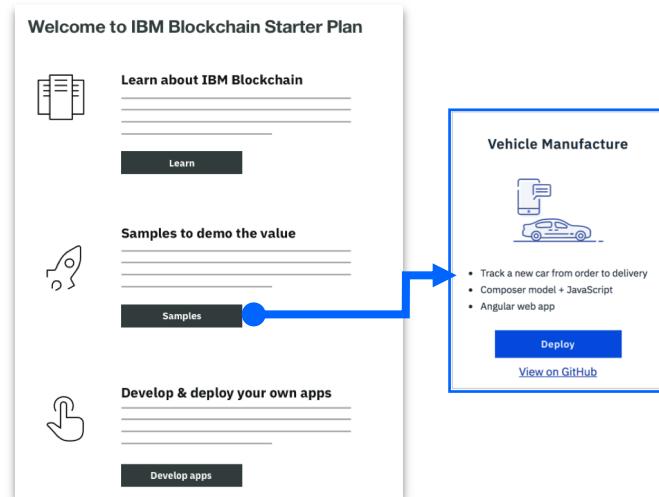
Flexible pricing plans

Plan	Key Features	Deployment
Starter	Easy on-ramp for blockchain-as-a-service	IBM Cloud
Enterprise	Production plan for industries comfortable with cloud	IBM Cloud
Enterprise +	Production plan for regulated industries, multi-region HA/DR and highest performance	IBM Cloud
Remote Peer	Deploy organization's blockchain peers on-premise	On-premise
Support-only	Supported instances of Hyperledger Fabric and Composer running outside IBM Cloud Platform	Docker

Starter Plan

- Get started with IBM Blockchain Platform with **one-click setup and a fully functional network**
 - One-click network configuration, code samples and support for Hyperledger Fabric 1.1
 - Environment enables iterative development prior to production deployment
 - Same experience as Enterprise
 - Uses SOLO ordering for simplified configuration, development and testing
- **Monthly charge of \$500** for two peers
 - \$250 membership fee per month, plus \$125 per peer
 - Receive \$500 in IBM Cloud credits on sign-up

Sign up at
www.ibm.com/blockchain



Enterprise Plan

- Everything in Starter, plus everything you need for a **full production** environment:
 - Fault-tolerant ordering service, added layers of security and premium support
 - Compliance certification: ISO27001, GDPR (coming soon), SOC 2 Type 2 (coming soon)
 - Single-zone HA/DR
- Monthly cost starts at **US\$3000 per organization per network**
 - Assumes two peers for high availability (\$1000 per peer plus \$1000 membership fee)
 - Includes basic blockchain support only; support for services on IBM Cloud is an additional 10%
 - Certificate authorities and access to the ordering service is not chargeable



Enterprise+ Plan

- Enterprise+ Plan is also intended for **production or near-production** scenarios
- Everything in Enterprise, plus:
 - Data isolation
 - Customized compute for scaling performance
 - Multi-zone HA/DR (coming soon)
 - Virtual circuits: VPN access from your data center
- Currently limited availability
 - Contact IBM for pricing information



Remote peer

- Allows an organization's blockchain peers on-premise.
 - Supports **data residency, regulation and compliance** requirements
- Initial release supported for **all plans** allowing deployment of peers **on-premise** using **IBM Cloud Private (ICP)**.
- Leverages power of the IBM Blockchain Platform running on IBM Cloud for CAs and Ordering Service
- Release schedule
 - ICP beta September 2018
 - Not intended for production scenarios whilst in beta
 - No additional charge while in beta



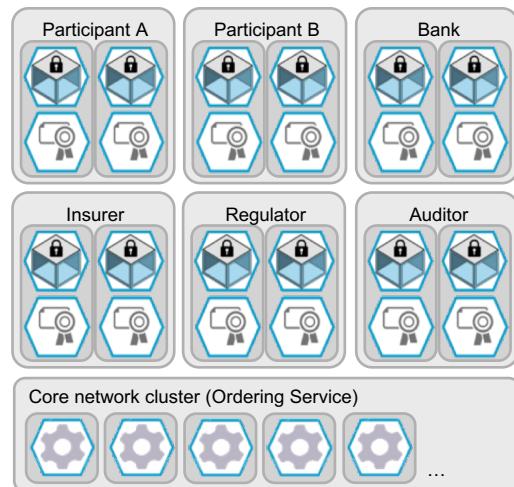
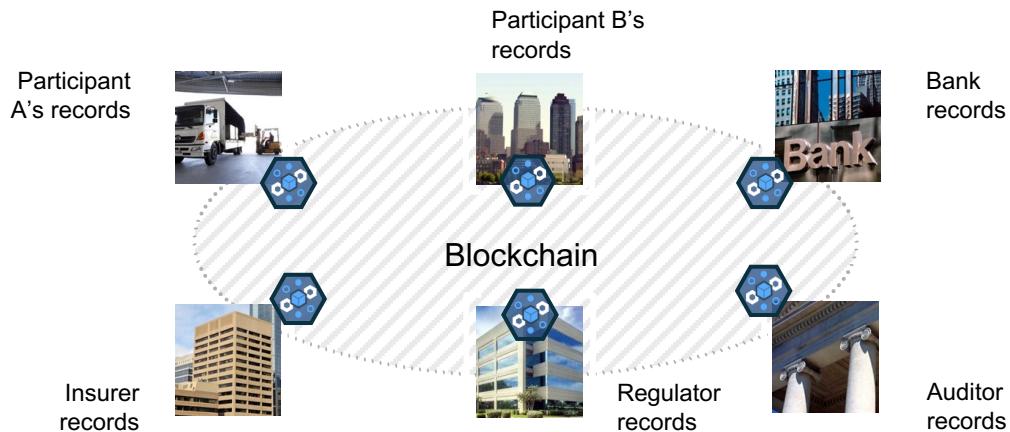
Support-only Plans

- Looking for **IBM support on Hyperledger Fabric or Composer?**
 - IBM produces signed Hyperledger Fabric images which can be supported for production usage outside of IBM Cloud
 - Hyperledger Composer supported within same plan
 - Available for LinuxONE (IBM Z), Power and x86 architectures
 - Subscription term one year
- **Elite tier (5737-E89/DV13ALL)**
 - Supported 24x7x365; response target within 2 business hours
 - Multiple technical contacts and developer assistance
 - Yearly cost \$24,000 per peer
- **Entry tier (5737-E90/DV13BLL)**
 - Support hours Monday – Friday 8am-5pm local time; response target within 8 business hours
 - Single technical contact
 - Yearly cost \$6,000 per peer

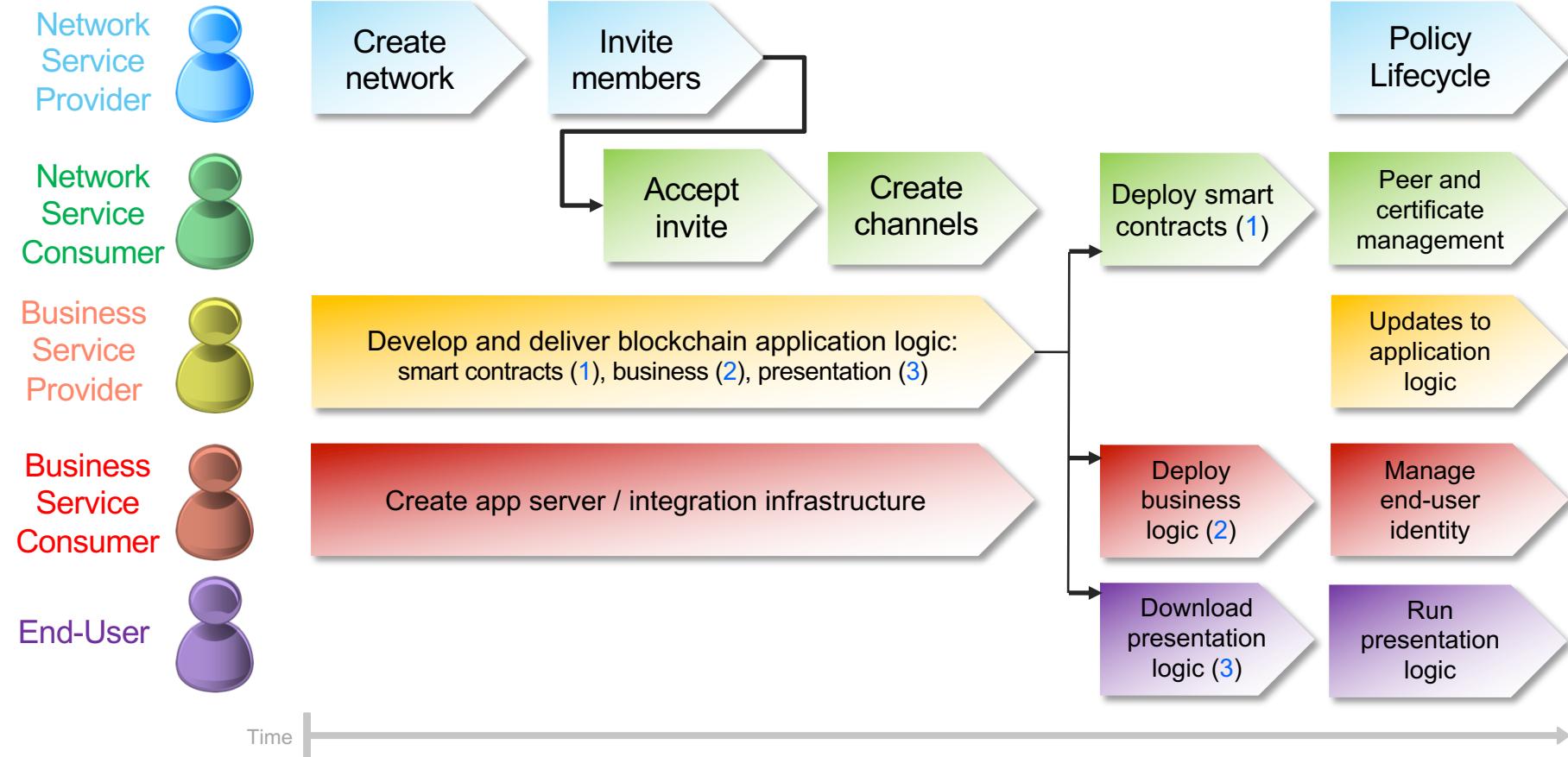


Example Network

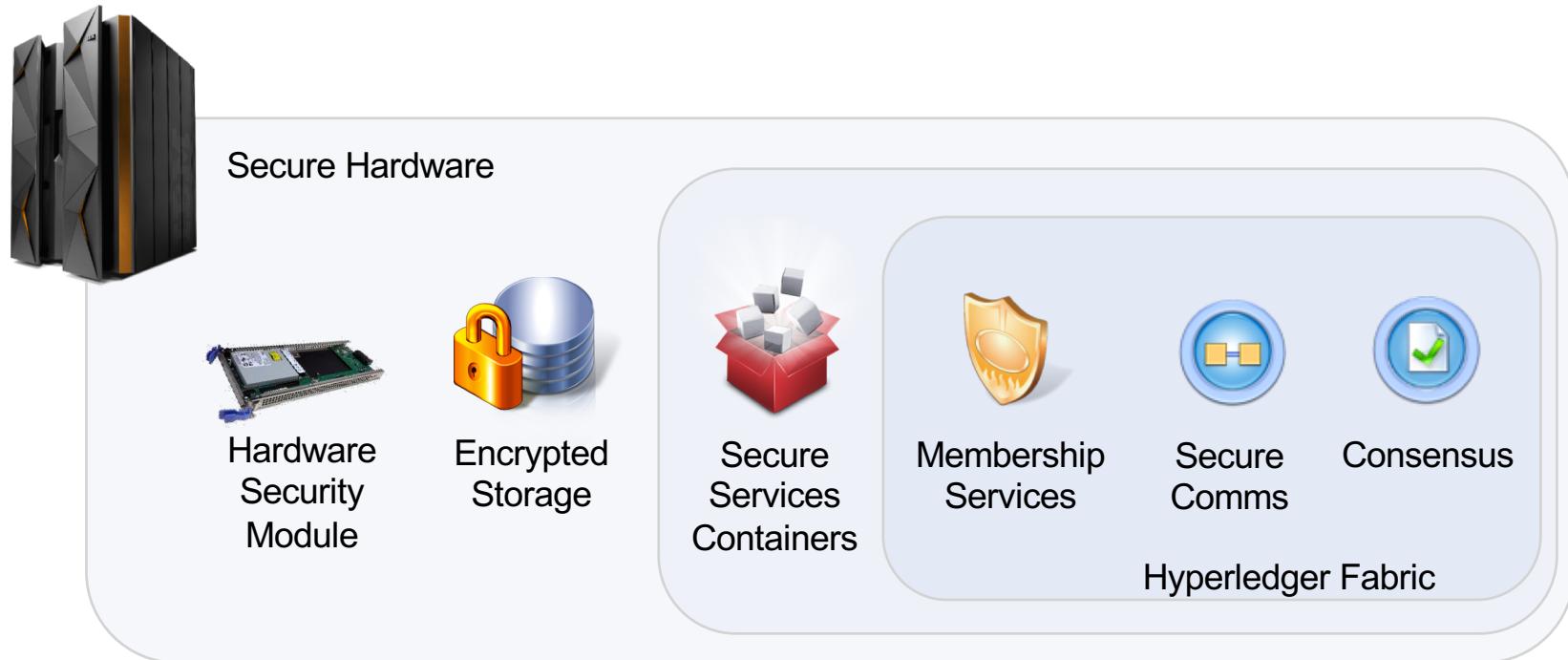
- Consider an in-production blockchain business network comprising multiple organizations running Enterprise Plan on IBM Cloud
 - Each organization has two peers and two certificate authorities
 - Blockchain cost per organization (two peers + membership fee) = US\$3000 per month
 - Support for IBM Cloud services @10% = US\$300
 - Cost for one year per organization = $12 \times \text{US\$3300} = \text{US\$39600}$



Workflow for Network Formation



Security is implemented at each layer of the architecture



Security is implemented at each layer of the architecture

- Hyperledger Fabric
 - Membership Services: Organizations are invited to join and authenticated using an Enrollment Certificate
 - Transaction Consensus: Each transaction is endorsed and validated by multiple peers before committing to the ledger
 - Controlled Ledger Access: Channels restrict transactions to a set of organizations that are shared on the ledger
 - Secure Communications: Between the end-user application and smart contract is secure
 - Extensive security scans and audits performed by IBM, and independently by IBM and Linux Foundation sponsored 3rd-party penetration testing and code audits
- Secure Service Containers
 - Secure appliance framework providing infrastructure services encapsulating the Hyperledger Fabric
 - No root access: Access system and software only through API's; even trusted administrators
 - Impervious to the injection of malware: Installed from encrypted, signed boot image
 - Data Privacy: Encryption of data in flight and at rest on the ledger
- Secure Performant Hardware
 - Hardware Security Module (HSM) is certified to FIPS 140-2 level 4
 - Fastest cryptographic acceleration: used by block hashing and digital signatures

IBM Blockchain Platform Sites



- IBM Blockchain Platform Enterprise plan is hosted in multiple sites to help you satisfy data residency requirements
- More platform locations planned
- ↑ Complemented by a set of IBM Blockchain Garages to help you get started with IBM Blockchain Platform

Learn more at
www.ibm.com/blockchain



IBM Blockchain Platform Overview

What you need to know



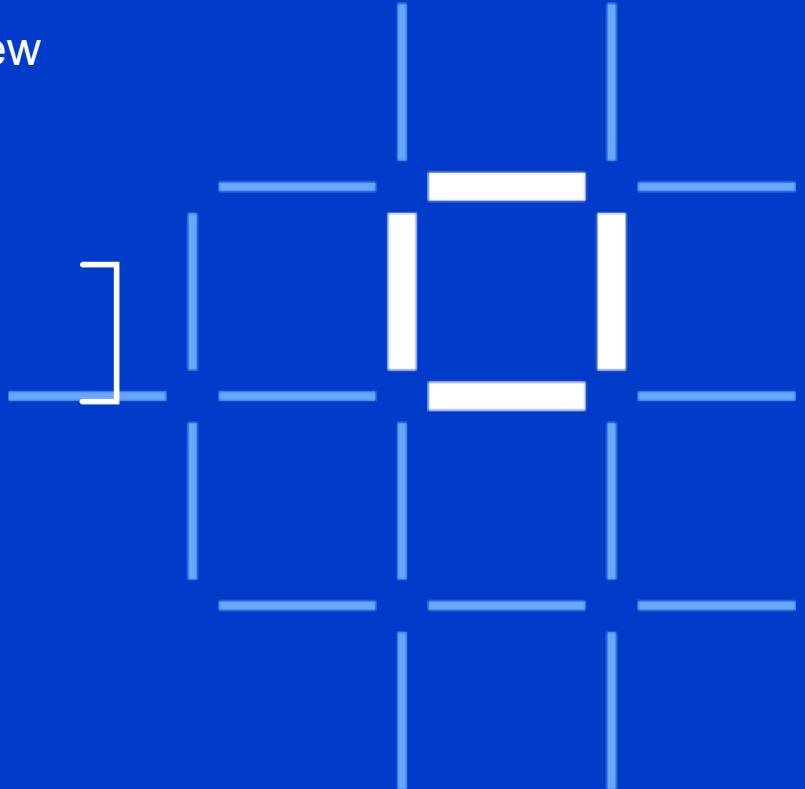
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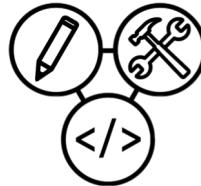
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Making blockchain real



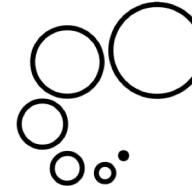
Core Capabilities for 2018

The IBM Blockchain Platform will give users the ability to...



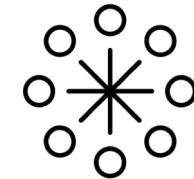
Build Apps & Networks

- **Development tools** to create applications which leverage blockchain networks
- **API endpoints and SDKs** for building and monetizing blockchain apps
- **Model for founders** to create business models enabled by blockchain



Grow Networks

- **Operational tools** to test, manage, monitor, troubleshoot, deploy, migrate and upgrade blockchain networks
- **Governance tools** to create and manage governance policies on permissioned networks



Accelerate Ecosystems

- **Network registry** to discover and join existing blockchain networks
- **Marketplace** to discover and use APIs, service components and applications
- **Public networks** to accelerate blockchain ecosystems

Blockchain Network Finder

[SIGN UP / LOG IN](#)[RESERVE NETWORK](#)

Industry

All Categories

- Accommodation and Food Services
- Admin. and Support
- Agriculture
- Arts (Entertainment and Recreation)
- Construction
- Educational Services
- Energy
- Finance and Insurance
- Healthcare
- Identity Management
- IoT - Asset Tracking
- IoT - Healthcare
- IoT - Location Based Services
- Management of Companies and Enterprises
- Manufacturing
- Media
- Mining and Oil and Gas Extraction
- Non-Profit
- Real Estate
- Real Estate Rental and Leasing
- Record Management
- Retail Trade
- Supply Chain Management
- Transportation and Warehousing
- Utilities
- Voting

Waste Mgmt. and Remediation

Q Search

A B C E F G J M N O S V W Y {

Name	Industry	Summary	Peers	Created Date
{(2+9)}			3	December 4th 2017, 4:21 AM
artsexpo Canada	Non-Profit		1	March 7th 2018, 2:41 AM
besthouse China	Real Estate, Real Estate Rental and Leasing		2	November 1st 2017, 9:48 AM
coffeeshopschain United States	Retail Trade, Supply Chain Management	This is the main chain for updates regarding Coffeeshops in the US- look here for updates, deals, promotions, branches...	3	March 6th 2018, 7:41 AM
ecodisposal USA	Waste Mgmt. and Remediation Services		4	March 6th 2018, 7:41 AM
ewewde		ВИСИВСИВСИВС	3	March 6th 2018, 7:41 AM
fishmarket	Agriculture, Supply Chain Management, Wholesale Trade	This is a Fish Market blockchain	3	March 6th 2018, 7:41 AM
friendsid			2	November 1st 2017, 8:42 AM

Network Registry

Your idea

The Business Network

Build

Grow

Accelerate

Blockchain Asset Marketplace

[SIGN UP / LOG IN](#)[PUBLISH ASSETS](#)

Carbon Credit Model

v3.4

Type: Composer model

Added by: Organization

Used in: 3057 networks

[TRY NOW](#)[BUY NOW](#)

Simple Supply Chain

v5.3.6

Type: Composer model

Added by: OrganizationA

Used in: 208 networks

[TRY NOW](#)[BUY NOW](#)

Bilateral Config

v1.2

Type: Network template

Added by: OrganizationB

Used in: 12 networks

[TRY NOW](#)[BUY NOW](#)

Marketplace



Your idea



The Business Network



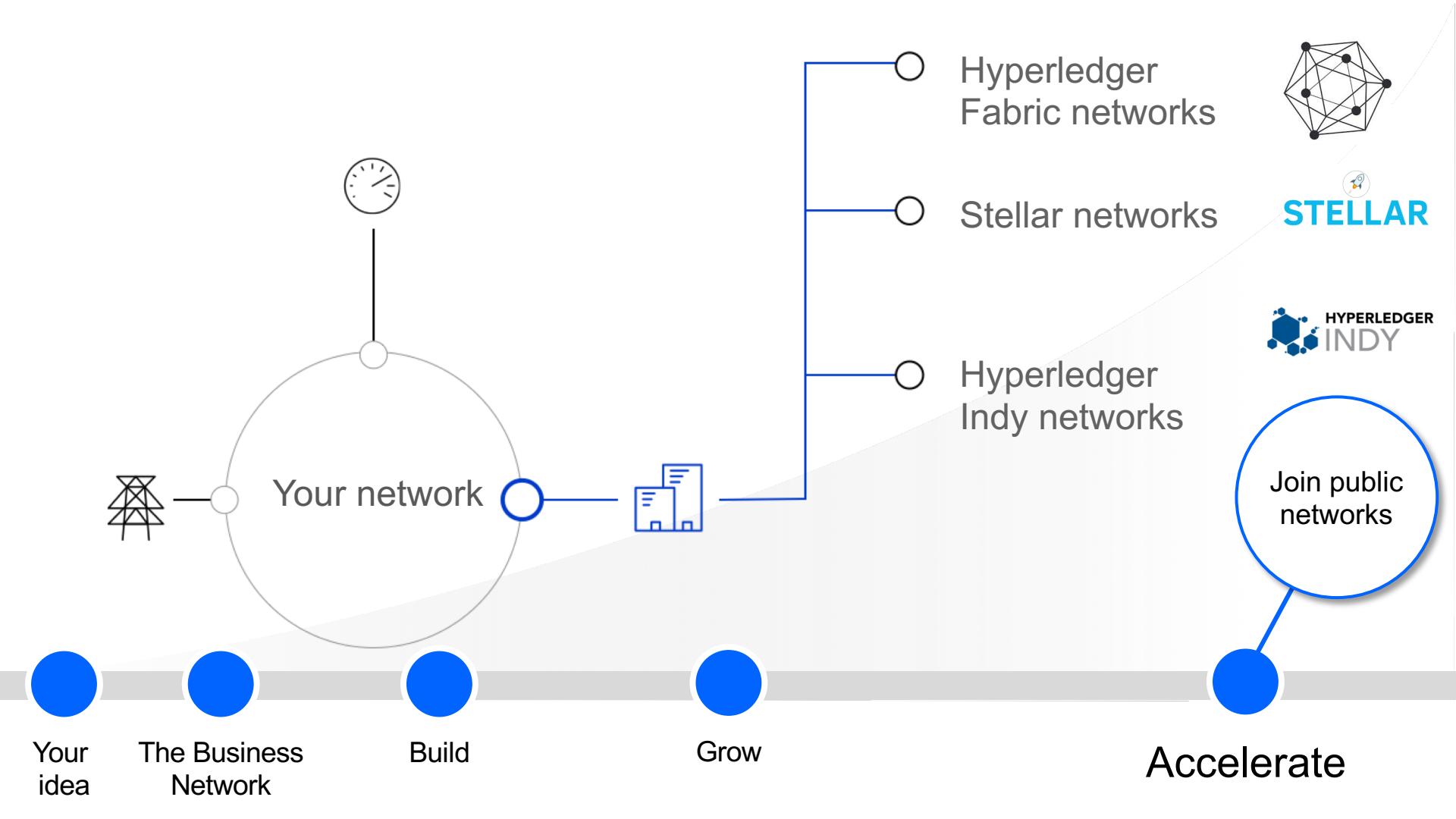
Build



Grow



Accelerate





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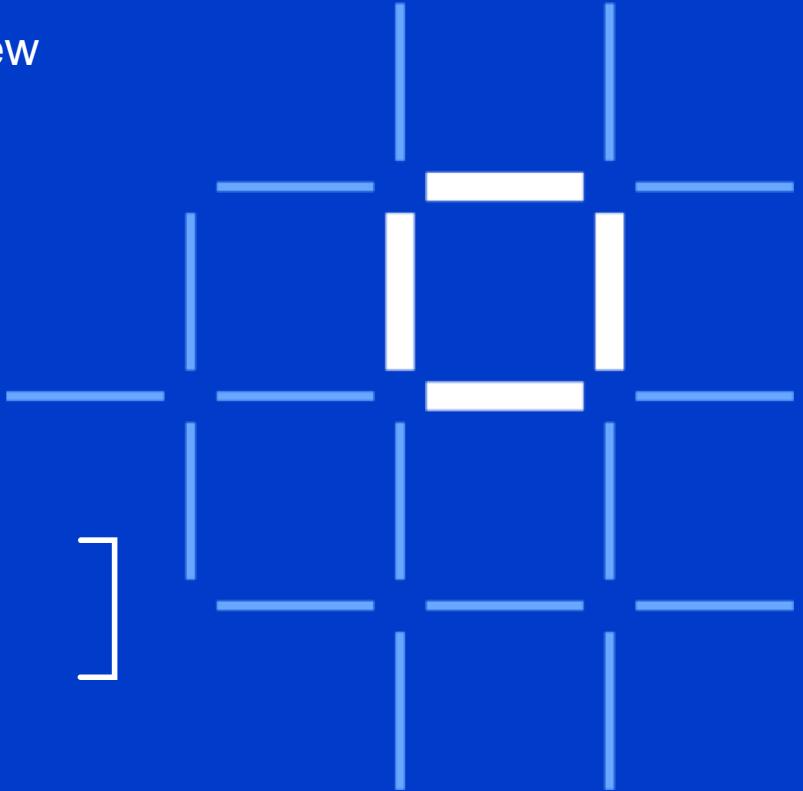
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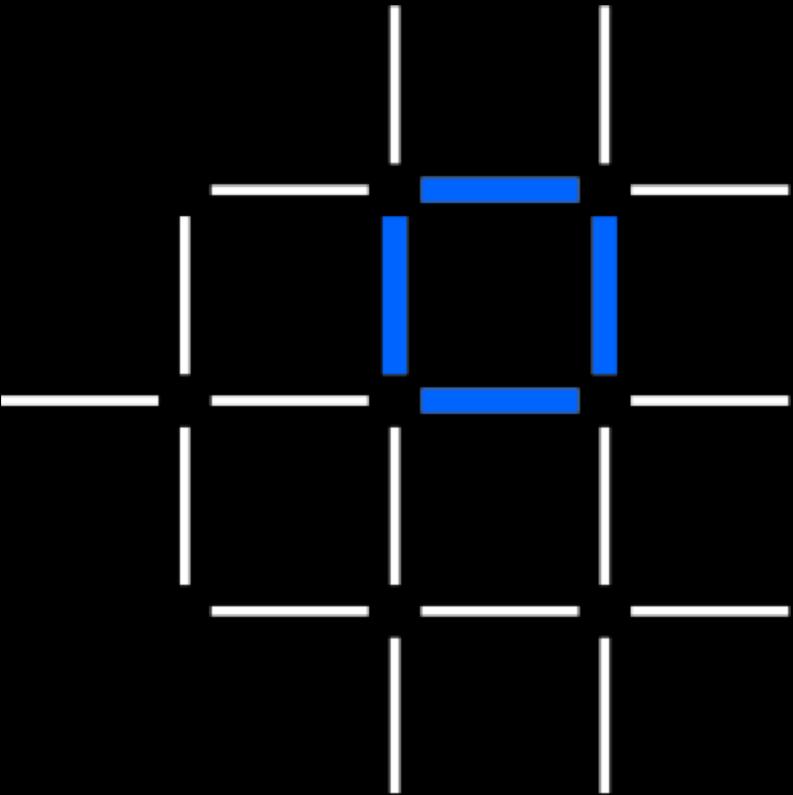


IBM Blockchain Platform Demo

Making blockchain real



Thank you



Questions? Tweet us or
go to ibm.com/blockchain

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 IBM Blockchain

 IBM Blockchain



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