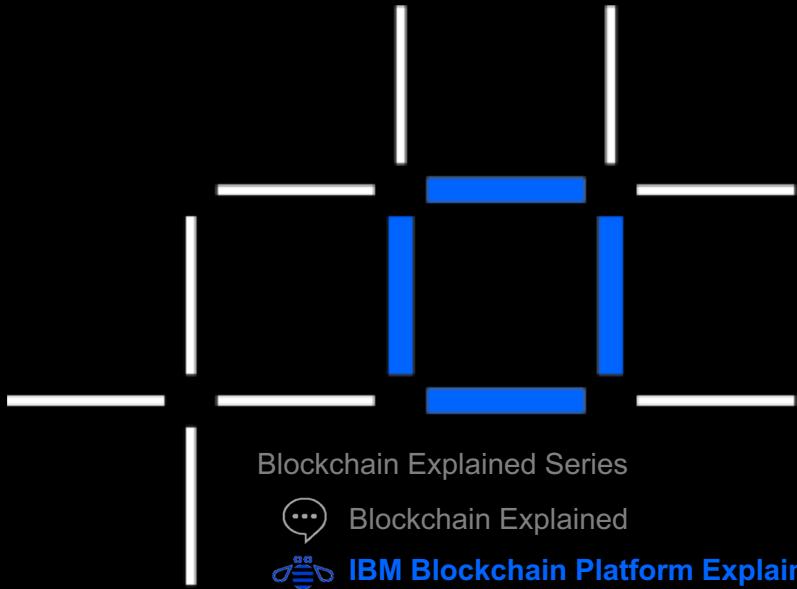


IBM Blockchain Platform Explained

An Introduction to the IBM Blockchain Platform

Jin VanStee
jinxiong@us.ibm.com

Austin Grice
Austin.Grice@ibm.com



Blockchain Explained Series

… Blockchain Explained

IBM Blockchain Platform Explained

✓ Solutions Explained

House Garage Explained

→ Next Steps



IBM Blockchain Platform Overview

What you need to know



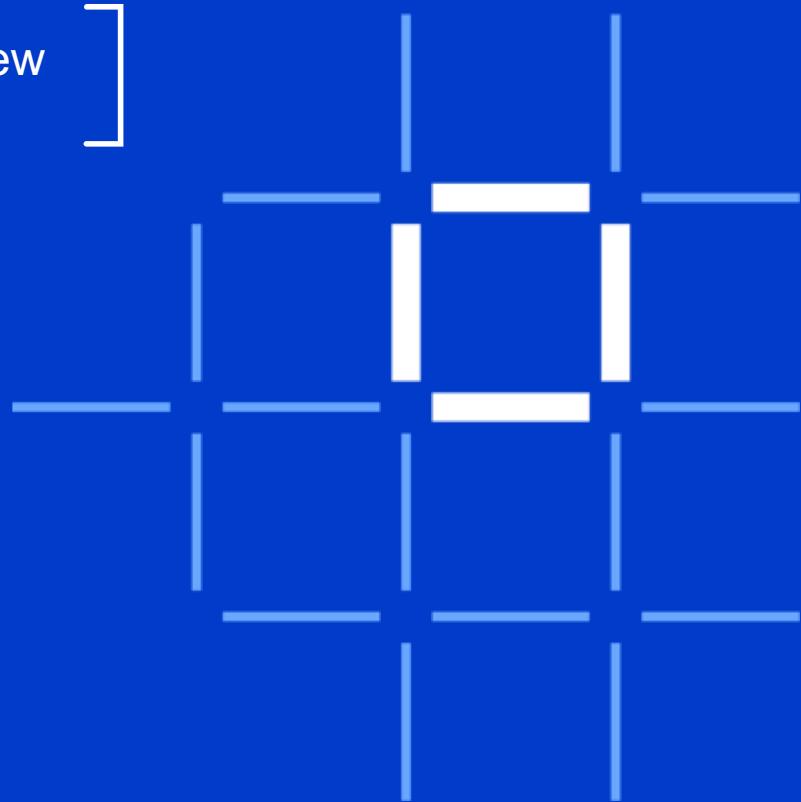
Roadmap

IBM's blockchain strategy and where the platform is going



IBP DEMO

The tools to make your blockchain real



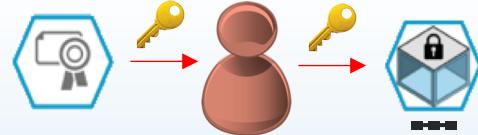
Blockchain Technical Concepts



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



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



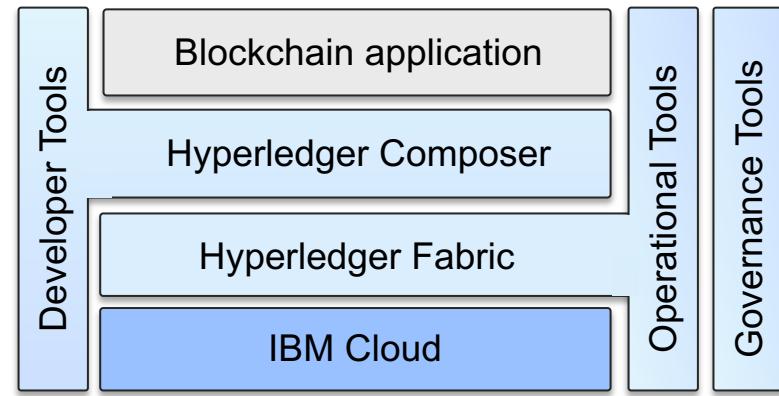
The **Ordering Service** agrees transaction sequence and distributes blocks to peers

Introducing the IBM Blockchain Platform

http://ibm.biz/Platform_Demo

IBM Blockchain Platform is a fully integrated enterprise-ready blockchain platform designed to accelerate the development, governance, and operation of a multi-institution business network

- **Developer tools** that make use of Hyperledger Composer to quickly build your blockchain application
- Hyperledger Fabric provides the ledger, which is managed through a set of intuitive **operational tools**
- **Governance tools** for democratic management of the business network
- Flexible deployment options, including a highly secure and performant **IBM Cloud** environment



End-to-end lifecycle coverage



Develop

- Accelerated creation of blockchain applications
- No-charge development and test tools hosted on IBM Cloud
- Based on popular Hyperledger Composer toolset

Govern

- Activate, customize and change complete blockchain business networks
- Secure democratic governance across organizations
- Implement rules for authorizing network updates

Operate

- Connect, deploy and manage blockchain peers with flexible deployment options
- Production ready, secure and scalable
- Based on Linux Foundation Hyperledger Fabric V1

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

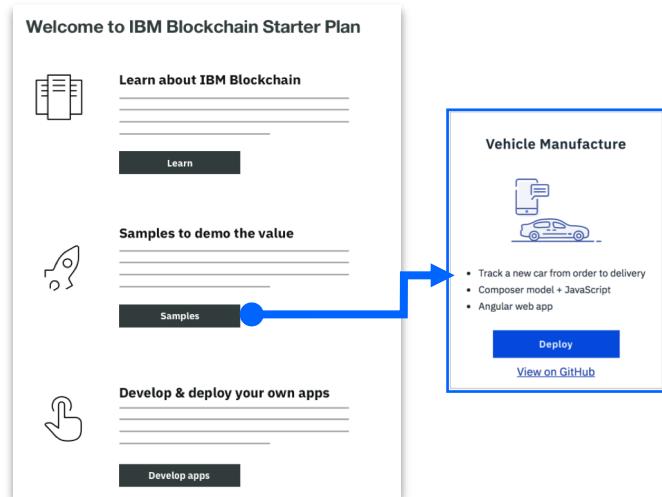
Plan	Key Features	Deployment
Starter	Easy on-ramp for blockchain-as-a-service	IBM Cloud
Enterprise	Production plan for industries comfortable with cloud	IBM Cloud
Enterprise +	Production plan for regulated industries, multi-region HA/DR and highest performance	IBM Cloud
Support-only	Supported instances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

Starter Plan

Sign up at

www.ibm.com/blockchain

- Get started with IBM Blockchain Platform with **one-click setup and a fully functional network**
 - Configured for two organizations with one peer each, sample applications and informational tutorials
 - Environment enables iterative development prior to production deployment
 - Same experience as Enterprise
 - Uses SOLO ordering for simplified configuration, development and testing
- Currently in beta, and free until generally available
 - After that time, sign up for 30 day free trial



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



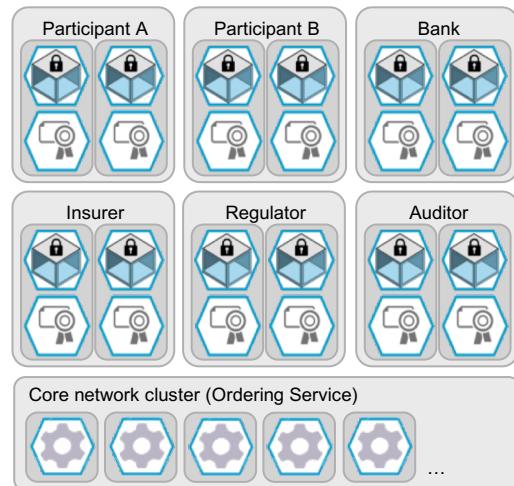
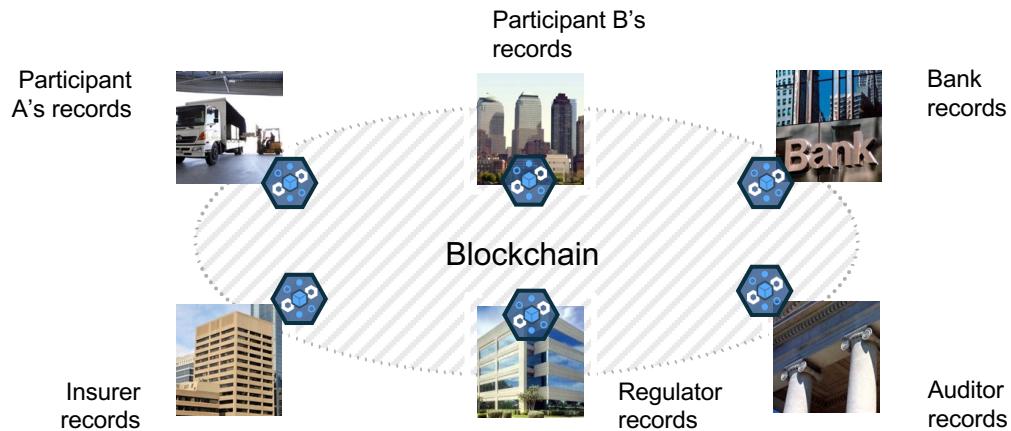
Support-only Plans

- 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 = $12 \times \text{US\$3300} = \text{US\$39600}$



IBM Blockchain Platform Sites



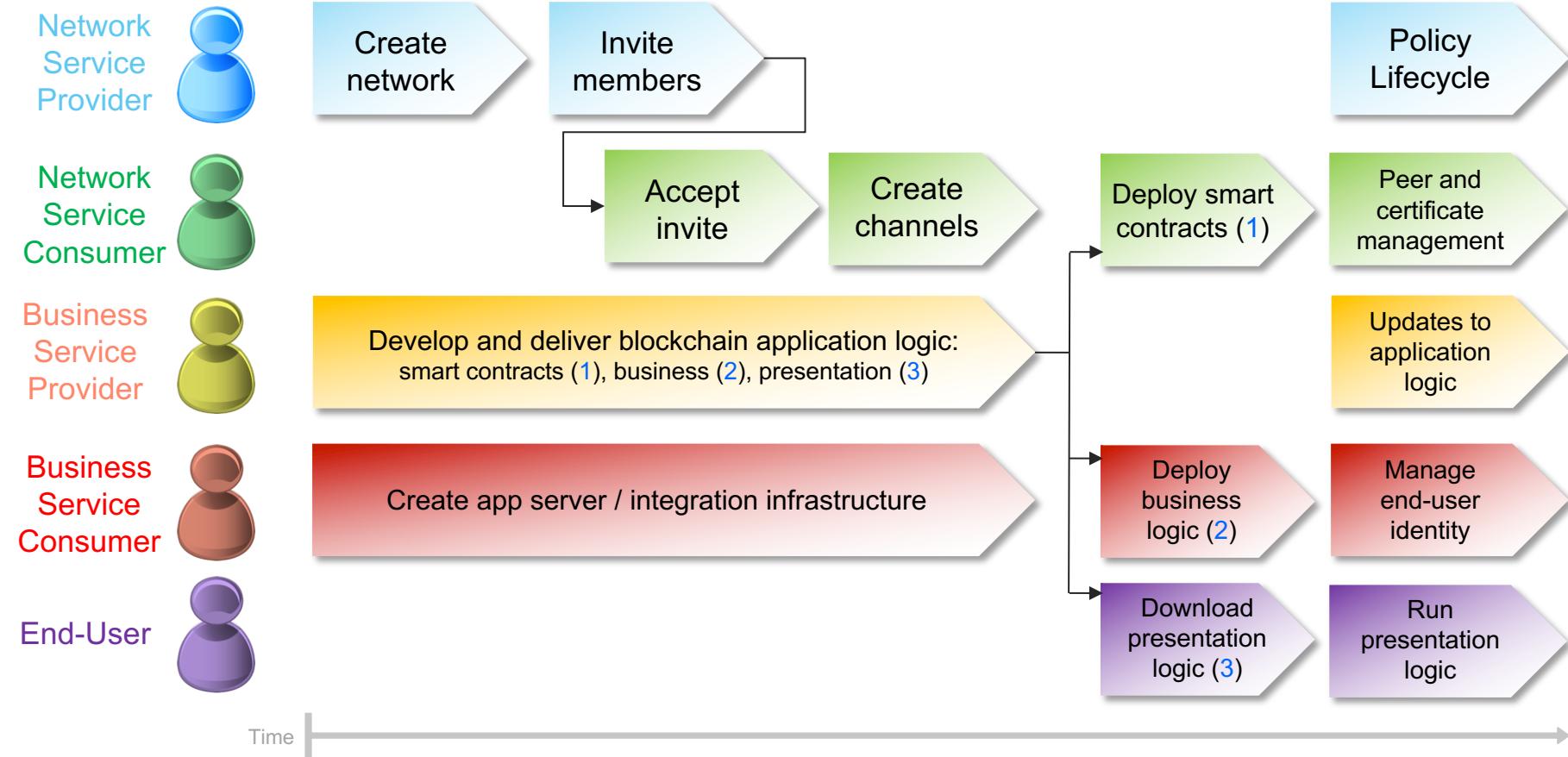
- IBM Blockchain Platform Enterprise plan is hosted in multiple sites to help you satisfy data residency requirements

- More platform locations planned

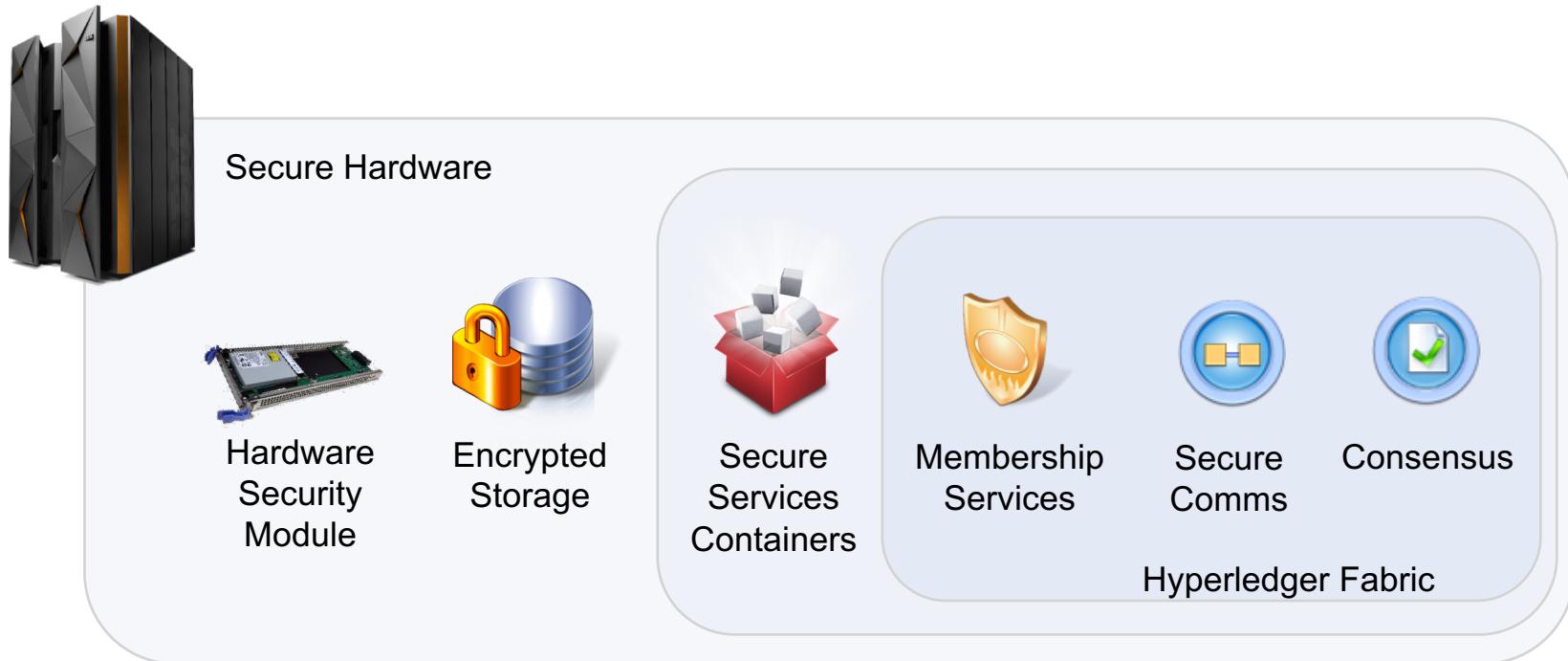
- ↑ Complemented by a set of IBM Blockchain Garages to help you get started with IBM Blockchain Platform

Learn more at
www.ibm.com/blockchain

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 Overview

What you need to know

[



Roadmap

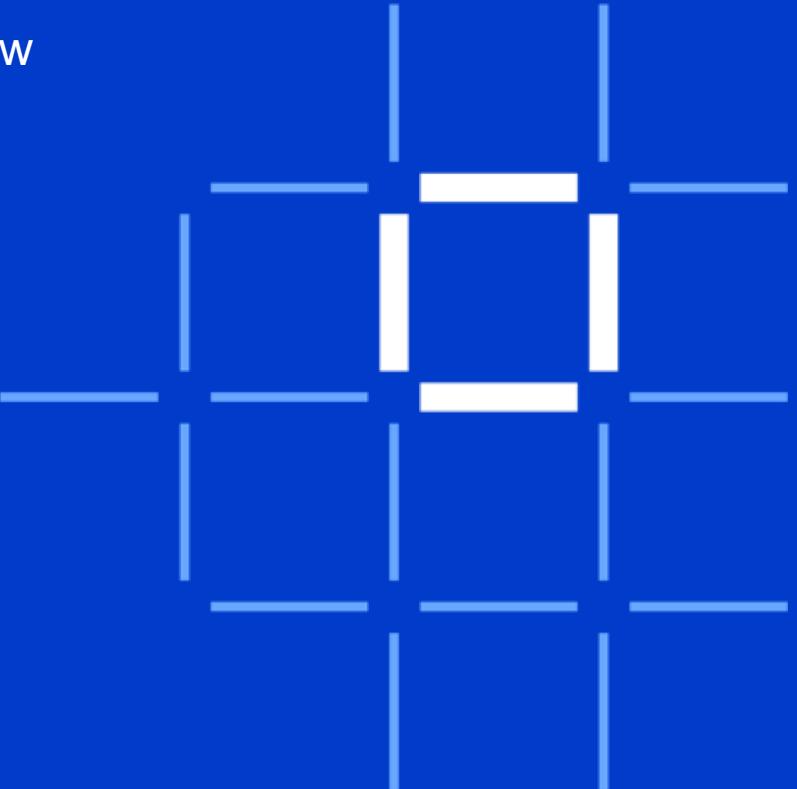
IBM's blockchain strategy and where the platform is going

]



IBP DEMO

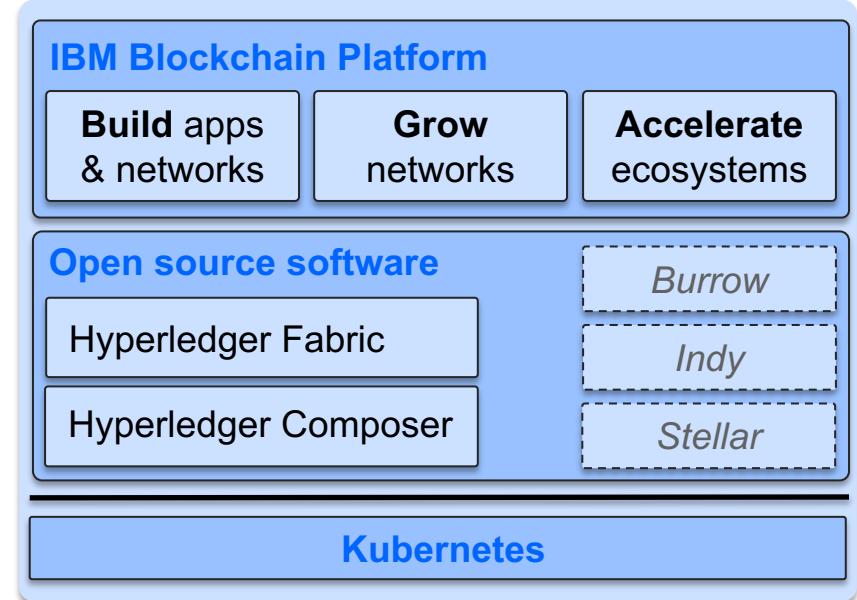
The tools to make your blockchain real



IBM Blockchain Platform – 2018 Strategy

IBM Blockchain Platform is the catalyst that enables true blockchain innovators to disrupt industries:

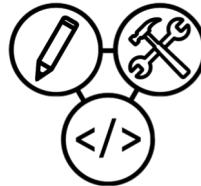
- **Best in market tools** to quickly build, launch, run enterprise applications on blockchain networks
- **Accelerated progression** path from POC to production by making it easy to create & join networks, integrate existing applications, and grow the ecosystem
- **Flexible deployment options** on Kubernetes architecture



Under consideration

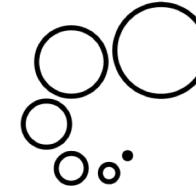
Core Capabilities for 2018

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



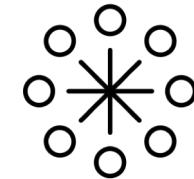
Build Apps & Networks

- **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 Services

Search

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

Name	Industry	Summary	Peers	Created Date
<code>{{2+9}}</code>			3	December 4th 2017, 4:21 AM
<code>artsexpo</code> Canada	Non-Profit		1	March 7th 2018, 2:41 AM
<code>besthouse</code> China	Real Estate, Real Estate Rental and Leasing		2	November 1st 2017, 9:48 AM
<code>coffeeshopschain</code> 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	January 4th 2018, 11:53 AM
<code>ecodisposal</code> USA	Waste Mgmt. and Remediation Services		4	November 1st 2017, 9:52 AM
<code>ewewde</code>		ВИСИВСИВСИВС	3	March 7th 2018,
<code>fishmarket</code>	Agriculture, Supply Chain Management, Wholesale Trade	This is a Fish Market blockchain	3	March 6th 2018, 7:41 AM
<code>friendsid</code>			2	November 1st 2017, 8:42 AM
<code>garcoin</code>			4	November 1st 2017,

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



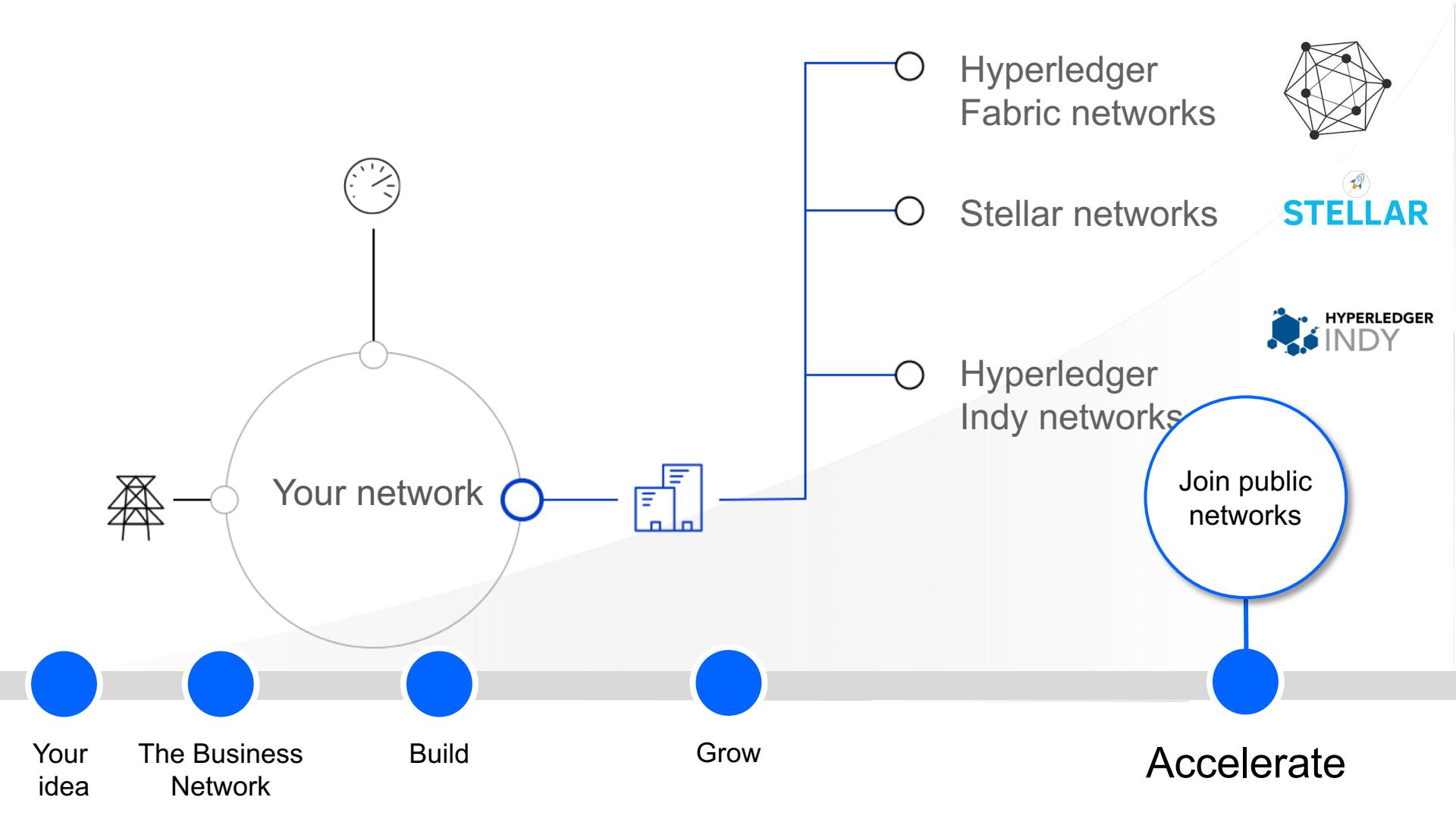
Build



Grow



Accelerate



IBP capabilities available in flexible deployments

IBM Blockchain



SaaS

Available now: \$

- **Use:** Dev/ Test and Production
- **Infrastructure:** Pre-defined by IBM Cloud
- **Configuration:** Default with optionality
- **Software lifecycle:** IBM
- **Geo Location:** Defined by IBM
- **Business continuity:** Basic
- **Compatibility:** All

Pricing/ Packaging/ RFP: Andy Whalen



Hybrid PaaS

Available Q2/Q3: \$\$

- **Use:** Dev/test and production
- **Infrastructure:** OSS: On-prem, AWS, MSFT, Google
IBP: IBM Cloud with customizable options
- **Configuration:** Default with optionality
- **Software lifecycle:** IBM manages IBP; Client OSS
- **Geo Location:** IBM choice of geo, region, zone
- **Business continuity:** DR option
- **Compatibility:** All

Pricing/ Packaging/ RFP: Lukas Staniszewski

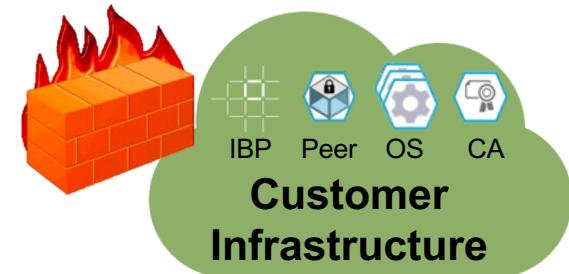


License (On-Prem)

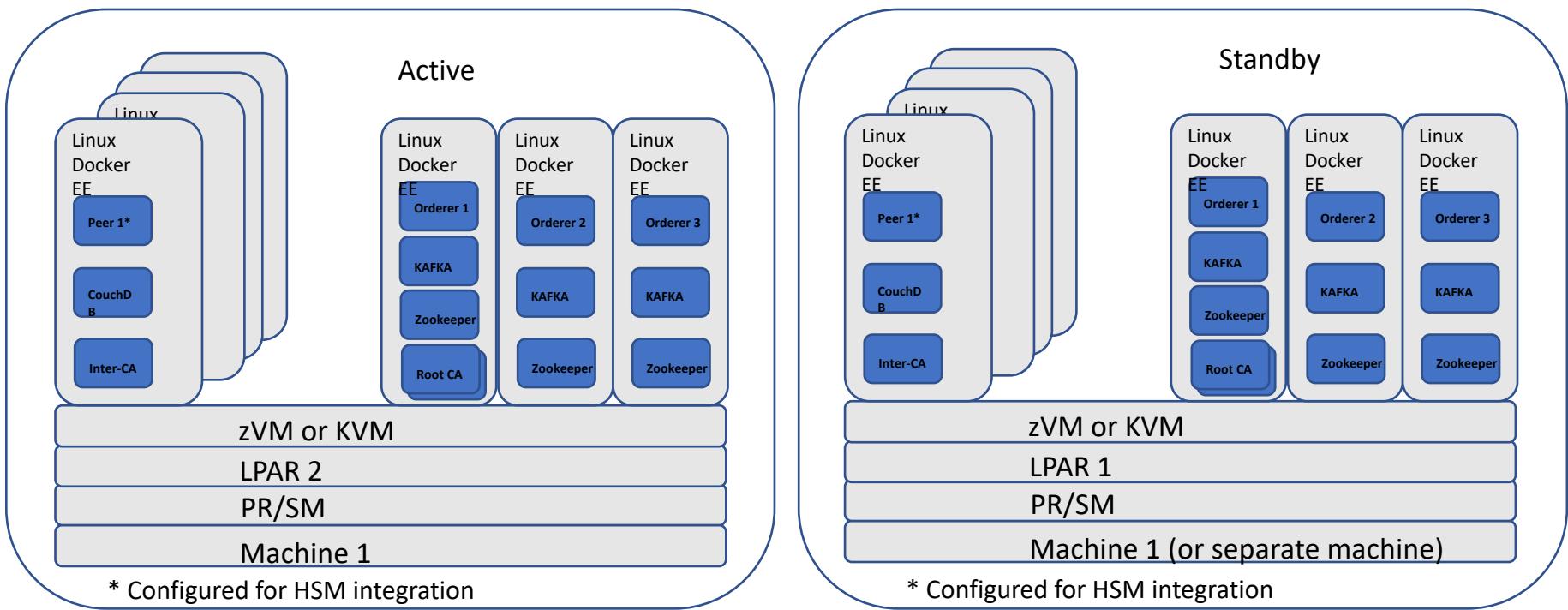
Available Q3/Q4: \$\$\$

- **Use:** Dev/ test and production
- **Infrastructure:** Client owned & managed
- **Configuration:** Client managed
- **Software lifecycle:** Client managed (compatibility guidelines apply)
- **Geo Location:** Client managed
- **Business continuity:** Client managed
- **Compatibility:** All

Pricing/ Packaging/ RFP: Lukas Staniszewski

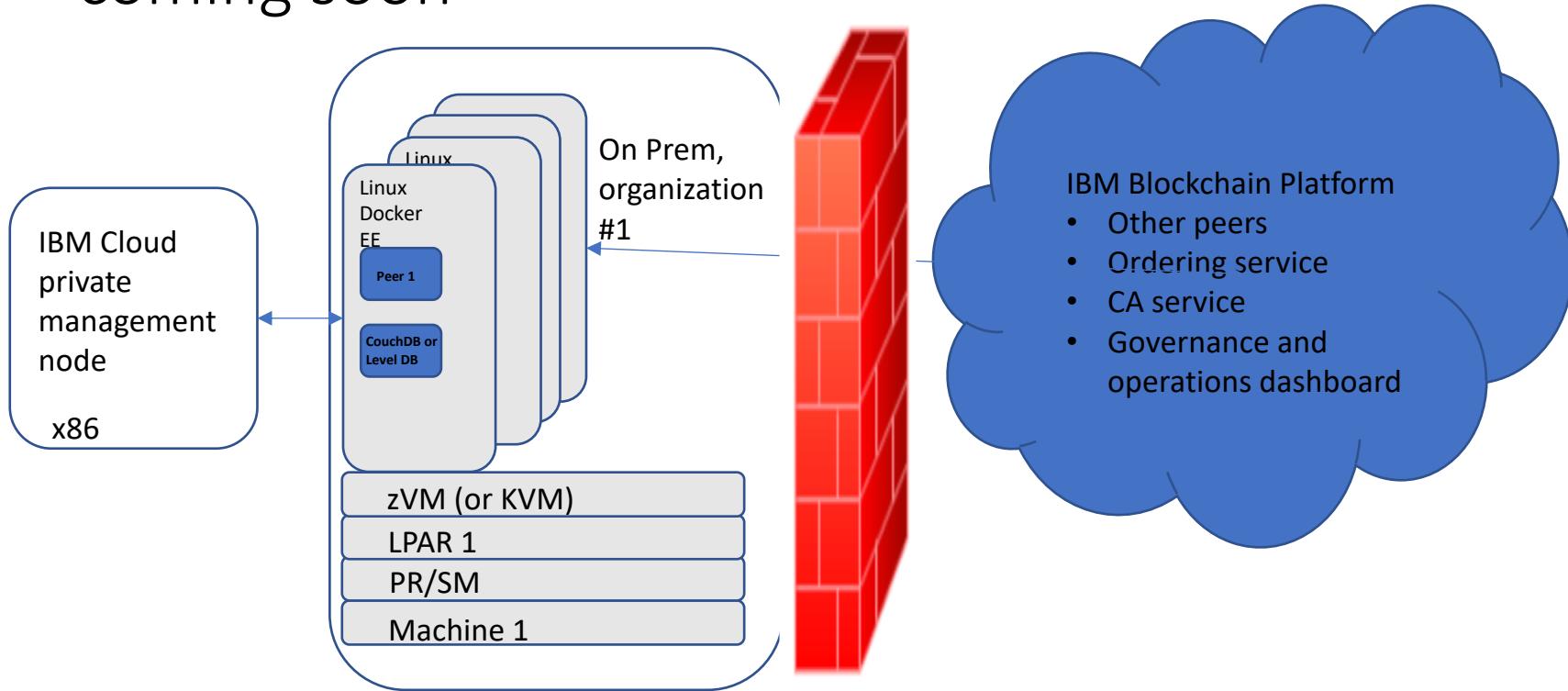


On prem blockchain deployment option #1



The above depicts a sample HA production environment for one blockchain network. For a test/dev environment, one can put all the components into one Linux image (no redundancy). Alternative: You can use one set of ordering and Root CA service for multiple networks, see chart 4. Alternative: You can leverage client's existing CA service, which may or may not reside on Z. Other considerations: If using Hyperledger Composer, where to place composer rest server?

On prem blockchain deployment option #2 – coming soon





IBM Blockchain Platform Overview

What you need to know



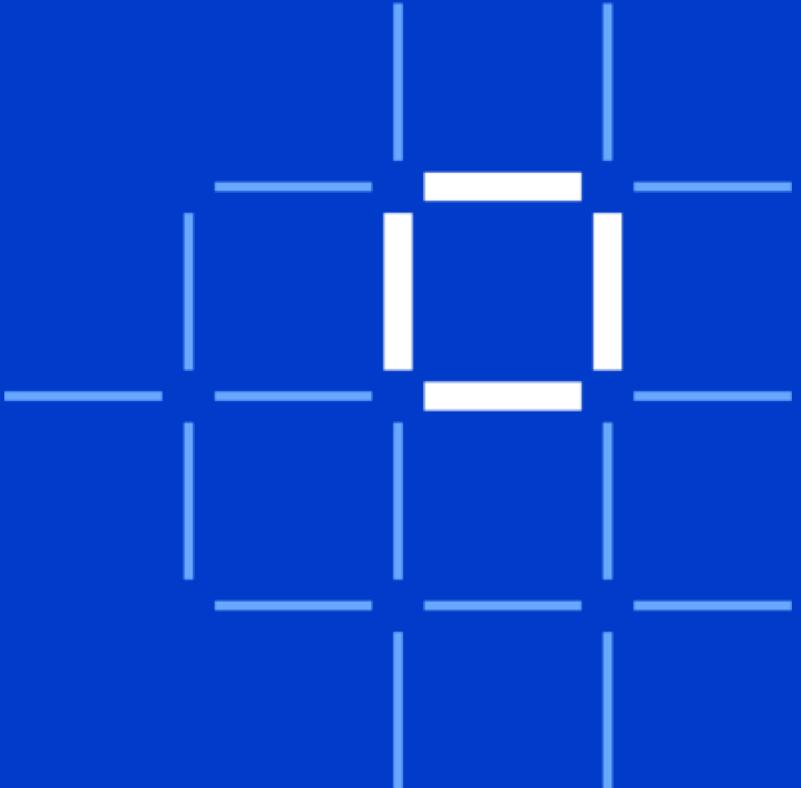
Roadmap

IBM's blockchain strategy and where the platform is going



IBP DEMO

The tools to make your blockchain real



Thank you

Jin VanStee

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

 @IBMBlockchain

 IBM Blockchain

 IBM Blockchain

