# Blockchain For Business

An Introduction to Blockchain for Business

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**Blockchain Explained**

**IBM Blockchain Platform**

Blockchain Solutions

Blockchain Composed

Blockchain Architected

Blockchain Explored

Next Steps

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# Business networks, wealth and markets
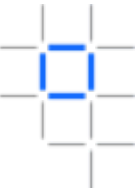
- Business Networks benefit from connectivity
  - Participants are customers, suppliers, banks, partners
  - Cross geography and regulatory boundary

- Wealth is generated by the flow of goods and services across business network in transactions and contracts

- Markets are central to this process:
  - Public (fruit market, car auction), or
  - Private (supply chain financing, bonds)



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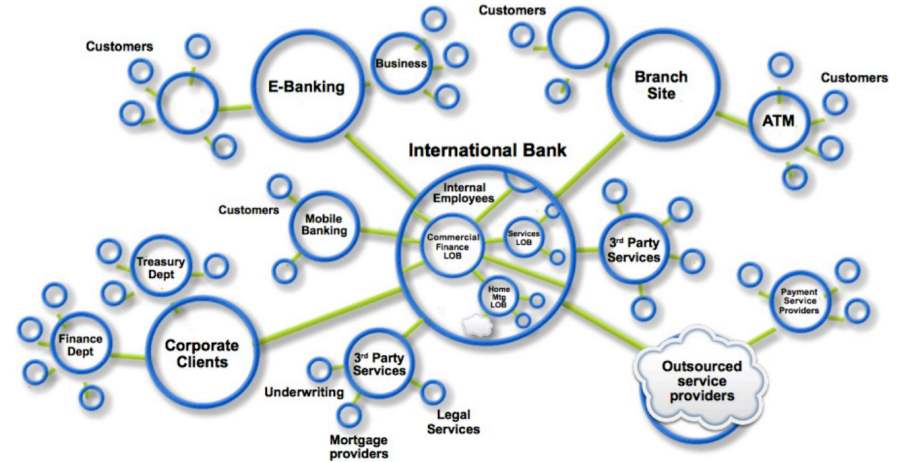
# Transferring assets, building value
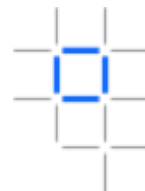
Anything that is capable of being owned or controlled to produce value, is an asset

## Two fundamental types of asset

- Tangible, e.g. a house
- Intangible, e.g. a mortgage

## Intangible assets subdivide

- Financial, e.g. bond
- Intellectual, e.g. patents
- Digital, e.g. music

## Cash is also an asset

- Has property of anonymity

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Problem...

Participant A's records

Participant B's records

Bank records

Insurer records

Regulator records

Auditor records
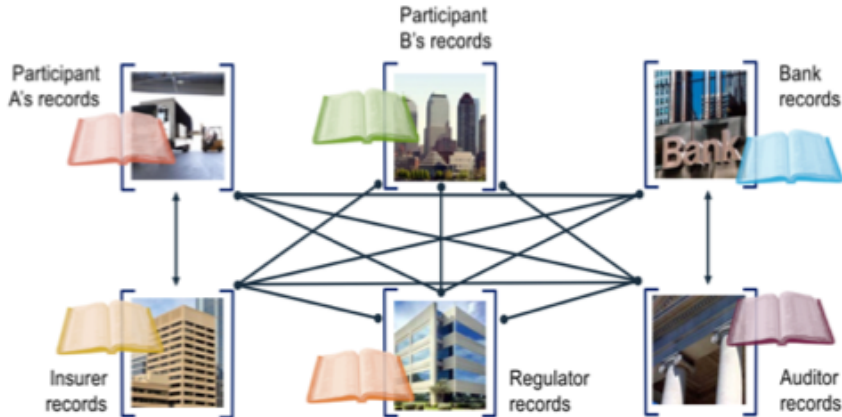
... inefficient, expensive, vulnerable

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# The Solution

A shared, replicated, permissioned ledger ...

Participant A's records

Participant B's records

Bank records

Blockchain

Insurer records

Regulator records

Auditor records

... with consensus, provenance, immutability and finality

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# Other types of blockchain exist

**bitcoin** **is an example of an unpermissioned, public ledger:**

- The first blockchain application
- Defines an unregulated shadow-currency
- Resource intensive

- Blockchains for business are generally permissioned and private, and prioritize:
  - Identity over anonymity
  - Selective endorsement over proof of work
  - Assets over cryptocurrency

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# Good blockchain use-case or bad?
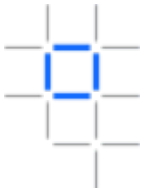
Dispute resolution

Holiday Tracking Tool

Know Your Customer

Food Provenance

Track Your Child

Electronic Medical Records

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# What makes a good blockchain use case?

– Identifying a good blockchain use-case is not always easy!

   – However there should always be:

1. A **business problem** to be solved
   - That cannot be more efficiently solved with other technologies

2. An identifiable **business network**
   - With Participants, Assets and Transactions

3. A need for **trust**
   - Consensus, Immutability, Finality or Provenance

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# What makes a good first blockchain use case?

– First use-cases are even more difficult to identify!

1. A **limited scope**, but still solves a real business problem
   - Minimum Viable Product in a few weeks of effort

2. A smaller **business network**
   - Usually without requiring regulators and consortia

3. Allows for **scaling with more participants and scenarios**
   - Consider shadow chains to mitigate risks

## Start small, succeed and grow fast!

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# Building Communities in Blockchain Networks

## Consortium Based Network
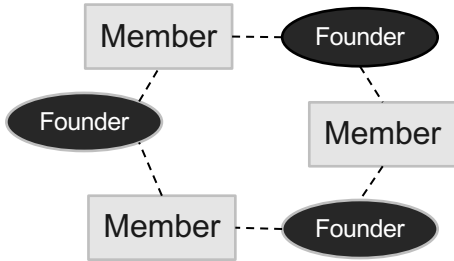


Founders are equal among other participants, may include a joint legal entity among the founders (e.g. – JV)

Examples:



## Founder Directed Network



Individual founder in a position to provide strong direction

Examples:



## Community Based Network
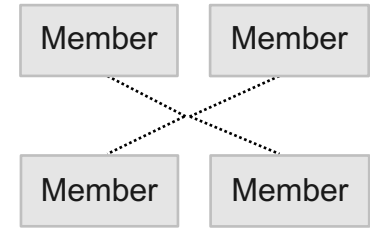


Driven by industry standards bodies or existing non-blockchain network owners

Examples:



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# we.trade – Digital Trade Chain
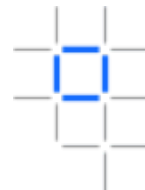
## What?

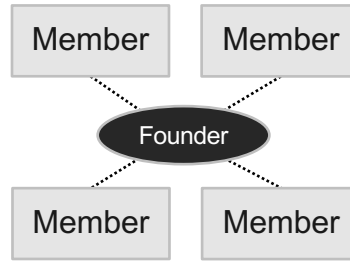- Digital Trade Chain (DTC), is a blockchain-based international trading system for a consortium of major world banks including: **Deutsche Bank, HSBC, KBC, Natixis, Rabobank, Société Générale, Santander, UniCredit and Nordea**

- Enables accurate trading posture information, order to settlement control, risk coverage, track and trace options

## Benefits

- 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



Source: BoAML, HSBC, IDA

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# Accelerating Global Payments

## What?

- A universal rail for real-time clearing and settlement on an integrated Blockchain network

## How?

- Collaboration between IBM and technology partners Stellar.org and KlickEx Group
- Initial participants include over 13 financial institutions

## Benefits

- Create secure, high volume, low-cost cross-border payments services without sacrificing margins
- Access new markets and currencies with limited risk
- Generate new sources of revenue with value-added products and services
- Aim: near real-time international payments
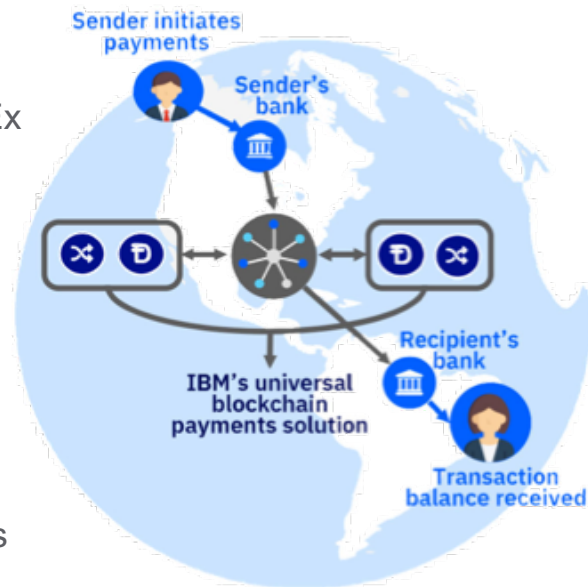
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# Financial Audit and Compliance Ledger

**ABN·AMRO**

## What?

- Reimagine current expensive audit process requiring integrating data – often inconsistent and outdated - from various sources on the blockchain

## How?

- Shared replicated ledger serves as single point of truth

- Auditors are guaranteed that no one has tampered the data via immutability of blockchain

## Benefits

- Clients, bank and regulators all see single version of truth

- No data inconsistencies => clear audit trail

- Enables efficient lower-cost Asset Quality Reviews (AQR)



**MONITOR & ENHANCE**
Follow-up review, report status and/or new findings and recommend

**DEFINE**
Understand your business operations and challenges

**COMMUNICATE**
Report findings and/or conduct training

**IDENTIFY**
Assess risk and/or compliance control gaps

**RECOMMEND**
Propose best-fit solutions and action items

**AUDIT ADVISORY**

Governance

Risk Management

Compliance

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# Global Financing: Dispute Resolution
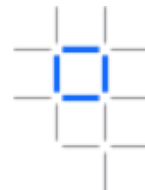
## What?

- IBM Global Finance provides a $41bn channel financing per year. There are a number of disputes that take time to resolve and can lock up transactions costing time and money

## How?

- Blockchain provides visibility and provenance end-to-end across supply chain

## Benefits

- Reduced dispute resolution time by 75%

- Released working capital from $100m

- Combine IGF and Supplier info to further expand benefits further

- In production since Sept 2016



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# Private Equity Administration

NORTHERN TRUST
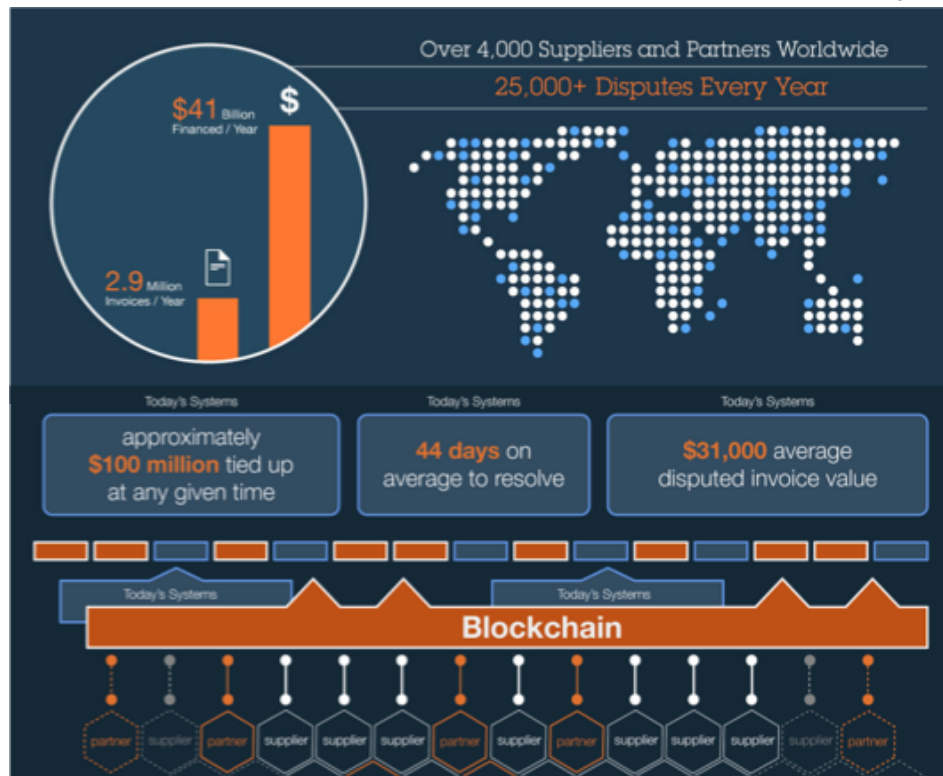
## What?

- Infrastructure supporting private equity has seen little innovation in recent years at a time when investors are seeking greater transparency, security and efficiency.

## How?

- Creation of an innovative private equity ecosystem designed to deliver increased efficiency, security and transparency.

## Benefits

- Provides real-time insight and transparency to all parties, including the fund managers and investors.

- Designed to allow regulatory access as required.

- Support compliance of local regulations.

- In production



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# Common KYC Data
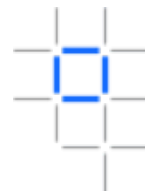
## What?

- View of customer identity to enable compliance with Know Your Customer (KYC)

## How?

- A complete view of customers' documents across a distributed network

## Benefits

- Creation of a single but cross-businesses KYC platform to inform all of the banks processes.

- Crédit Mutuel Arkéa could enable its customers to deliver proof of their identity to third-parties such as local utilities, retailers or regulated service providers.

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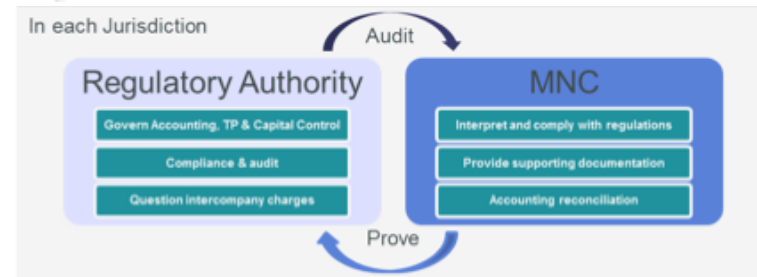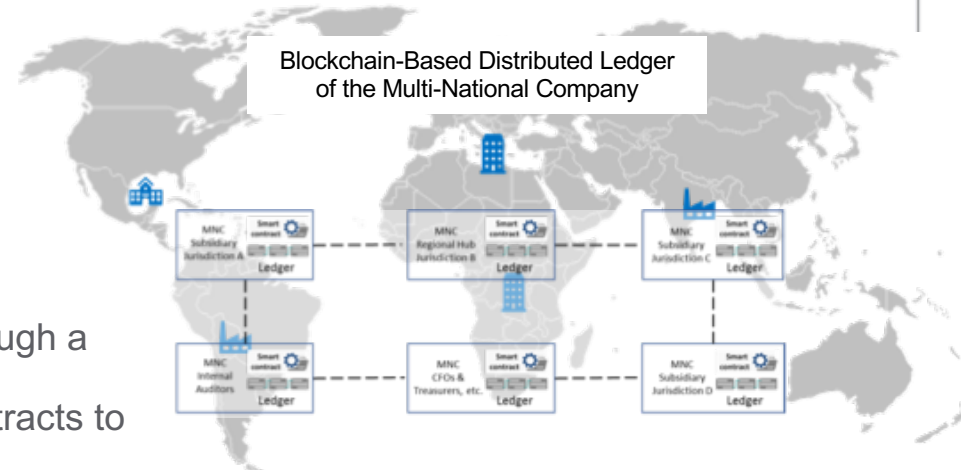# BlueAudit – Intercompany Supply Chain Optimization

## What?

- Transactions over the intercompany supply chain are subject to compliance and audit on finance, accounting, transfer pricing, capital control, etc., in each Jurisdiction.

## How?

- Document intercompany transactions, linkage, supporting documents contemporaneously through a blockchain-based application.
- Encode regulatory and trade rules in smart contracts to enhance control and compliance
- Complement exiting systems with minimal disruption

## Benefits

- End-to-end traceability & tamper-proof documentation for external auditing.
- End-to-end visibility with resolution preserved for CFOs, Treasurers, & Internal Auditors, etc.



Blockchain-Based Distributed Ledger of the Multi-National Company

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# Legitimize Diamonds and Reduce Fraud

## What?

- Track diamonds across supply chain from mine to retail

## How?

- Shared ledger for storing digital certification with supporting material

## Benefits

- Protect against the occurrence of fraud, theft, trafficking and black markets

- Assist in the identification and reduction of synthetic stones being labelled as authentic

- Increase speed of transparency for cross border transactions for insurance companies, banks and claimants



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# Renewable Energy Flexibility
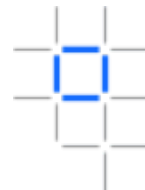
## What?

- Tennet must match supply & demand of electricity. This new era of renewable energy meant that existing systems are under strain to keep up.

- New battery technology enables a new near-instantaneous source of power to adapt to requirements

## How?

- The blockchain presents the operator from Tennet with a view of the available pool of flexibility, ready to activate at the push of the button

- This then signals batteries in Electric Vehicles connected to the grid (Vandebron) or distributed power banks in consumers homes (Sonnen)

## Benefits

- Giving the flexibility to match supply & demand

- Rapidly understanding the resources available

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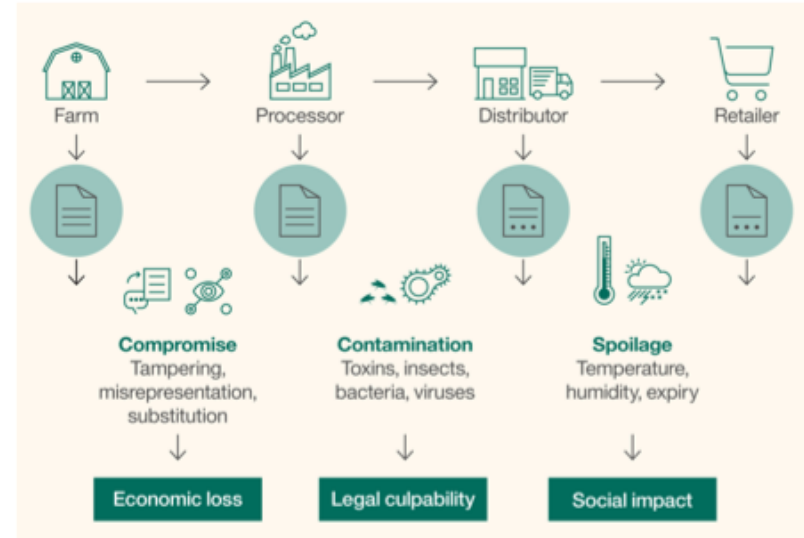
# Food Trust



## What?

- Provide a trusted source of information and traceability to improve transparency and efficiency across the food network.
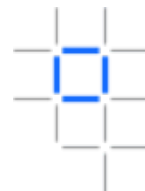
## How?

- Shared ledger for storing digital compliance documentation, test results and audit certificates network.

## Benefits

- Reduce impact of food recalls through instant access to end-to-end traceability data to verify history in the food network and supply chain.

- Help to address the 1 in 10 people sickened and 400,000 fatalities WW which occur every year from food-born illnesses.



Farm → Processor → Distributor → Retailer

**Compromise**
Tampering, misrepresentation, substitution
→ Economic loss

**Contamination**
Toxins, insects, bacteria, viruses
→ Legal culpability

**Spoilage**
Temperature, humidity, expiry
→ Social impact

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# Trusted Identity

## What?

- New experience for consumers to effortlessly sign-on to digital services, while remaining in control of their identity attributes.
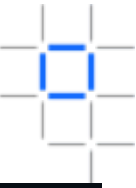
## How?

- No central database or identity honeypots

- No central point of failure

- "Triple Blind" data sharing – PRIVACY

## Benefits

- Institutions that participate in an ecosystem benefit with increased customer satisfaction, reduced risk in identity theft, and new revenue sources to institutions

TD

RBC  BMO  CIBC

ROGERS  Desjardins

Digital Asset Providers and Consumers

SECURE KEY

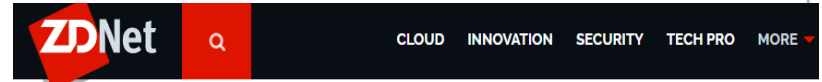**IBM Blockchain**

# IBM and FDA Partnership

## What?

- Create and promote a secure, efficient and scalable exchange of health data using blockchain technology.

## How?

- Blockchain technology will be used to create an electronic ledger of where and how data is transferred and exchanged

- Initial trial focus on oncology data

## Benefits

- Creating an audit trail through the ledger, healthcare professionals will be able to:
  - hold information leakers accountable
  - maintain transparency in what data is going where
  - secure weak spots in the sharing process



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**IBM bets on the blockchain to keep your medical data safe**

Big Blue believes the secure transfer of medical information can be achieved through technology associated with Bitcoin.

IBM has announced a new partnership with the US Food and Drug Administration (FDA) in a study designed to determine whether blockchain technology can be used to keep medical data transfers safe from theft or exploit.

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# CDC: Reference Data Chain of Custody & Consent for EHR
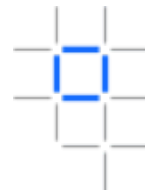
## What?

- Track the chain of custody of the EHRs and how they are stored, accessed and moved through the lifecycle in compliance with specific governmental regulations

- Manage consent and sharing of EHRs

## How?

- Each participant agrees to capture the access and storage of EHR data on the blockchain

- Blockchain creates single view of the EHR reference data

- Include consent model so that owners of data can quickly and easily provide consent for others to access their data and then record consent to avoid dispute



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# Why Hyperledger Fabric?

**Open Governance**
Anyone can join or contribute

**Built from the ground up for enterprise**
With a maturity model to help companies move to production
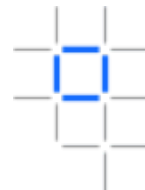
**Performance**
Supports up to 1000 tps*

**Confidentiality and privacy**
Built-in channels for isolation and membership services for signing and encryption. Supports IBM Blockchain Platform.

**Modularity and flexibility**
Choice of consensus algorithms and programming languages

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# Why IBM?

**Industry Expert**
- Hundreds of experienced consultants, researchers and developers
- Deep systems integration and middleware experience

**Secure by Design**
- IBM Blockchain High Security Business Network
- Dedicated compute, cryptography hardware, tamper-resistant container.

**Open By Design**
- Linux Foundation Hyperledger founding member
- Ongoing donation of code, developers and intellectual property to Hyperledger

**Fast Start**
- 400+ clients in engagement pipeline in 2016
- IBM Blockchain Garage engagement model to implement MVP rapidly

**Hyper Scale**
- Choice of deployment including on-prem, off-prem, self-managed or *aaS
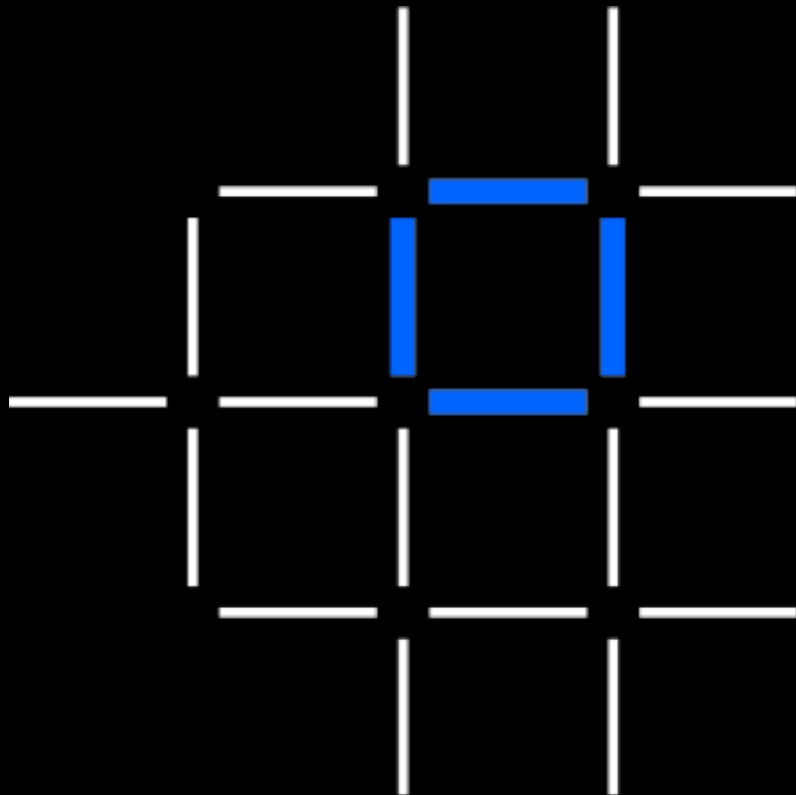- Supports rapid expansion of initial solution.

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# Thank you

*Richard Gordon*
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