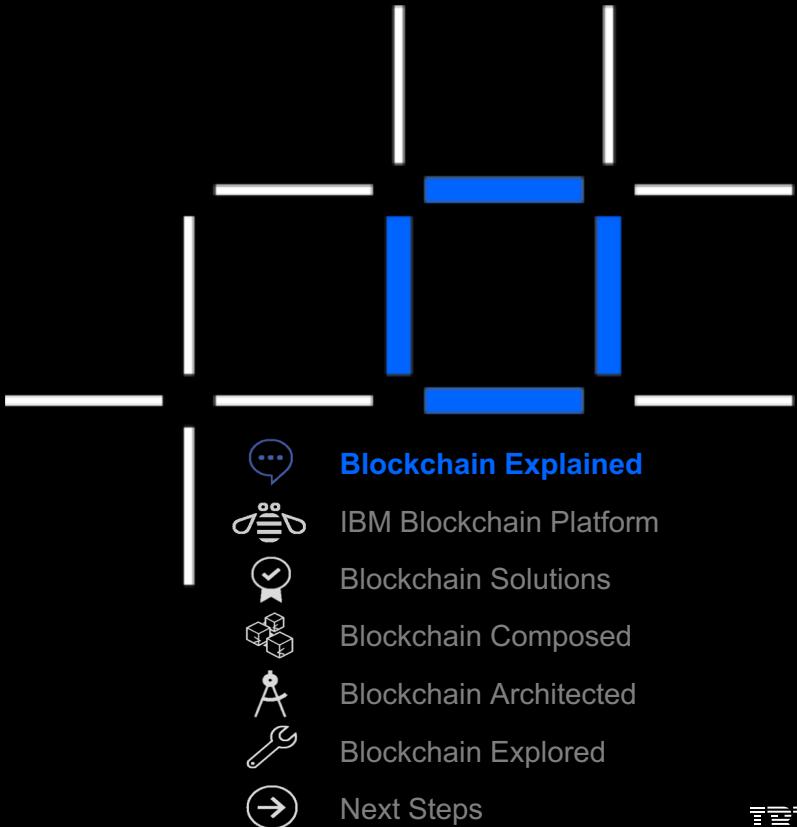


Blockchain Explained

An Introduction to Blockchain for Business

Austin Grice
Blockchain Technical Leader
austin.grice@ibm.com





What is Blockchain?



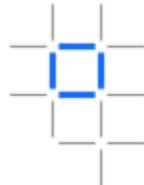
Why is it relevant for
our business?



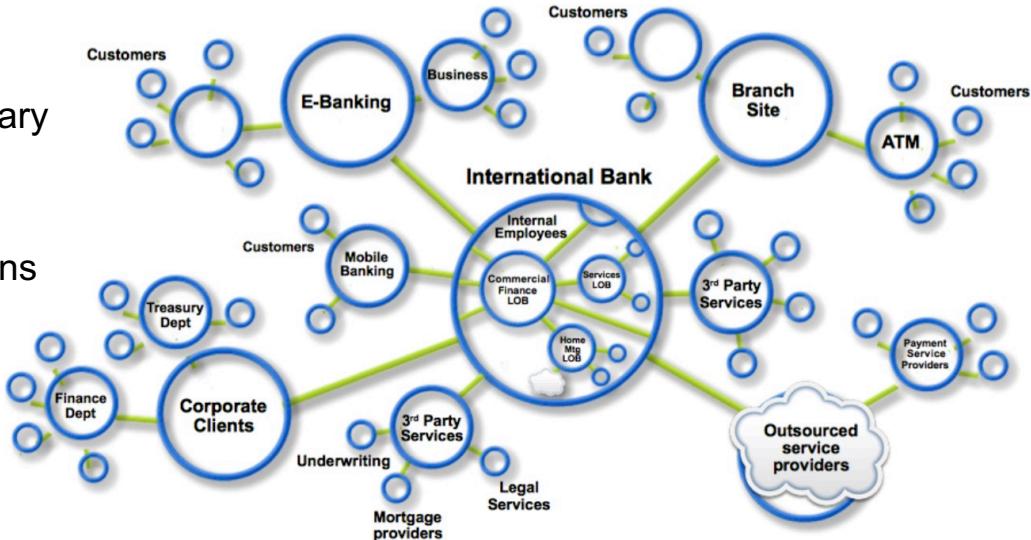
IBM and Blockchain



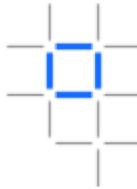
Business networks, wealth and markets



- **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)



Transferring assets, building value



Anything that is capable of being owned or controlled to produce value, is an asset



Two fundamental types of asset

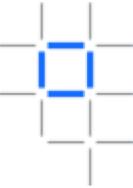
- Tangible, e.g. a house
- Intangible, e.g. a mortgage

Intangible assets subdivide

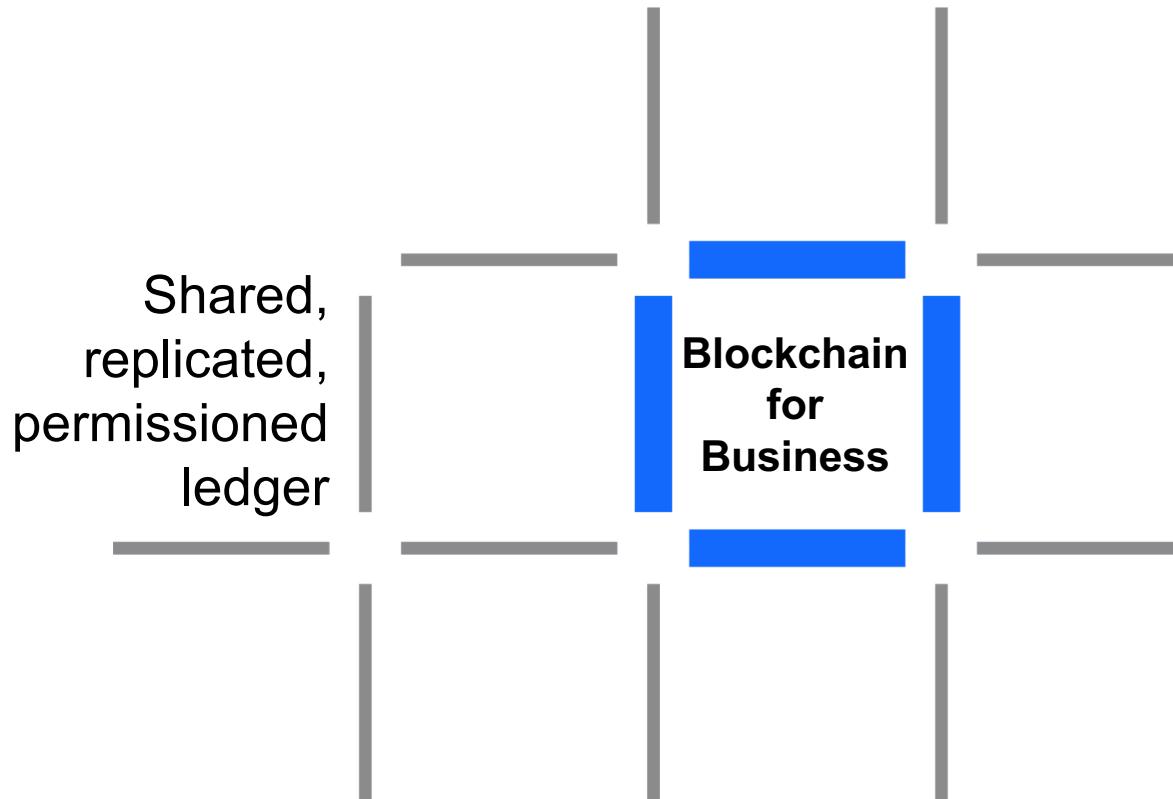
- Financial, e.g. bond
- Intellectual, e.g. patents
- Digital, e.g. music

Cash is also an asset

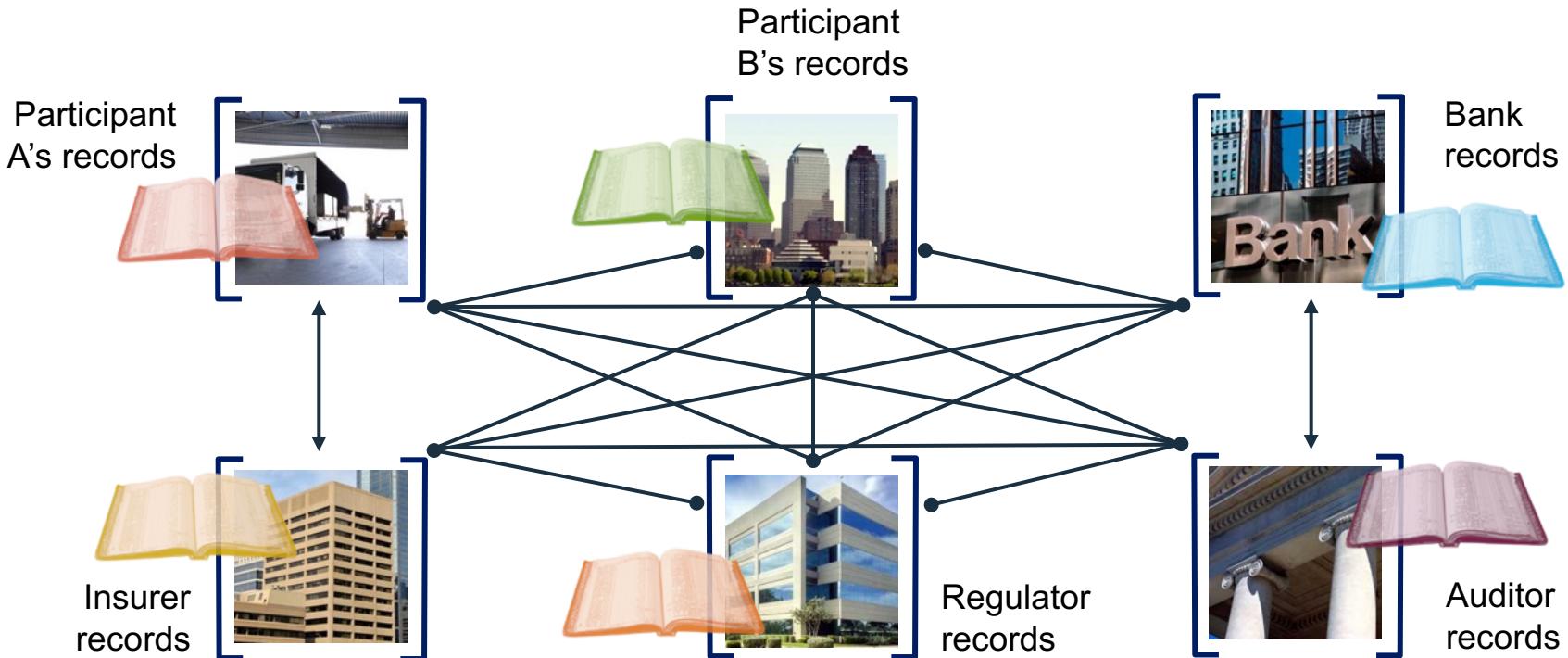
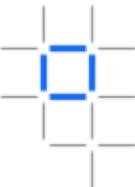
- Has property of anonymity



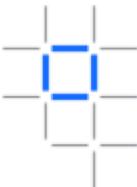
Introducing Blockchain for Business...



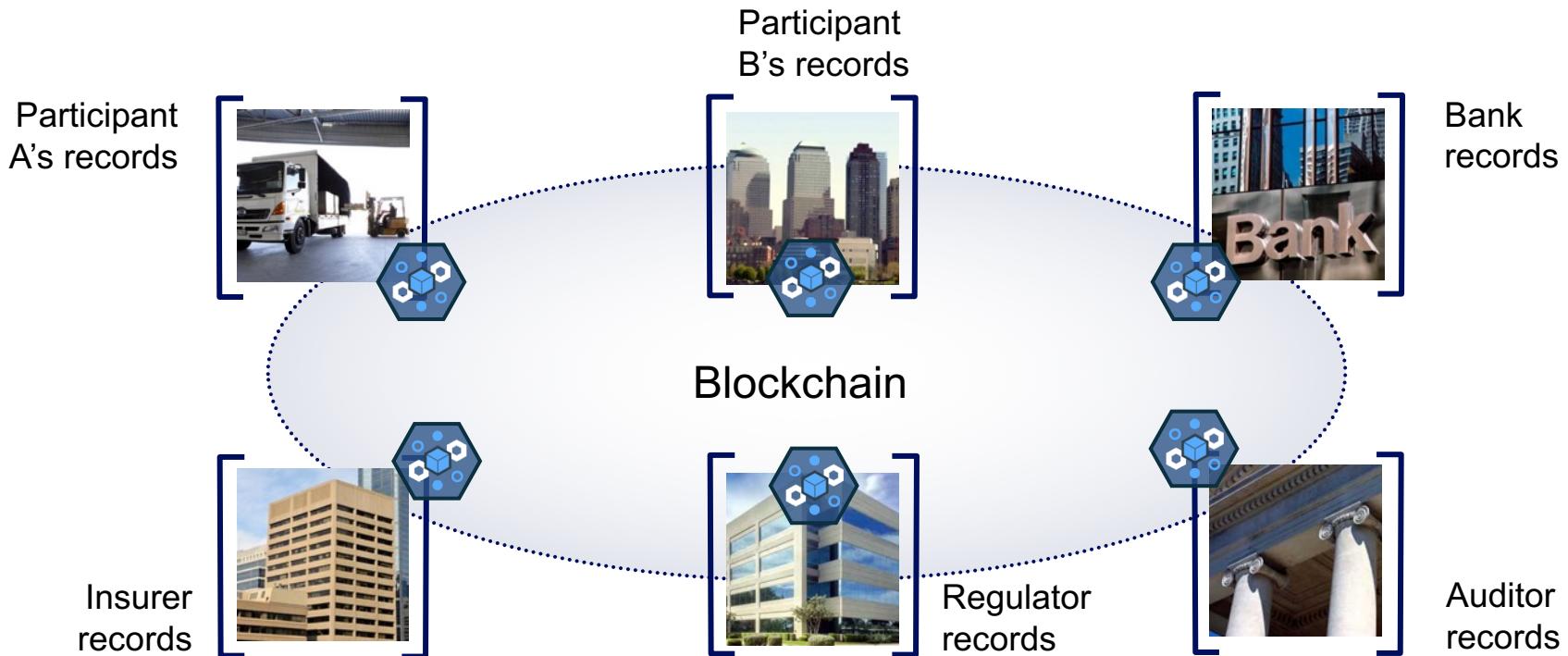
Problem...



... inefficient, expensive, vulnerable

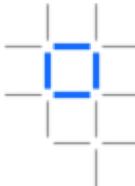


A shared, replicated, permissioned ledger ...



... with consensus, provenance, immutability and finality

Other types of blockchain exist

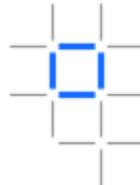


is an example of an unpermissioned, public ledger:

- 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



Blockchain for business requires trust



Append-only
distributed system of
record shared across
business network



Shared
ledger



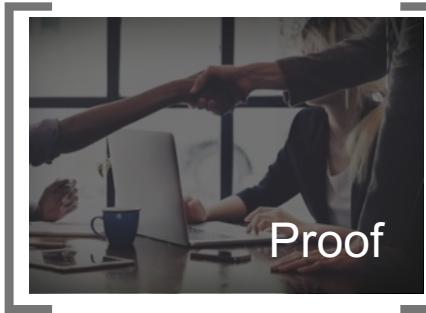
Smart
contract

Business
terms
executed with
transactions

Transactions
are secure with
appropriate
visibility



Privacy



Proof

Transactions are
provably endorsed
by relevant
participants



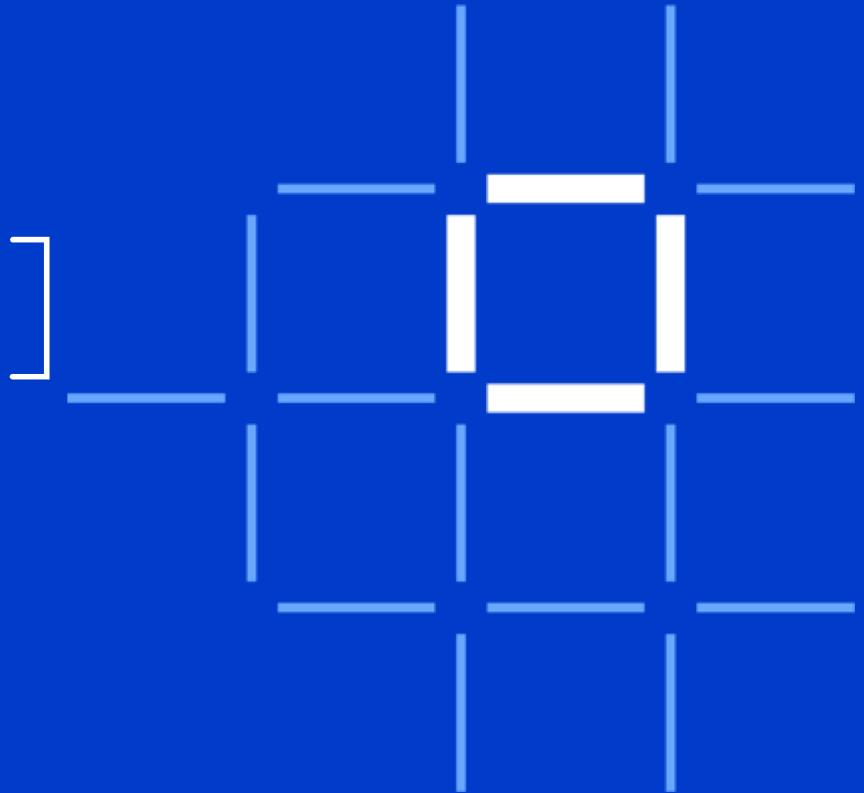
What is Blockchain?

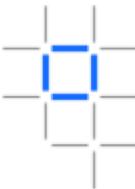


Why is it relevant for
our business?



IBM and Blockchain





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.



Accelerating Global Payments

What?

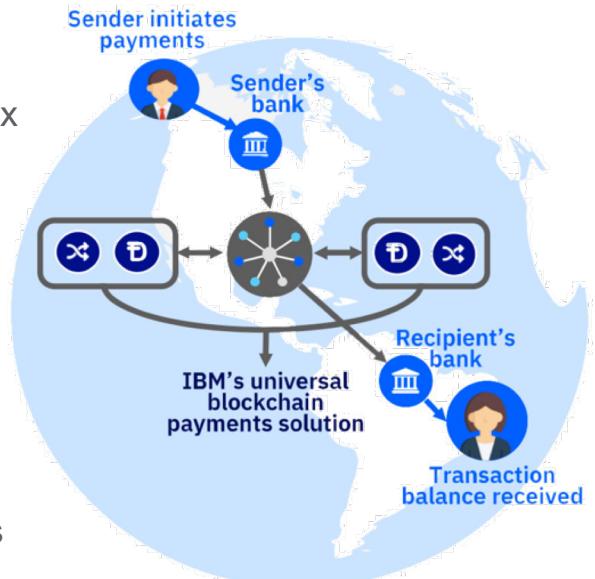
- A universal rail for real-time clearing and settlement on an integrated Blockchain network

How?

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

Benefits

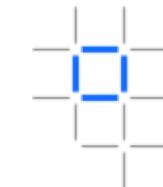
- Create secure, high volume, low-cost cross-border payments services without sacrificing margins
- Access new markets and currencies with limited risk
- Generate new sources of revenue with value-added products and services
- Aim: near real-time international payments



Food Trust



MCLANE
INTELLIGENT. SOLUTIONS



Walmart

Nestlé

Tyson

gsf
golden state foods



Unilever

What?

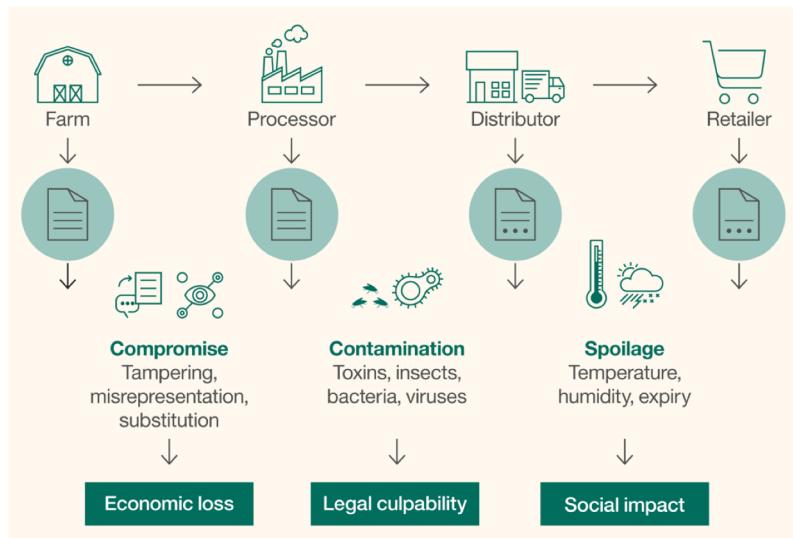
- Provide a trusted source of information and traceability to improve transparency and efficiency across the food network.

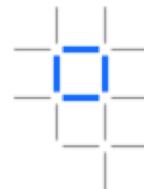
How?

- 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.





What?

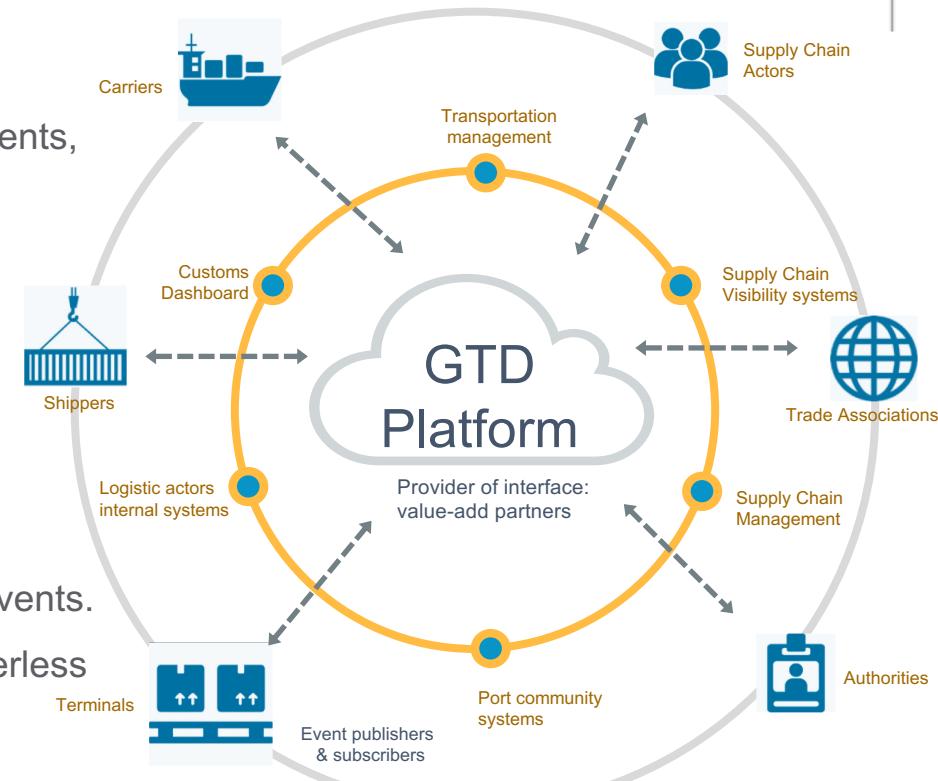
- An open, extensible platform for sharing shipping events, messages, and documents across all the actors and systems in the supply chain ecosystem.

How?

- Providing Shared Visibility and Shared State for Container Shipments

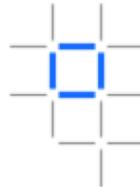
Benefits

- Increase speed and transparency for cross border transactions through real time access to container events.
- Reduced cost and increased efficiency through paperless trade





Global Financing: Dispute Resolution



What?

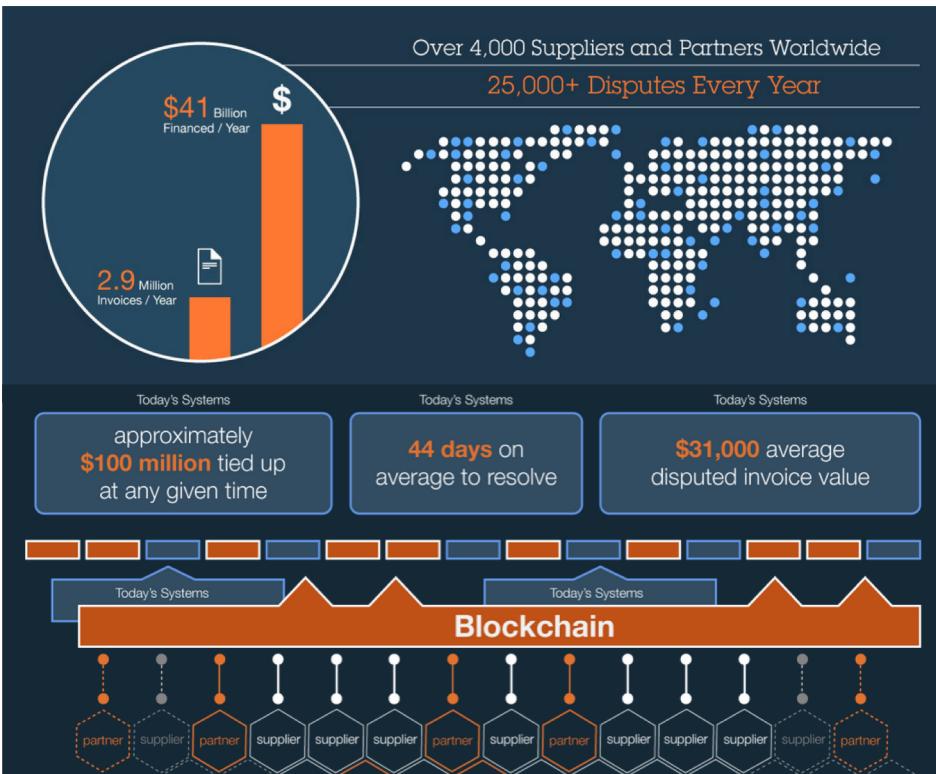
- IBM Global Finance provides a \$41bn channel financing per year. There are a number of disputes that take time to resolve and can lock up transactions costing time and money

How?

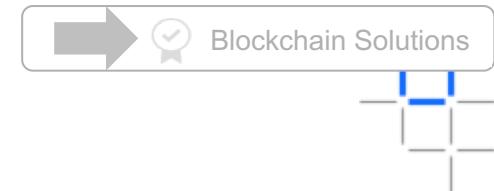
- Blockchain provides visibility and provenance end-to-end across supply chain

Benefits

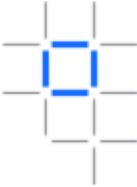
- Reduced dispute resolution time by 75%
- Released working capital from \$100m
- Combine IGF and Supplier info to further expand benefits further
- In production since Sept 2016



Making blockchain real for business...



Trade Finance	Pre and Post Trade	Complex Risk Coverage
 we.trade more trust. more trade. 	  	
Identity/ Know your customer (KYC)	Unlisted Securities/ Private Equity Funds	Incentive Program
  	 	
Medicated Health Data Exchange	Government	Distributed Energy/ Carbon Credit
		 
Supply Chain	Food Trust	Provenance/ Traceability
  IBM Blockchain	     	    



Further examples by (selected) industry



Financial	Public Sector	Retail	Insurance	Manufacturing
<ul style="list-style-type: none">• Trade Finance• Cross currency payments• Mortgages	<ul style="list-style-type: none">• Asset Registration• Citizen Identity• Medical records• Medicine supply chain	<ul style="list-style-type: none">• Supply chain• Loyalty programs• Information sharing (supplier – retailer)	<ul style="list-style-type: none">• Claims processing• Risk provenance• Asset usage history• Claims file	<ul style="list-style-type: none">• Supply chain• Product parts• Maintenance tracking



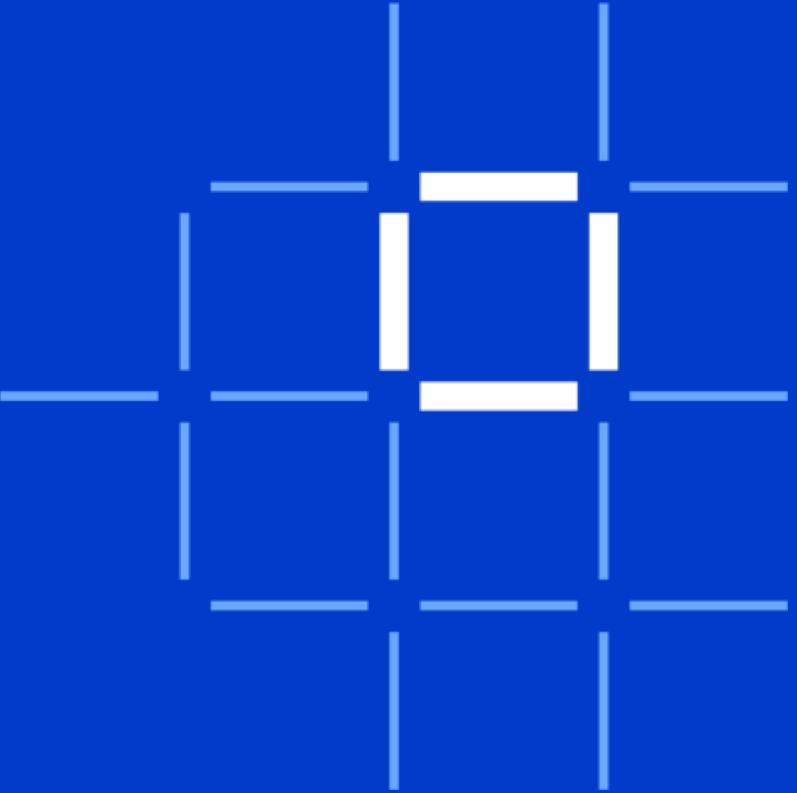
What is Blockchain?



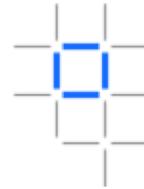
Why is it relevant for
our business?



IBM and Blockchain



Hyperledger: A Linux Foundation project



- A collaborative effort created to advance cross-industry blockchain technologies for business
- Founded February 2016; now more than 230 member organizations
- Open source, open standards, open governance
- Five frameworks and five tools projects
- IBM is a premier member of Hyperledger

www.hyperledger.org



Hyperledger Members

Premier



Associate



Source: <https://www.hyperledger.org/members>
Updated: 3 April 2018

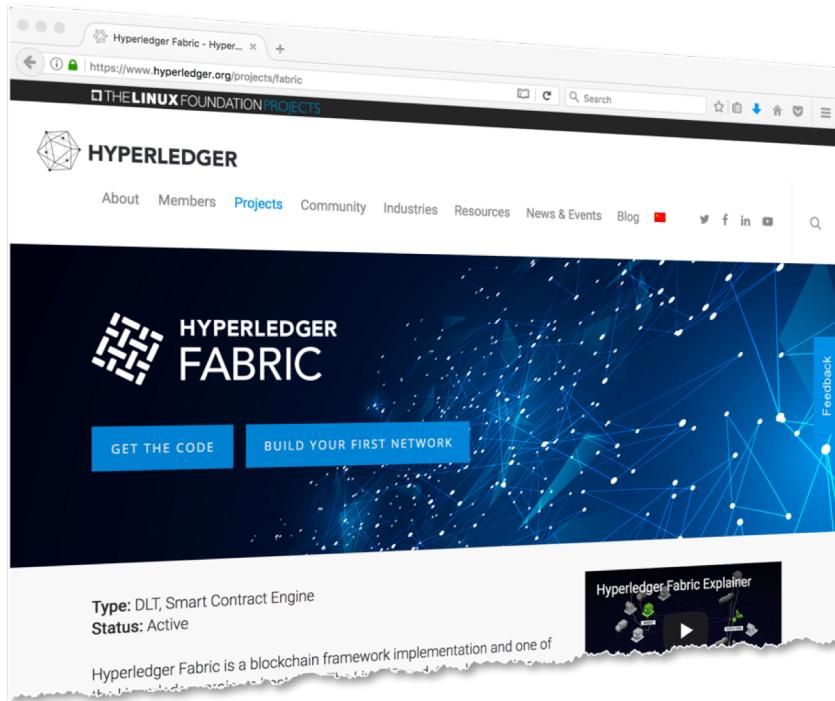
General



Associate (Academia)

IBM

Distributed ledger platform

The screenshot shows the official Hyperledger Fabric project page. It includes a navigation bar with links to About, Members, Projects (highlighted), Community, Industries, Resources, News & Events, and Blog. Below the navigation is a large banner with the Hyperledger Fabric logo and a network graph. Two prominent buttons are visible: 'GET THE CODE' and 'BUILD YOUR FIRST NETWORK'. On the left side, there's a sidebar with project details: Type: DLT, Smart Contract Engine and Status: Active. At the bottom, a video player titled 'Hyperledger Fabric Explainer' is shown.

- An implementation of blockchain technology that is a foundation for developing blockchain applications
- Emphasis on ledger, smart contracts, consensus, confidentiality, resiliency and scalability.
- V1.1 released March 2018
 - Includes significant performance, security, migration and smart contract improvements
- IBM is one of the many contributing organizations

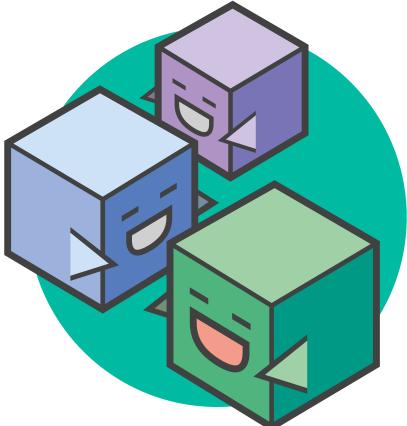
<http://hyperledger-fabric.readthedocs.io/>

Hyperledger Fabric and Composer Roadmap (Linux Foundation)

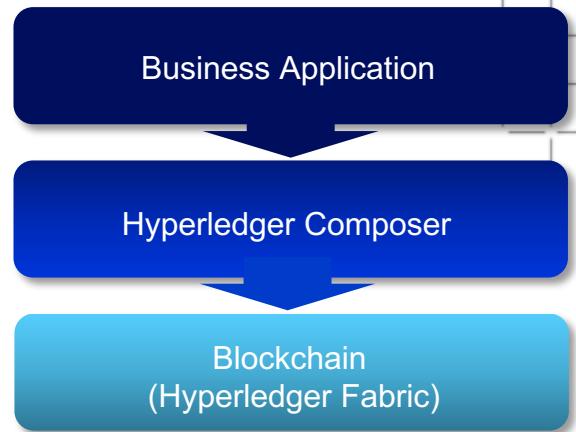
	Q1	Q2	Q3	Q4
Fabric	<p>1.1 release</p> <ul style="list-style-type: none">• JS Chaincode• Channel events• CouchDB indexes• CRL• Mutual TLS• Connection profiles• Performance and scale improvements• Experimental: SideDB, fine-grained, access control etc.	<p>1.2 release</p> <ul style="list-style-type: none">• UX improvements• Technical debt• Experimental from 1.1• Native asset model• Pluggable transaction mode• State-based ownership• Flexible policies for chain code governance• Private transactions with SideDB• Service Discovery• Identity Mixer	<p>1.3 release</p> <ul style="list-style-type: none">• Zero Knowledge Proof (confidential transactions)• RAFT consensus• Experimental: BFP consensus	<p>1.4 release</p> <ul style="list-style-type: none">• TBD
Composer	<p>0.18 release</p> <ul style="list-style-type: none">• Hyperledger Fabric JS Chaincode integration• Cloud storage for network identities• HSM support• Enhanced data collection• Application generator capability	<p>1.0 release</p> <ul style="list-style-type: none">• Standalone test tool• Additional industry samples• Integrated documentation	<p>1.1 release</p> <ul style="list-style-type: none">• Enhanced transaction processing function• Onboarding and secure document store integrations	<p>1.2 release</p> <ul style="list-style-type: none">• Public network integration

Hyperledger Composer: Accelerating Time to Value

- A suite of high level application abstractions for business networks
- Emphasis on **business-centric vocabulary** for quick solution creation
- Reduce risk, and increase understanding and flexibility



- Features
 - Model your business networks, test and expose via APIs
 - Applications invoke transactions to interact with business network
 - Integrate existing systems of record
- Fully open and part of Linux Foundation Hyperledger
- Try it in your web browser now:
<http://composer-playground.mybluemix.net/>

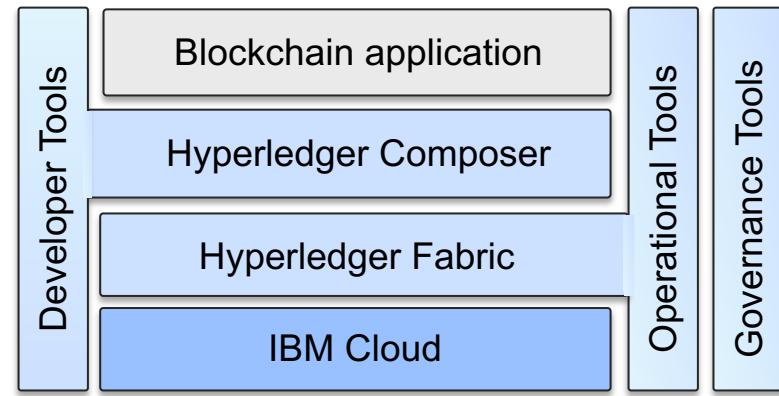


Introducing the IBM Blockchain Platform

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



Thank you

*Austin Grice
Blockchain Technical Leader*

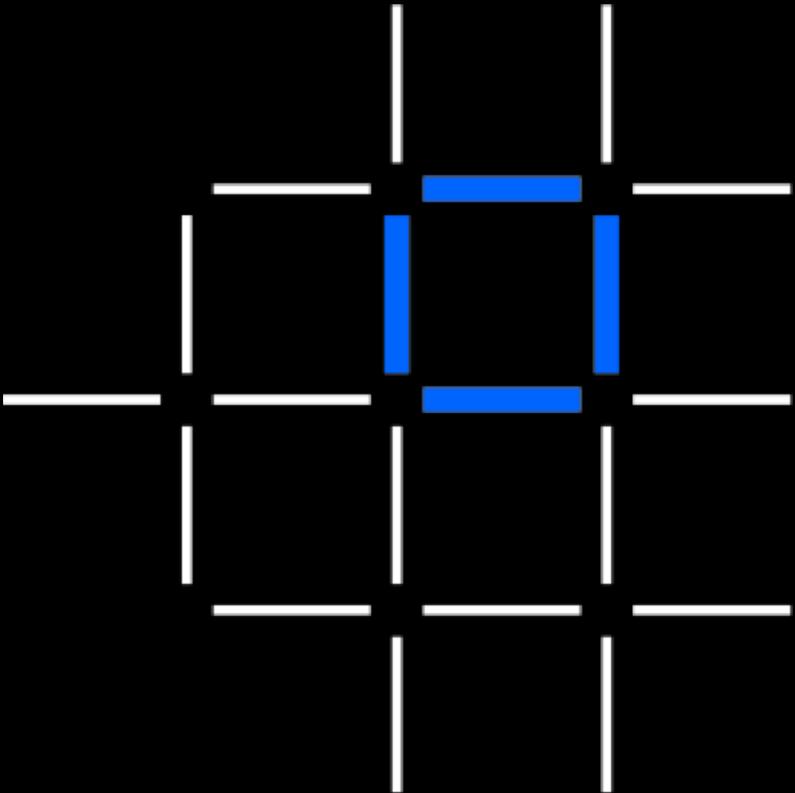
austin.grice@ibm.com

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

 @IBMBlockchain

 IBM Blockchain

 IBM Blockchain





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