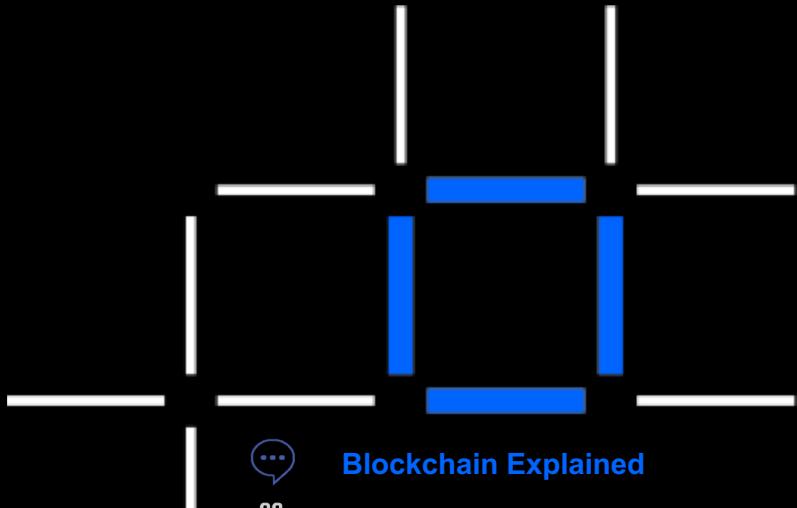


# Blockchain Explained

An Introduction to Blockchain for Business

Austin Grice  
Blockchain Technical Leader  
[austin.grice@ibm.com](mailto:austin.grice@ibm.com)



**Blockchain Explained**



IBM Blockchain Platform



Blockchain Solutions



Blockchain Composed



Blockchain Architected



Blockchain Explored



Next Steps





What is Blockchain?

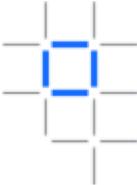


Why is it relevant for  
our business?



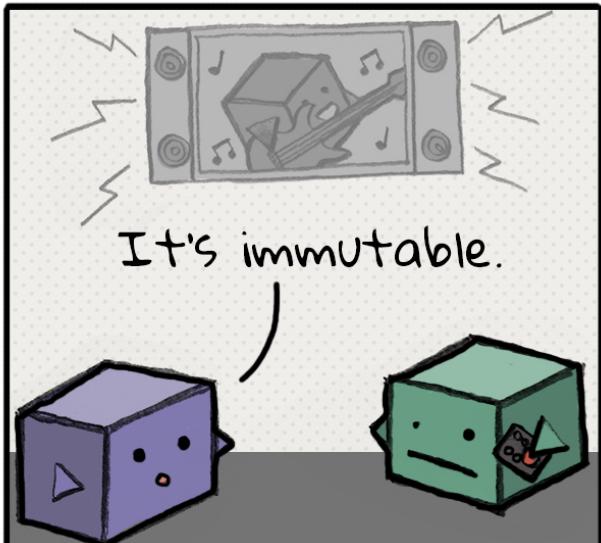
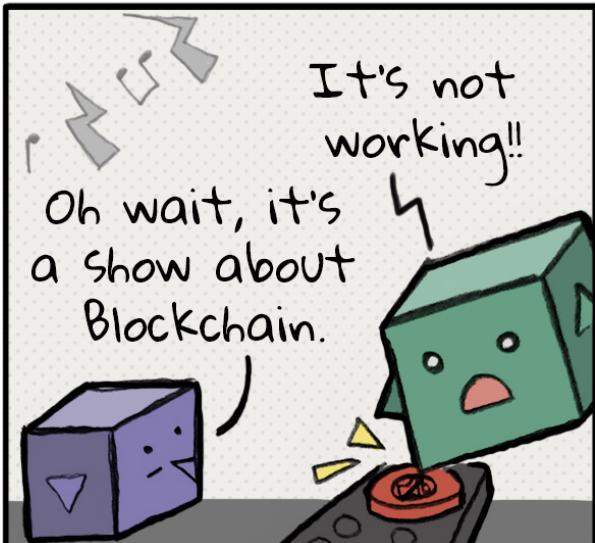
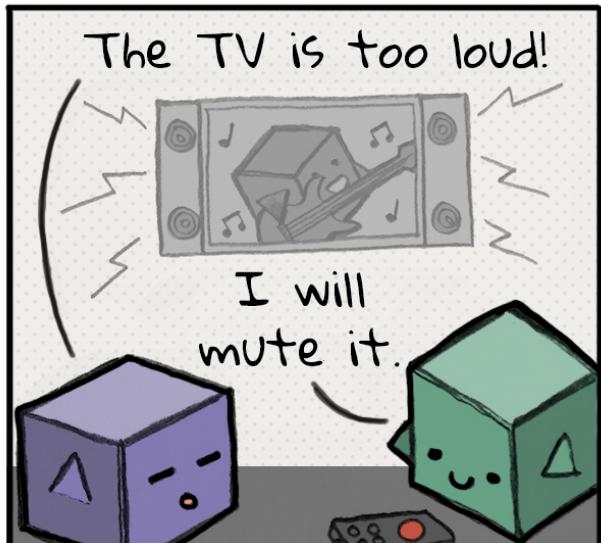
IBM and Blockchain

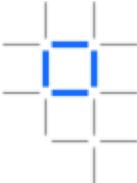




# CONGA COMICS

## Block Height 1: "Loud Noises"

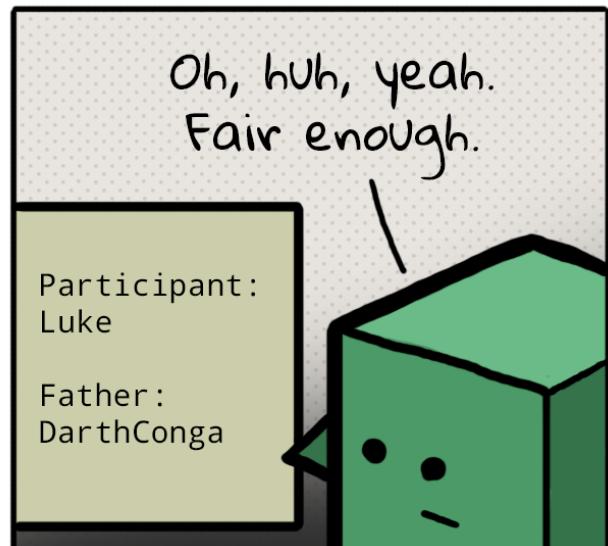




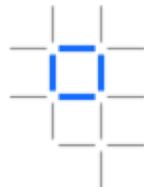
# CONGA COMICS

Block Height 13: "Inheritance"

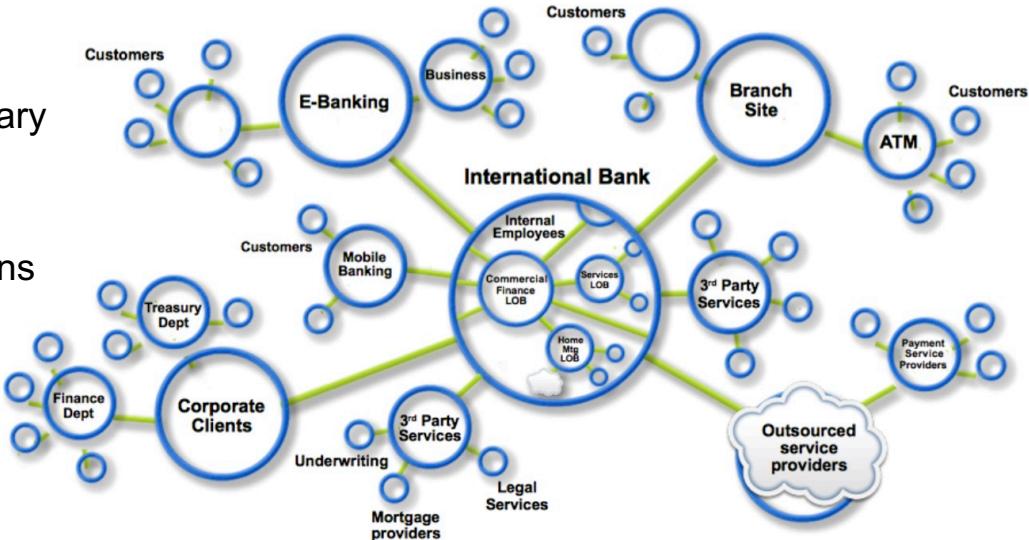
#M



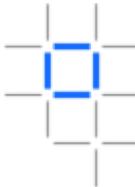
# Business networks, wealth and markets



- **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

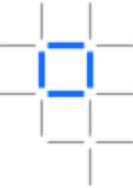
- Tangible, e.g. a house
- Intangible, e.g. a mortgage

## Intangible assets subdivide

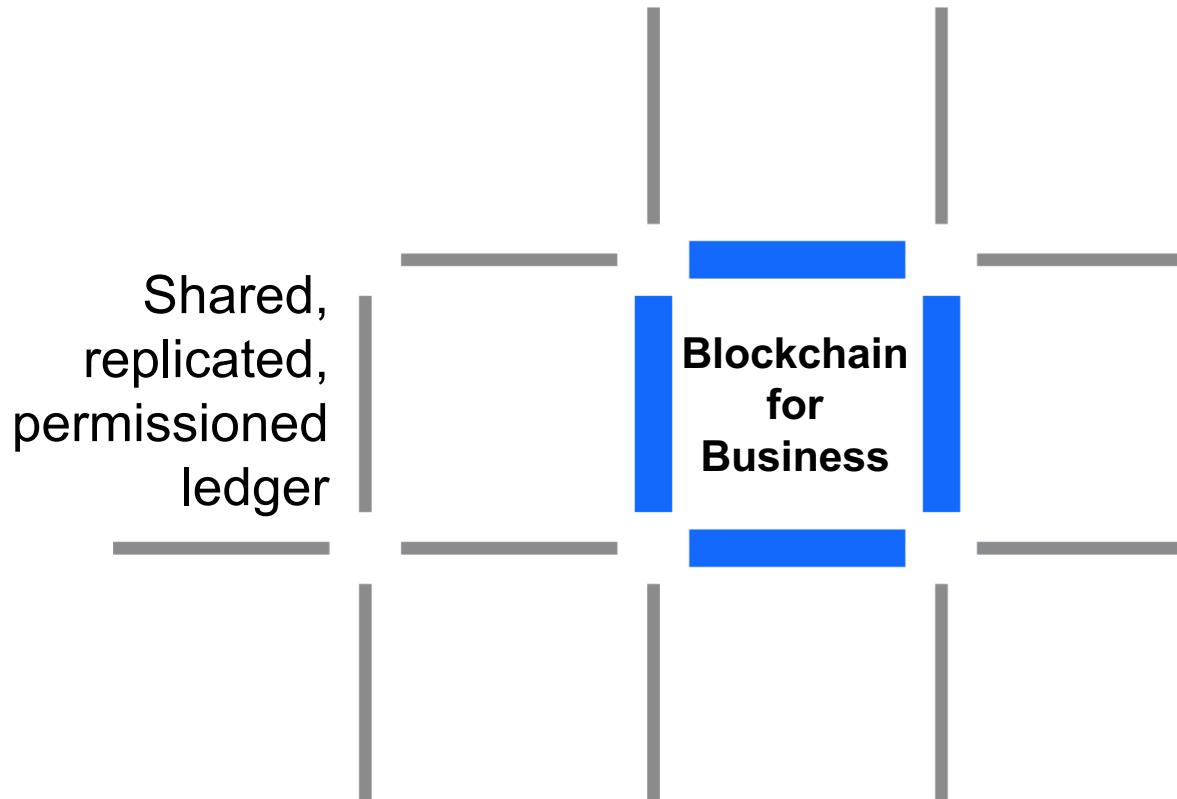
- Financial, e.g. bond
- Intellectual, e.g. patents
- Digital, e.g. music

## Cash is also an asset

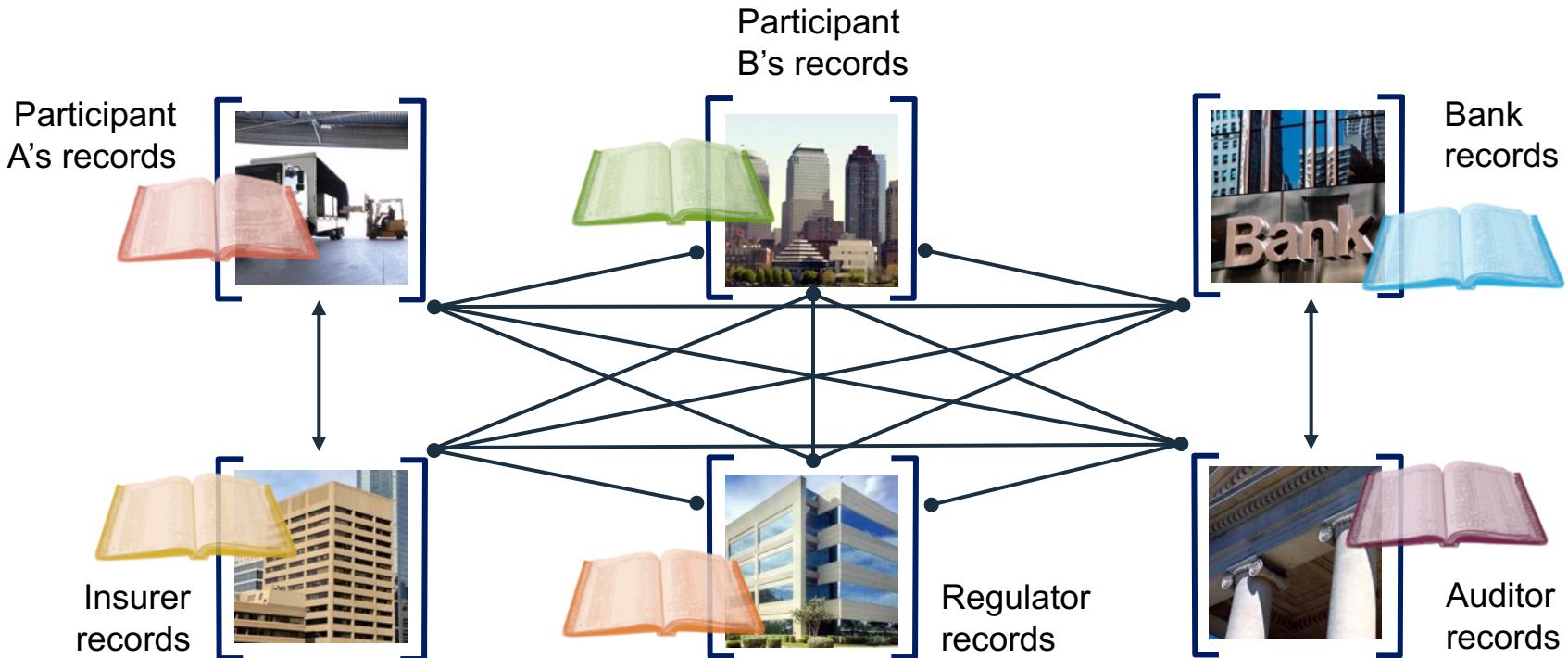
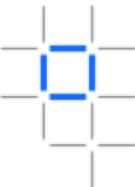
- Has property of anonymity



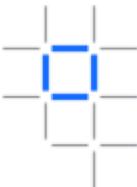
# Introducing Blockchain for Business...



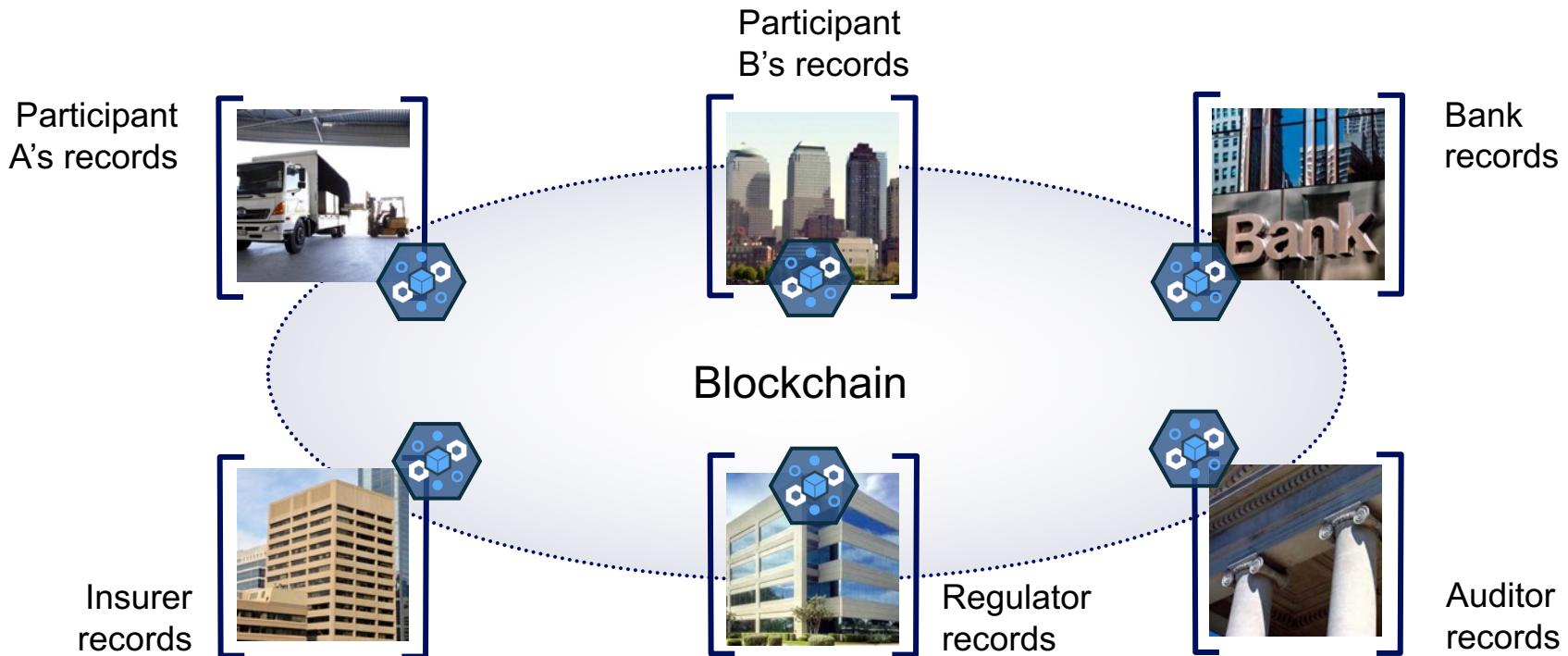
# Problem...



... inefficient, expensive, vulnerable

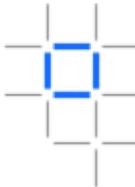


# A shared, replicated, permissioned ledger ...



... with consensus, provenance, immutability and finality

# Other types of blockchain exist

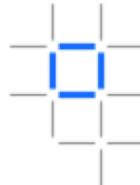


is an example of an unpermissioned, public ledger:

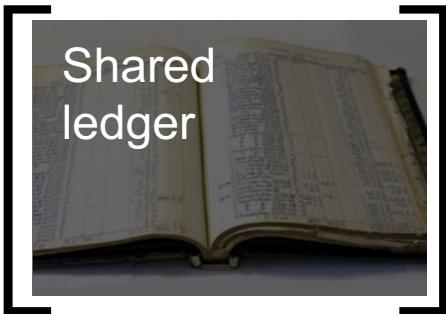
- The first blockchain application
  - Defines an unregulated shadow-currency
  - Resource intensive
- 
- **Blockchains for business** are generally permissioned and private, and prioritize:
    - Identity over anonymity
    - Selective endorsement over proof of work
    - Assets over cryptocurrency



# Blockchain for business requires trust



Append-only  
distributed system of  
record shared across  
business network



Smart  
contract



Business  
terms  
executed with  
transactions

Transactions  
are secure with  
appropriate  
visibility



Proof



Transactions are  
provably endorsed  
by relevant  
participants



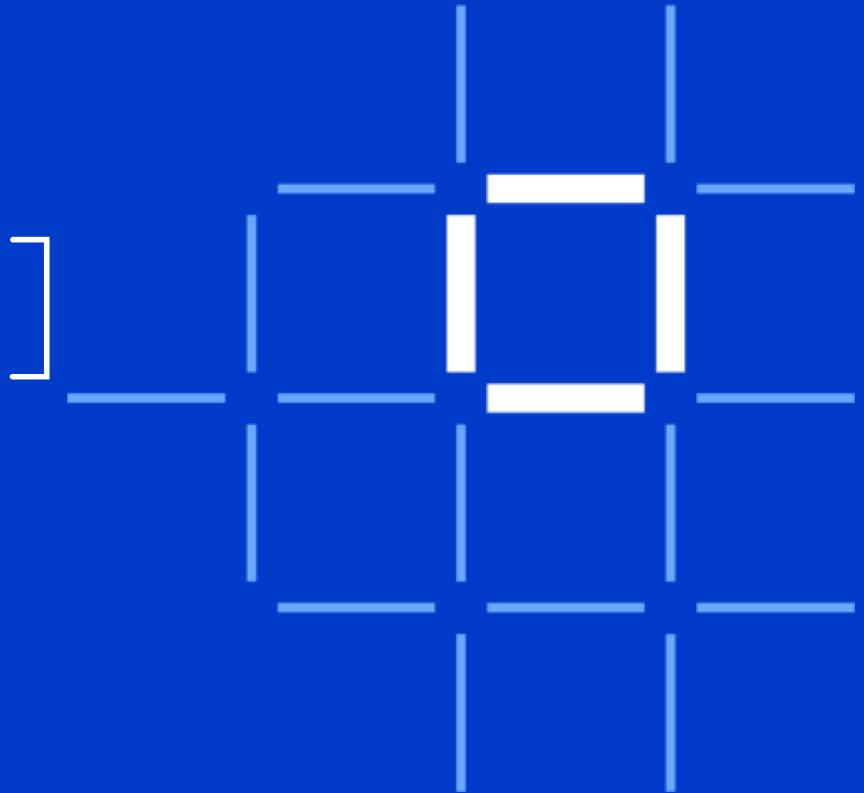
What is Blockchain?

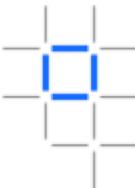


Why is it relevant for  
our business?



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

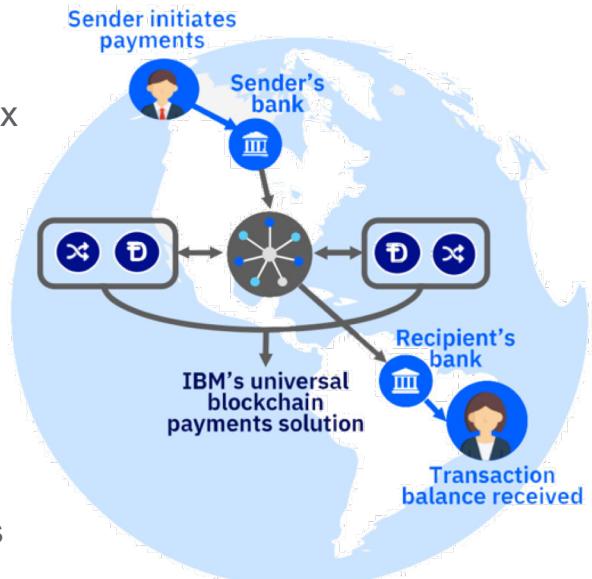


## How?

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

## Benefits

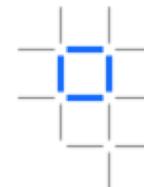
- Create secure, high volume, low-cost cross-border payments services without sacrificing margins
- Access new markets and currencies with limited risk
- Generate new sources of revenue with value-added products and services
- Aim: near real-time international payments



# Food Trust



MCLANE  
INTELLIGENT. SOLUTIONS



## What?

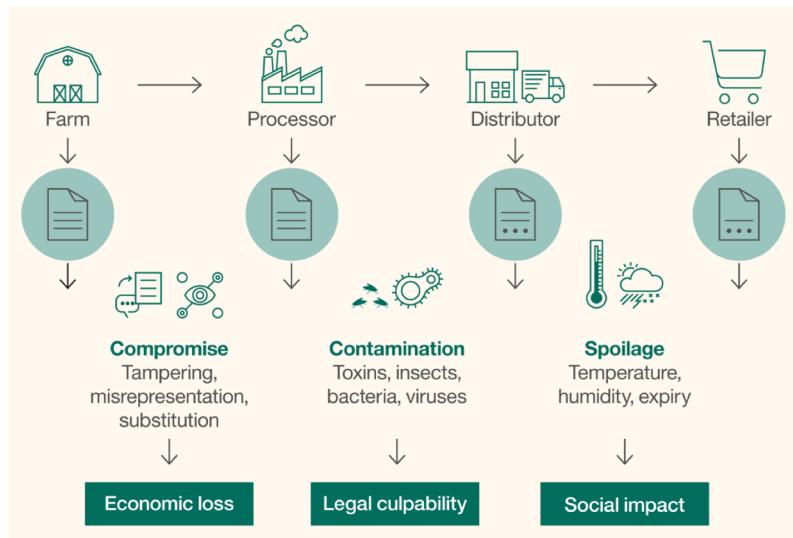
- Provide a trusted source of information and traceability to improve transparency and efficiency across the food network.

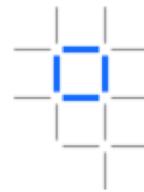
## How?

- 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?

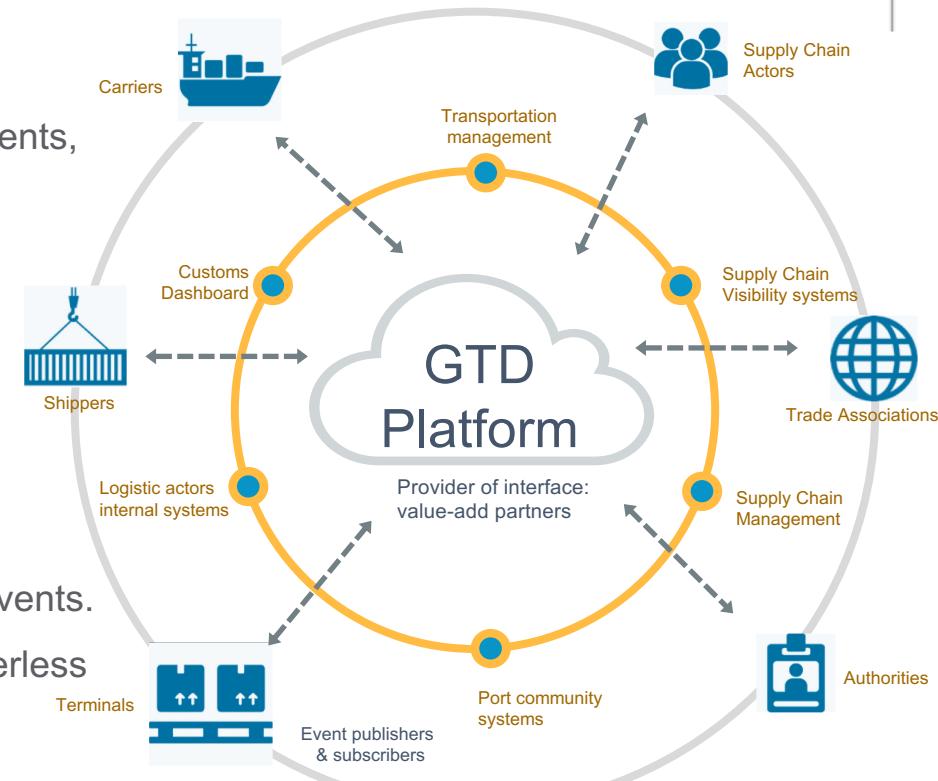
- An open, extensible platform for sharing shipping events, messages, and documents across all the actors and systems in the supply chain ecosystem.

## How?

- Providing Shared Visibility and Shared State for Container Shipments

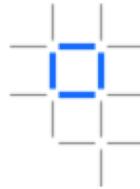
## Benefits

- 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?

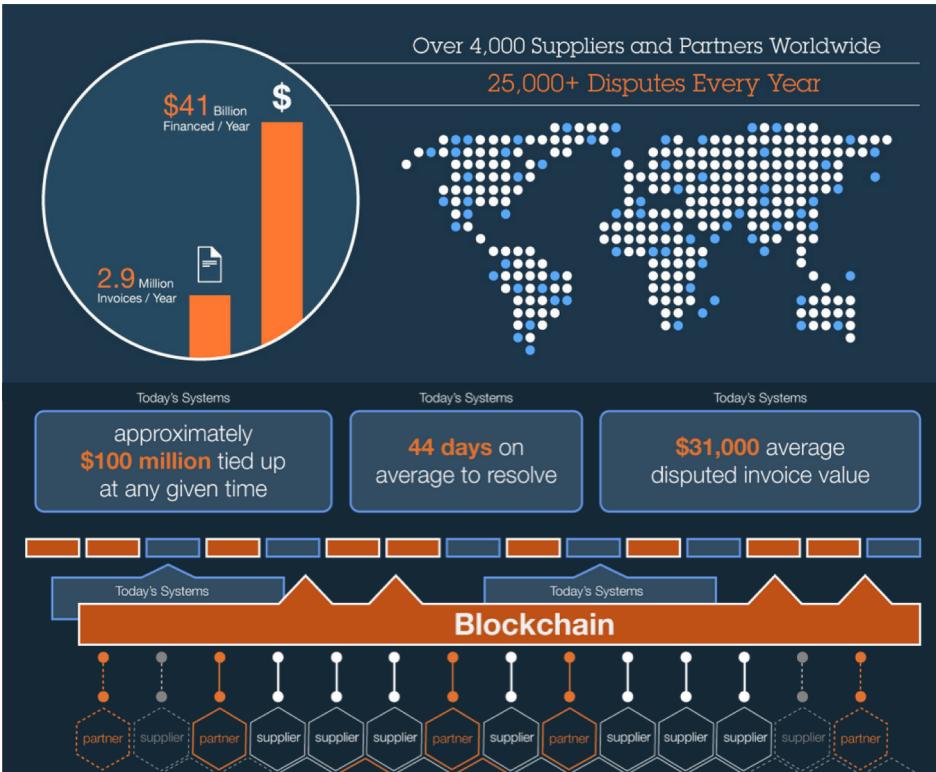
- IBM Global Finance provides a \$41bn channel financing per year. There are a number of disputes that take time to resolve and can lock up transactions costing time and money

## How?

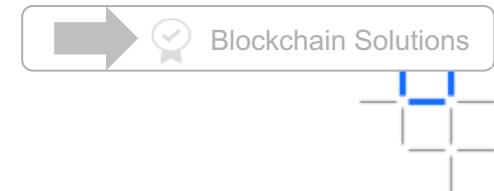
- Blockchain provides visibility and provenance end-to-end across supply chain

## Benefits

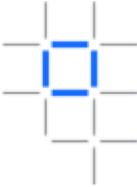
- Reduced dispute resolution time by 75%
- Released working capital from \$100m
- Combine IGF and Supplier info to further expand benefits further
- In production since Sept 2016



# Making blockchain real for business...



Trade Finance	Pre and Post Trade	Complex Risk Coverage
 <b>we.trade</b> 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
   <b>IBM Blockchain</b>	       	 



# Further examples by (selected) industry



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



What is Blockchain?

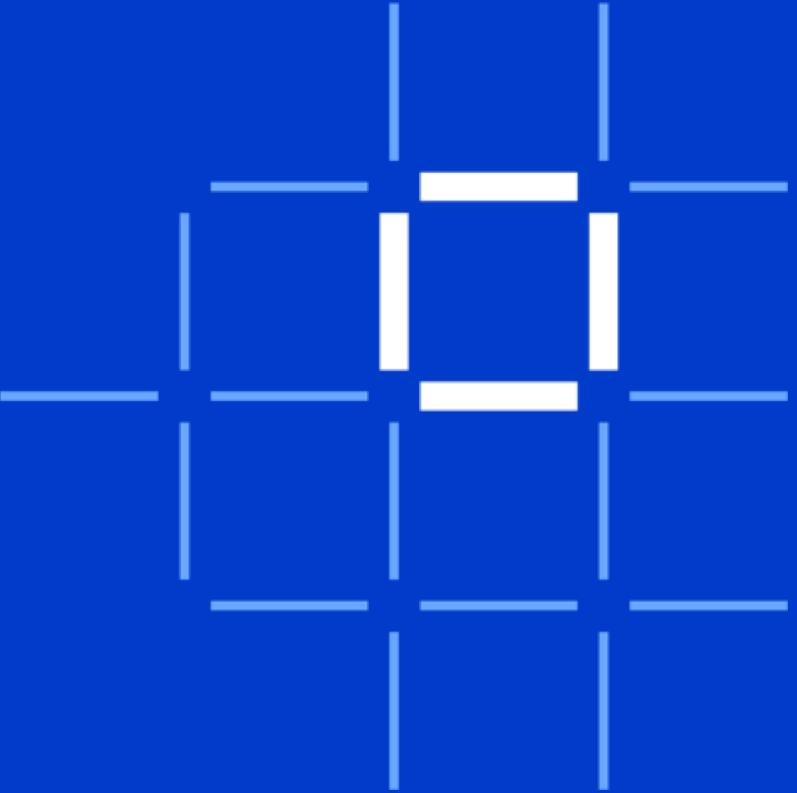


Why is it relevant for  
our business?

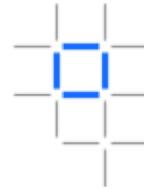


IBM and Blockchain

]



# 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](http://www.hyperledger.org)



# Hyperledger Members

## Premier



## Associate



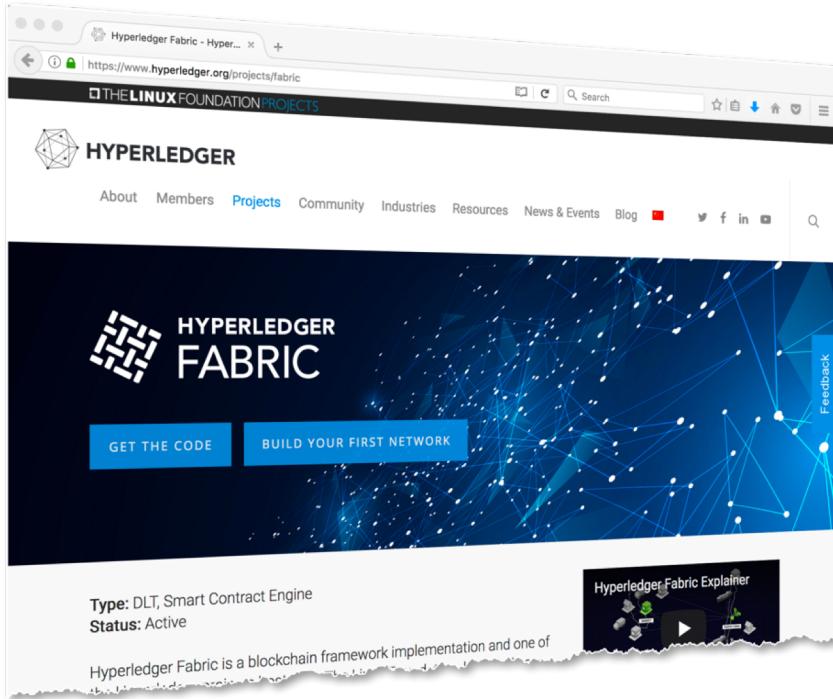
Source: <https://www.hyperledger.org/members>  
Updated: 3 April 2018

## General



## Associate (Academia)

# Distributed ledger platform

The screenshot shows the official Hyperledger Fabric project page. At the top, there's a navigation bar with links for About, Members, Projects (which is the active tab), Community, Industries, Resources, News & Events, and Blog. Below the navigation is a large banner with the Hyperledger Fabric logo and a complex network graph. Two prominent buttons are visible: 'GET THE CODE' and 'BUILD YOUR FIRST NETWORK'. Further down, the text 'Type: DLT, Smart Contract Engine' and 'Status: Active' is displayed. A small video player titled 'Hyperledger Fabric Explainer' is shown at the bottom.

- 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

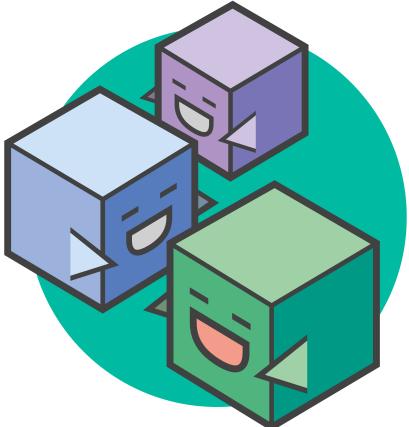
<http://hyperledger-fabric.readthedocs.io/>

# Hyperledger Fabric and Composer Roadmap (Linux Foundation)

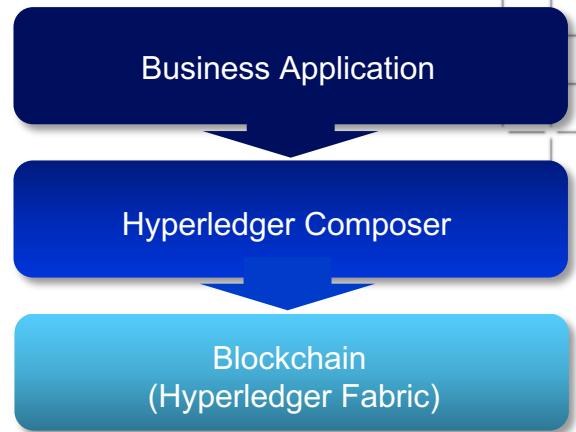
	Q1	Q2	Q3	Q4
Fabric	<p><b>1.1 release</b></p> <ul style="list-style-type: none"><li>• JS Chaincode</li><li>• Channel events</li><li>• CouchDB indexes</li><li>• CRL</li><li>• Mutual TLS</li><li>• Connection profiles</li><li>• Performance and scale improvements</li><li>• Experimental: SideDB, fine-grained,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

# 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/>

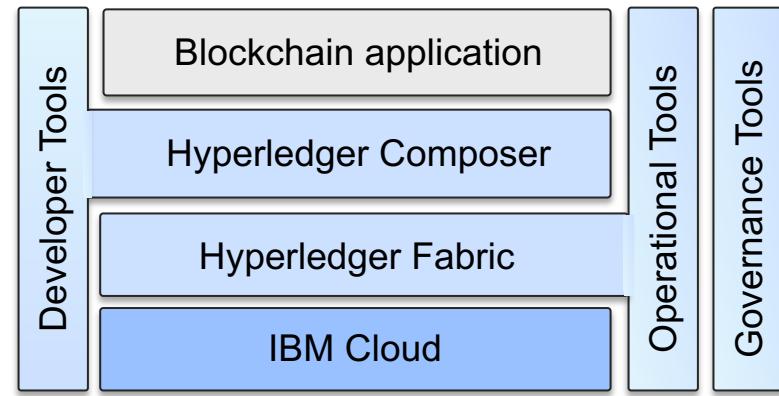


# Introducing the IBM Blockchain Platform

[http://ibm.biz/Platform\\_Demo](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*

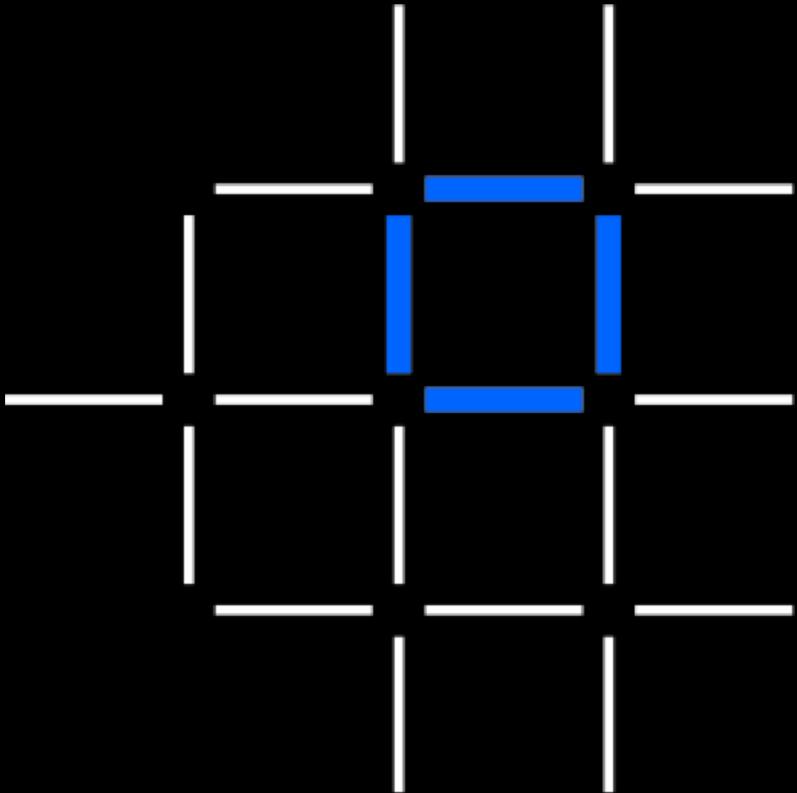
*austin.grice@ibm.com*

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

 @IBMBlockchain

 IBM Blockchain

 IBM Blockchain





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