

Blockchain in real implementations

- the new revolutionary trust model

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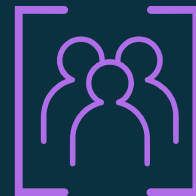
Contents



IBM Blockchain in a
nutshell



Customer
implementations



How can IBM help
you apply Blockchain?

Increase trust, speed & simplify any asset transfer

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, car
- 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

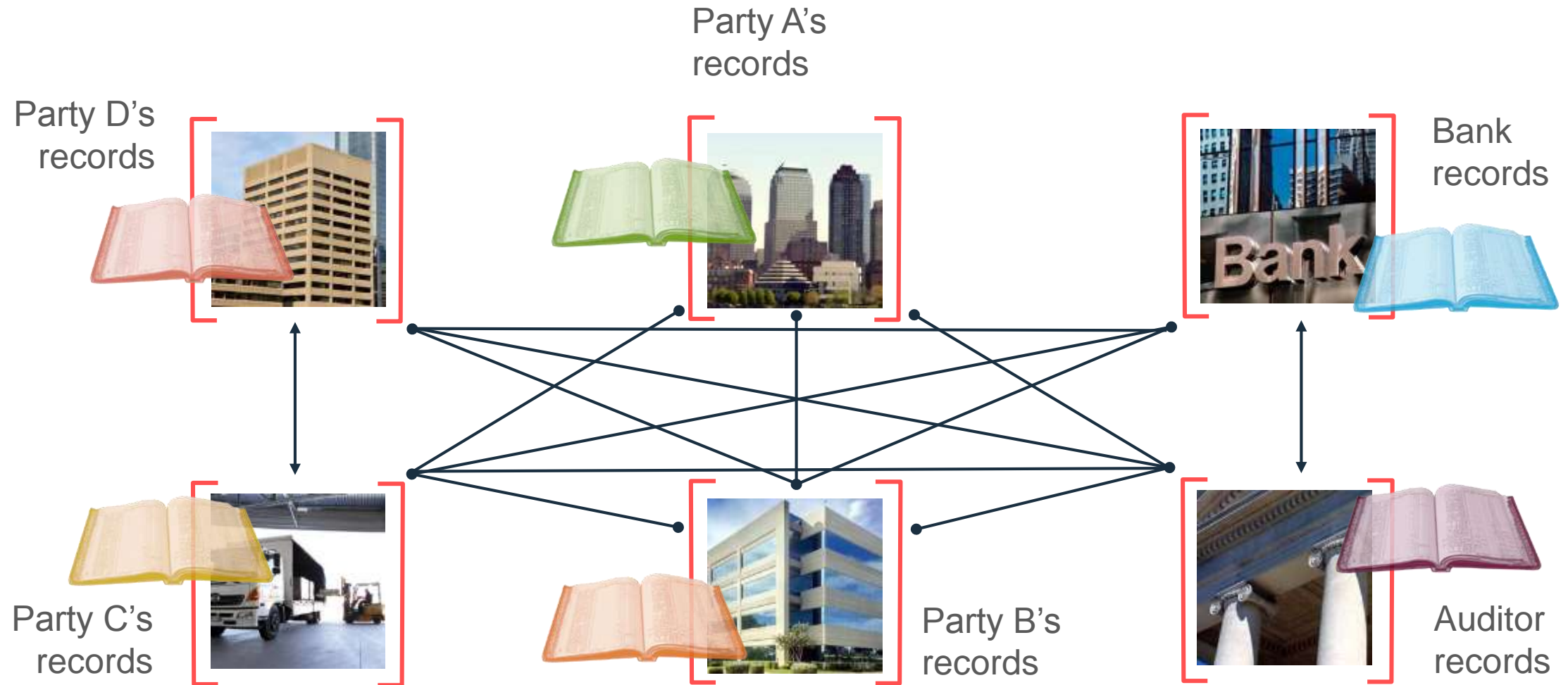
Ledgers are key ...

Ledger is THE system of record for a business. Business will have multiple ledgers for multiple business networks in which they participate.

- **Transaction** – an asset transfer onto or off the ledger
 - John gives a car to Anthony (simple)
- **Contract** – conditions for transaction to occur
 - If Anthony pays John money, then car passes from John to Anthony (simple)
 - If car won't start, funds do not pass to John (as decided by third party arbitrator) (more complex)

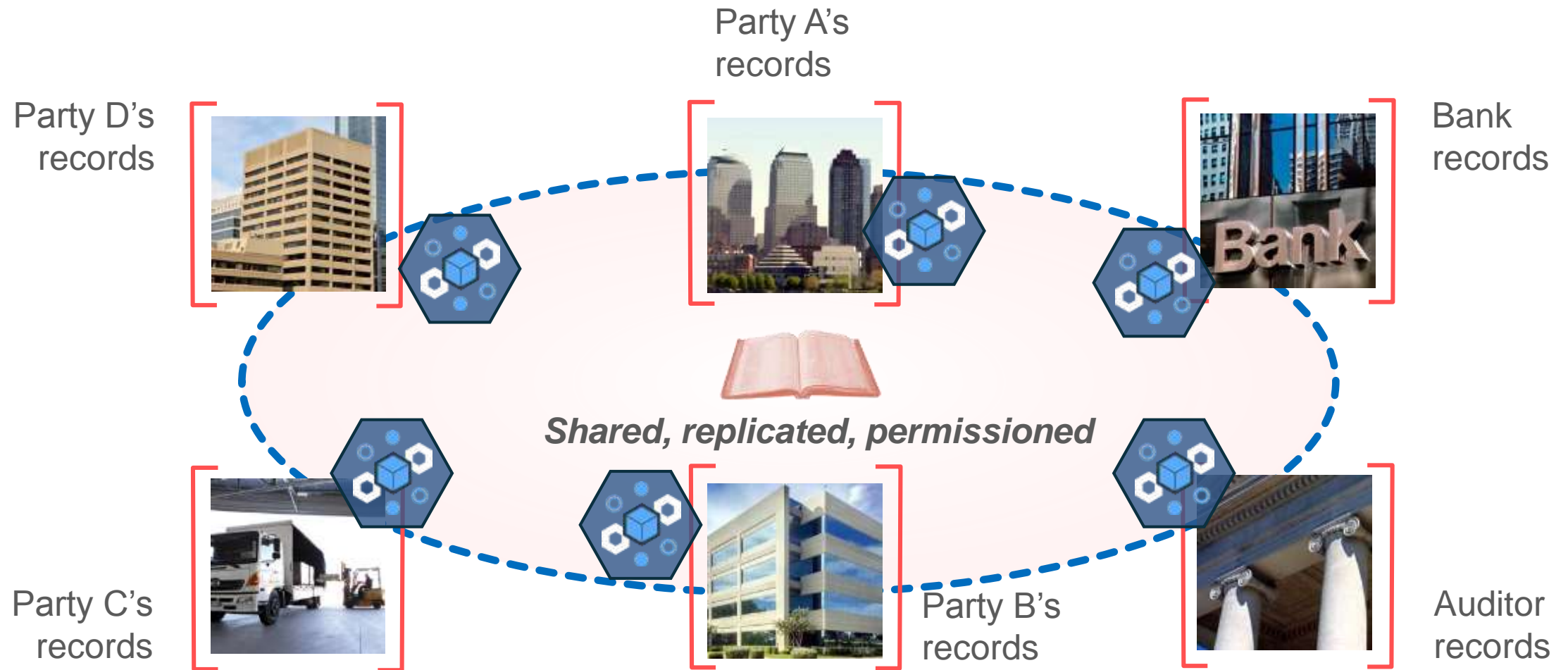


Problem today is individual ledgers ...



... inefficient, expensive, vulnerable

Solution is a shared, trusted distributed ledger...



... Consensus, provenance, immutability, finality

Using the right Hyperledger Terminology and IBM Blockchain



- **Hyperledger** is a Linux Foundation trademark
- **Hyperledger Fabric** is one project under the Hyperledger umbrella
 - It is NOT an IBM project
- **Hyperledger Composer** is one project under the Hyperledger umbrella
- **IBM Blockchain Platform** refers to the collection of IBM products and services built on Linux Foundation Hyperledger Fabric

See <https://www.hyperledger.org/trademark-usage> for details

Blockchain for Business

Shared Ledger

Append-only distributed **system of record** shared across business network



Smart Contract / chaincode

Business terms embedded in transaction database & executed with transactions

Privacy

Ensuring appropriate visibility; transactions are secure, authenticated & verifiable



Consensus

All parties agree to network verified transaction

Broader participation, lower cost, increased efficiency

Blockchain and Bitcoin ...

bitcoin:

- Unregulated, censorship-resistant shadow currency
- First Blockchain application
 - Pioneer of Blockchain technology

 **bitcoin**



BUT

BLOCKCHAIN
is not *bitcoin*

... Blockchain is the underplaying technology

Hyperledger vs Bitcoin.

Hyperledger is to increase trust in a chain of asset transfer - bitcoin is for money txn

Hyperledger is not based on ANY crypto currency – but Bitcoin is

Hyperledger is for a closed chain of Peers – Bitcoin is totally open to everybody

Hyperledger characteristics:

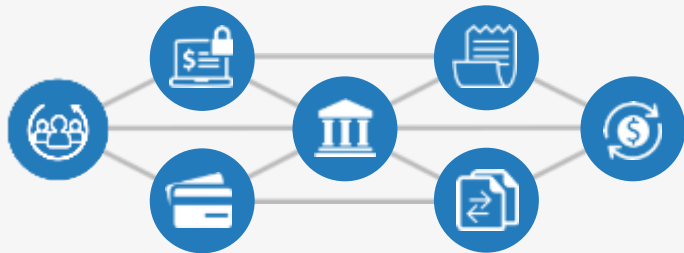
Open source
collaborative effort to
advance cross-
industry blockchain
technologies

Hosted by
The Linux
Foundation, fastest-
growing project in LF
history

Global collaboration
spanning finance,
banking, IoT, supply
chains, healthcare,
manufacturing,
technology and more.

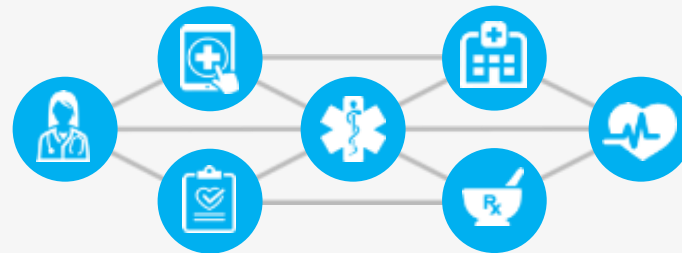
Shared Ledger Database

Blockchain allows multiple different parties to securely interact with the same universal source of truth



Finance

Streamlined settlement, improved liquidity, increased transparency and new products/markets



Healthcare

Unite disparate processes, increase data flow and liquidity, reduce costs and improve patient experience and outcomes



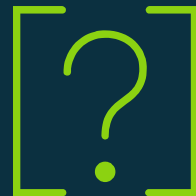
Supply Chain

Track parts and service provenance, ensure authenticity of goods, block counterfeits, reduce conflicts

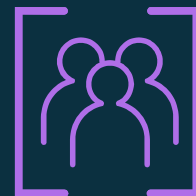
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How can IBM help
you apply Blockchain?

Northern Trust employs Blockchain to overhaul private equity administration



Northern Trust collaborated with IBM, Unigestion and other key stakeholders to launch its first commercial blockchain platform solution. The innovative ecosystem solution uses Hyperledger Fabric to transform an antiquated, manual and costly part of the private equity (PE) industry – making the PE administrative and investment processes secure, transparent, efficient and much faster.

The blockchain solution allows authenticated parties in the network including the managers, investors, administrators, auditors, advisors and even regulators, to manage, service and audit funds throughout the investment lifecycle, offering them “one version of the truth”.

Distributed Ledger Servicing Private Equity Interests for Unigestion Delivers Transparency for Fund Manager, Custodian, Investors, Regulators and Government

Source: <https://www.northerntrust.com/about-us/news/press-release?c=70b5ba1adc9928f9977162844c34f57a>

“This is an important first step to connecting participants much more effectively, including investors, managers, administrators, regulators, advisors and auditors.”

Justin Chapman
Global head of market advocacy and research
Northern Trust
United States



Walmart tracks pork from “farm to fork”



IBM is partnering with Walmart to improve traceability and transparency of the food supply chain using blockchains, and build the ultimate digitized food system.

On the blockchain network, food products can be digitally tracked within minutes from an ecosystem of suppliers to retailers and ultimately to consumers. The real-time, interconnected view of the food supply chain, and shared provenance information will enhance overall food safety, improve regulatory compliance and **promote consumer trust**.

Blockchain together with smart devices will also optimize the food supply chain and enable the ecosystem to share inter-related insights.

Years ago in the United States, a deadly strain of E. coli in tainted spinach ripped through 26 states, [killing three people](#) and sickening more than 200. The outbreak represents what can happen when sourcing food—and tracing contaminations—goes horribly wrong

Source: <http://fortune.com/2016/10/19/walmart-ibm-blockchain-china-pork/>

“Consumers today want more transparency about where and how a product came to be. If you shine a light on the food system, that leads to transparency.”

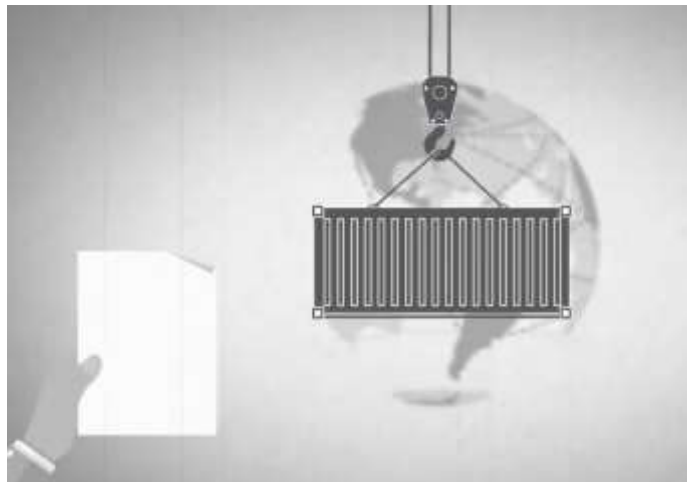
Frank Yiannas
VP of Food Safety, Walmart
United States



How Maersk Leverages IBM Blockchain for supply Chain management



IBM and Maersk are digitizing and simplifying global trade to create trust and transparency in the supply chain using blockchain technology.



<https://www.youtube.com/watch?v=tdhpYQCWnCW&t=135s>



Blockchain Developers

MonetaGo provides blockchain solutions for financial systems

One technology has been [disrupting financial institutions](#) everywhere, and it's called [blockchain](#). It has been characterized as both opportunity and threat, but one thing is for sure: the distributed ledger technology behind Bitcoin isn't something to be ignored. [MonetaGo](#), an IBM Blockchain partner, is bringing clarity to this rapidly developing landscape through its blockchain solutions for financial systems. In an interview with [Jesse Chenard](#), the CEO of MonetaGo, I got to learn more about his team's vision, what they've been working on and their experience participating in [The Hyperledger Project](#).

Our proof of concept (PoC) with banks and regulators in India is moving into the pilot phase with a path to production. We will be rolling out additional PoCs and pilots in other regions in the coming months, so stay tuned!

<https://www.ibm.com/blogs/blockchain/2017/04/monetago-provides-blockchain-solutions-for-financial-systems/>

IBM's universal blockchain payments solution

IBM Blockchain

TORONTO - 16 Oct 2017: SIBOS: IBM (NYSE: [IBM](#)) today announced a new blockchain banking solution that will help financial institutions address the processes of universal cross-border payments,



Key cross-border payment challenges



Banks' reliance on correspondent relationships drive prohibitive costs and poor customer experience



Retail banks are losing market share to agile, customer-focused non-bank competitors

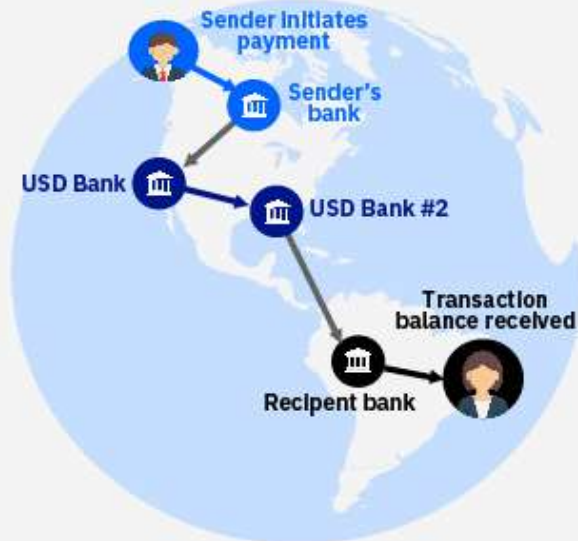


Global de-risking efforts have cut off high-potential emerging markets



New regulatory requirements address data privacy, security and open up competition

Today's process: Complex & process-intensive



IBM's universal blockchain payments solution

A multi-ledger, single network for real-time atomic clearing and settlement using IBM Blockchain technology

Designed to improve efficiency and reduce the cost of making global payments for businesses and consumers

Key components:

- Simple API for 24/7 payments, regardless of size, origination, destination, or asset type
- Messaging and clearing channel using Hyperledger Fabric
- Multi-ledger settlement network for interchangeable alternative settlement assets and channels
- Efficient real-time market pricing across digital and fiat currencies driven by proven FX and market solutions
- IBM's large-scale IT infrastructure and network governance
- Integration with digital identity solutions and new value-added services

Tomorrow's process: Near real-time international payment



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

The Plastic Bank



Vision & mission

- Canadian startup, founded by 2 entrepreneurs
- Business idea: reveal the value in plastic, by making plastic waste too valuable to enter the ocean
- Create a global network of micro recycling entrepreneurs that will transcend poverty by cleaning the environment
- Gather 1 Billion People to monetize waste through social plastic

<https://www.youtube.com/watch?v=p0WH-EJ8FTA>



How Poland's Central Securities Depository Uses IBM Blockchain to Revolutionize AGM Voting

For the investment market, inclusion can be improved by fostering broader involvement of retail investors. With an increasingly global nature of investments, it is an ongoing challenge to grow investors' engagement, with **Annual General Meetings (AGM)** having historically very low retail shareholders participation. Today, if an investor wants to influence any of the AGM decisions he or she has 2 options:

1. Participate in person in an AGM,
2. Engage proxies as their representatives.

What is required, is a secure and transparent means to allow shareholders to make their voice heard whilst still voting from a distance. Considering the potential benefits of greater shareholder engagement on the long term investment in Poland, the [Central Securities Depository of Poland \(KDPW\)](#), together with IBM, is using blockchain technology to secure remote participation and voting at Annual Meetings.

The **objectives** are straight forward:

- To give investors the ability to view reliable and indisputable information about meetings;
- To provide investors with the ability to cast and manage their votes, as well as credible means to confirm their voting;
- To give regulators transparent access to the full history of annual meetings, agendas and voting results.



B3i Blockchain Insurance Industry Initiative

Allianz 

Munich RE 

 **Swiss Re**



Achmea
Ageas
Generali
Hannover Re
Liberty Mutual
RGA
SCOR
Sompo Japan Nipponkoa Ins.
Tokio Marine Holdings
XL Catlin

 **AEGON**


ZURICH

Reinsurance blockchain prototype launched by B3i

by Artemis on September 10, 2017

- **The B3i members have been working to develop and exploit the potential of blockchain applications for the reinsurance industry**, aiming to create what they describe as, “An efficient world-wide industry platform for market participants to more easily cede, handle and trade risks.”
- B3i says that its current governance and membership of 15 companies:
Achmea, Aegon, Ageas, Allianz, Generali, Hannover Re, Liberty Mutual, Munich Re, RGA, SCOR, Sompo Japan Nipponkoa Insurance, Swiss Re, Tokio Marine Holdings, XL Catlin and Zurich Insurance Group will remain in place until the end of the year.
- After that the B3i will assess whether it needs to create a more permanent operation within a legal entity in 2018.
- **The platform has been created along with IBM using the Hyperledger Fabric blockchain technology variant from the Linux Foundation.**
- What’s interesting to us about the B3i blockchain platform is that it may be able to more efficiently **syndicate risks, including to the capital markets and insurance-linked securities (ILS) investors and funds**. That could make risk placement, trading and syndication more efficient for everyone.

<http://www.artemis.bm/blog/2017/09/10/reinsurance-blockchain-prototype-launched-by-b3i/>

Everledger shines a light on the diamond industry



Everledger is working with IBM to build a first of a kind blockchain solution to transform the diamond marketplace, to ultimately reduce fraud and black market trade.

Blockchain is used to track the provenance of the diamond, thus providing an immutable, distributed ledger audit trail for the traded stones. The shared “digital thumbprint” proves the authenticity and provenance of the diamond as it travels through the supply chain and serves as the single source of trust for all the stakeholders.

The blockchain solution evolved further to use smart contracts built on IBM’s cognitive Watson to track compliance of diamonds on the blockchain across the global supply chain – thus digitizing the currently paper based diamond certification system, the Kimberly Process.

Source: <https://www.itnews.com.au/news/everledger-uses-blockchain-to-stamp-out-blood-diamonds-455537>

“There was a desperate need to create a single point of truth so that all stakeholders across the supply chain, from producers, to cutters, to bankers, to insurers, had shared visibility of records.”

Leanne Kemp
Founder and Chief Executive Officer, Everledger
United Kingdom



IBM Z

Cognitive Blockchain Demo

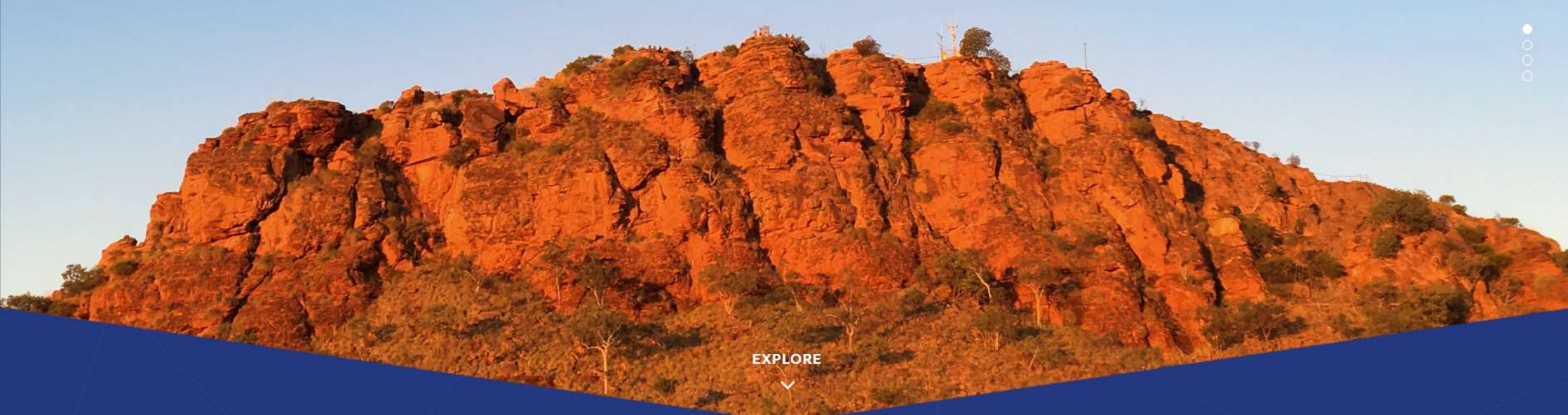
- 1. Ingest Regulation**
- 2. Kick off Bot**
- 3. Obtain Permissions**
- 4. Check Blockchain Records Compliance**





AUSTRALIA AND THE KIMBERLEY PROCESS

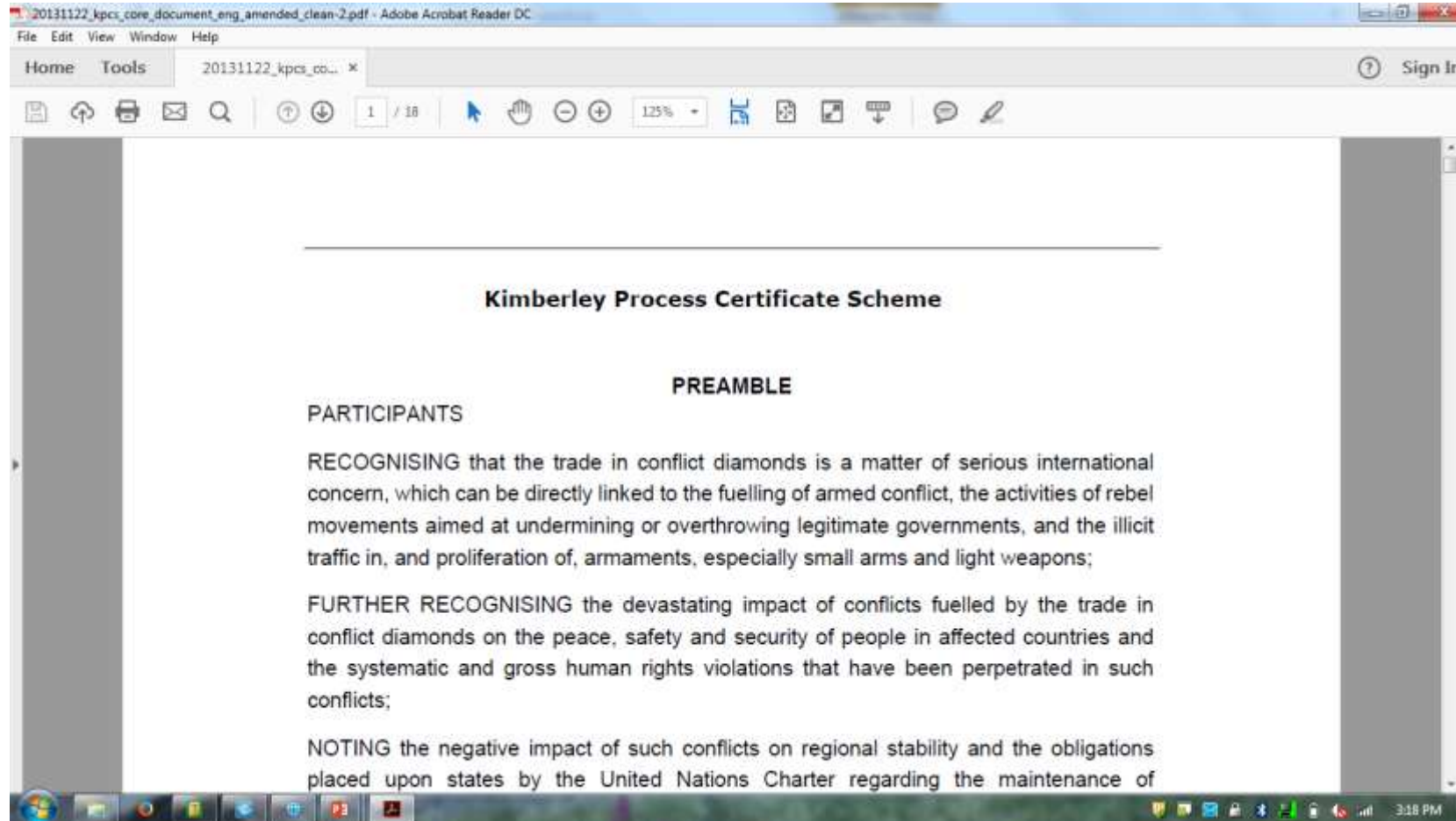
CHAIR AND HOST OF 2017

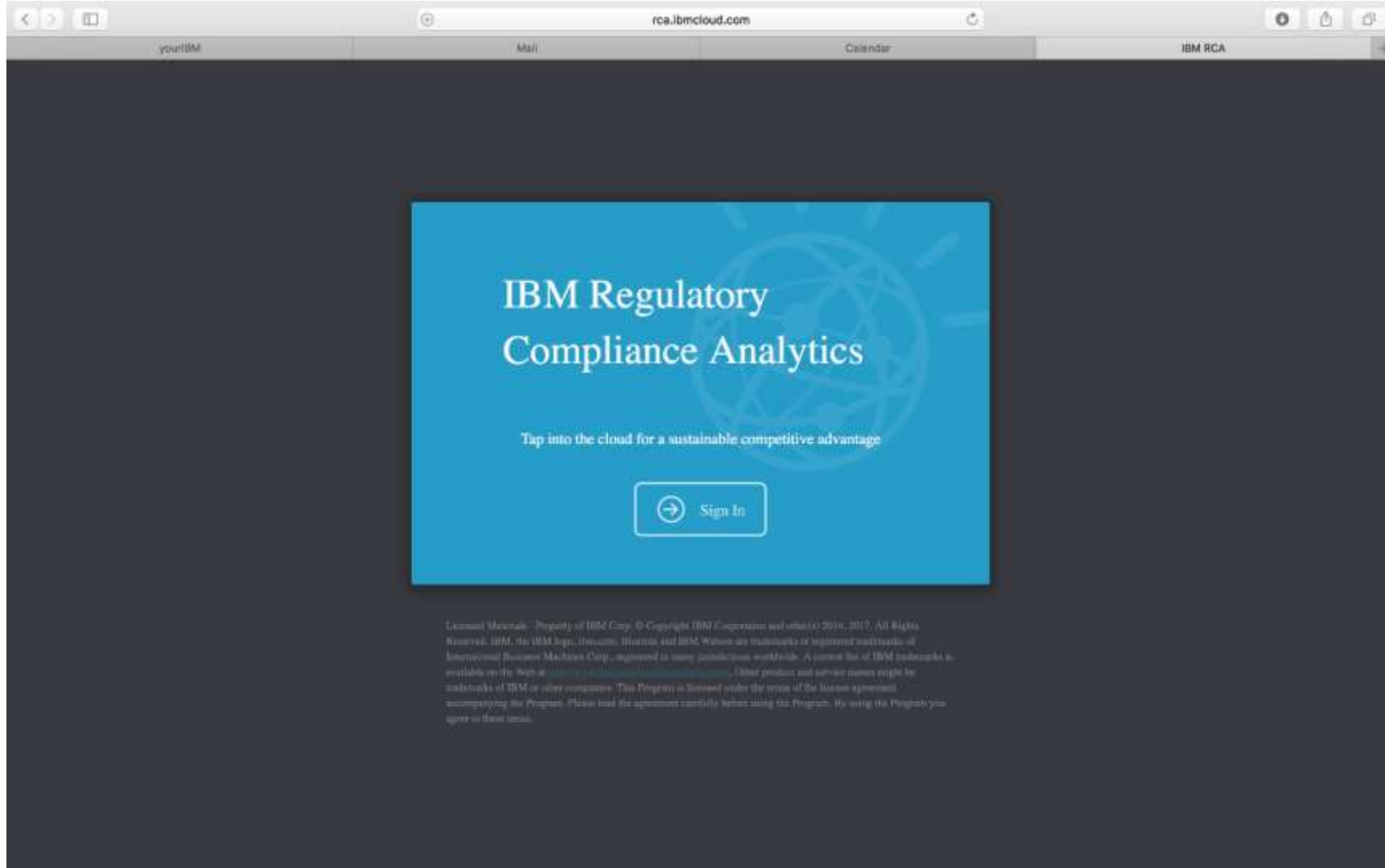


EXPLORE
↓



Kimberley Diamond Certification Regulatory Document





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 <p>CFPB Consumer Laws.</p>	 <p>Data Protection Act</p>	 <p>Data Protection Act</p>	 <p>Data Security, Financial</p>	 <p>Directive 2003/6/EC of</p>	 <p>Dodd-Frank 12 CFR</p>

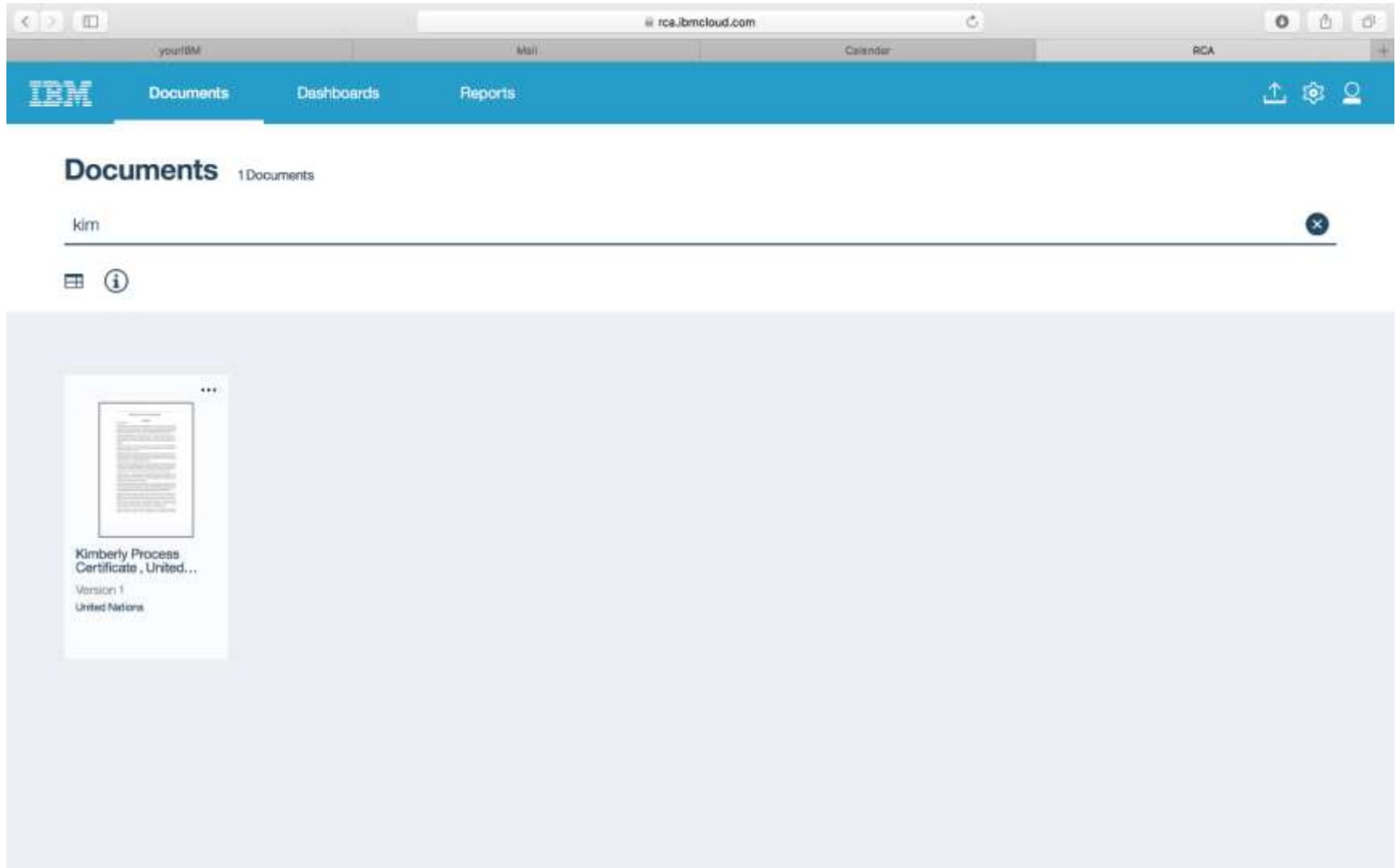
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Kimberly Process Certificate , United...
Version 1
United Nations



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Kimberly Process Certificate , United Nations

Version 1
United Nations

Kimberly Process Certificate , United Nations

Version 1 [Version History](#)

United Nations [Open in...](#)

Summary

Status Available

Contact

Upload date February 24, 2017 Publication date

Statistics

73 Obligations	0 Control Objectives	0 New Control Objectives
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Details Edit

Name Kimberly Process Certificate , United Nations

Identifier In force date

Description Kimberly Process Certificate , United Nations

Version type Consultative

Document type Regulation

Document History

Obligations by Top 4 Business Lines

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Filter search x

Obligations | Control Objectives

Compliance Theme

Geography

Risk Process

Line of Business

Key Role

Product

Risk Type

Process

Documents

EU Reg 648/2012 of 4 July 2012- EMIR
 Regulation (EU) 596/2014 of 16-Apr-2014 EU Market
 BCBS Stds- Minimum Capital Reqcs for Market Risk
 EU - GDPR - 20160408
 EU - GDPR - 2016/680 - Data Protection by Compe
 29 CFR Part 2550, Best Interest Contract Exemptio
 EU - GDPR - 2016/679 - Processing & Movement of

Clear Filters

certificate

Filter by:
Kimberly Process Certificate , United Nations x

18 Obligations

a Kimberley Process Certificate accompanies each shipment of rough diamonds on export;

Venezuela, Bolivarian Republic of | Central African Republic | Slovenia | Spain | Lebanon | China

View More (77)

The unique Certificate number may be replicated on the container.

A Certificate is to meet the following minimum requirements: | Each Certificate should bear the title "Kimberley Process Certificate" and the following statement: "The rough diamonds in this shipment have been handled in accordance with the provisions of the Kimberley Process Certification Scheme for rough diamonds"

Certificates meet the minimum requirements set out in Annex L

Controls Definition | 4.0 Deliver Physical Products (20022) | National Government

A Certificate may include the following optional features: | Characteristics of a Certificate (for example as to form, additional data or security elements)

The Exporting Authority is encouraged to transmit a detailed (preferably encrypted) e-mail message to the relevant Importing Authority containing information on the carat weight, value, country of origin or provenance, importer name and address, exporter name and address, the date of issue, the date of expiry and the serial number of the Certificate."

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Edit Obligation

Cancel Save

Obligation details Category

Obligation Description - Required
PARTICIPANT means a state or a

External System ID - Optional

External ID - Optional

Linked to Obligation as

Requirement

Interpretation - Optional
Write an interpretation

Attach Images - Optional
Select File

Next >

consultations to be undertaken *

ication Scheme is

2016 KP Participants List

States and regional economic integration organizations, with the exception of those indicated with an asterisk (*), meet the minimum requirements of the Kimberley Process Certification Scheme are:

1. Angola	28. Lesotho
2. Armenia	29. Liberia
3. Australia	30. Malaysia
4. Bangladesh	31. Mali
5. Belarus	32. Mauritius
6. Botswana	33. Mexico
7. Brazil	34. Namibia
8. Cambodia	35. New Zealand
9. Cameroon	36. Norway
10. Canada	37. Panama
11. Central African Republic*	38. Russian Federation
12. China, People's Republic of	39. Sierra Leone
13. Congo, Democratic Republic of	40. Singapore
14. Congo, Republic of	41. South Africa
15. European Union	42. Sri Lanka
16. Ghana	43. Swaziland
17. Guinea	44. Switzerland
18. Guyana	45. Tanzania
19. India	46. Thailand
20. Indonesia	47. Togo
21. Israel	48. Turkey
22. Ivory Coast	49. Ukraine
23. Japan	50. United Arab Emirates
24. Kazakhstan, Republic of	51. United States of America
25. Korea, Republic of	52. Venezuela
26. Lao, Democratic Republic of	53. Vietnam
27. Lebanon	54. Zimbabwe

NOTE: The rough diamond trading entity of Chinese Taipei has also met the minimum requirements of the KPCS.

* Consistent with the Administrative Decision on Resumption of Exports of Rough Diamonds from the Central African Republic July 2010.

94_of_participants_2016_en.pdf

Filter search ×

Compliance Theme ▾

Geography ▾

Risk Process ▾

Control Type ▾

Line of Business ▾

Key Role ▾

Product ▾

Risk Type ▾

Documents ▾

Obligations Control Objectives

Search for a control objective



Create a Control Objective

555 Control Objectives

1 2 3 4 5 ... 56

cert req valid



ID <http://centerlinebeta.net/7151/public/index.html> Owner Diane

Each Certificate bears the appropriate Validation of Certificate marks by the Exporting Authority

Provenance Summary 2 Obligations, 1 Documents

Diamond



cert req issuer



ID <http://centerlinebeta.net/7151/public/index.html> Owner Diane

Each Certificate bears the name of the Issuing authority

Provenance Summary 2 Obligations, 0 Documents

Diamond



cert req imp/exp



ID <http://centerlinebeta.net/7151/public/index.html> Owner Diane

Each Certificate provides Identification of exporter and importer

Provenance Summary 3 Obligations, 0 Documents



Blockchain Solution: Everledger Diamonds Tracking

Available obligations

Obligation details

Blockchain Data

2 obligations created or imported for this solution

Any diamond from a participating country, should have a Kimberley certificate

Define rule



Each Participant should: with regard to shipments of rough diamonds imported from a Participant: require a duly validated Certificate





Blockchain Solution: Everledger Diamonds Tracking

Rule Definition for Obligation

Any diamond from a participating country, should have a Kimberley certificate

Blockchain Datatypes

Blockchain Permissions

Rule Definition

Select data structures relevant for this compliance rule

Diamond Data

Description: information about diamond properties

Sample Attributes:

```
"origin": { "type": "string" },  
"shape": { "type": "string" },  
"weight": { "type": "float" },  
"date": { "type": "timestamp" },  
"width": { "type": "float" },  
"depth": { "type": "float" },  
"color": { "type": "string" },
```



Kimberley Certificate

Description: Diamond export information including exporter, importer, certificates, verification, etc.

Sample Attributes:

```
"certificateBatchNumber": { "type":  
  "int" },  
"creationDate": { "type": "date" },  
"expiryDate": { "type": "date" },  
"exportCountry": { "type": "string" },  
"exportDate": { "type": "date" }
```



Permit Access



Blockchain Solution: Everledger Diamonds Tracking

Rule Definition for Obligation

Any diamond from a participating country, should have a Kimberley certificate

[Blockchain Datatypes](#)[Blockchain Permissions](#)[Rule Definition](#)

Select data structures relevant for this compliance rule

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[Permit Access](#)



Blockchain Solution: Everledger Diamonds Tracking

Rule Definition for Obligation

Any diamond from a participating country, should have a Kimberley certificate

Blockchain Datatypes

Blockchain Permissions

Rule Definition

Check Blockchain Compliance

From the available data structures on the left create the compliance and noncompliance rules

Kimberley Certificate

Description: Diamond export information including exporter, importer, certificates, verification, etc.

Available Attributes:

certificateBatchNumber
hasPaperKBCUploaded
creationDate
expiryDate
exportCountry
exportDate
exportCountry
hasPaperKBCUploaded
verifiedBy
verifierDetails
verifyDate

Compliance Condition

When the conditions below is satisfied the document on blockchain will be compliant

Condition:

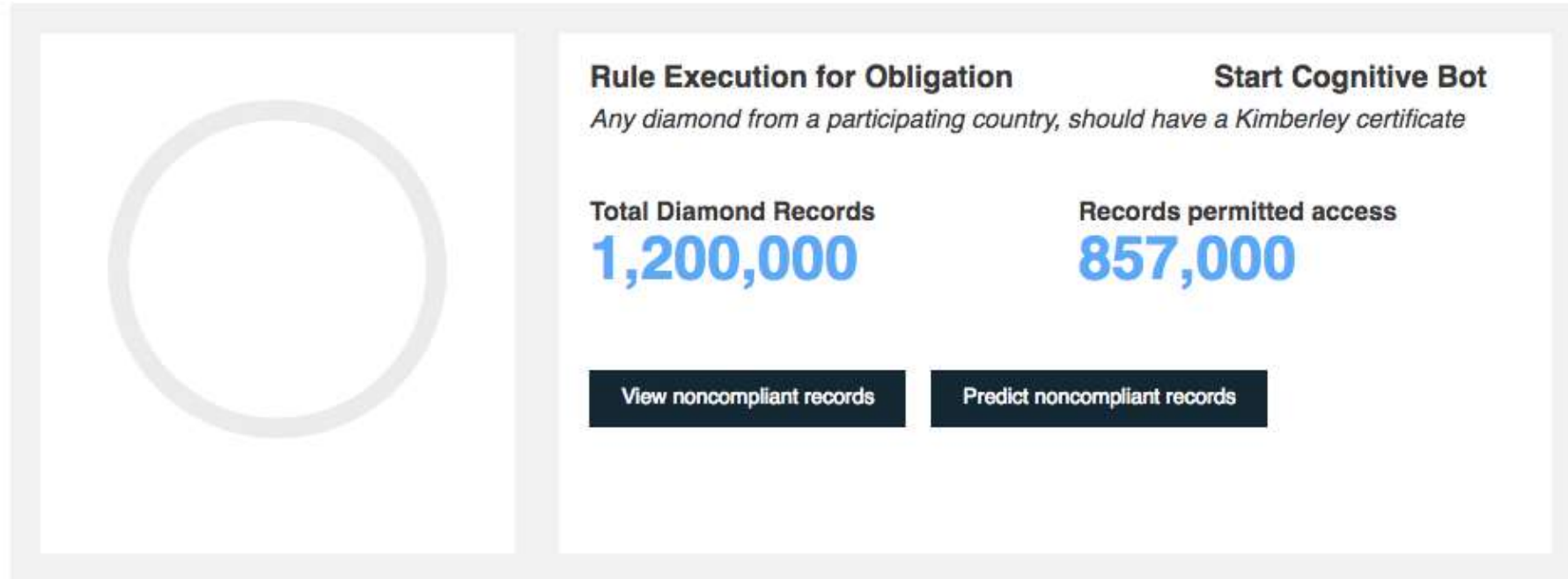
ANY:
IF exportCountry in
participatingCountries AND
hasPaperKBCUploaded is TRUE
IF exportCountry not in
participatingCountries

Check against:

blockchain ledger blockchain state

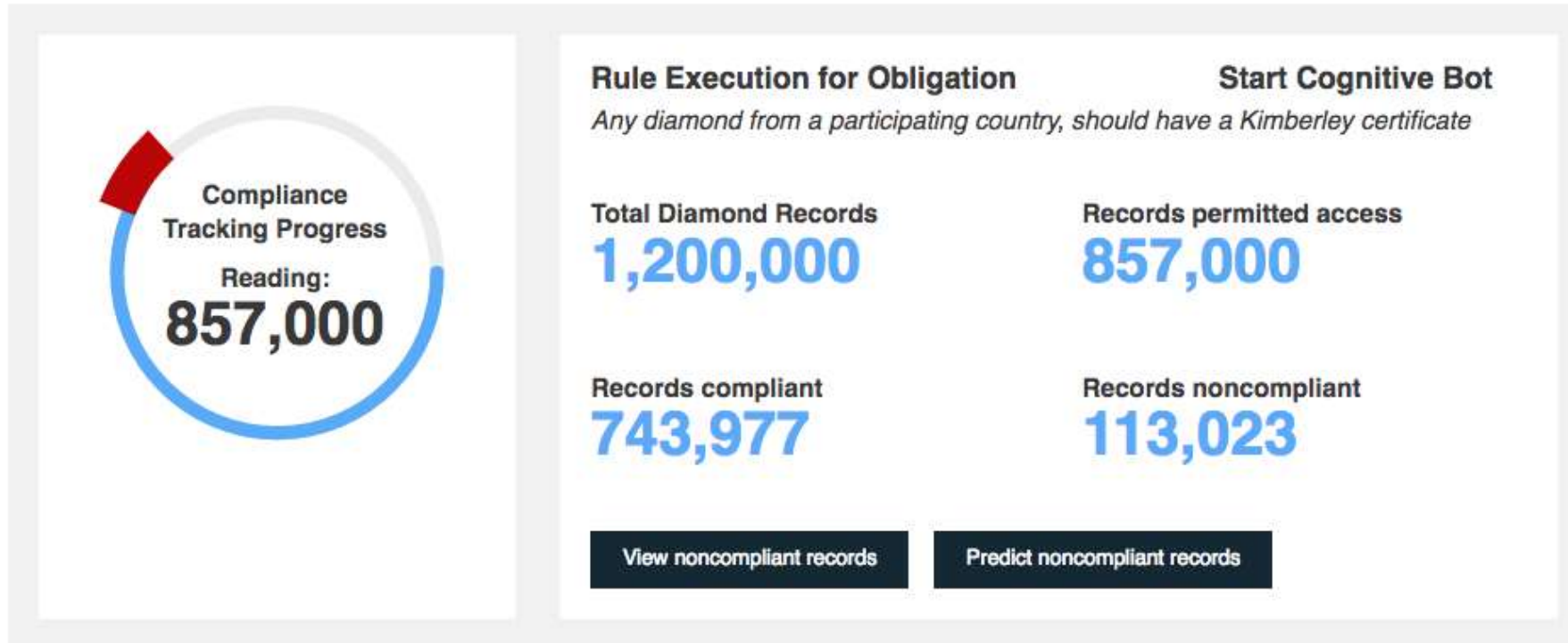


Blockchain Solution: Cognitive Compliance Tracking





Blockchain Solution: Cognitive Compliance Tracking



Cognitive Blockchain

Blockchain is revolutionizing the world of transactions. Marrying cognitive & AI with blockchain in principled ways will transform what and how organizations learn about their businesses and act as a catalyst for unlocking the value of multiparty data & networks while preserving confidentiality and privacy.

- Leverage power of blockchain and cognitive by combining them in fundamental ways to unlock the value of multiparty, cross-organizational data while preserving confidentiality and privacy.
- Create direct value on top of blockchain solutions, act as a catalyst for new opportunities (e.g., cognitive compliance, fraud, privacy preserving cross-organization AI, insights, analytics, etc.)

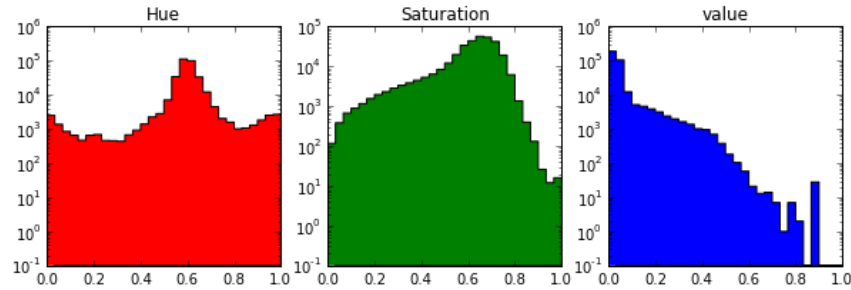


Cognitive Blockchain & Analytics

1. Unlock the value of data on Blockchain by providing advanced cognitive and analytics capabilities (start with commonly used analytics, move to cognitive)
 - enabling development of richer intelligence and analytics on top
2. Enable new value added services that were previously not feasible
 - end-2-end, cross-participant, cross-organizational, cross-data sets
3. Preserve confidentiality and privacy
 - privacy preserving analytics / differential privacy
4. Act as a catalyst for new types of collaborations, networks, insights & analytics
5. Integration across off-chain and on-chain data (privacy, linkages, integration value)



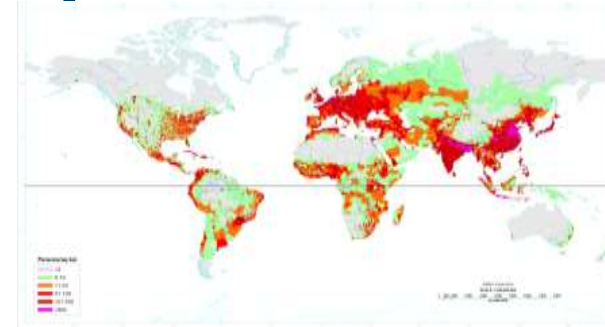
Cognitive Blockchain & Analytics



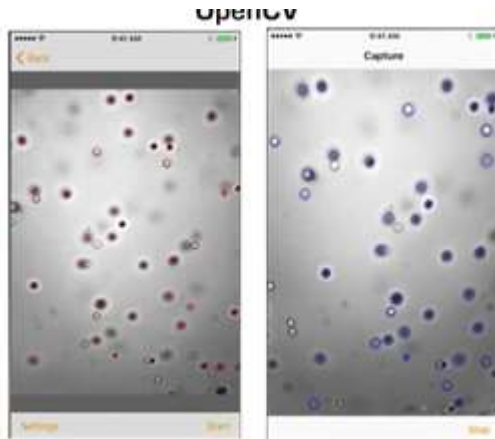
Trends

Time Series

Abnormalities



Geospatial



Micron resolution Image analytics that can detect if the physical asset is the same as a photo of the asset. Photo or hash of the photo is stored on the blockchain. Detects counterfeit of : Manufactured Parts, Computer Parts, Diamonds, Wine, Luggage, Drugs, etc.

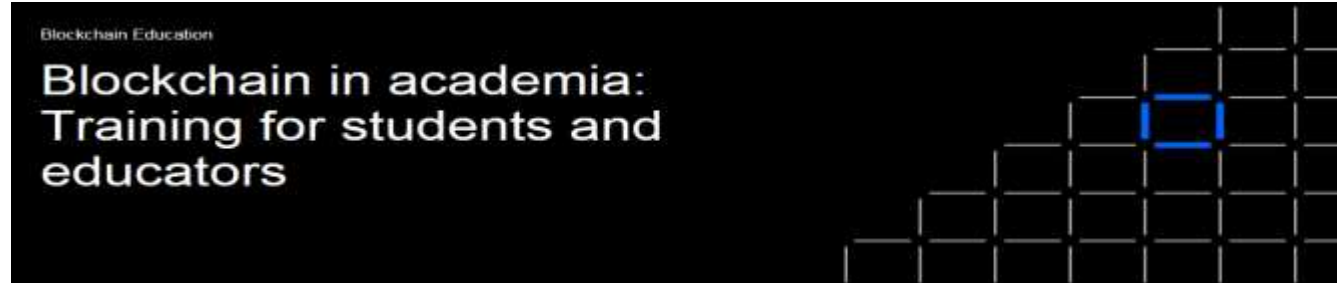
- Logistics, Capacity Planning
- Anomalies
- Financial Events
- Predict Food Safety
- Cognitive Contracts, Compliance
- Identification Verification, KYC

Common Analytics Services and Libraries



Blockchain in IBM academic initiative

<https://www.ibm.com/blogs/blockchain/2017/08/blockchain-in-academia-training-for-students-and-educators/>



- **Resources for students**

- The best place for students to begin is the [Blockchain essentials](#) course, which is available at no charge. Next, test out your new skills in the IBM Blockchain Platform [developer sandbox](#), which has three ways to get your hands on blockchain technology: online, locally or on the cloud. Use your browser to experiment with blockchain in the [Hyperledger Composer web playground](#), then spin up a sample blockchain network on your [computer](#).

- Students at over 1,000 academic institutions are eligible for a six month trial of [IBM Bluemix](#). To get the promo code, you just need to [register](#) with your school credentials.

- If you want to follow a more comprehensive learning path, you can use the [blockchain educator guide](#). The guide details paths for aspiring blockchain developers, consultants and architects. It also provides a complete list of blockchain resources, including demos, articles and documentation, books and videos. IBM has posted educational materials on [developerWorks](#) for Hyperledger Fabric 1.0.

- **Resources for educators**

- For educators a good start is the [blockchain educator guide](#). You'll learn the basics of blockchain technology and the careers that you can propose to your students based on their interest in topics such as distributed computing, JavaScript or business operations. You'll also get an introduction to [Hyperledger](#), an open source effort to advance cross-industry blockchain technologies for businesses, which is hosted by The Linux Foundation. Finally, you can use the e-book, videos, courses, and hands-on labs to enhance engagement in your classroom.

Blockchain in real implementations

IBM and Maersk Demo: Cross-Border Supply Chain Solution on Blockchain

- <https://www.youtube.com/watch?v=tdhpYQCWnCw>

Genius of Things: Blockchain and Food Safety with IBM and Walmart

- https://www.youtube.com/watch?v=MMOF0G_2H0A

Walmart's Food Safety Solution Built on the IBM Blockchain Platform

- <https://www.youtube.com/watch?v=SV0KXBxSoio>

Securing your Blockchain: The Details That Matter

- <https://www.youtube.com/watch?v=xOCK-GnpchY>

Blockchain: Real World Use Cases – by CapGemini

- https://www.youtube.com/watch?v=cHe_ow9v094

IBM Blockchain Business Models

- <https://www.youtube.com/watch?v=z5sY0eZbB7E>

How to Activate a Blockchain Network with IBM Blockchain Platform

- <https://www.youtube.com/watch?v=QgLLgbuPO5g>

19 Industries The Blockchain Will Disrupt

- <https://www.youtube.com/watch?v=G3psxs3gyf8>

Blockchain real implementations

IBM Blockchain Car Lease Demo

- <https://www.youtube.com/watch?v=IgNfoQQ5Reg>

Streamlining Trade Finance with IBM Blockchain

- <https://www.youtube.com/watch?v=JEYO8RuS4fM&list=PL7LSy0eQMvjvayxRfu1SDt1I6NKFfso8e>

Trading Coffee with IBM Blockchain – learn with a game

- <https://www.youtube.com/watch?v=suE5KHkESF4>

Improving Dispute Resolution for Commercial Financing with IBM Blockchain - IGF

- https://www.youtube.com/watch?annotation_id=annotation_1496020045&feature=iv&src_vid=F0P7NM7d-ps&v=0DSNdLDOZ5w

Expanding Bank Trade Financing, multi bank collaboration with IBM Blockchain

- <https://www.youtube.com/watch?v=FAvVRfBCECc&t=1s>

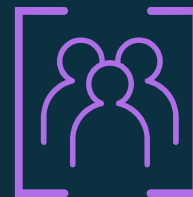
Contents



IBM Blockchain in a nutshell



Customer implementations



How can IBM help you apply Blockchain?

IBM Blockchain Platform

The only fully integrated enterprise-ready blockchain platform designed to accelerate the development, governance and operation of a multi-institution business network.

Develop a blockchain application

Activate a blockchain network

Use cases

Features

Membership plans

Resources

Get started

Talk to an expert

Benefits

Learn how IBM is making 2017 the year of the blockchain.

Read the IDC Report



Accelerated development

Significantly reduce development time with tools that ensure close alignment between business leaders and developers.



Democratic governance

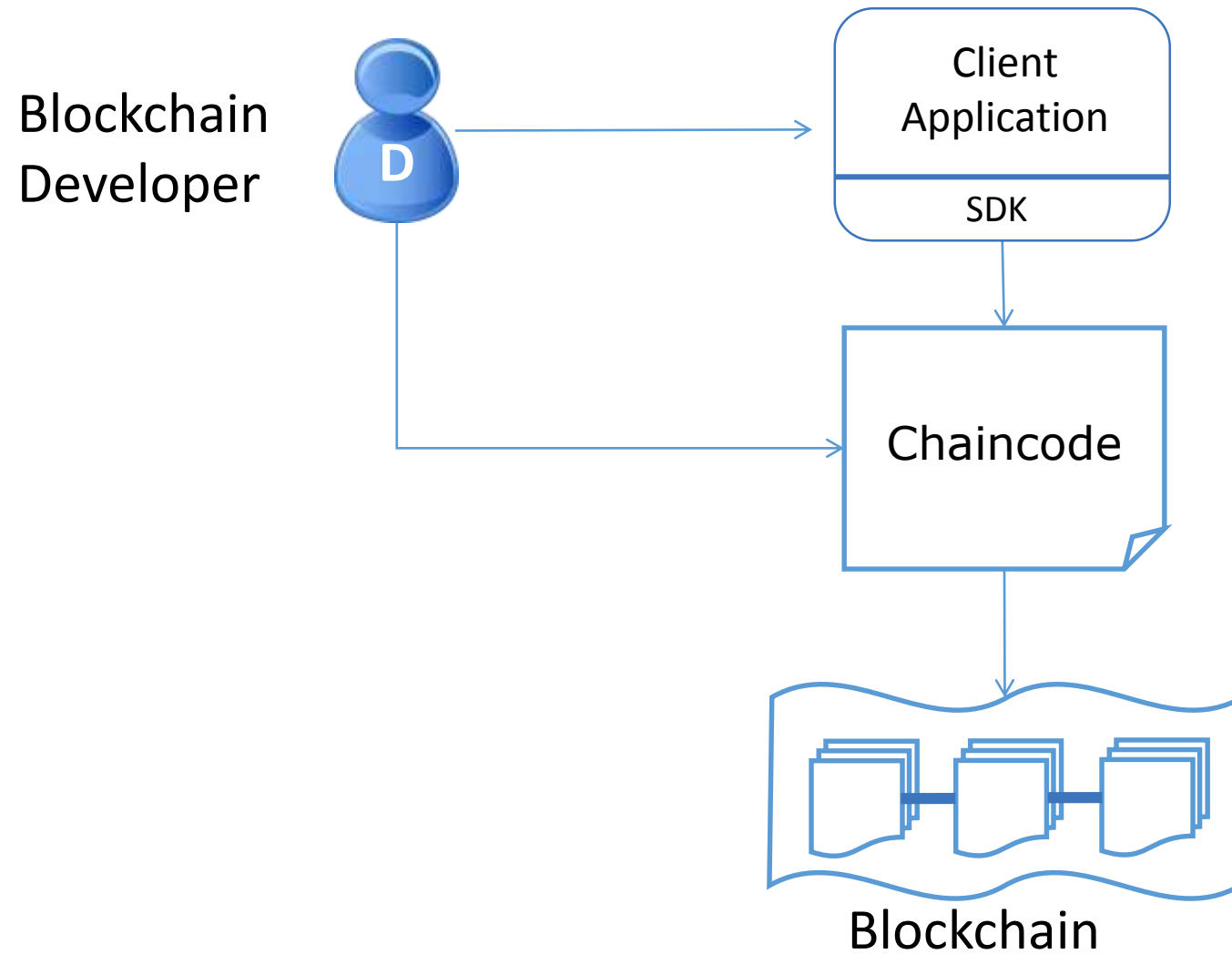
Enable faster activation, customization and ongoing management of your business network with collaborative management tools.



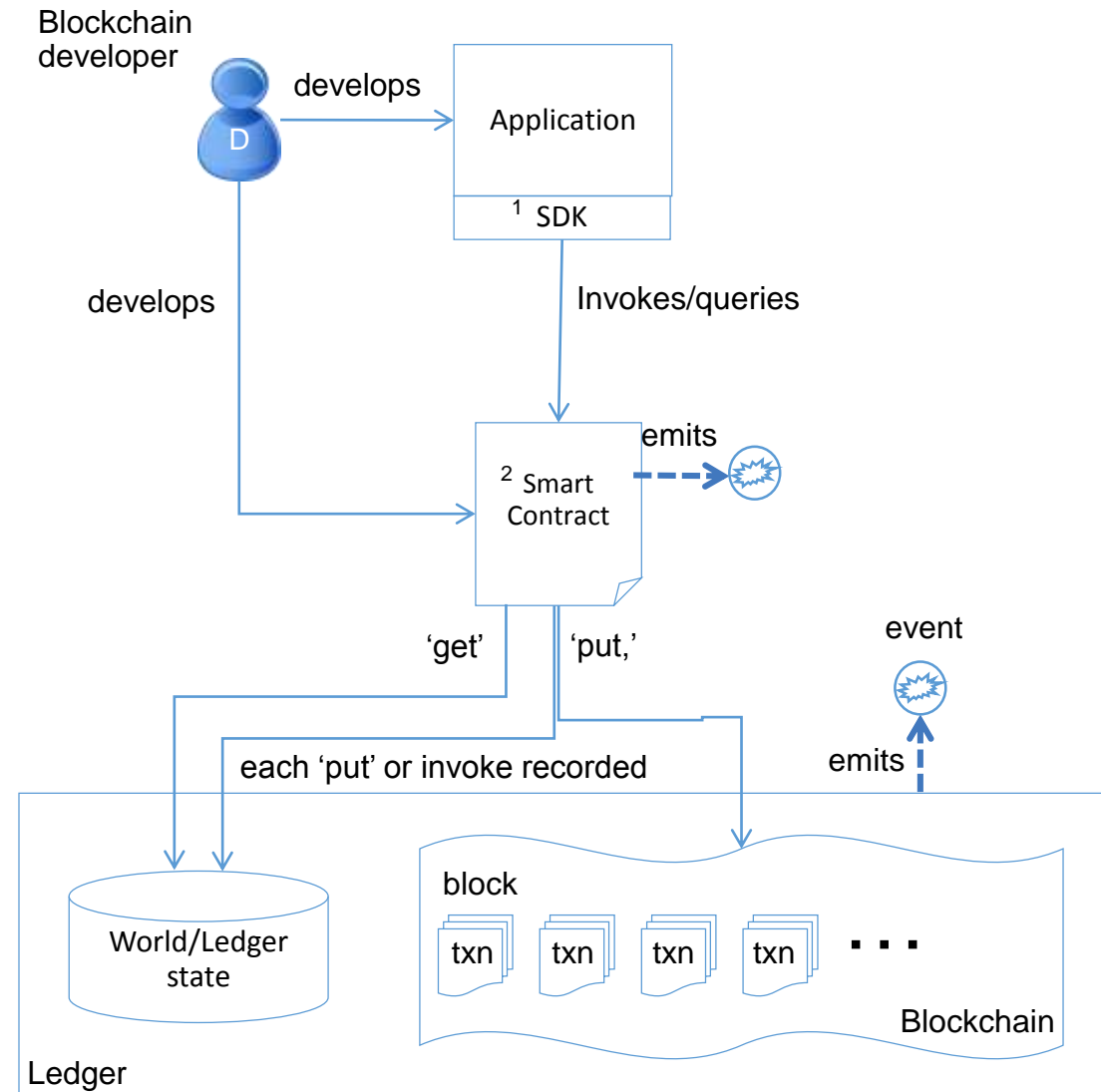
Always-on operations

Meet the needs of the most demanding use cases and regulated industries with networks that are scalable, hardened, highly secure and always on.

Blockchain Applications



Blockchain application and the ledger



1 Client Application in JavaScript using Hyperledger Fabric Client (HFC) SDK
2 Smart Contract implemented using chain code

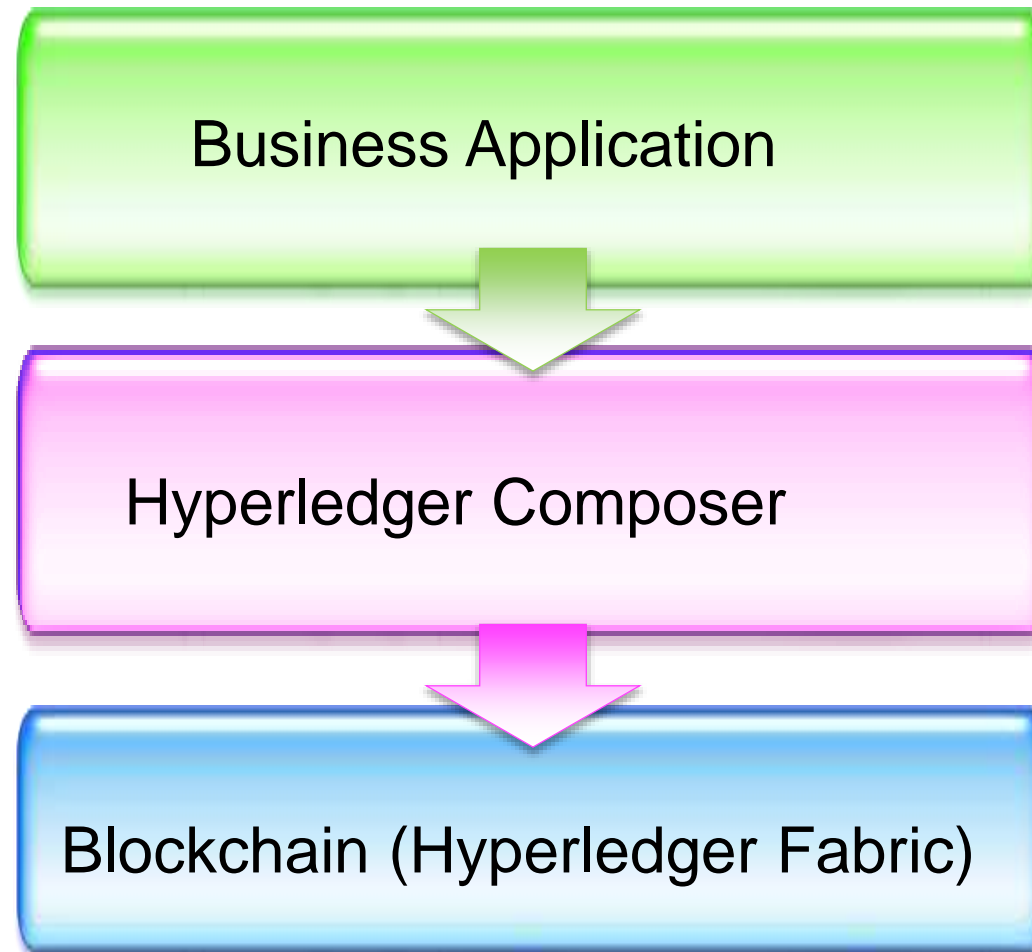
How to Connect Business and Infrastructure?

Business Application

?

Blockchain (Hyperledger Fabric)

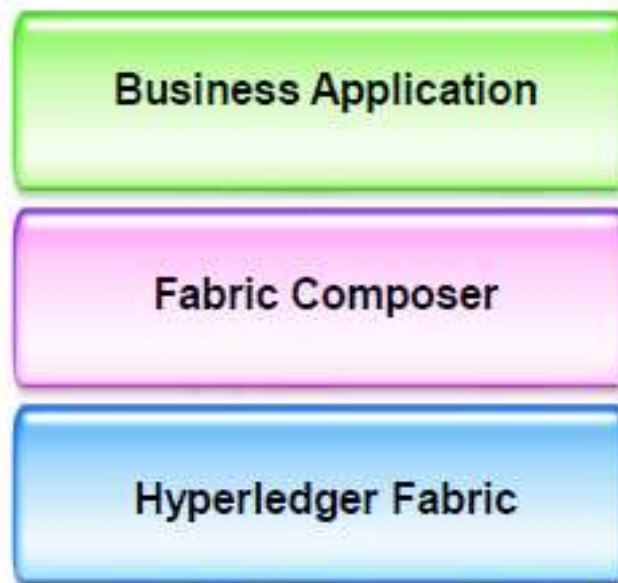
Closing the Gap



What is Fabric Composer?

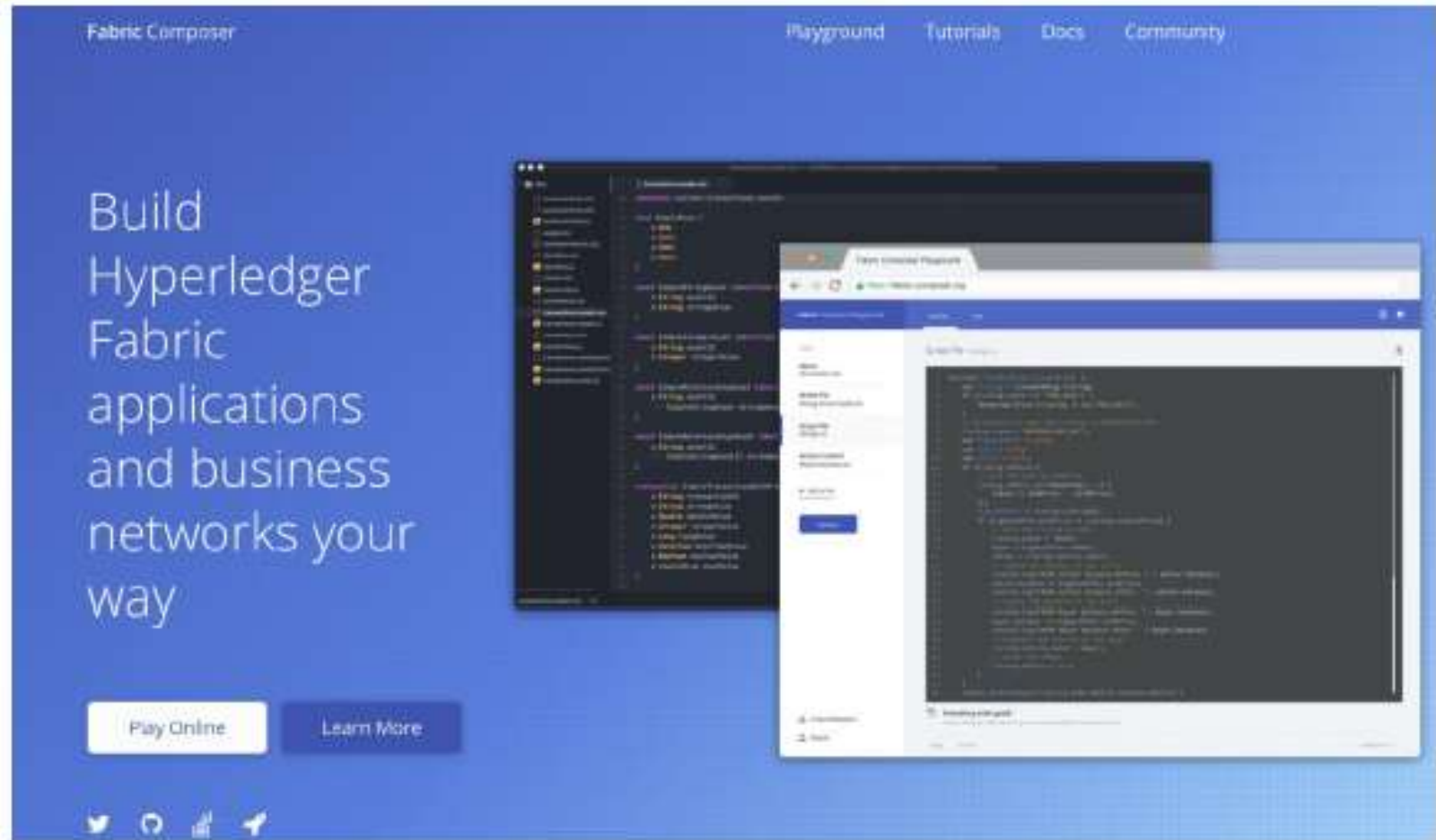
- Blockchains provide a low-level interface for business applications
 - **Smart contract** code run on a distributed processing system
 - **Inputs** go into an immutable ledger; **outputs** to a data store
 - **Applications** are built on top of a low level of abstraction
- **Fabric Composer**
 - A suite of high level application abstractions for **business networks**
 - Emphasis on business-centric vocabulary for quick solution creation
- **Features**
 - **Model** your business network, test and deploy
 - **Applications** use APIs to interact with a business network
 - **Integrate** existing systems of record using loopback/REST
- **Open Tools, APIs and libraries** to support these activities
 - Exploits Hyperledger Fabric blockchain technology
 - Currently proposed as Linux Foundation Hyperledger project

<http://fabric-composer.org/>



Getting Started with Fabric Composer

- Start at <http://fabric-composer.org>
- Very active project
 - Continuously updated
- Many useful links
 - Getting started
 - Documentation
 - Chat
 - Community
 - GitHub
- Proposed to Hyperledger Project



<http://fabric-composer.org/>

Blockchain will do for transactions what the internet did for information

Increasing regulation, cybercrime and fraud inhibit business growth.

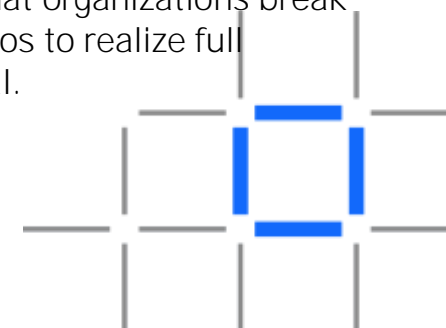
- Security incidents are up by 65%. The average consolidated total cost of a data breach grew to \$4 million.
- The last 10 years have seen the growth of global, cross-industry regulations, including HIPA, Sarbanes -Oxley Act, anti-money laundering and more.
- Advanced cryptography and distributed systems enable secure networks that protect the integrity of transactions.

Digital transformation has been embraced across much of business operations, yet transactions remain an inefficient process, lack transparency, and often are still tracked manually.

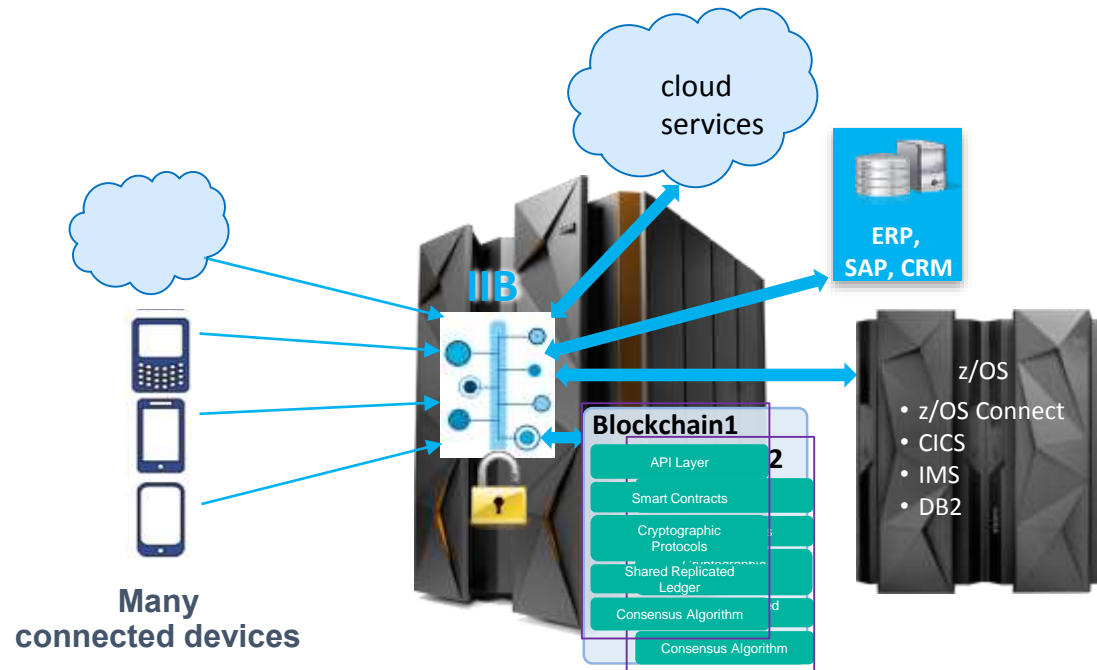
- Cloud computing offers access to compute power to track billions of transactions.
- The ability to digitize your transactions creates the opportunity to interact with your business network in a more efficient more transparent way.
- New business models are being formed daily to solve for the limitations in manual transactions while capitalizing on distributed ledger technology

Enterprise growth increasingly depends on bringing together partners in an open environment to create impact at scale.

- Enterprises who will win tomorrow have recognized the need to define new models of partnerships that incorporate the shared needs and goals of different kinds of partners, creating a powerful tide that lifts all boats.
- The potential for business growth from ecosystems is still hampered by disconnected operations.
- Increased operational efficiency across networks requires that organizations break down information silos to realize full competitive potential.



Blockchain Integration with IIB on Linux on z



Challenges

- “How to integrate with multiple Blockchains ?”
 - ANY System of Record or transactional service
 - end-user solutions, partners, ISVs
 - transactional workload to selectively attach to different Blockchains
 - securely, audit proof and scalable

Solution

- **Use IIB for Blockchain integration**
 - embeddable, low bandwidth cost, flexible, multi protocol switching, context based routing to different Blockchains, SSCs and SoRs

Why LinuxONE / IBM Z

Avoiding typical challenges w/ services integration

- **Range of devices: everything to everything integration**
- **Pace of Innovation: simplification and devOps**
- **Security: single point of control for end-to-end integration, exploits IBM Z security**
- **Back-end integration: flexible, co-location, orchestration, workflow for selective integration**
- **Scale and latency: docker, virtualization, I/O bandwidth, internal network (Hipersockets)**

Used SW:

- IBM Integration Bus (IIB)
- Blockchain

The Enterprise Integration Hub with IBM Integration Bus (IIB)

- Flexible integration with Web, Mobile, Cloud, Analytics and IT services
- Standard Interfaces and Open source based Integration APIs like Swagger & CHEF
- Intelligent transformation and content based routing
- Universal Integration with high scalability and security incl. workflow & workload Mgmt

Deployable full active/active

No charge for developers

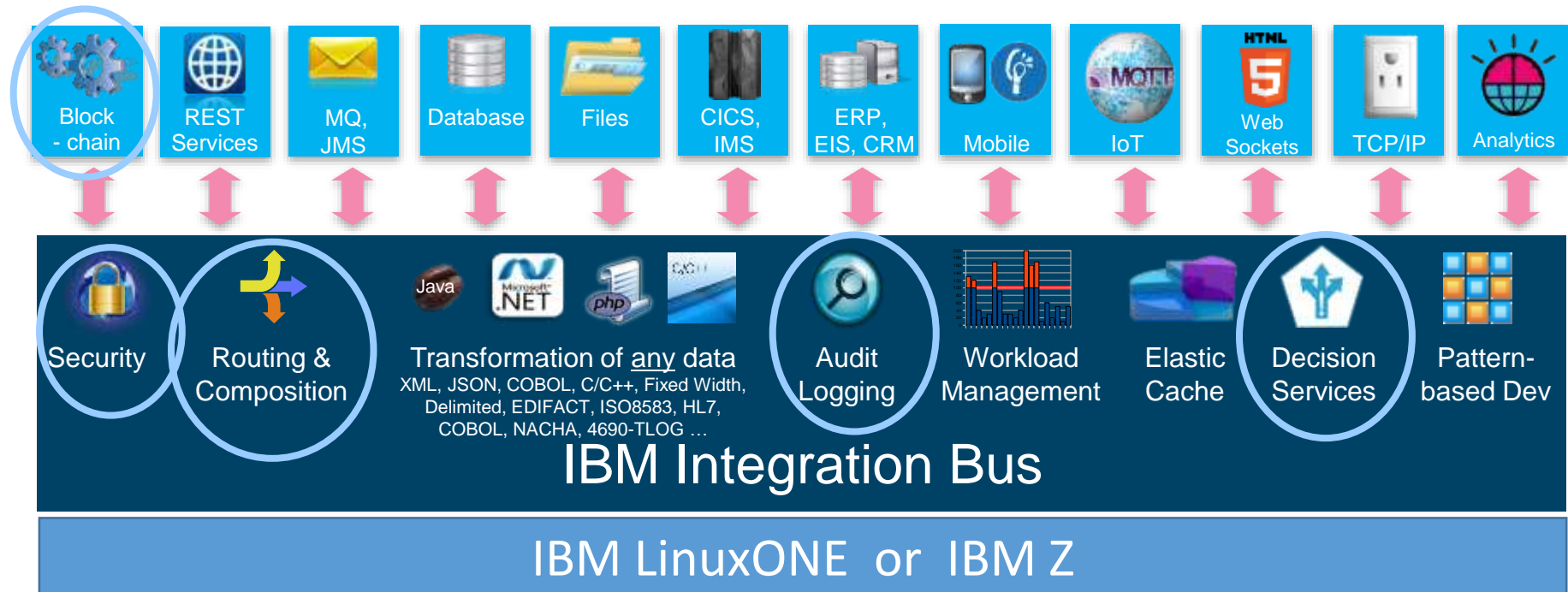
Streamlined to ESB use case

Scalable in Docker Containers

HTML5 web admin/monitoring

High scale MQ events/messaging

<http://www-03.ibm.com/software/products/en/ibm-integration-bus>



IBM LinuxONE or IBM Z

IBM Blockchain Offerings



IBM managed on IBM cloud

Self managed, On Premises

Starter

- Start writing chaincode in seconds
- Integrated dashboard, logs and tools
- Community samples, tutorials, and quickstarts

High Security Business Network

- High performance and reserved capacity
- Best in Industry security, isolation and spec support
- Proven Audit environment for compliance and forensics

IBM Blockchain Starter for Developers

Public Beta

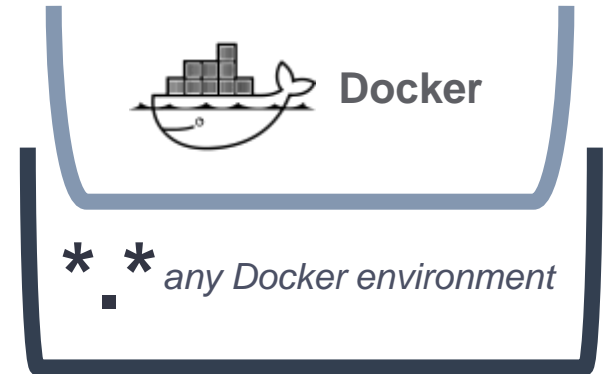
[provision now on IBM Bluemix!](#)

IBM Blockchain for High Security Business Networks

Generally Available

[Available on IBM Bluemix!](#)
(on-premise planned)*

GA



IBM offers technical support for x86, Power and System z

Support for Hyperledger Fabric

Generally Available

<https://hub.docker.com/r/ibmblockchain/fabric/>

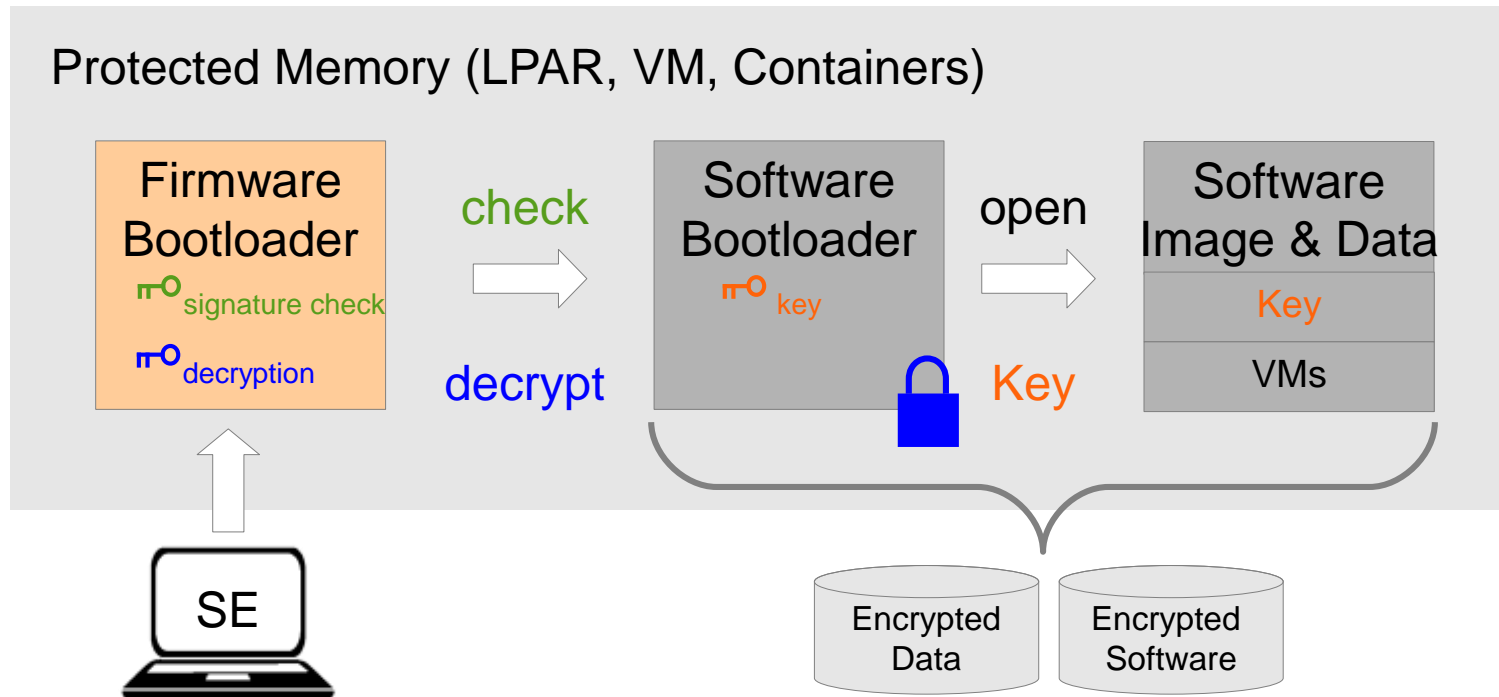
GA

*can be withdrawn without further notice

Secure Services Container

Protect blockchain software, chain code and data.

- Root users and System Administrators cannot access or see data or software
- Malware cannot self install in this container
- Data is encrypted. Keys are in protected memory
- **No other platform provides this capability.**



IBM investments: Transforming Industries with Blockchain

IBM Blockchain Ecosystem

Blockchain Solutions

UPDATE

NEW

IBM Blockchain Platform

Develop

Govern

Operate



HYPERLEDGER

Projects

Driving new enterprise value via the transformation of business processes; through design, build and operation of Blockchain Business Networks; complemented by investment with key industry partners for differentiated Blockchain Solutions

Industry expertise, hands-on blockchain education, and go-to-market support services to create a thriving Blockchain ecosystem

Secure, proven, and cloud based Blockchain Platform with technology services and business ready solutions to enable the creation and management of Blockchain business networks

GA of IBM Blockchain V1 Platform: Aug 15th 2017

An extensive Linux Foundation community to ensure the best possible foundation for Blockchain in a commitment to open standards, open source and open governance

[Link to full platform messaging doc](#)

[Link to messaging playback video led by Jerry Cuomo](#)

* Hyperledger Fabric is a blockchain framework implementation and one of the five Hyperledger projects hosted by The Linux Foundation.

Introducing the new IBM Blockchain Platform

The only fully integrated enterprise-ready blockchain platform designed to accelerate the development, governing, and operation of a multi-institution business network.

Key Benefits

Accelerated Development

Significantly reduce development time with popular tools and languages designed to ensure close alignment between business leaders and developers

Democratic Governance

Enable faster activation, customization and ongoing management of your business network with collaborative management tools.

Always-on operations

Meet the needs of the most demanding use cases and regulated industries with networks that are scalable, hardened, highly secure and always on

IBM Blockchain Platform Features

Develop

- Tools that use business terms to generate chaincode and smart contracts.
- Sample industry use cases
- Online, local and shared development environments
- Integration with popular developer environments using open developer tools
- Powered by Hyperledger Composer

Govern




- Activation tools for new networks, members, smart contracts and transaction channels
- Policy Editor to define flexible, democratic policies to govern changes to the network
- Multi-party workflow tool with member activities panel, integrated notifications and secure signature collection for policy voting

Operate

- Always-on, high availability with seamless software and blockchain network updates
- Hardened security stack with no privileged access and malware blocking by design
- Encryption keys stored in a hardware tamper proof vault
- 24/7/365 IBM Blockchain Support
- Built-in blockchain monitoring for full network visibility
- Powered by the Hyperledger Fabric

[Link to full platform messaging doc](#)

Only the IBM Blockchain Platform provides must-have features for production distributed business networks

	MUST HAVE	IBM Blockchain Platform			
Enterprise ready	Security	✓ Integrated HSM with highest FIPS level compliance	✗ Lack of dedicated blockchain security	✗ Lack of dedicated blockchain security	✗ Lack of dedicated blockchain security
	Scalability	✓ Fastest Linux compute and high speed network	✗ Cannot scale beyond basic test network	✗ No production offering	✗ No production offering
	Support	✓ 24x7x365 support coverage backed by deep Fabric expertise	✗ No dedicated Fabric support	✗ No dedicated Fabric support	✗ No dedicated Fabric support
Trusted	Transformation expertise	✓ Services and infrastructure support for new distributed business networks	✗ No transformation services	✗ No transformation services	✗ No transformation services
	Industry focus	✓ Active networks for key industries (Retail, Supply Chain, FSS, etc.)	✗ Limited to no active networks	✗ No industry focus	✗ No industry focus
	Tools and management	✓ Network governance and development tools	✓ Development tools, limited interoperability	✗ No tooling	✗ No tooling
Open	Open governance	✓ Fabric governed by enterprise-focused Hyperledger Project	✗ Only supports EEA	✓ Supports Hyperledger project	✗ No governance support
	Ecosystem	✓ 25+ organizations contributed to Hyperledger Fabric v1.0	✓ Support from Ethereum ecosystem	✗ No ecosystem support	✗ No ecosystem support
	Licensing	✓ Apache 2 and MIT licensing make using and contributing to code easier	✗ Ethereum GPL/LGPL licensing	✗ No licensing support	✗ No licensing support

With IBM, how to Engage with Blockchain



1. Discuss Blockchain technology
2. Explore customer business model
3. Show Blockchain Application demo

Remote or face to face

Free of charge



1. Understand Blockchain concepts & elements
2. Hands on with Blockchain on Bluemix
3. Standard demo customization

Remote or face to face

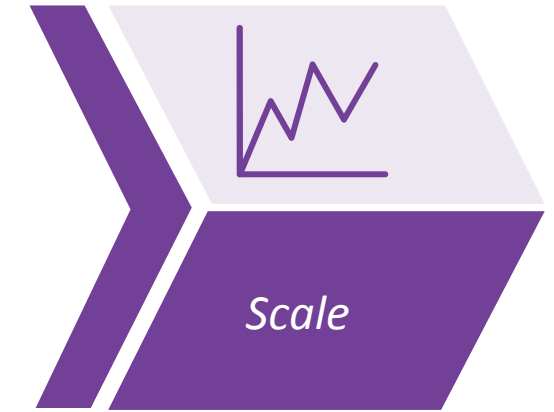
Free of charge



1. Design Thinking workshop to define business challenge
2. Agile iterations incrementally build project functionality
3. Enterprise integration

Face to face

For fee



1. Scale up pilot or Scale out to new projects
2. Business Process Re-engineering
3. Systems Integration

Face to face

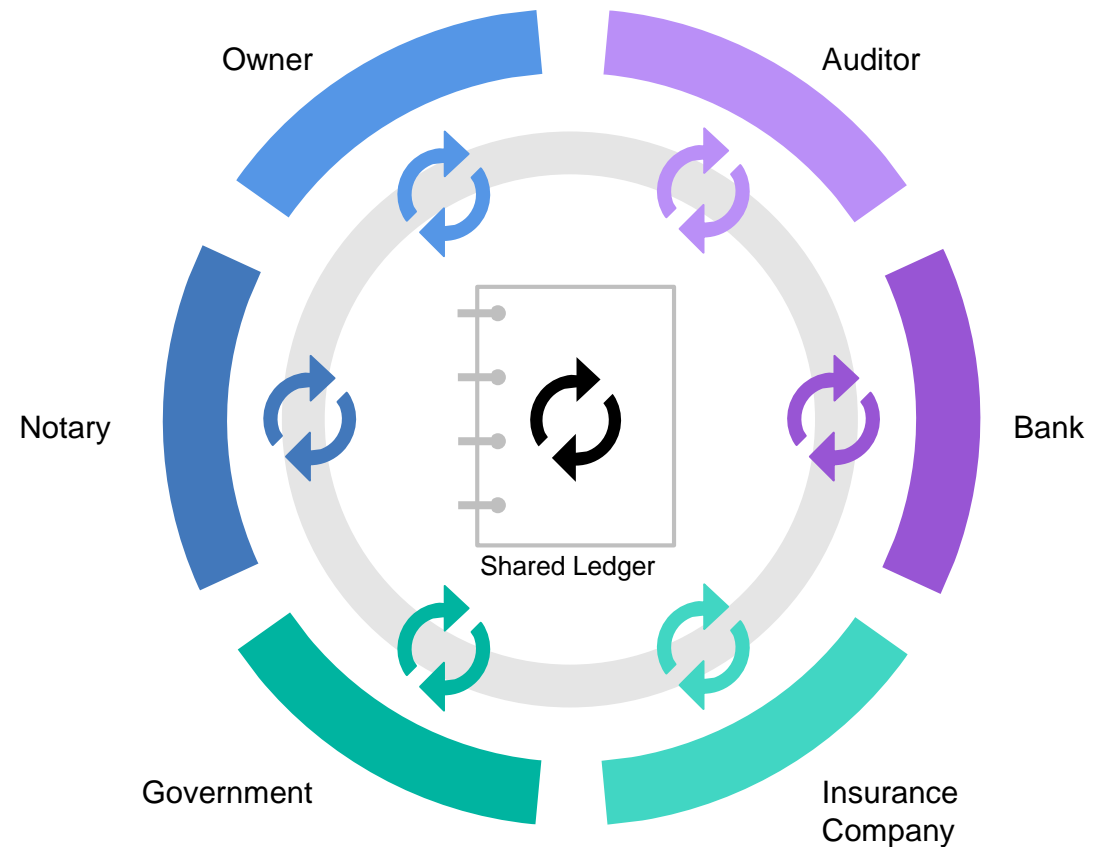
For fee

Shaun Frankson (Plastic Bank) reflecting on Design Thinking workshop experience [here](#):

Conclusion: Blockchain is a shared distributed ledger that can increase trust in any asset transfer without central control engine

“At its core, blockchain is a shared ledger that allows participants in a business network to transact assets where everyone has control but no one person is in control.”

Leanne Kemp
CEO and Founder, Everledger
United Kingdom



Become a Blockchain Ecosystem Partner using Hyperledger

<https://www.ibm.com/blockchain/partner-solutions.html>

Netki, Inc.

- Simplify blockchain addresses with Netki's Wallet Name Service. Enable blockchain apps for financial services to be open, interoperable and compliant with Digital Identity Certification Solution. [Learn more about Digital ID Certification](#)

loyyal

- Improve your loyalty and rewards with the loyyal platform, built with blockchain. It offers interoperability, multi-branded coalitions, strong liability management and dynamic issuance and redemption options. [Learn more](#)

Cloudsoft

- Deploy Hyperledger Fabric from the Linux Foundation to virtually any environment using Cloudsoft AMP to speed the development of chaincode apps. [Learn more](#)

IntellectEU

- Analyze, design and implement any financial services solution or proof of concept based on blockchain technology with Hyperledger development. [Learn more](#)

Reference Material

- IBM Blockchain Homepage

<https://www.ibm.com/blockchain/>

- IBM Blockchain Developer Center

<https://developer.ibm.com/blockchain/>

- Blockchain Essentials

<https://developer.ibm.com/courses/all/blockchain-essentials/>

- Hyperledger Composer Playground

<https://composer-playground.mybluemix.net/>

- IBM Blockchain Community ([link](#))

- Hyperledger Fabric – Read the docs: Getting Started, Tutorials, ...

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

Questions?



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NOTES: Linux penguin image courtesy of Larry Ewing (lewing@isc.tamu.edu) and The GIMP

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