AWS Office Hours:
Amazon Managed Blockchain - Building Distributed Applications with Hyperledger Fabric

Managed Blockchain Office Hours Team

Shruthi Rao

Business Development Lead

Jonathan Fritz

Head of Amazon Managed Blockchain

Jonathan Shapiro-Ward

Sr. Solution Architect

Chirag Dhull

Product Marketing Lead

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How do “Office Hours” work?

office hours noun

Definition of *office hours*

1 **:** the time during the day when people work in an office
// Our *office hours* are 8:30 to 4:00 Monday through Friday.

2 *US* **:** the time during the day when a teacher is available to meet with students in his or her office
// She has *office hours* Monday and Wednesday mornings from 9:00 to 11:00.

3 *US* **:** a time during the day when people can see a doctor or dentist

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How do “Office Hours” work?

Office Hours webinar…

You: Ask tough/thoughtful/interesting questions about how to build blockchain networks on AWS

We: Leverage all of the resources at our disposal to get you a helpful answer

How did we choose the questions?

300+ customers
registered for the webinar

150+ questions
were submitted across
many categories

Looked for common themes in questions

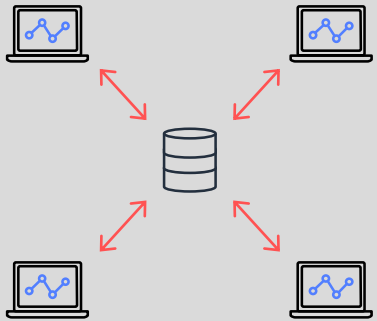
Dedicated time for live questions

What is Blockchain? Do I need a blockchain? What is Amazon's view on it?

Need for a ledger with centralized trust

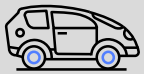
1 LEDGERS WITH CENTRALIZED TRUST

2 TRANSACTIONS WITH DECENTRALIZED TRUST



Healthcare

Verify and track hospital equipment inventory



DMV

Track vehicle title history

Manufacturers

Track distribution of a recalled product

HR & Payroll

Track changes to an individual's profile

Amazon QLDB (Preview)

Fully managed ledger database
Track and verify history of all changes made to your application's data

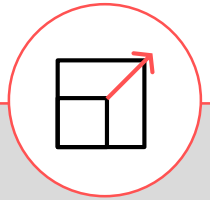
Immutable

Maintains a sequenced record of all changes to your data, which cannot be deleted or modified; you have the ability to query and analyze the full history

Cryptographically verifiable

Uses cryptography to generate a secure output file of your data's history

Highly scalable



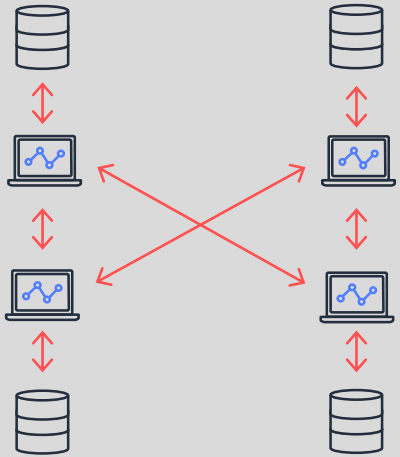
Executes 2–3X as many transactions as ledgers in common blockchain frameworks

Easy to use

Easy to use, letting you use familiar database capabilities like SQL APIs for querying the data

Need for running transactions with decentralized trust

1 LEDGERS WITH CENTRALIZED TRUST



2 TRANSACTIONS WITH DECENTRALIZED TRUST

Financial institutions
Peer-to-peer payments

Mortgage lenders
Process syndicated loans

Supply Chain
Transact with suppliers and distributers

Retail
Streamline customer rewards

Customer problems with complex business networks

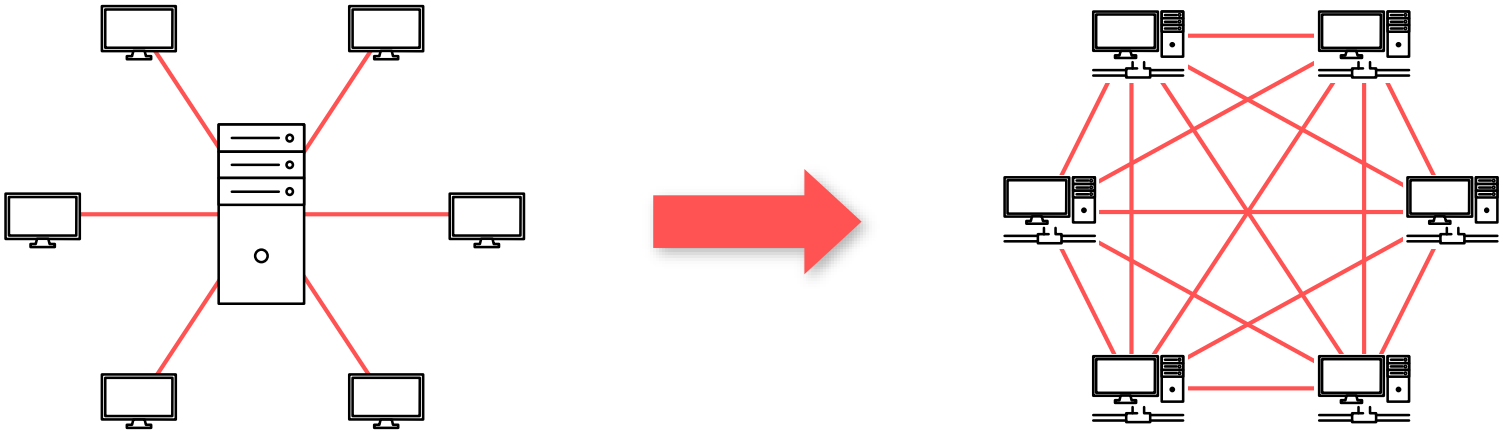
- Many existing business **networks rely on central authorities**, which can be inefficient, expensive, and requires time-consuming auditing
- A consortium could **achieve better outcomes by sharing information**, but cannot agree on how data can be securely and fairly shared
- Multiple organizations **need to independently verify transaction** history and **need a single, up to date, accurate view of data**
- **Business logic** among multiple organizations could be **simplified** through **automation**
- **Asset transfers require** an expensive and inefficient **escrow**
- A public network needs a way to maintain a **tamper-proof history of transactions** and global state

Blockchain builds trust in a network

Eliminates the need for central authority in business networks

Three main components: distributed ledger, consensus mechanism,
and “smart contract” execution environment

Together these elements allow two parties to transact with one another by ensuring other parties consent to the transaction and record the transaction. This provides immutability and trust



NEW

Amazon Managed Blockchain

Fully managed blockchain service, supporting both Hyperledger Fabric and Ethereum frameworks

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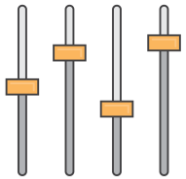
What is Amazon Managed Blockchain?

Amazon Managed Blockchain is a fully managed service that makes it easy to create and manage scalable blockchain networks using popular open source frameworks:
Hyperledger Fabric and Ethereum

Question:

Benefits of Amazon Managed Blockchain? Why use it over your own Hyperledger Fabric Environment?

Amazon Managed Blockchain features



Fully managed

Create a blockchain network in minutes

HYPERLEDGER FABRIC

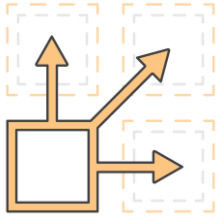
ethereum

Open-source variety

Support for two frameworks

Decentralized

Democratically govern the network

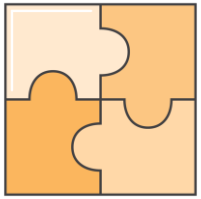


Reliable & scalable

Backed with Amazon QLDB technology

Low cost

Only pay for resources used



Integrated

Send data to Amazon QLDB for secure analytics

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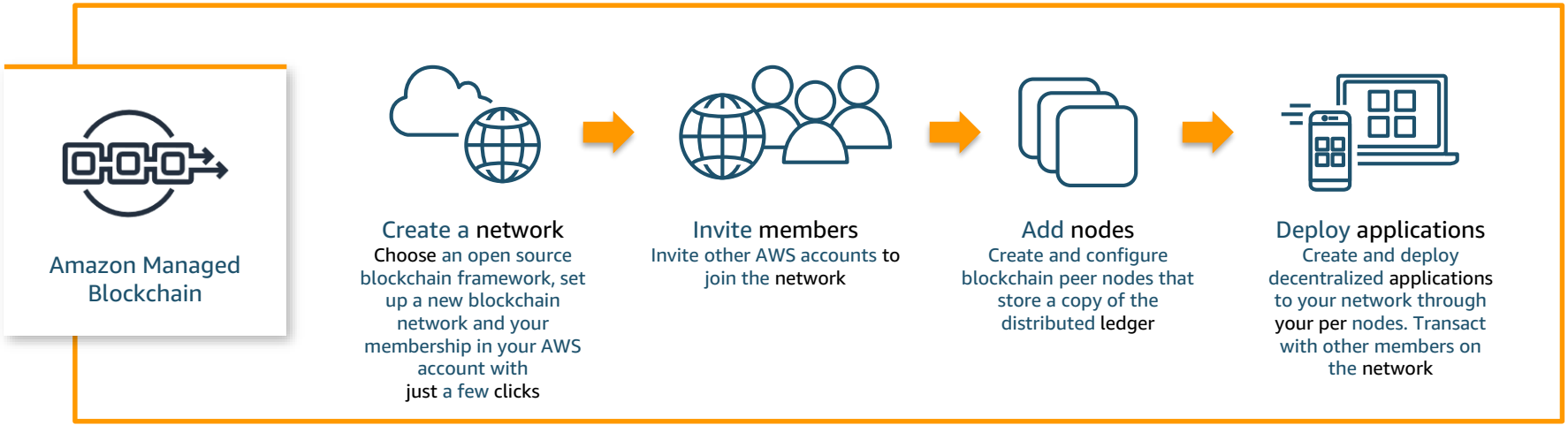
How Amazon Managed Blockchain works



Architecture Questions

What is the architecture of a Hyperledger Fabric network and how do transactions get committed?

How do you invite different members (organizations) to the same AWS account? How does access control work?

How does identity management work with Fabric?

Can I bring existing chaincode to Managed Blockchain?

How do you deploy chaincode on Managed Blockchain?

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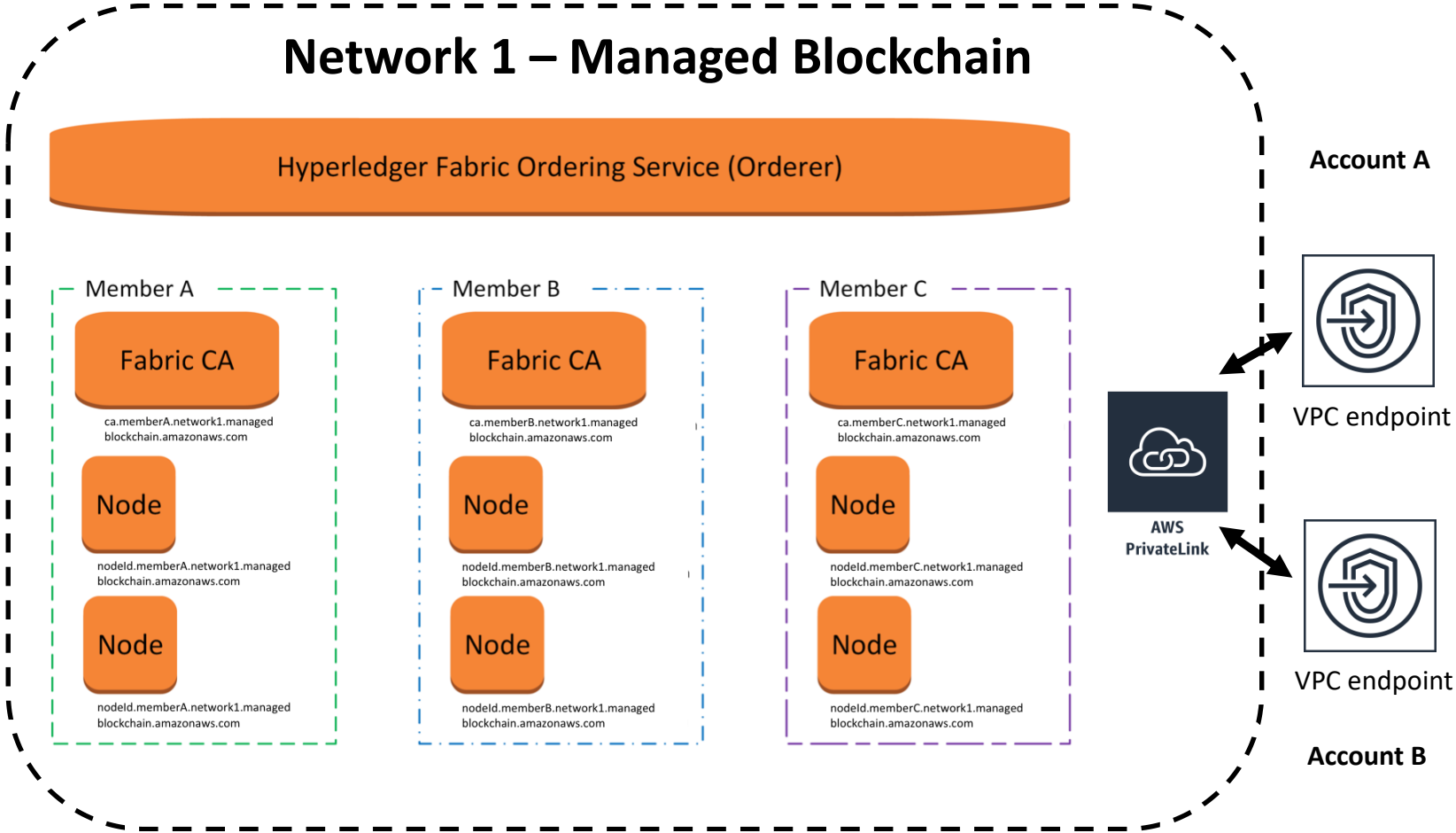

Network 1 – Managed Blockchain
Hyperledger Fabric Ordering Service (Orderer)
Member A
Fabric CA
ca.memberA.network1.managed blockchain.amazonaws.com
Node
nodeId.memberA.network1.managed blockchain.amazonaws.com
Node
nodeId.memberA.network1.managed blockchain.amazonaws.com
Member B
Fabric CA
ca.memberB.network1.managed blockchain.amazonaws.com
Node
nodeId.memberB.network1.managed blockchain.amazonaws.com
Node
nodeId.memberB.network1.managed blockchain.amazonaws.com
Member C
Fabric CA
ca.memberC.network1.managed blockchain.amazonaws.com
Node
nodeId.memberC.network1.managed blockchain.amazonaws.com
Node
nodeId.memberC.network1.managed blockchain.amazonaws.com
AWS PrivateLink
Account A
VPC endpoint
VPC endpoint
Account B

Architecture Questions (contd.)

What are the security controls and infrastructure certifications surrounding the Managed Blockchain environment?

Explain member management (creation, administration) on this platform.

Is there support for Hyperledger Composer on Managed Blockchain?

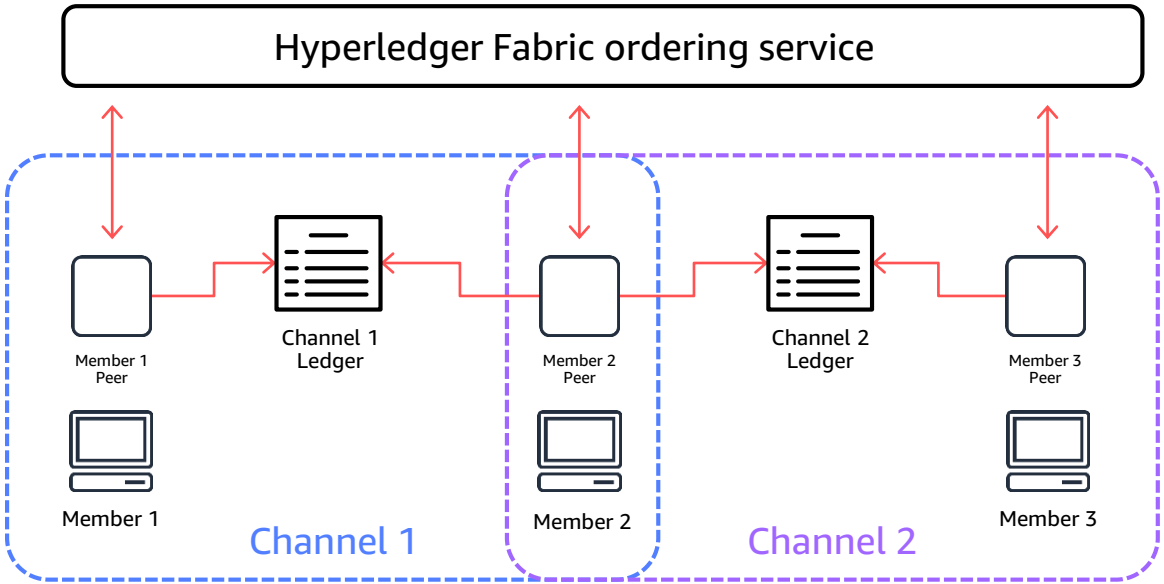
What is the SDK Language support for Fabric?

Channels and private data for access control

Channels allow isolation of transactions among specific members in the network

Create or update a channel with configuration transaction (configtx)

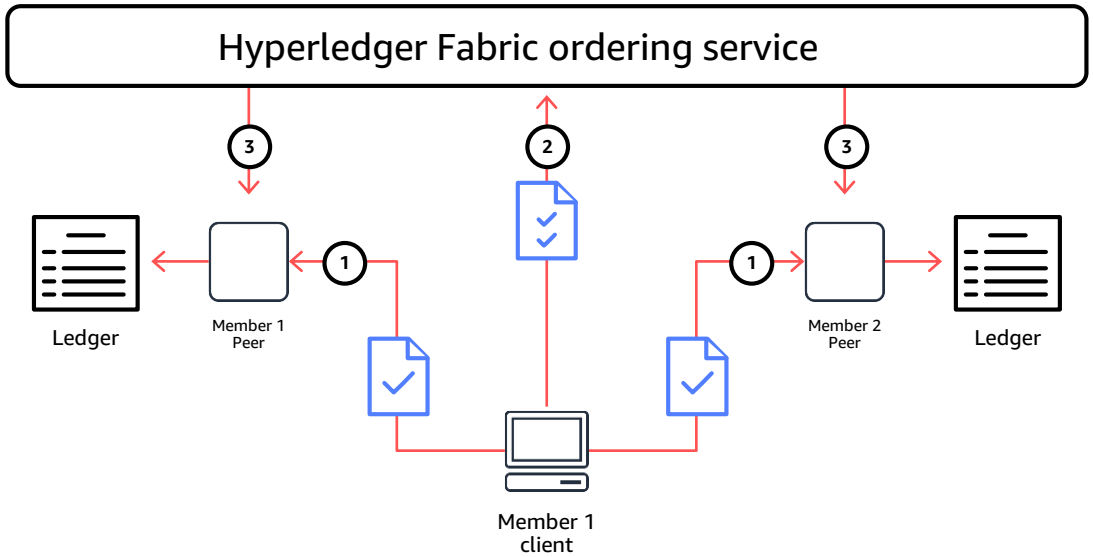
Private data enables sub-channel access control



Endorsement policies

Endorsement policies allow chaincode to specify which members (or how many) need to validate a transaction before submitting

Endorsed transactions then get submitted to the ordering service and assembled into blocks



Decentralized / Performance

Current state and adoption of public vs. private networks?

Where are current performance bottlenecks in validating transactions for public vs. private networks? Is hybrid blockchain true to original spirit of blockchain?

By using AWS to host a blockchain service, how does the network maintain the merits of decentralization if everything is stored on one platform's cloud infrastructure?

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Integrating Blockchain Applications

How can I build an AWS wide solution/application with managed blockchain and other AWS services?

How can I use AI and IoT in a blockchain application?

How to set up a HA blockchain?

Blockchain Use Cases

Healthcare

Government

Agriculture

Supply Chain

Financial Markets

Customers are experimenting in many industries

Proof of Ownership

Documents/Contracts

Digital Security Trading

Enterprise Platforms

Mortgage Loans

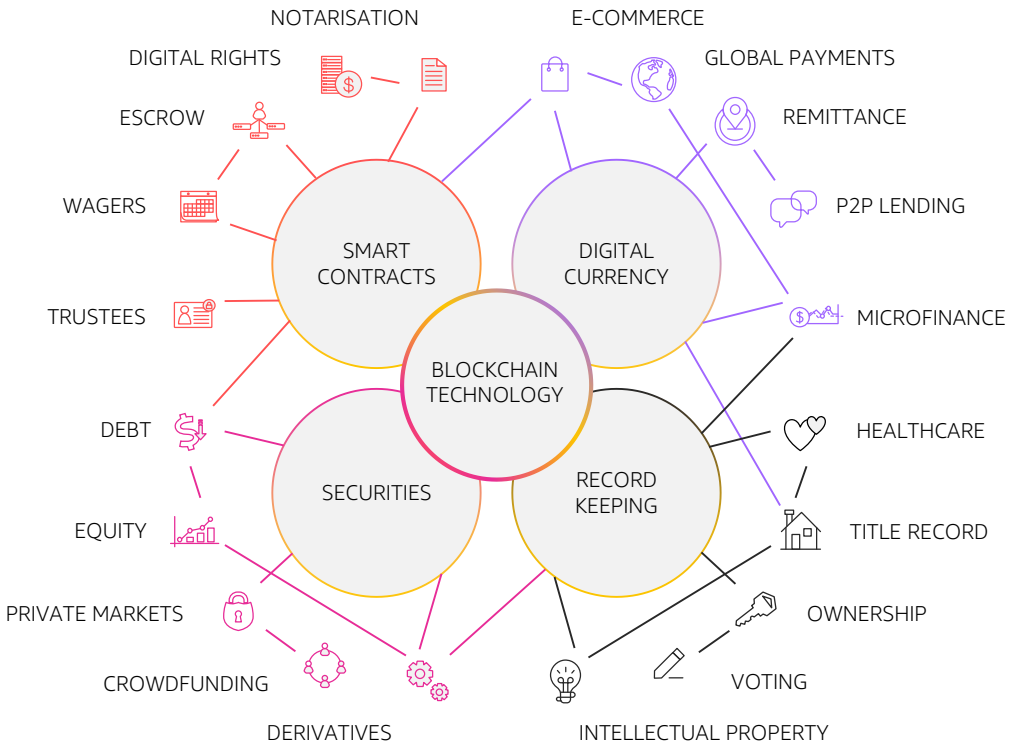
Voting Mechanisms

Patient Records

Corporate Governance

Financial

Insurance



Capital Markets

HCLS

Real Estate

Legal

Agriculture

Gaming

Transportation

M & E

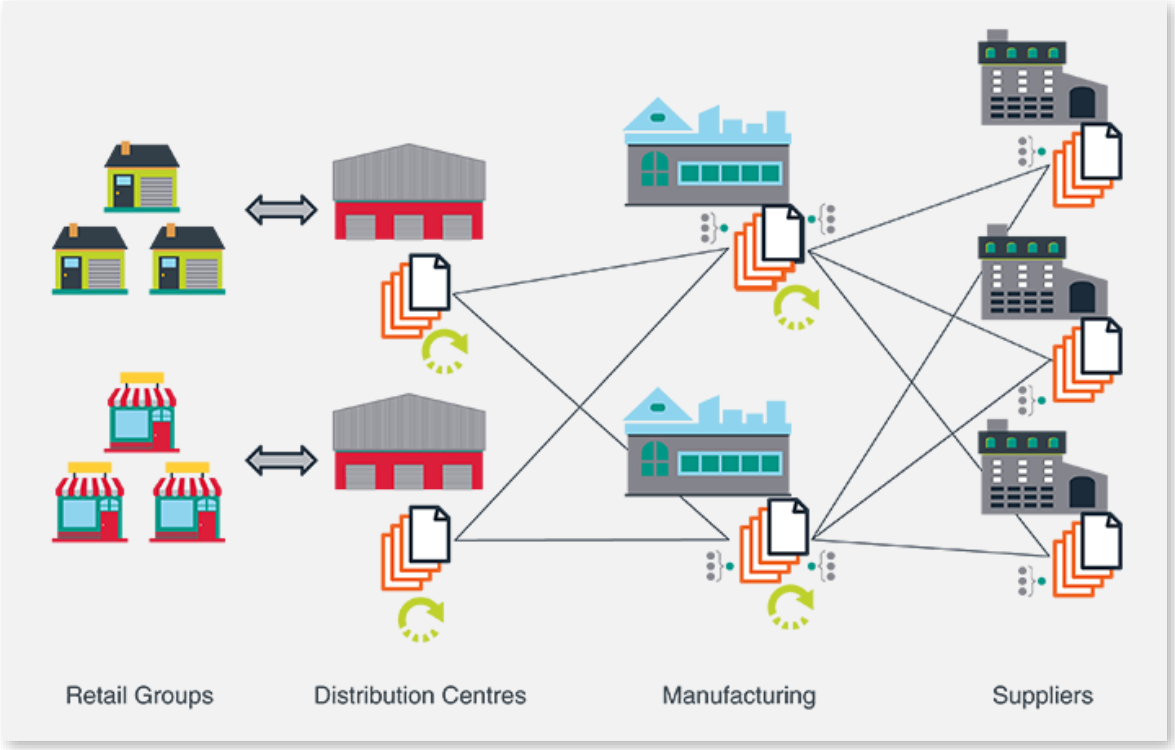
Digital Advertising

Power/Utilities

Retail

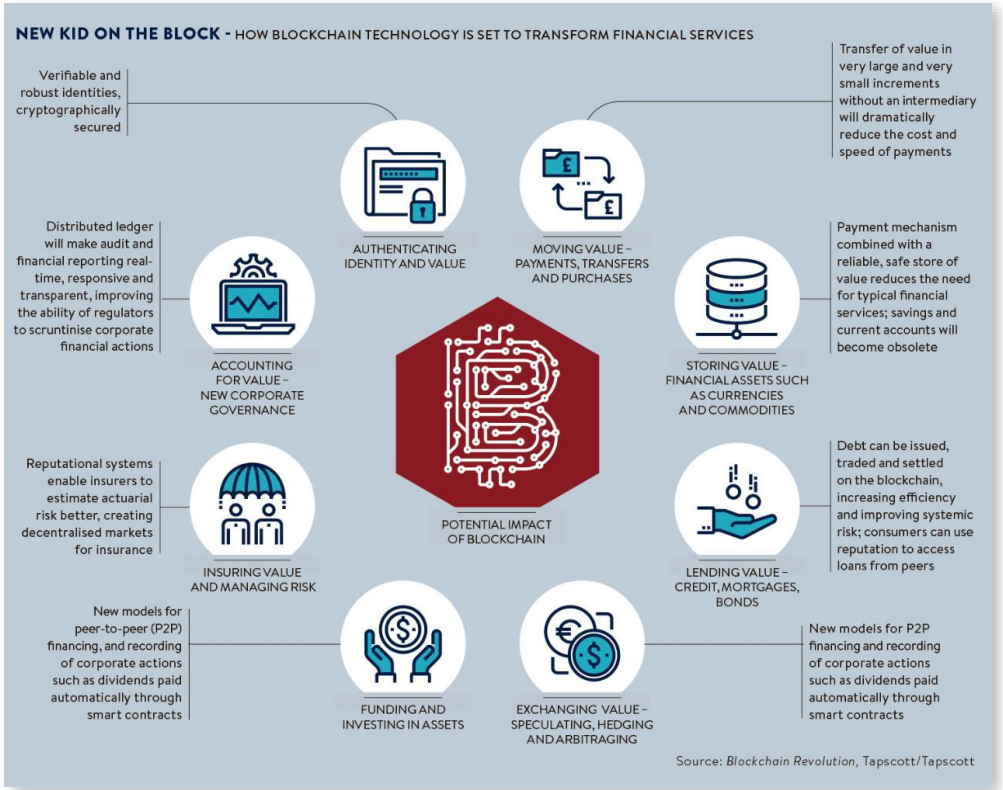
Cloud

Blockchain in supply chain



- Each organization has a trusted copy of the supply chain data
- Payments can be automated through smart contracts
- Identity of components are immutably tracked as they move through the supply chain
- Quality of products can be monitored and immediately acted on

Blockchain in financial services



Who is Singapore Exchange

A diversified exchange group that runs key market infrastructure including the Singapore stock market and a pan-Asian derivatives exchange covering all major asset classes.

High annual dividend of 28 cents for the past 5 years

Strong cash-flow with debt-free balance sheet

Anchored in Singapore, an AAA-rated economy

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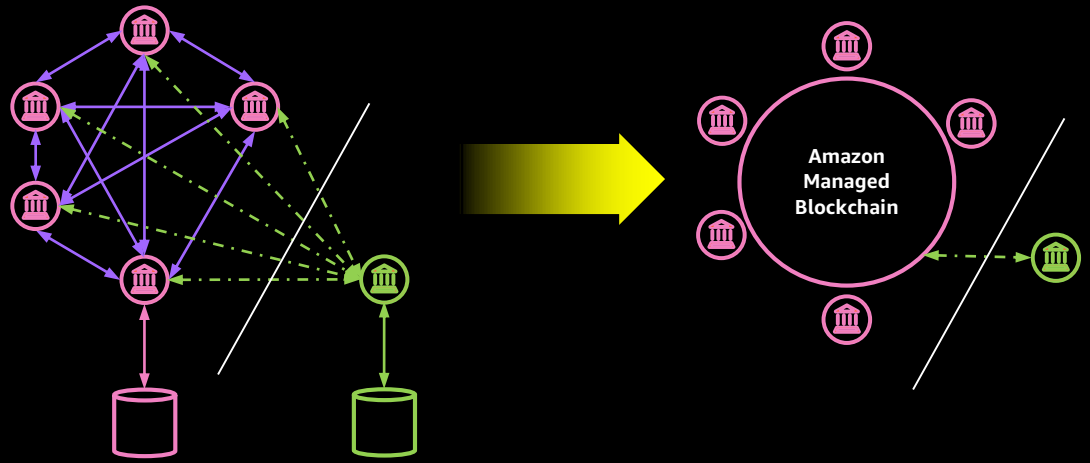
Singapore Exchange: Project Ubin's blockchain use case



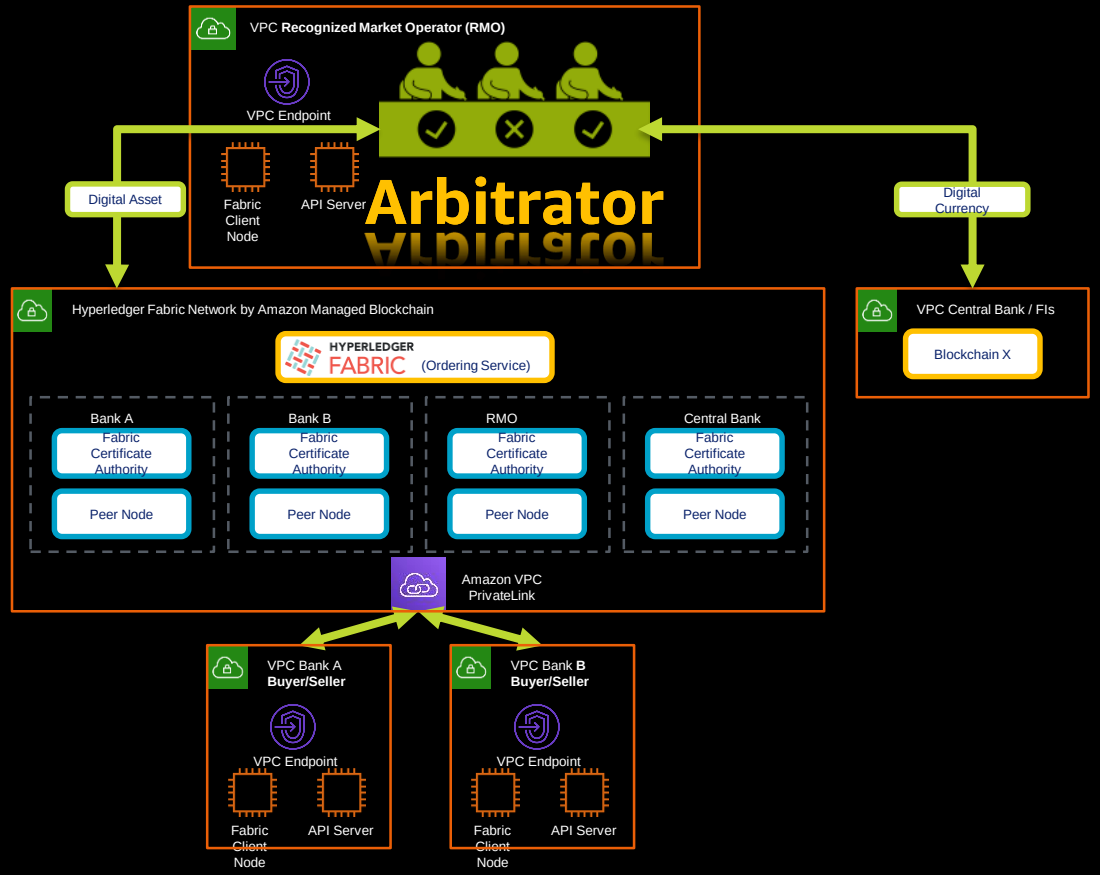
Challenges with existing financial systems:

- Lack of trust
- Inefficient processes for sending data across borders
- API divergence is expensive and cumbersome to maintain

Benefits of implementing a blockchain

- Distributed application provides trust
- Provides reliability and resiliency
- Easy to add new participating members
- Efficient transfer of data and transactions without intermediaries

Our preview on Amazon Managed Blockchain



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Other

Do or will these services fall under HIPAA privacy guidelines and the related BAA?

How do I implement security in blockchain applications?

How do you get started?

Video Tutorials & Getting Started Guides:
https://aws.amazon.com/managed-blockchain/resources/

Blogs:

https://aws.amazon.com/blogs/database/build-and-deploy-an-application-for-hyperledger-fabric-on-amazon-managed-blockchain/

https://aws.amazon.com/blogs/database/add-new-members-to-a-hyperledger-fabric-channel-on-amazon-managed-blockchain/

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How do you reach out to the team?

Email: amazon-managed-blockchain-help@amazon.com