



# HASHED

## HEALTH

### Introduction to Blockchain

PRESENTED TO

NHCC Fellows 2018

# Bramble's Paradigm

Globally, healthcare is facing seemingly intractable problems of cost, quality and experience.

We believe that these and related problems stem from the payment and exchange infrastructure that lies at the foundation of healthcare delivery.

Fundamentally, bad transactional infrastructure makes for malfunctioning marketplaces.

# Setting the Stage

“In many industries significant effort is needed to keep organisation specific databases in sync with each other. In the financial sector the effort of keeping different databases synchronised, reconciling them to ensure they actually are synchronised and resolving the ‘breaks’ that occur when they are not represents a significant fraction of the total work a bank actually does! Why not just use a shared relational database? This would certainly solve a lot of problems using only existing technology, but it would also raise more questions than answers:

- Who would run this database? Where would we find a sufficient supply of angels to own it?
- In which countries would it be hosted? What would stop that country abusing the mountain of sensitive information it would have?
- What if it were hacked?
- Can you actually scale a relational database to fit the entire financial system?
- What happens if The Financial System™ needs to go down for maintenance?
- What kind of nightmarish IT bureaucracy would guard changes to the database schemas?
- How would you manage access control?”

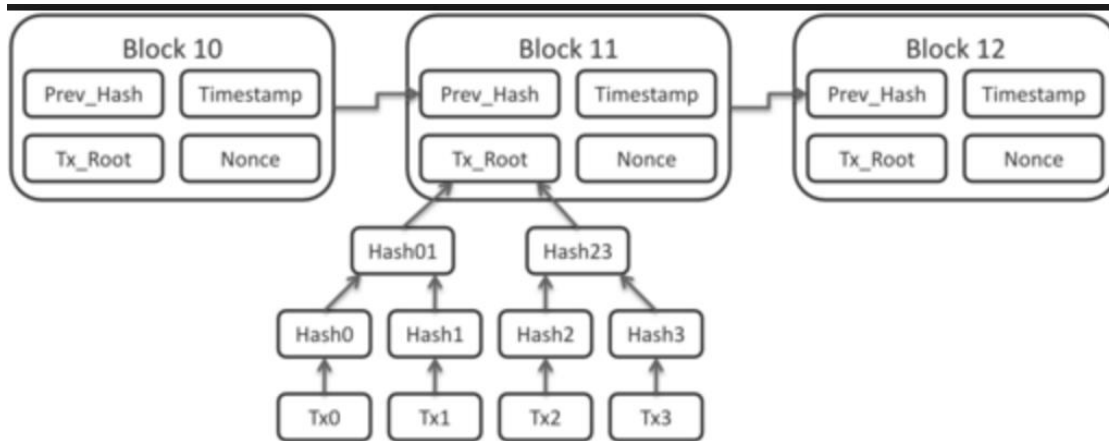
-R3 Corda Whitepaper, November 2016

# Introduction to Blockchain



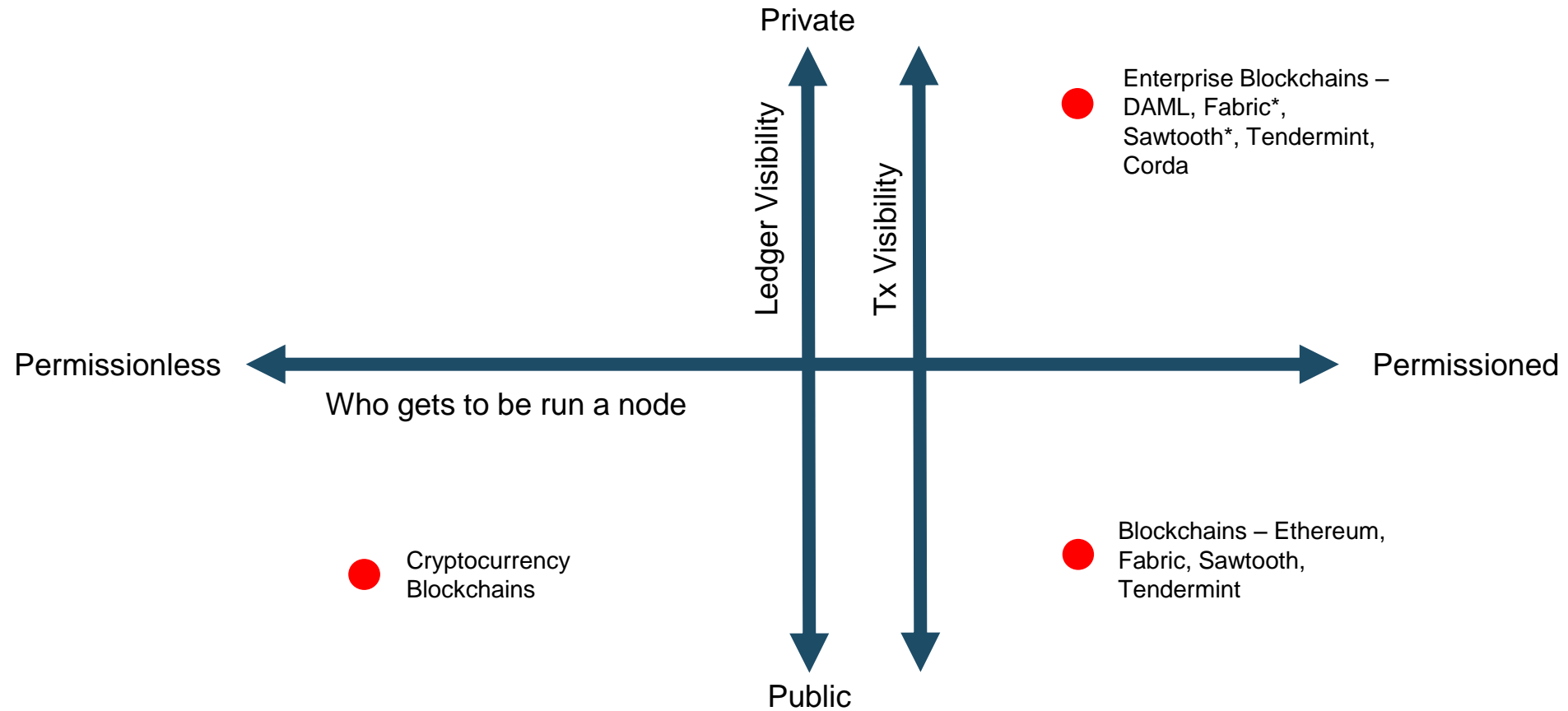
- Transactional business infrastructure that is jointly operated and shared
- Like physical infrastructure, blockchain is foundational structures that facilitate a market-level transactions
- Shared, redundantly replicated infrastructure offers resiliency, fault tolerance and greater efficiency
- Joint operation is the key to security, reliability and trust in the infrastructure

# What is a blockchain?

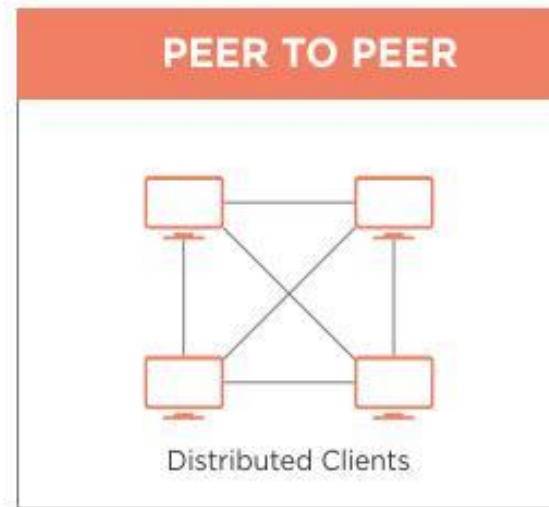
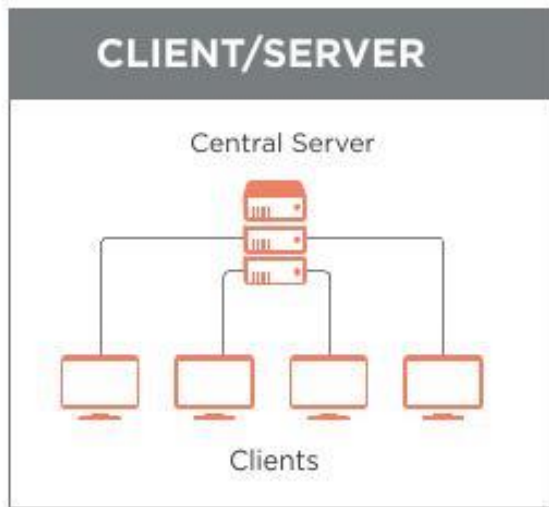


- Append-only, cryptographically secure distributed ledger
- Network nodes both generate own data and verify data generated by others
- No Central Repository – Each node stores identical copies of the ledger
- Resilient due to network power and cryptographic integrity
- Distributed Consensus eliminates costly and inefficient reconciliation processes
- Large economic disincentive for malicious actors

# Basic Configurations



# Paradigm Change - Network Architecture



**“IBM’s database model stood unchanged until about 10 years ago, when the blockchain came into this conservative space with a radical new proposition:**

**What if your database worked like a network? Blockchains support the formation of more complex value networks than can otherwise be supported.”**

- Harvard Business Review, March 2017

# Paradigm Change - Control

**Blockchains offer transactional systems in which everyone has control but no one is in control.**

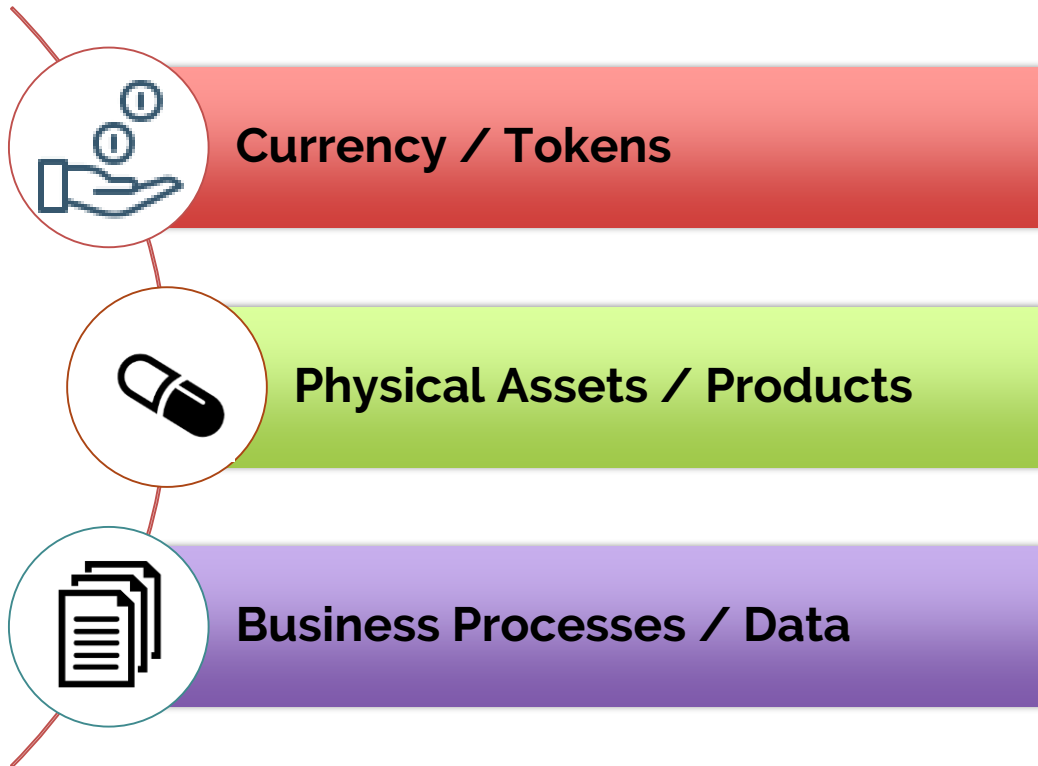
Arvind Krishna, IBM

**Blockchain networks rely on a decentralized infrastructure that can't be controlled by any one person or group. Blockchain governance is not emergent from the community. Rather, it is ex ante, encoded in the protocols and processes as an integral part of the original network architecture.**

Harvard Business Review, April 2017



# Paradigm Change - “Assets” and “Transactions”



**Anything that you can conceive of as a supply chain, blockchain can vastly improve its efficiency - it doesn't matter if its people, numbers, data, money.**

Ginni Rometty, CEO IBM

# Healthcare Blockchain Areas

Supply Chain Tracking

Identity Management

Contracting Innovation

Direct Services Purchasing

Wellness and Population Health

- Shared source of truth for multiparty business processes
- Contract adjudication (and other automated business logic)
- Safety Valve for Centralized and Hybrid Centralized Offerings



**bramble**

## **Distributed Infrastructure for Healthcare Service Marketplaces**

Fundamentally, bad transactional infrastructure makes for malfunctioning marketplaces.

Bramble brings together buyers and sellers of healthcare services to enable rational price and value discovery

# A Path Forward – Bramble Overview

- Bramble is transactional blockchain infrastructure to support a new generation of healthcare marketplaces that enables providers and buyers to rationally transact healthcare service offerings.
- Bramble combines innovative contracting and discrete HC service offerings via a complex and dynamic set of “rights” and “obligations.” The Bramble engine reconciles the interplay of these rights and obligations at the transactional level, offering complex contract adjudication and efficient HC services unit level transactions.
- Why blockchain? Bramble offers a high transactional thru-put, transactional level privacy and a common market infrastructure to support diverse healthcare marketplaces.

## Contact Information



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For more information on this and other use cases,  
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<https://chat.hashedhealth.com>