CABLE-TEC EXPO® 2017

SCTE · ISBE

# THE NEXT BIG...

DEAL
CONNECTION
INNOVATION
TECHNOLOGY
LEADER
NETWORK

SCTE·ISBE CABLE-TEC EXPO 2017

DENVER, CO
OCTOBER 17-20

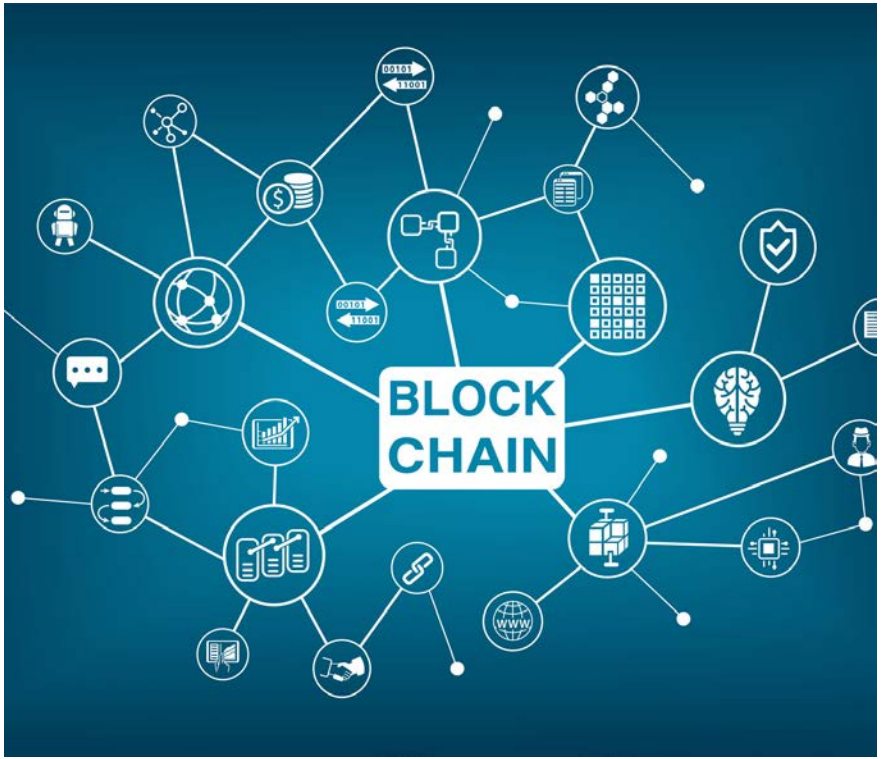
2017 Fall Technical Forum
SCTE·ISBE • NCTA • CABLELABS

SCTE · ISBE

# Comparing Blockchain Implementations

**Zane Hintzman**
Associate Engineer
CableLabs

SCTE·ISBE CABLE-TEC EXPO 2017
DENVER, CO
OCTOBER 17-20




# Introduction

- Blockchain technology increasingly popular
- Multiple implementations available
- Many factors to consider:
  - Purpose
  - Ease of participation
  - Performance
  - Security algorithms
  - Governance

# I know what a blockchain is.

# What is a Blockchain?

- Distributed ledger of data in blocks, stored across multiple computers
- “Blocks” store transaction(s), timestamp, and reference to previous block
- Blockchain is singly-linked, chronologically sorted list
- Network of full nodes that store complete copy of blockchain

## Why is this important to cable, and what can we do?

- Many areas where cable operators will seek transparency and trust
- Compare implementations to understand pros & cons of blockchains
- Factors important to cable:
  - Is high bandwidth & low latency required?
  - Is full, permanent record good?
  - Public or private transactions?

## Bitcoin

- Cryptocurrency
- Can store small metadata in certain transactions (up to 100 bytes)
- Open-source, open ecosystem
- Can run full node or lightweight client
- Block generation time: 10 min.
- Max transaction rate: 7 txn/sec.

## Litecoin

- Alt coin
- Can store metadata similar to Bitcoin
- Open-source, open ecosystem
- Can run full node, but fewer lightweight clients
- Block generation time: 2.5 min.
- Max transaction rate: 28 txn/sec.

## Dogecoin

- So alt coin
- Much similar to Bitcoin & Litecoin
- Many Dogecoin supply: unlimited
- Such block generation time: 60 sec.
- Very max transaction rate: 70 txn/sec.
- Wow

| | Bitcoin | Litecoin | Dogecoin |
|---|---|---|---|
| Block generation time | 10 min. | 2.5 min. | 60 sec. |
| Max transaction rate | 7 txn/sec. | 28 txn/sec. | 70 txn/sec. |
| Unique Factor | Alt coins derived from this | Fewer lightweight clients | Uncapped supply of cryptocurrency |

Comparison of cryptocurrency blockchains.

# Blockchains are only good for cryptocurrency.

Agree


## Ethereum

- Purpose: smart contracts
- Open-source, open ecosystem
- Block generation time: 12 sec.
- Max transaction rate: Unlimited
- D.A.O. hacked on June 17th, 2016
  - Split blockchain in two: Ethereum, and Ethereum Classic

steemit

## Steem

- Blockchain for *Steemit*, a social media platform
- Stores platform content on blockchain
- Gives payout for posting content
- Block generation time: 3 sec.
- Max transaction rate: >10K txn/sec.
- July 2016: Currency stolen from Bittrex accounts, followed by DDoS attack on Steem network

Lisk

## Lisk

- Create applications on sidechains linked to Lisk's mainchain
- Example applications:
  - Games
  - Social networks
  - Internet of Things
- Open-source, open ecosystem
- Block generation time: 10 sec.
- Max transaction rate: 25 txn/sec.

| | Ethereum | Steem | Lisk |
|---|---|---|---|
| Purpose | Smart contracts | Social media platform | Create applications on sidechains |
| Block generation time | 12 sec. | 3 sec. | 10 sec. |
| Max transaction rate | Unlimited (in theory) | > 10K txn/sec. | 25 txn/sec. |

Comparison of blockchains with purpose other than cryptocurrency.

# The most important factor for a blockchain is…

A Performance

B Ability to record any kind of data

C Control of user permissions

D Security algorithms

E Other

A - E

# Multichain

- Platform to make private blockchains
- Records multiple assets
- Fine-tuned user permissions
- Control performance metrics
- Does not implement smart contracts


## Hyperledger

- Linux Foundation project to advance blockchain technology for business use cases
- Many projects, some of which are tools to deploy blockchains
- All open-source code
- All in development

# Hyperledger Fabric

- Designed by IBM for industry use cases
- Stores data as “chaincode”, programmatic code similar to smart contracts
- Permissioned networks
- Encrypted transactions

# Hyperledger Sawtooth

- Designed by Intel for companies to deploy blockchains
- “Transaction families” define data stored on blockchains
- Supports permissioned and permissionless networks
- Transactions transparent by default, but can require admin key
- Block generation time: Configurable

| | MultiChain | Hyperledger Fabric | Hyperledger Sawtooth |
|---|---|---|---|
| Purpose | Create private blockchains | Industry use cases | Enable companies to deploy blockchains |
| Can performance be controlled? | Yes | (unknown) | Yes |
| Permissioned or Permissionless Network? | Permissioned | Permissioned | Both |

Comparison of platforms for deploying blockchains.

## Conclusions

- Many blockchains for cryptocurrency, but don’t fit other applications
- Some blockchains cover specific use cases
- Protocols are available for configurable blockchains
- Consider creating new implementation

SCTE · ISBE

# THANK YOU!

**Zane Hintzman**
z.hintzman@cablelabs.com
303.517.2664

SCTE·ISBE CABLE-TEC EXPO 2017

DENVER, CO
OCTOBER 17-20

CableLabs®