

# SITA Lab

Blockchain Research

By: Kevin O'Sullivan

**SITA**

# BLOCKCHAIN: AN ENABLER (OF TRUST)

## for decentralisation, disintermediation



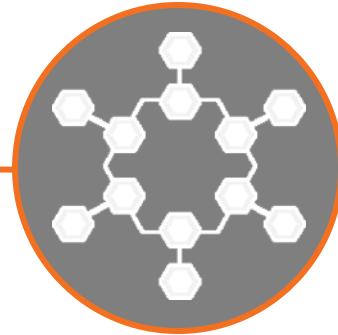
It keeps a record of all transactions taking place on a peer-to-peer network.

Creating a chain of custody



Information can be encrypted and every occurrence recorded; it cannot be altered.

Creating trust between un-trusted parties



Used for transfer of currency; contracts, records etc.

Allowing programmable, immediate, flexible, transfer of ownership

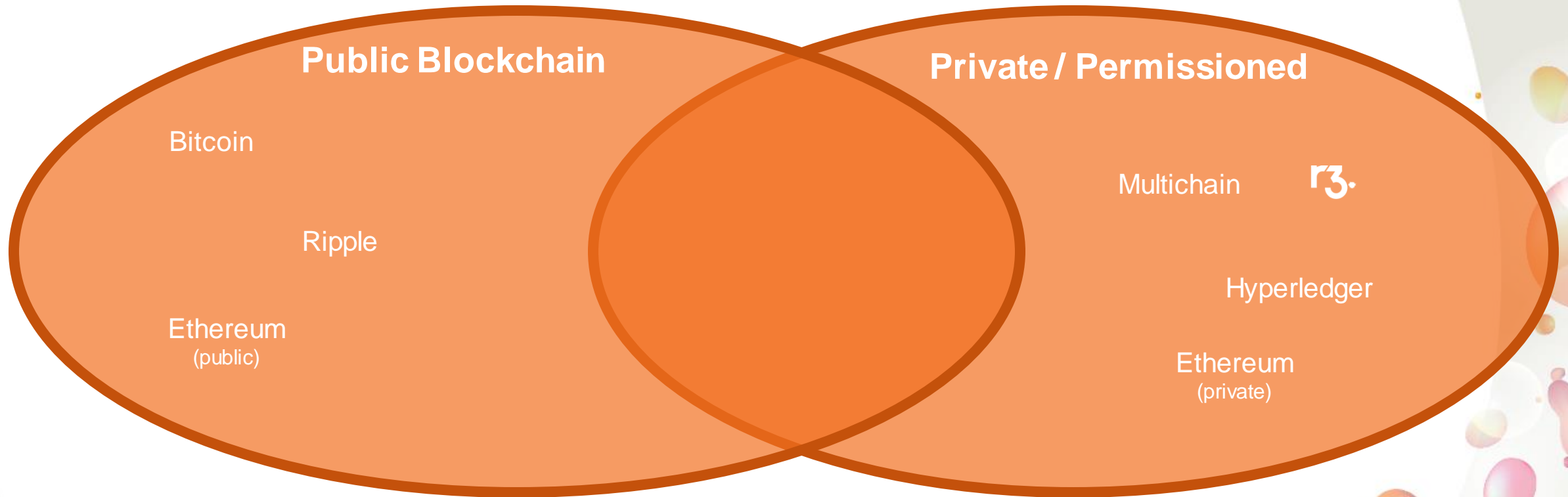


Information can be shared across multiple providers while guaranteeing consistency of data.

Creating shared control of data

# BLOCKCHAIN ECOSYSTEM

Tension between private & public models



# Sharing operational data



Q1 2016 – basic proof of existence



BITCOIN TRANSACTION

[View on BTC.com](#)

1D141322d4810157a29c15a098e66342f5c4dcdcf1731580a427187634

Value **0.02936449 BTC**

Confirmations **119,398 CONFIRMATIONS**

Fee Information **Contains dust**

Block **392200** [Main Chain](#)

Relay time **Thursday, January 7th 2016, 11:03:48 +00:00**

Time until confirmed **after 8 hours 57 minutes**

Total Inputs 0.02938849 BTC

Total Outputs 0.02936449 BTC

Fee 0.00002400 BTC

Fee / KB 0.00010480 BTC

Size 229 bytes

Encoded Message This transaction contains encoded data [view](#)

1 INPUTS Total Inputs: 0.02938849 BTC

[1DWootvp5LToyqF9Gf2dm53i5yvjqplJYM](#) (0.02938849)

2 OUTPUTS

[OP\\_RETURN](#) [view decoded message](#)  
[1DWootvp5LToyqF9Gf2dm53i5yvjqplJYM](#) (0.02936448)

INPUT SCRIPTS

3045022100ddd598c3ee39a68a3c5fe43a68bf79578f01e7eea76aa762ce7cb3d83ea65e  
f20220416eaa7d5bd0548271458f7d41c884a5173896028808efae1689afd9c2b783eb01  
030794ea0de018688521578970876f3a14b7dbe1c55e5afd01719ed8e2132ee4ce

OUTPUT SCRIPTS

OP\_RETURN 53495441204c6162206c6f76657320426c6f636b636861696e2e

[+ 1 more](#)

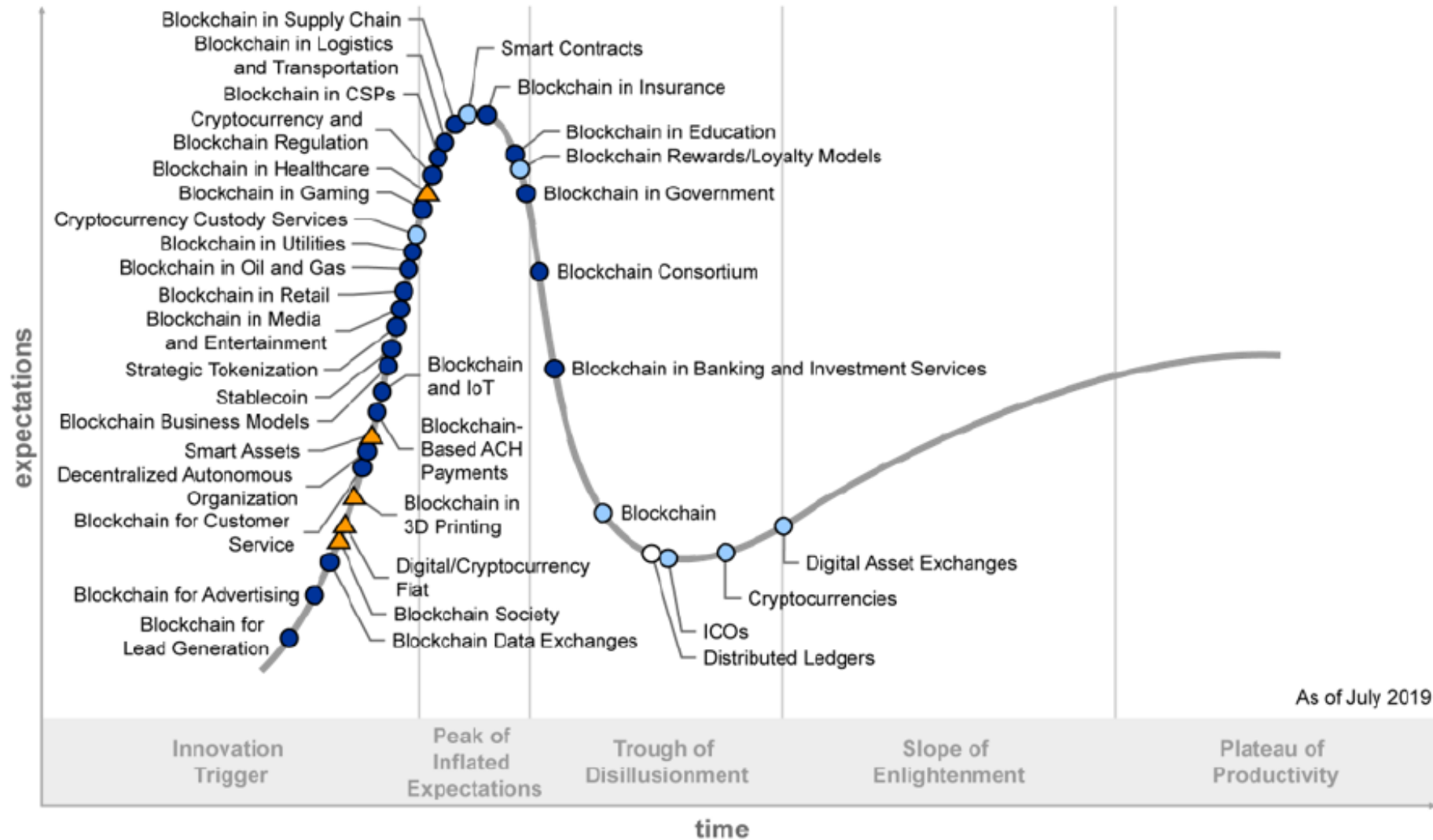
DECODED OP\_RETURN AND COINBASE MESSAGES

The messages below are 'hex2bin' decoded messages from OP\_RETURN outputs and coinbase inputs that are in this transaction. A lot of these 'messages' contain no sane text since they can be used for things other than just plain text.

6a1a53495441204c6162206c6f76657320426c6f636b636861696e2e  
SITA Lab loves Blockchain.



# Hype Cycle for Blockchain Business, 2019

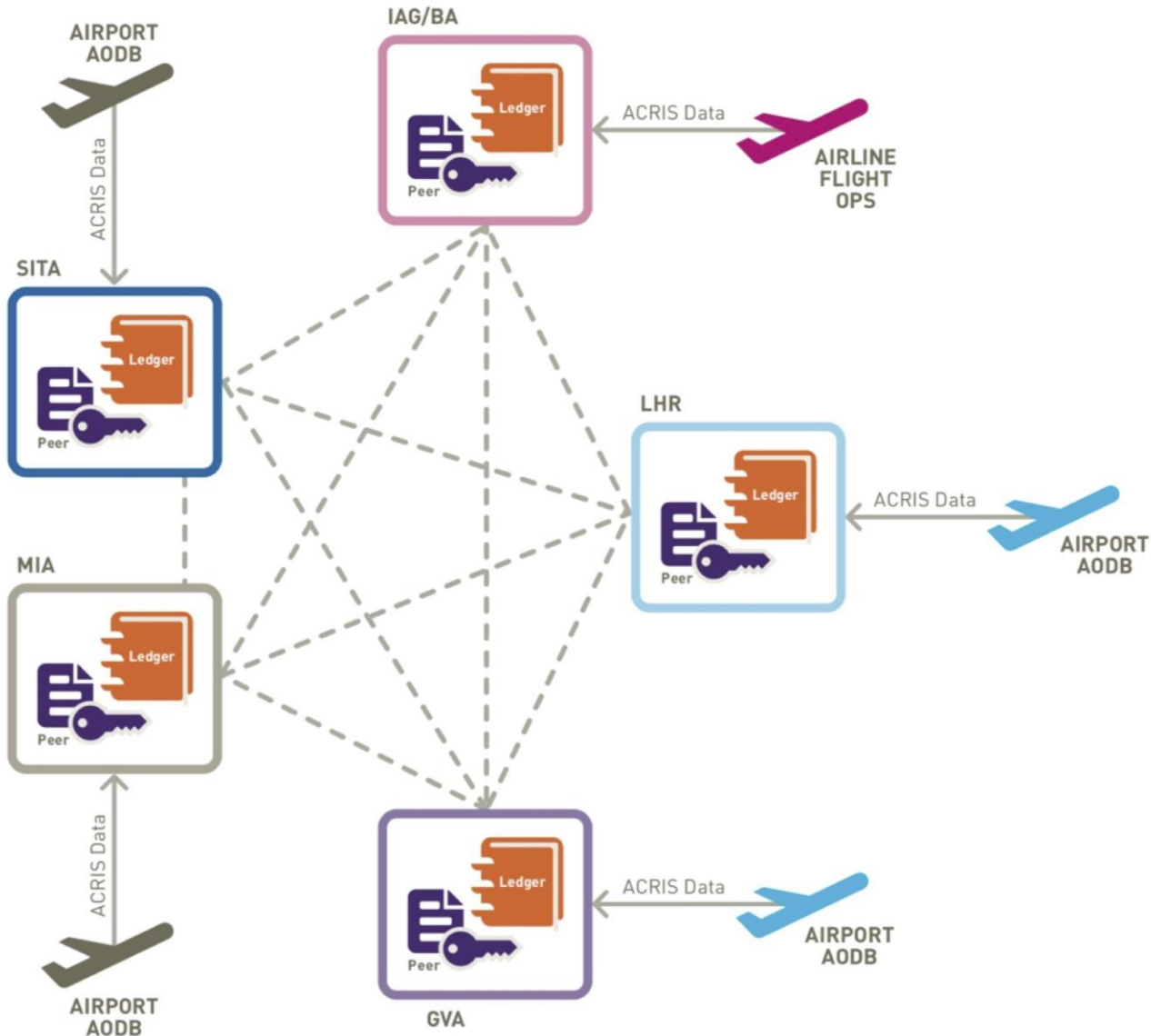


As of July 2019

Plateau will be reached:  
 ○ less than 2 years    ● 2 to 5 years    ● 5 to 10 years    ▲ more than 10 years    ⊗ obsolete before plateau



# FLIGHT CHAIN – 2017



- Flight Chain is a **multi-enterprise application** implementation of a flight operating database
- Each airline & airport writes flight status to the blockchain Smart Contract
- The Smart Contract manages rules about who can update what data and how to manage conflicting data
- The end result is a *single version of the truth* shared by all participants

## Summary of Features of top 5 Blockchain Platforms for Enterprises

	Ethereum	Hyperledger Fabric	R3 Corda	Ripple	Quorum
<b>Industry-focus</b>	Cross-industry	Cross-industry	Financial Services	Financial Services	Cross-industry
<b>Governance</b>	Ethereum developers	Linux Foundation	R3 Consortium	Ripple Labs	Ethereum developers & JP Morgan Chase
<b>Ledger type</b>	Permissionless	Permissioned	Permissioned	Permissioned	Permissioned
<b>Cryptocurrency</b>	Ether (ETH)	None	None	Ripple (XRP)	None
<b>% providers with experience<sup>1</sup></b>	93%	93%	60%	33%	27%
<b>% share of engagements<sup>2</sup></b>	2%	12%	13%	4%	10%
<b>Coin Market Cap<sup>3</sup></b>	\$91.5 B (18%)	Not applicable	Not Applicable	\$43.9 B (9%)	Not Applicable
<b>Consensus algorithm</b>	Proof of Work (PoW)	Pluggable framework	Pluggable framework	Probabilistic voting	Majority voting
<b>Smart contract functionality</b>	Yes	Yes	Yes	No	Yes

Technology platform is irrelevant

1. Based on responses from 15 leading blockchain service providers  
 2. Based on a random sample of set of 50 enterprise blockchain engagements across multiple industries  
 3. Coinmarketcap.com as of Feb 20, 2018, 6:20 PM UTC

Source: HfS Research, 2018



# FLIGHT CHAIN –

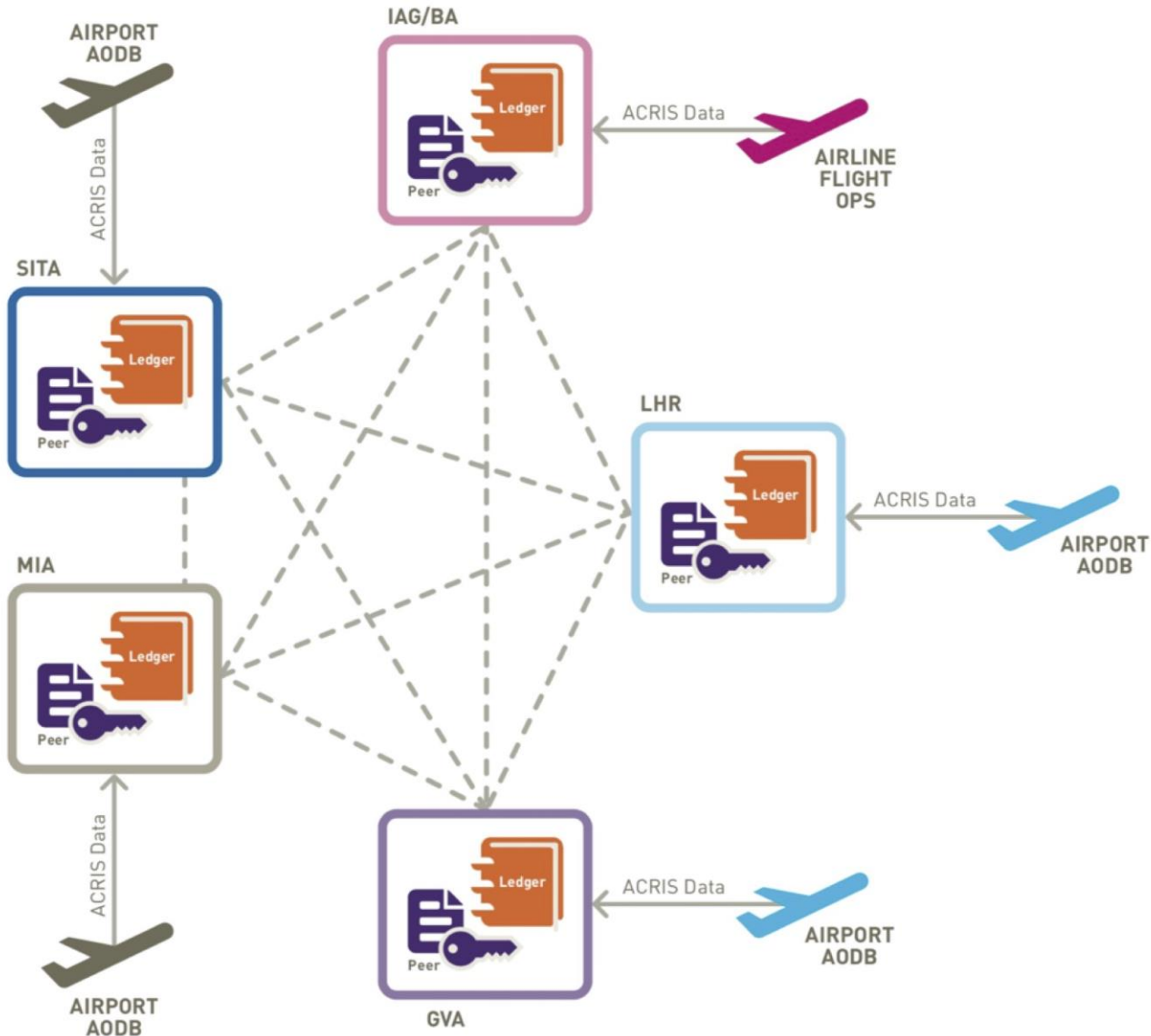
New questions arise in a multi-enterprise application environment.

- Who defines, agrees & signs off on the rules of the smart contract?
- Who updates the smart contract across the network?
- If everyone is contributing partial data, who 'owns' the data?
- Who is accountable for 99.999 uptime?
- Who is responsible for & accountable for network security?
- What happens if one entity adds illegal data?

Governance model is key



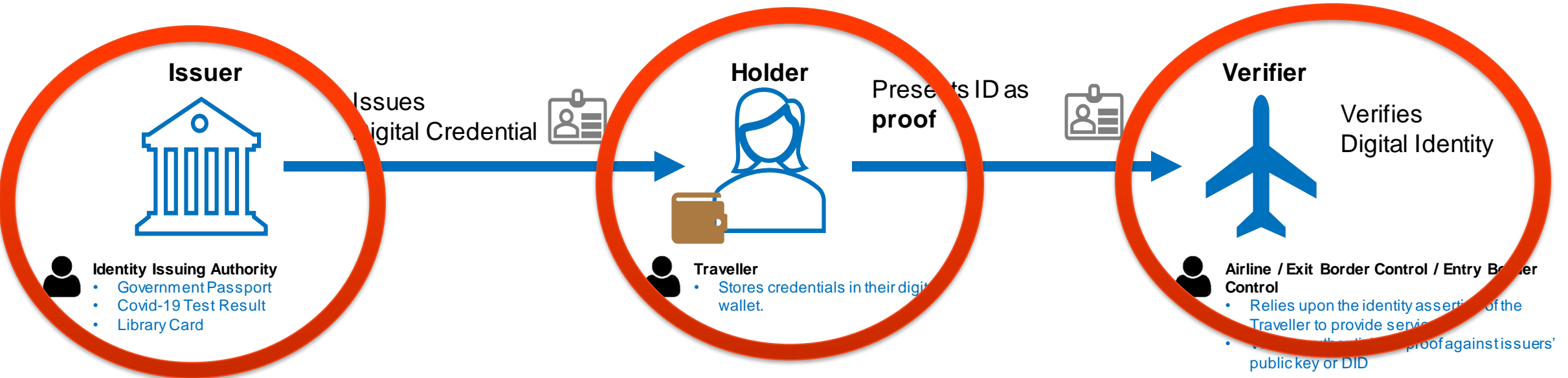
# FLIGHT CHAIN – 2020



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# Self-Sovereign Identity

# Background – Roles in Self Sovereign Identity



Digitally Signed Data

Sovrin.org blockchain (public key registry)

# Airlines ask US, EU for coronavirus resume to

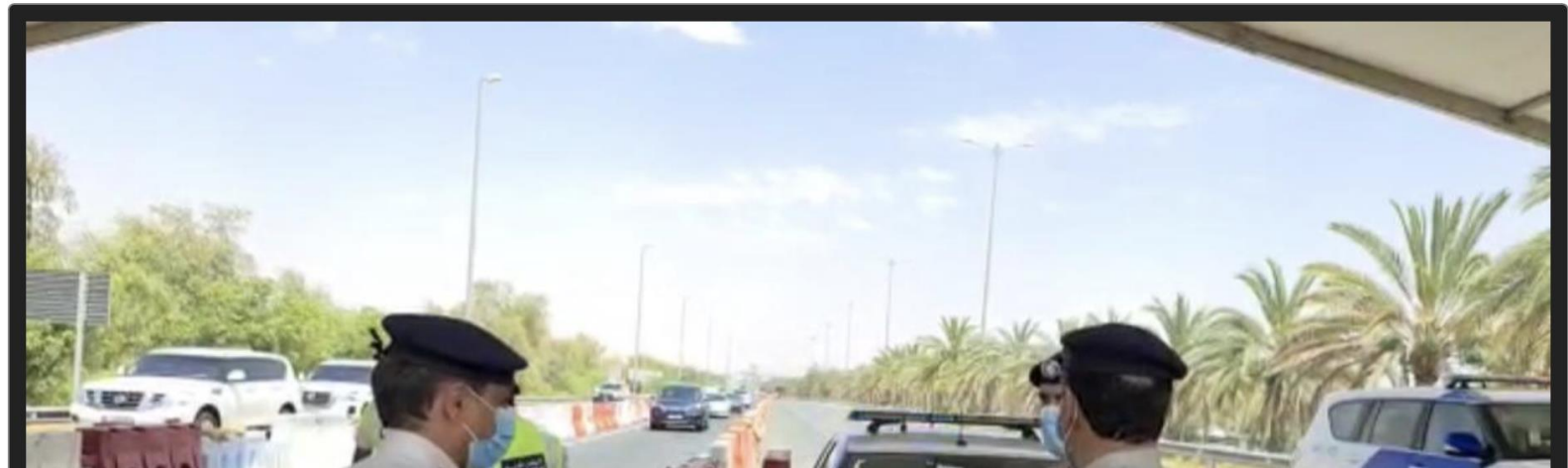
42°C | 12:31Dhuhr | [READ OUR E-PAPER](#)

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### More than 100 people found guilty of tampering with Covid-19 test results to enter Abu Dhabi

► Legal action has been taken against each individual



Curtis Tate | USA TODAY  
Published 12:15 PM EDT Jul

Four leading air carriers  
establish a joint COVID  
transatlantic air travel

- Susan had recovered from Covid-19 earlier in the year. She has been tested positive for antibodies, and also negative swab tests.
- The hospital issued a clearance credential.

Covid-19 is better understood with  
more research and review