

# Architecting Enterprise Blockchain apps

TruffleCon 2019



#### Who are we

- Microsoft
- Commercial Software Engineers
- · Blockchain Technical leads
- Work with top 500 customers
  - · Unlock the potential of Blockchain



David Burela

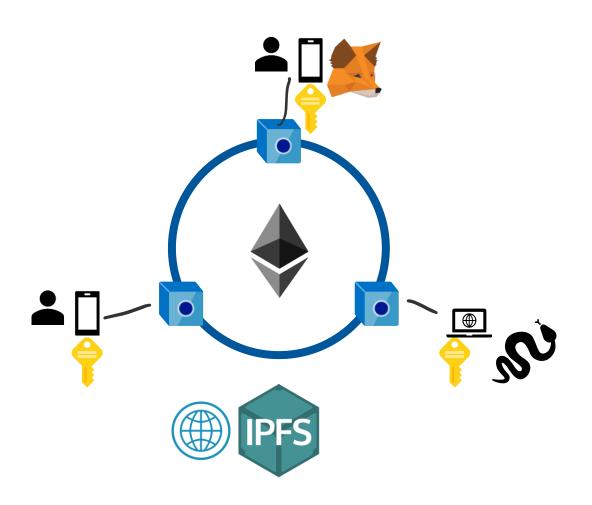
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# Agenda

- Why enterprise Blockchains?
- · Common anti-patterns
- Educating enterprises
- Enterprise

## **Public Ethereum**



#### Unified User Platform Optimize a process **Enterprises** Common Goal Company A Company B Unique Unique **Unique Data** Development Reporting **Policies** Needs Style

# Why Private Networks for Enterprises?

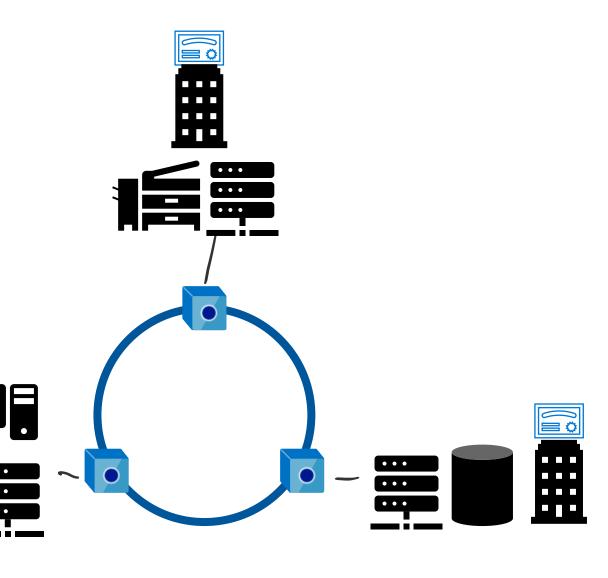
Transaction Volumes

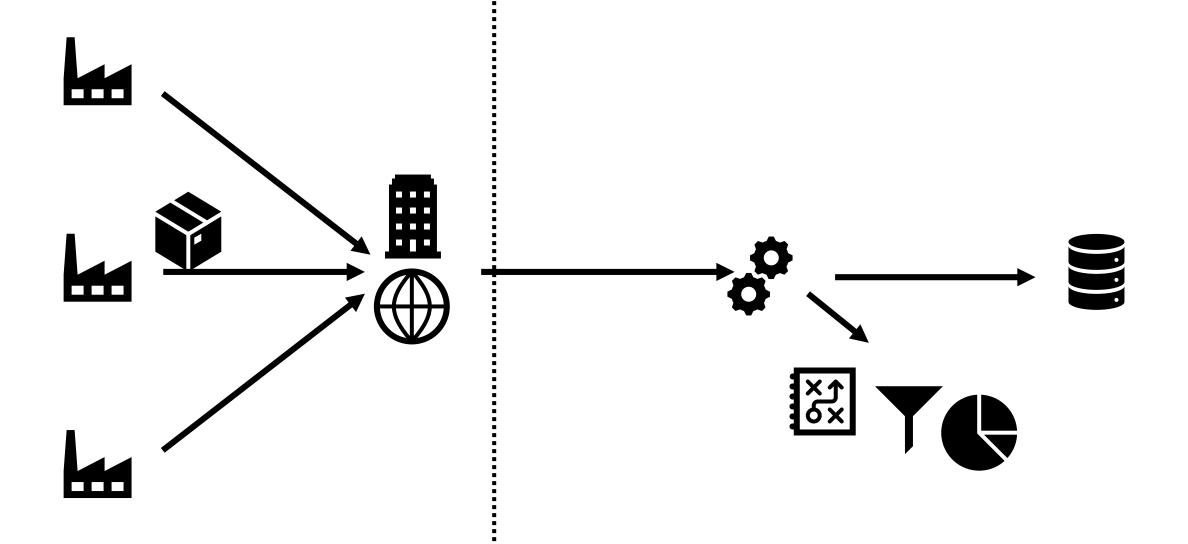
Scared of the Unknown

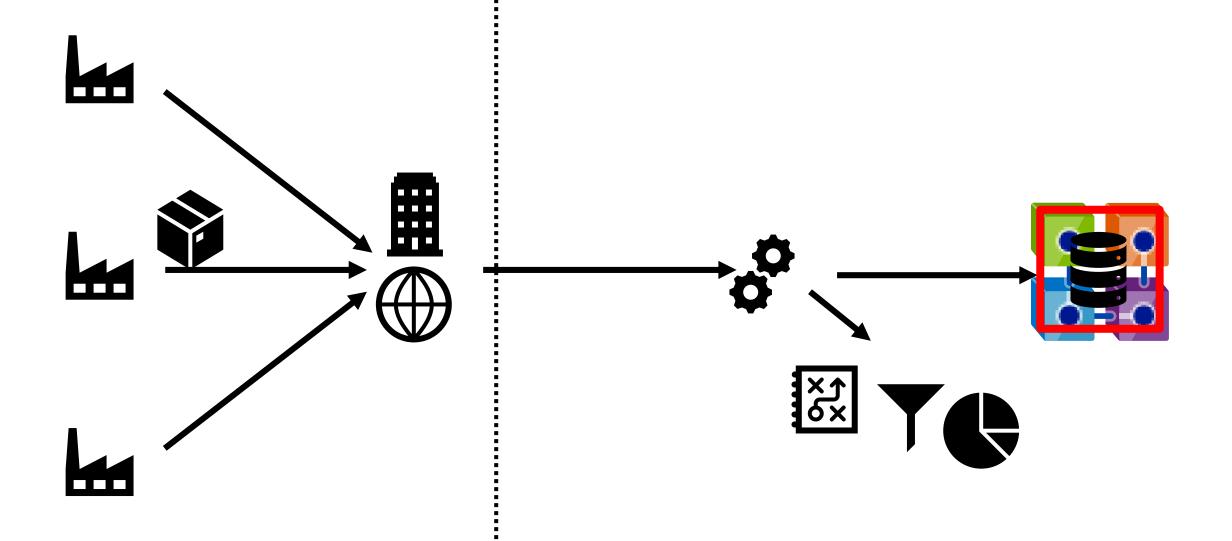
Maturity of Private Transaction

#### **Private networks**









#### Common mistakes

- · 3 tier app, full control thinking:
- · Use blockchain as DB
- Try to put a centralised flow onto blockchain
- · Largest company wants to control it

#### How we educate – Blockchain first

- Blockchain as source for truth
- · External systems react to Blockchain events
- Each party controls THEIR infrastructure
- · All the companies have to be present and contribute to development process. Not one company rolling out their solution

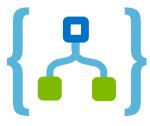
# **Enterprise Architecture**

#### **Azure Services**



#### **Azure Functions**

Serverless microservices. Javascript, .Net, python



#### **Logic apps**

Codeless serverless microservices



#### **Event grid**

Enterprise pub/sub of events between microservices

## **Ethereum logic app connectors**

**Triggers** 

Actions



When a smart contract event occurs (preview)

Ethereum Blockchain

Triggers

**Actions** 



Deploy smart contract (preview)

Ethereum Blockchain



Execute smart contract function (incurring gas cost) (preview)

Ethereum Blockchain



Get smart contract state (all properties) (preview)

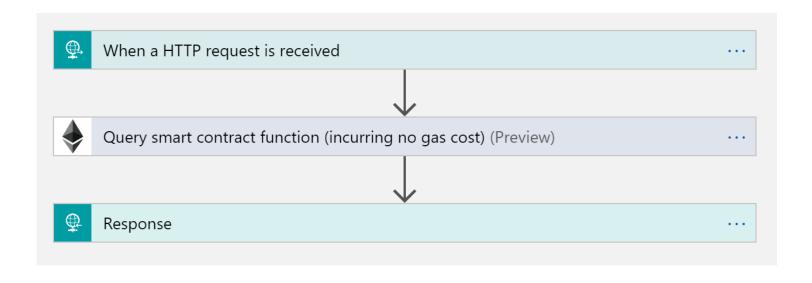
Ethereum Blockchain

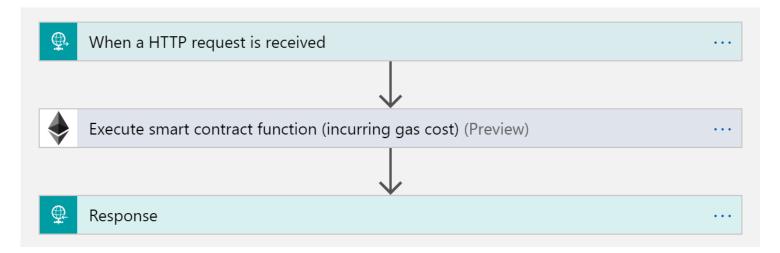


Query smart contract function (incurring no gas cost) (preview)

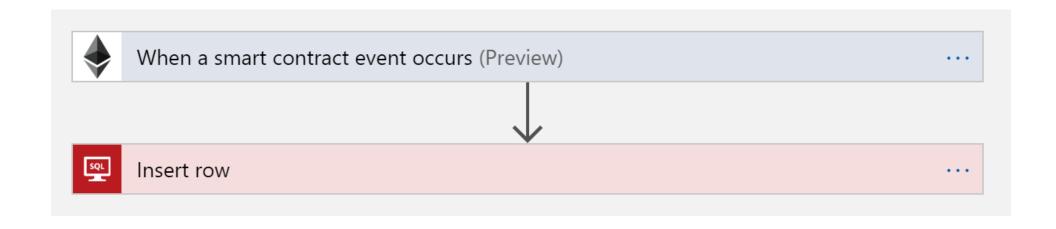
Ethereum Blockchain

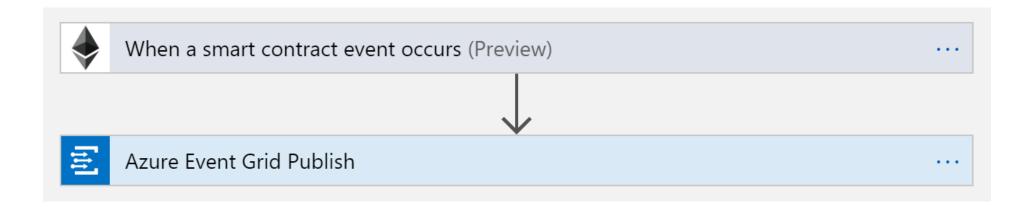
# Logic app – read / write



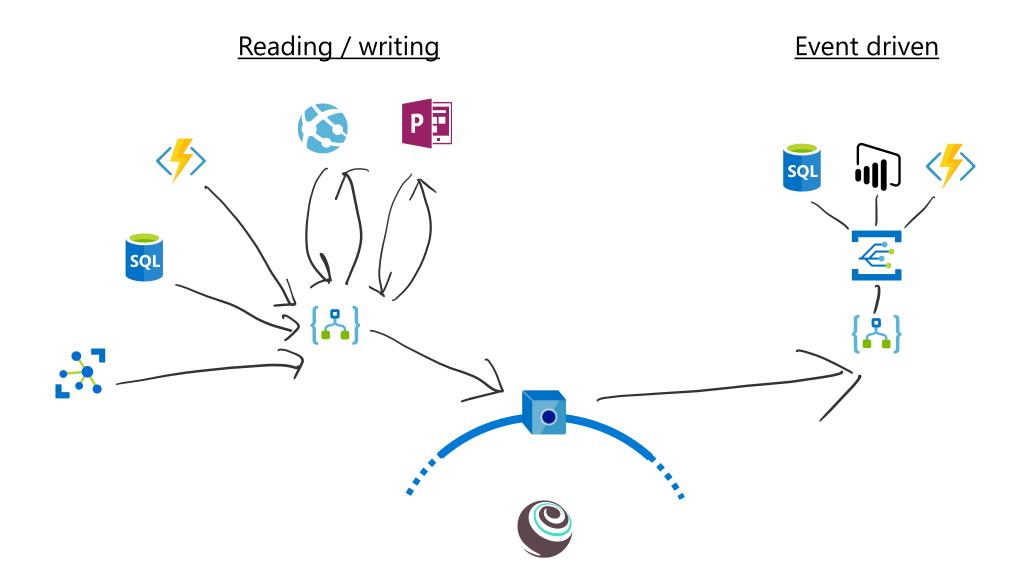


# Logic app – event based trigger



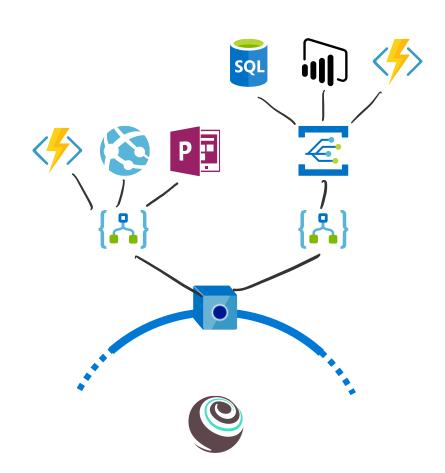


# Architecture – Single member

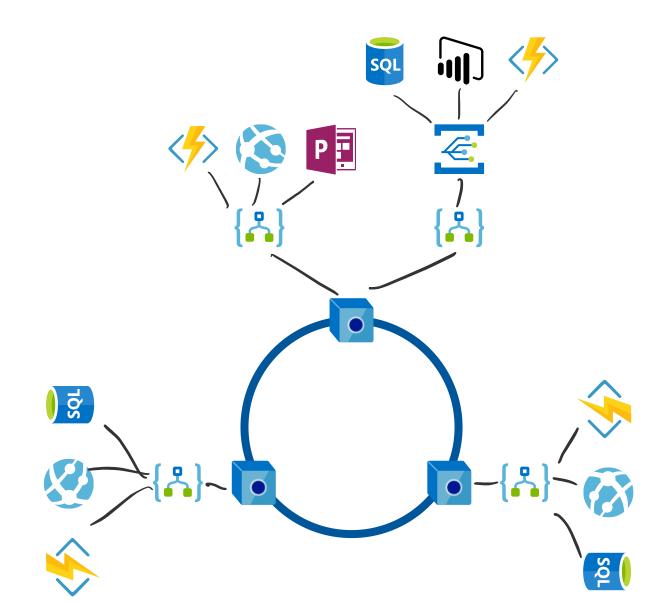


# Demo

# **Architecture – Single company**



#### Architecture – B2B



#### **Consortium Governance**

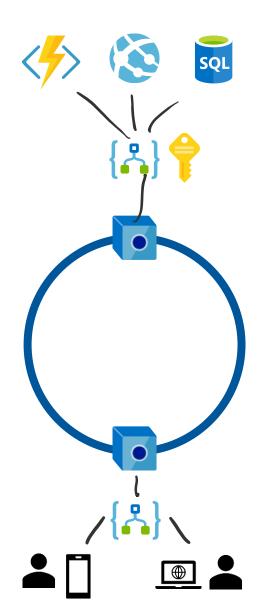
#### Addition of Members

Quorum and ABS support

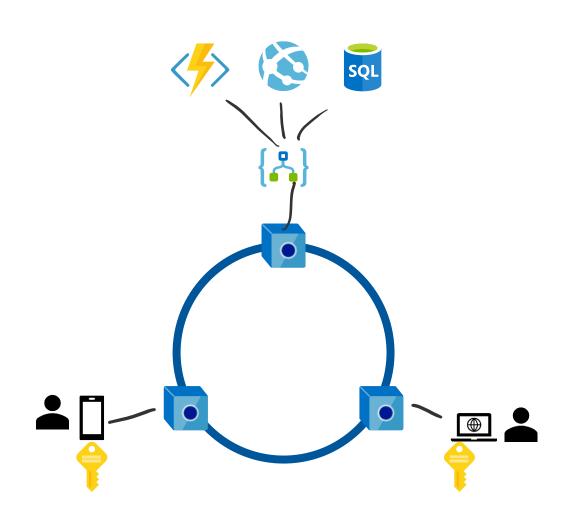
#### Development

- Azure DevOps
  - · One Canonical Blockchain State
  - Update of Smart Contract Address and ABI
  - Build Policies
    - Cross Company Approval Boards for Releases

## Architecture – B2C



## Architecture – B2C

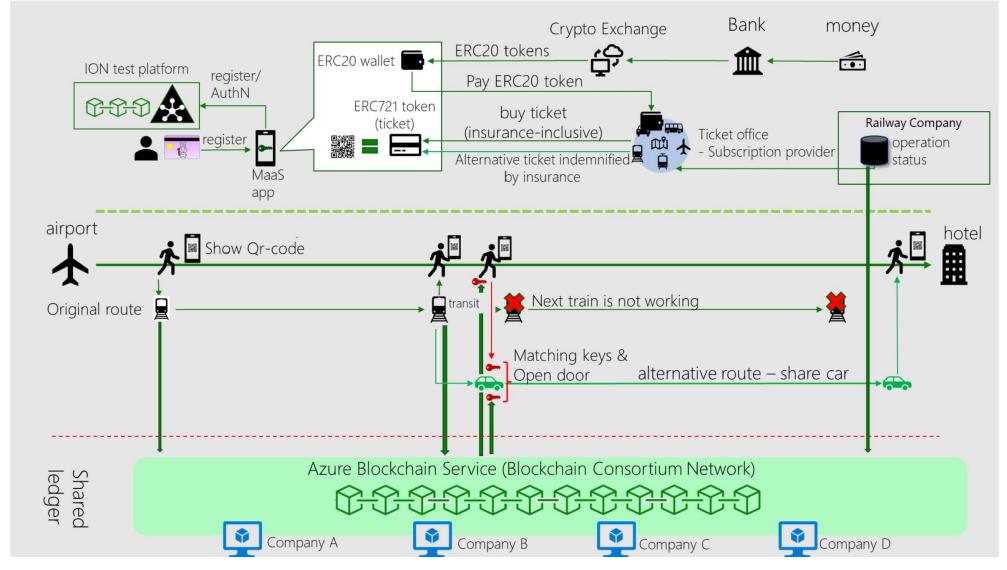


# **Customer Example**

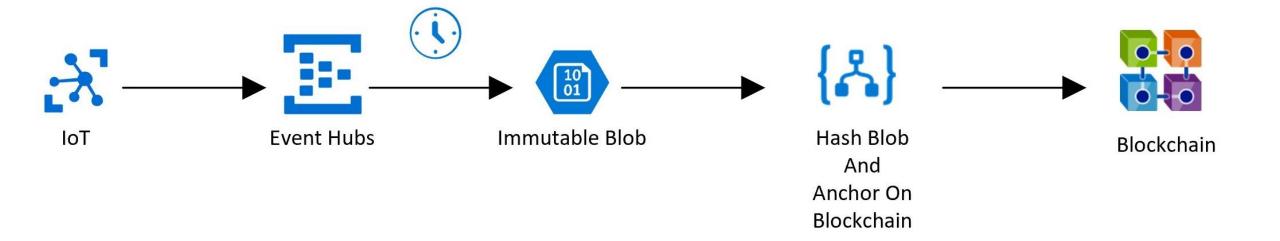
Customer's Architecture Mobility as a Service Platform ユーザー アプリケーション 金融機関 BIプラット フォーム Mizuho Bank 暗号通貨交換所 チケット読み取り機 チケットオフィス Mizuho **{**\$} Internal Open 東京 新宿 **@** 0 Bank API <u></u> company account account Blockchain コンソーシアム 暗号诵貨残高一覧 チケット一覧 プラットフォーム User1 :500 User2 :100 JE JELS ハッシュ化されて Rail :1,000,000 読解不可能な移動 :500,000 Bus **MIZUHO** 他の鉄道 履歴atitude Taxi :300,000 Ticket Office その他の企業 :15,987,650

#### **Customer's Architecture**

Mobility as a Service Platform



## Enterprise – High frequency data anchored to Blockchain



#### References

- @ImpactWhit
- @DavidBurela

https://aka.ms/truffle2019

MaaS Article

Logging IOT High Frequency Data On & Off Chain