



## **Cloud Customer Architecture for Blockchain**

<http://www.cloud-council.org/deliverables/cloud-customer-architecture-for-blockchain.htm>

*Webinar July 18, 2017*

# The Cloud Standards Customer Council

## *THE Customer's Voice for Cloud Standards!*



- Provide customer-led guidance to multiple cloud standards-defining bodies
- Establishing criteria for open standards based cloud computing

### 2017 Projects

- Hybrid Integration Ref. Architecture
- API Management Ref. Architecture
- Security for Cloud Services Ref. Architecture
- Data Residency discussion paper
- **Blockchain Ref. Architecture**
- Practical Guide to Cloud Management Platforms
- Big Data and Analytics Ref. Architecture, v2
- And more!

### 2015 Deliverables

- Web App Hosting Ref. Architecture
- Mobile Ref. Architecture
- Big Data & Analytics Ref. Architecture
- Security for Cloud Computing, V2
- Practical Guide to Cloud SLAs, V2
- Practical Guide to PaaS

### 2013/2014 Deliverables

- Convergence of Social, Mobile, Cloud
- Analysis of Public Cloud SLAs
- Cloud Security Standards
- Migrating Apps to Public Cloud Services
- Social Business in the Cloud
- Deploying Big Data in the Cloud
- Practical Guide to Cloud Computing, V2
- Migrating Apps: Performance Rqmnts
- Cloud Interoperability/Portability

### 2016 Deliverables

- Prac Guide to Hybrid Cloud Computing
- Public Cloud Service Agreements, V2
- Cloud Security Standards, V2
- IoT Ref. Architecture
- e-Commerce Ref. Architecture
- Impact of Cloud Computing on Healthcare, V2
- Enterprise Social Collaboration Ref. Architecture

**650+** Organizations participating



<http://cloud-council.org>

# Abstract & Agenda

**This talk introduces the Cloud Customer Architecture for Blockchain**

- **What are Cloud Solution Architectures?**
- **Blockchain Cloud Architecture**
- **CSCC's Cloud Reference Architecture series is growing!**
  - **Cloud Customer Architecture for e-Commerce** <http://bit.ly/2camhlz>
  - **Cloud Customer Architecture for IoT** <http://bit.ly/2cLcomc>
  - **Cloud Customer Architecture for Big Data** <http://bit.ly/2crffR2>
  - **Cloud Customer Architecture for Mobile** <http://bit.ly/2cIYtdI>
  - **Cloud Customer Architecture for Web Application Hosting** <http://bit.ly/2cgTVK2>
  - **Cloud Customer Architecture for Enterprise Social Collaboration** <http://bit.ly/2jDiMPD>
  - **Cloud Customer Architecture for Hybrid Integration** <http://bit.ly/2IHILs0>
  - **Cloud Customer Architecture for Securing Workloads on Cloud Services** <http://bit.ly/2puolzX>
  - **Cloud Customer Architecture for API Management** <http://bit.ly/2n59G>
  - **Cloud Customer Architecture for Blockchain** <http://bit.ly/2vvAZAM>

**Presenting  
today!**

# Cloud Customer Reference Architectures

## Cloud Customer Reference Architectures are...

- straightforward description of elements needed to implement particular application solutions using cloud infrastructure, cloud platforms, cloud software, and cloud services
- deployment neutral (public, private, hybrid) & implementable via IaaS, PaaS, SaaS
- general purpose reusable architectures as well as industry specific architectures
- vendor neutral & open

## Important because they...

- enable cloud customers to understand unique features & advantages of using cloud computing
- bridge gap between understanding cloud customer needs and cloud provider offerings
- provide practical guidance on how common business applications can be realized from a cloud customer role perspective
- are stable anchors in a rapidly innovating cloud landscape
- save time, effort & money: *be more productive*

## Useful when...

- those planning to build cloud based applications
- talking with cloud providers about their offerings
- understanding of the common elements and relationships in relevant solutions

## Target audience

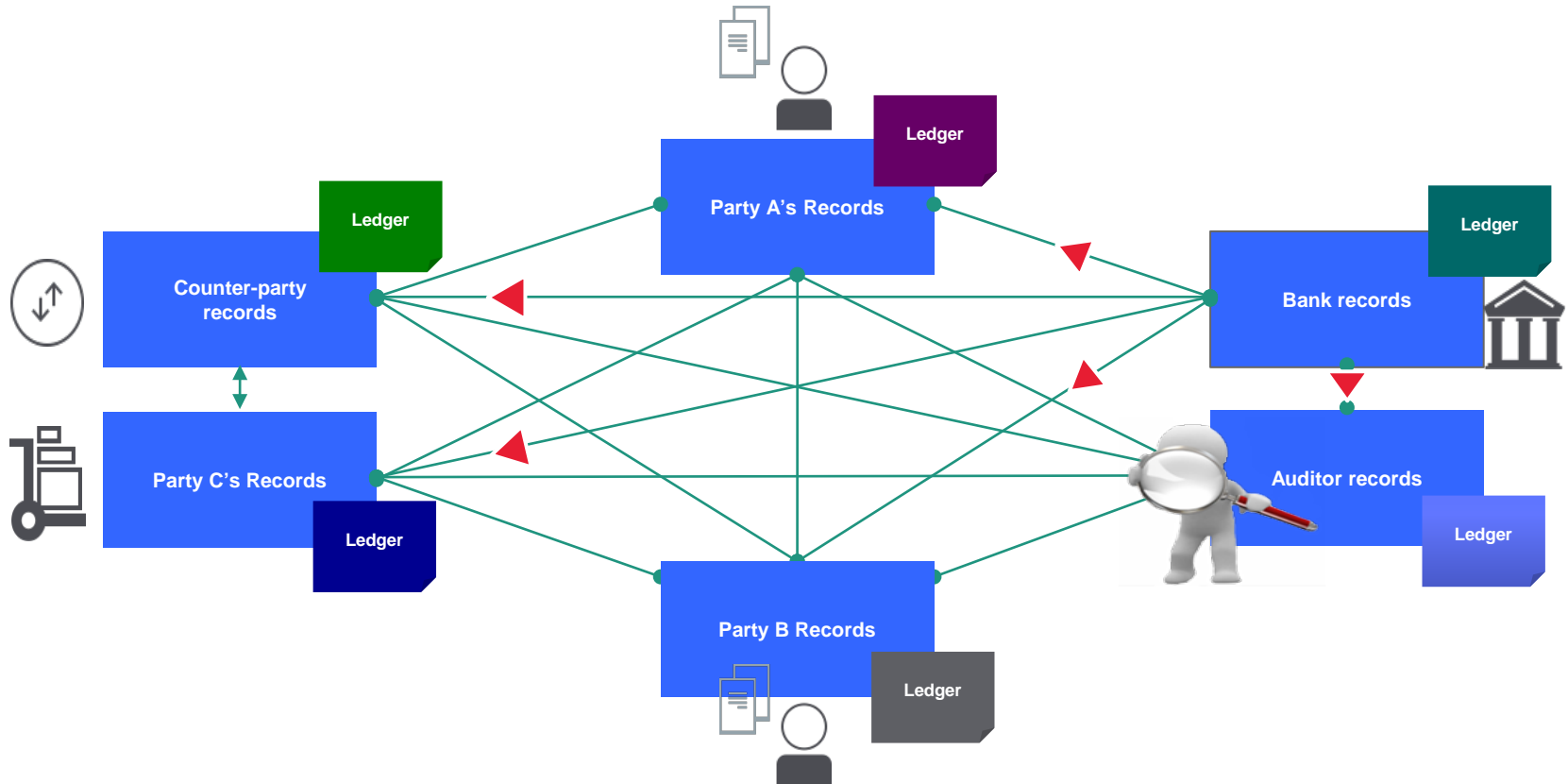
- those planning on building/purchasing cloud based applications
- developers, architects, managers

## Consistent with ISO/IEC 17789 International Standard Cloud Computing Reference Architecture

# Cloud Customer Reference Architecture for Blockchain

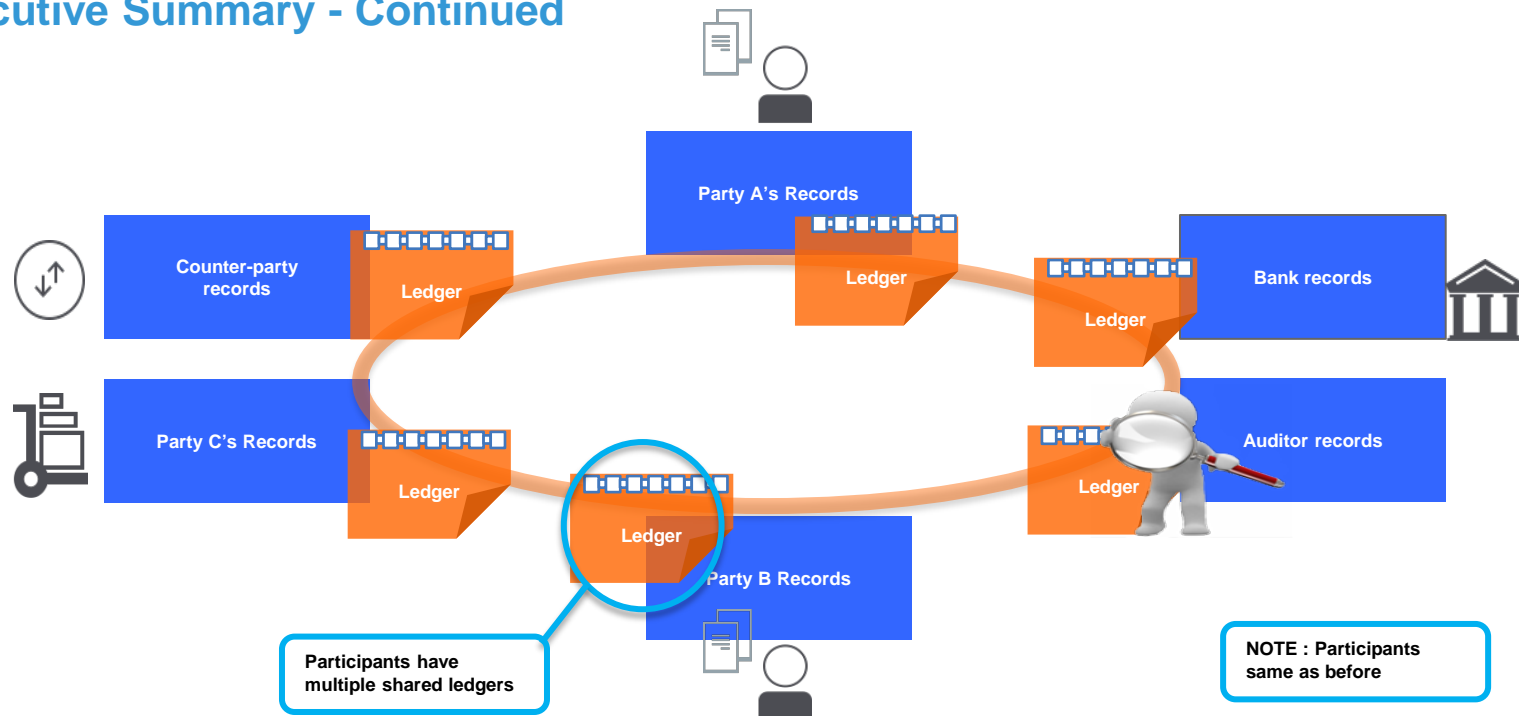
## Executive Summary

- Today enterprises operate in a business network
- Frictions exist in business networks



# Cloud Customer Reference Architecture for Blockchain

## Executive Summary - Continued



### ***Blockchain has the potential to***

- Radically alter the way enterprises conduct business
- Reduce operational cost
- Reduce friction in business transactions
- Dramatically change workflow and business procedures
- Open up new opportunities for innovation and growth

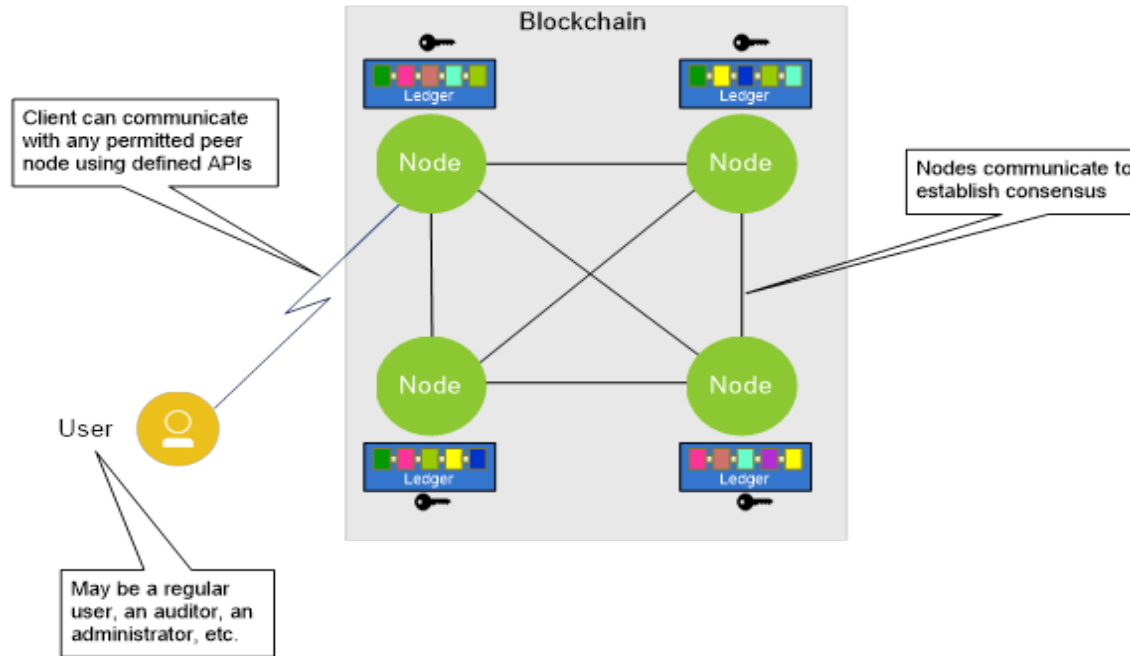
# Cloud Customer Reference Architecture for Blockchain

## Blockchain Fundamentals

- Ledger is shared
- Ledger is distributed across the business network
- Only “Append” operation permitted on the ledger
- Transactions are permanently recorded
- Each Block linked to the previous using cryptographic hash – thereby a chain of blocks or *blockchain*

# Cloud Customer Reference Architecture for Blockchain

## High level view of a blockchain network



- Blockchain network consists of **Nodes**
- Nodes have a local copy of a **Ledger**
- **Transactions** are added to the ledger by gaining agreement between nodes
- Process of gaining agreement is called **Consensus**
- Authority to perform transaction can be **Permissioned** or **Permissionless**
- Business oriented blockchains include the ability to use **Smart Contract** aka **Chaincode**
- Some blockchains implement **Subchains** aka **Channels**



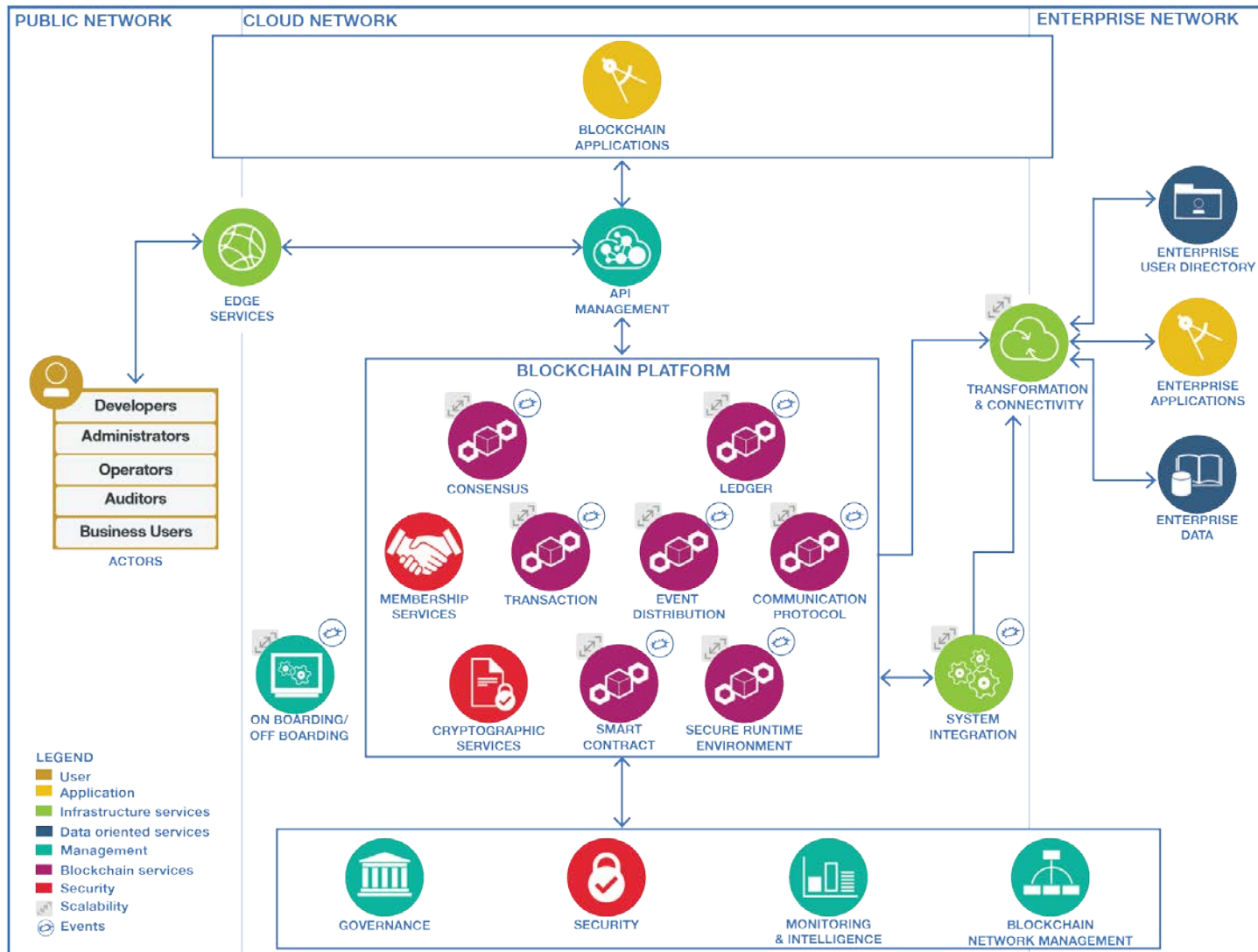
# Cloud Customer Reference Architecture for Blockchain

## Key Characteristics of a Blockchain Network

- Cryptography
- Immutability
- Provenance
- Decentralized computing infrastructure
- Decentralized transaction-processing platform
- Decentralized database
- Shared and distributed accounting ledger
- Software development platform
- Cloud computing
- Peer-to-peer network
- Wallet

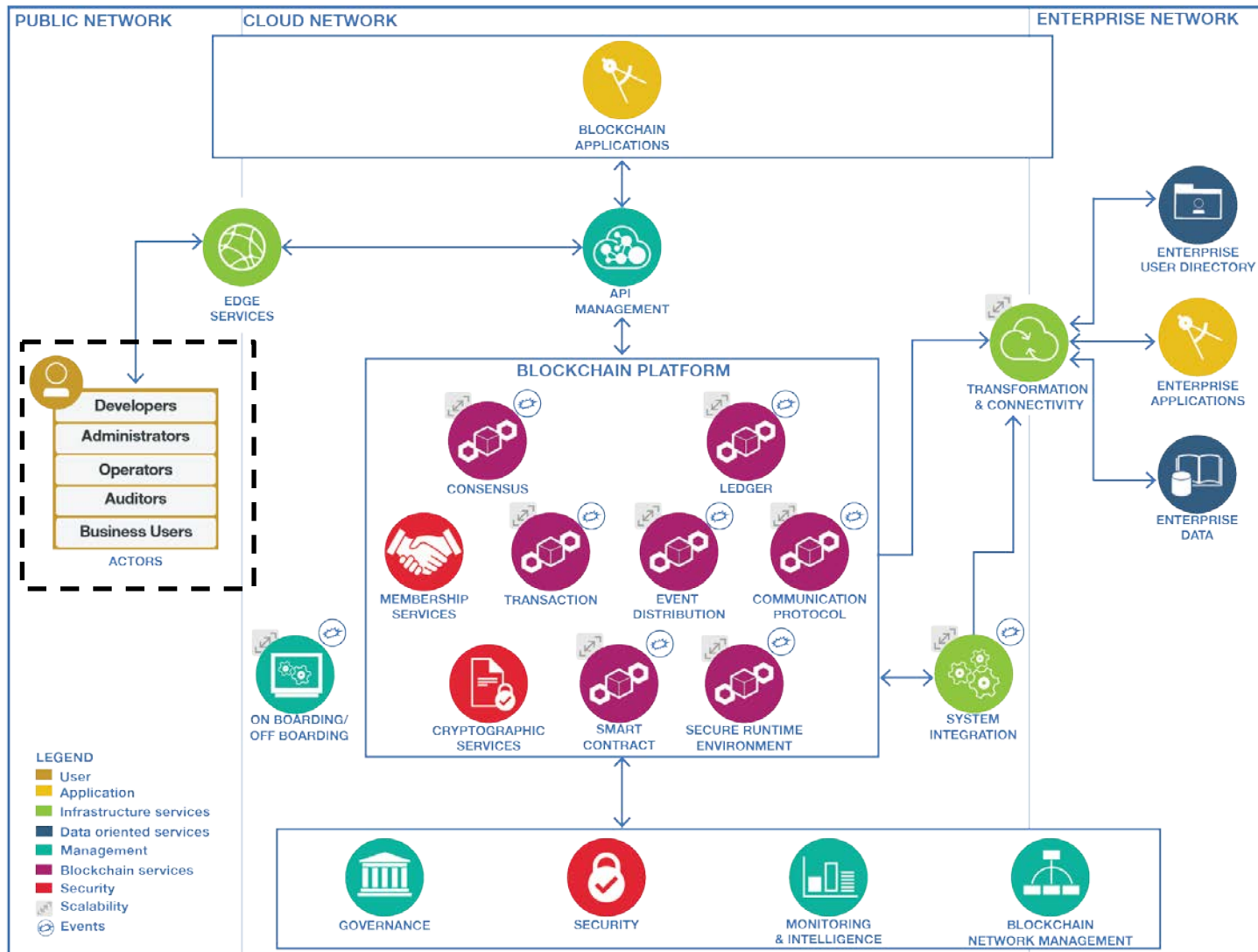
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## Architecture Overview



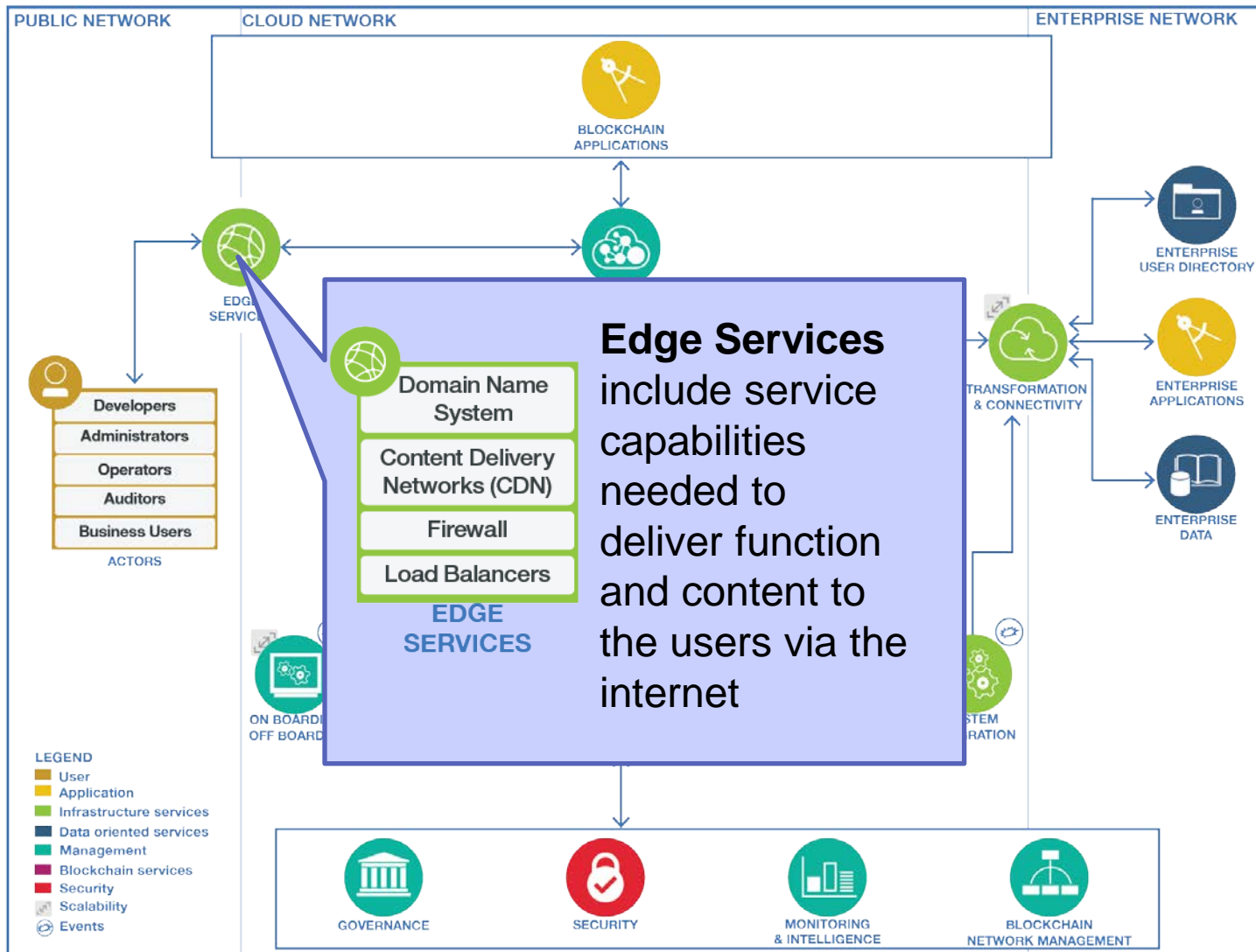
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## Architecture Overview - Users



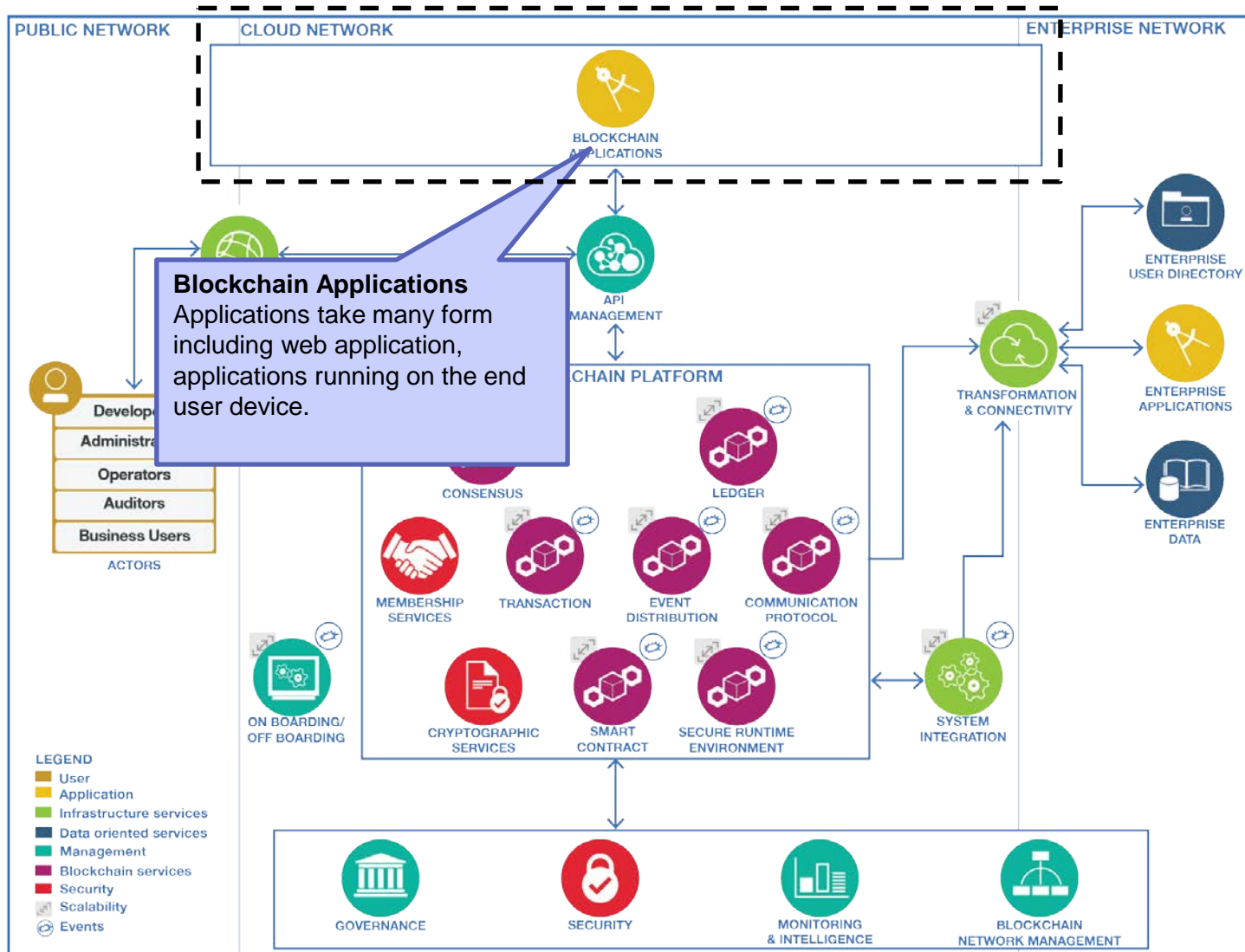
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## Architecture Overview – Edge Services



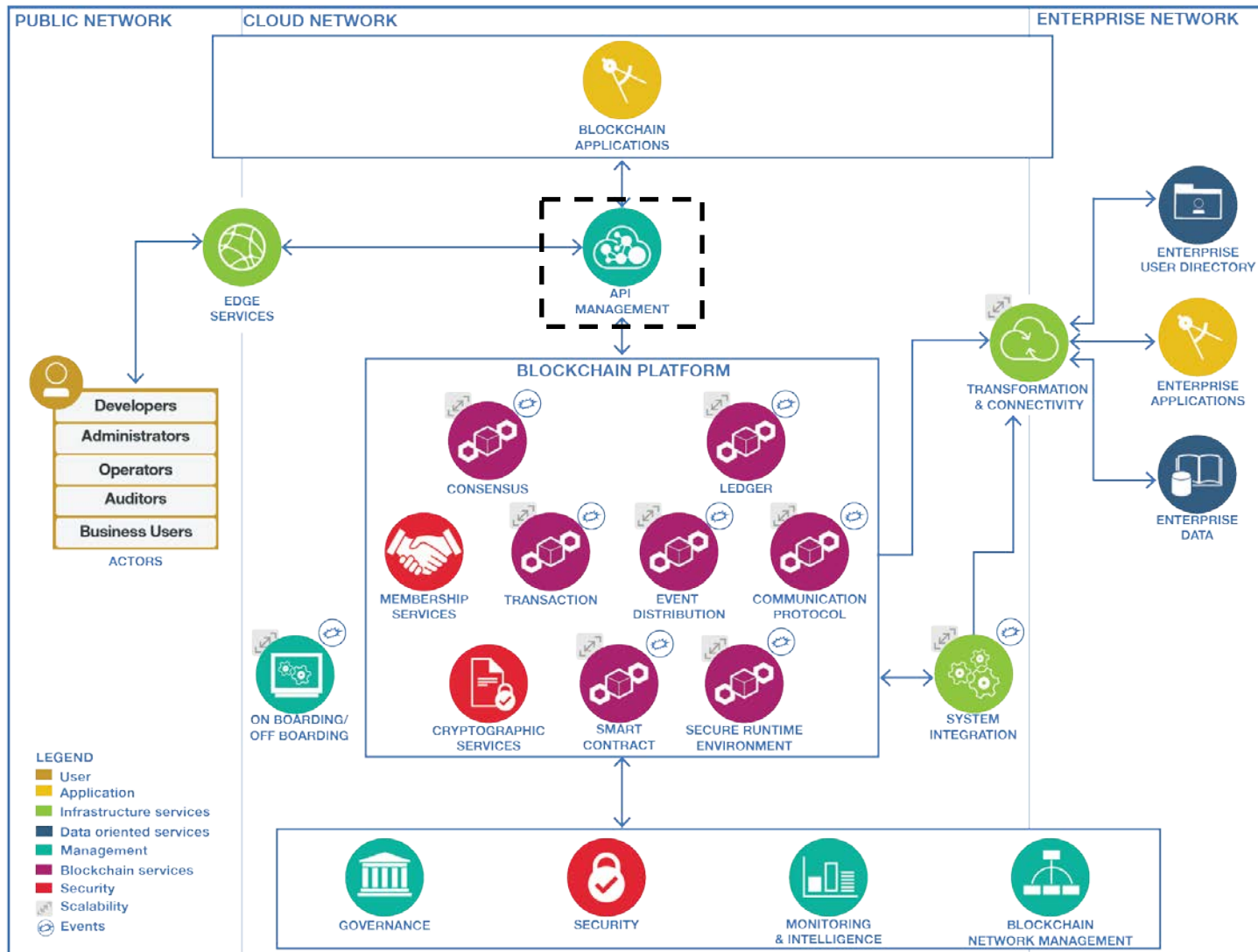
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## Architecture Overview – Blockchain Application



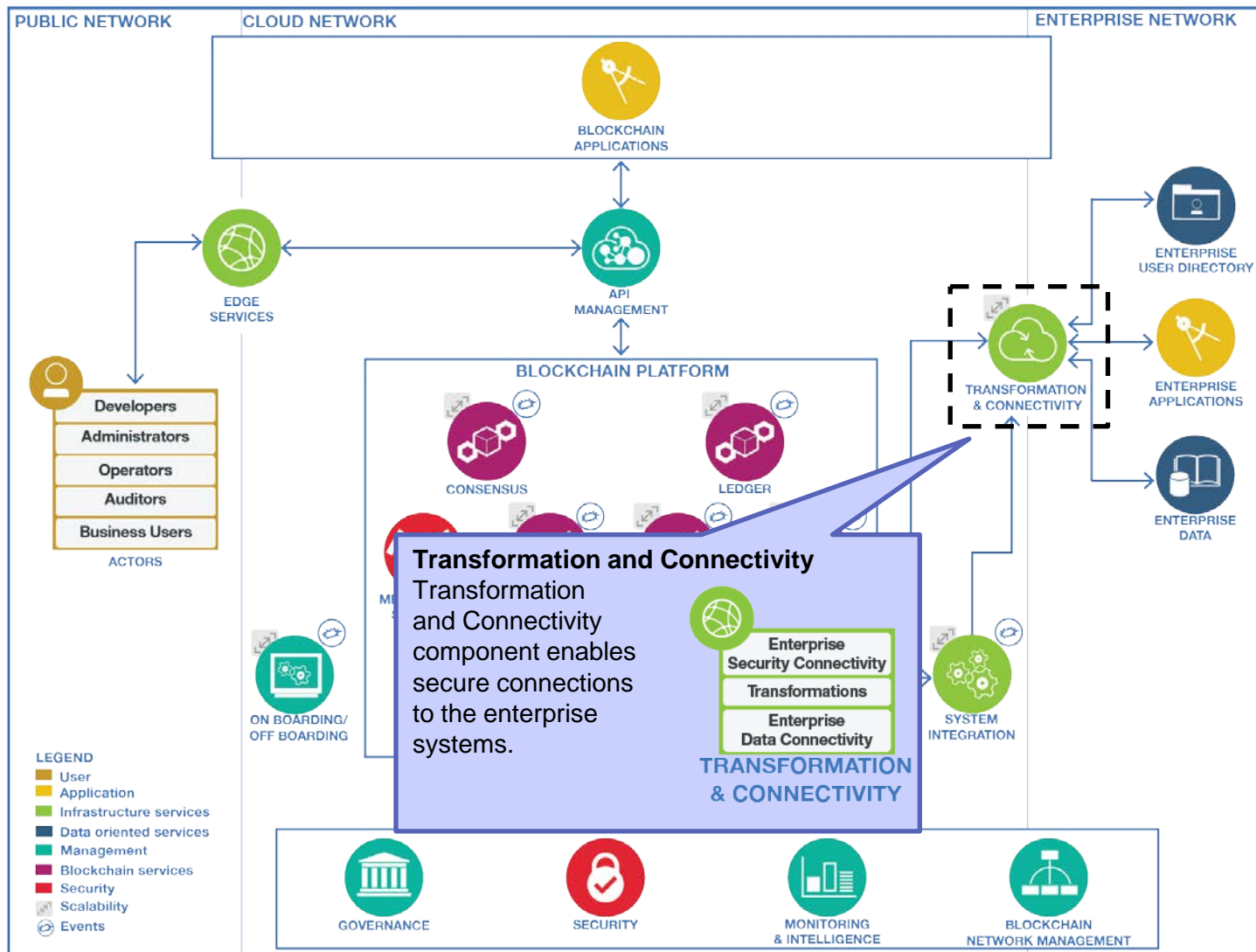
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## Architecture Overview – API Management



# Cloud Customer Reference Architecture for Blockchain

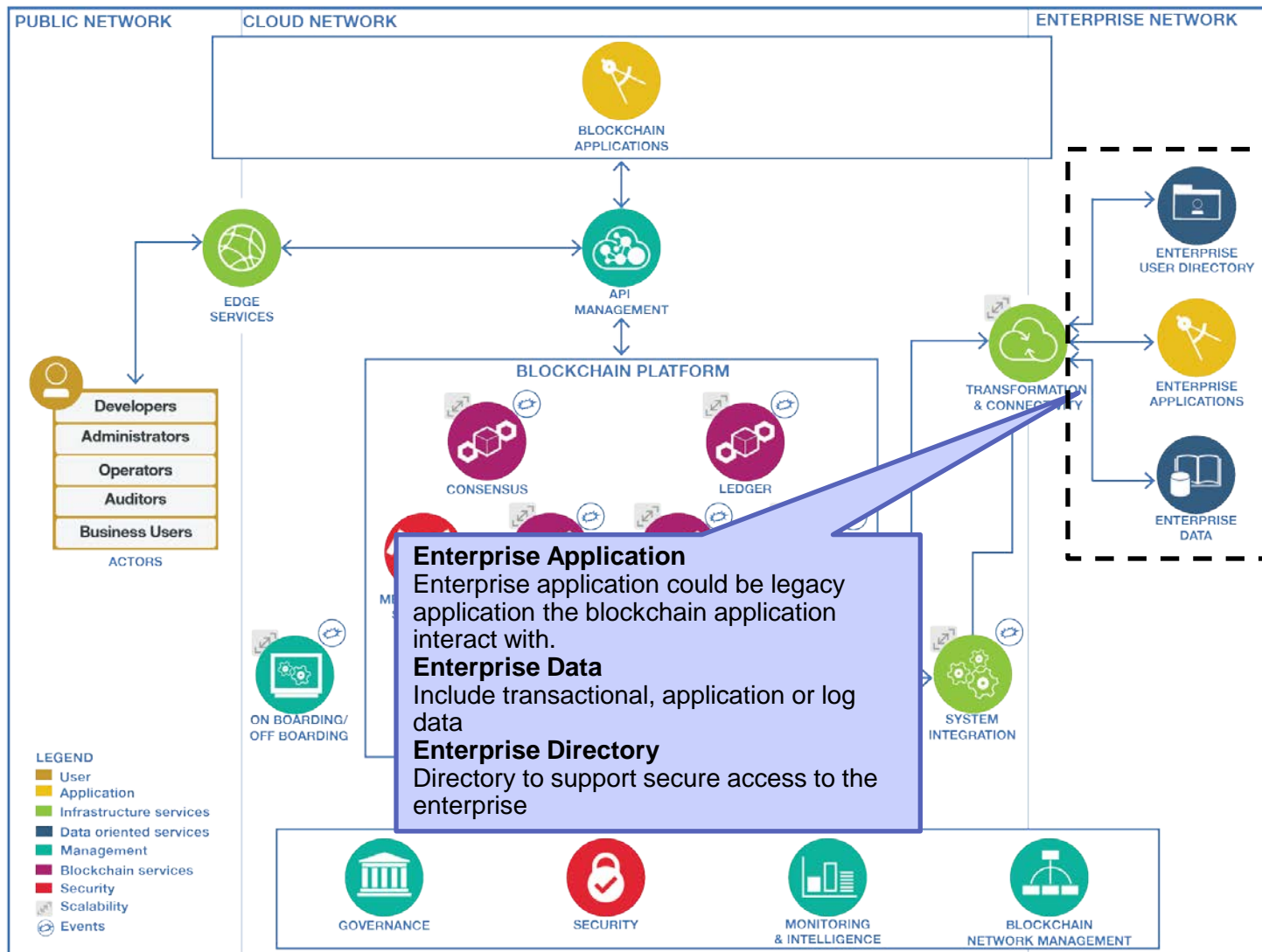
## Architecture Overview – Transformation and Connectivity





# Cloud Customer Reference Architecture for Blockchain

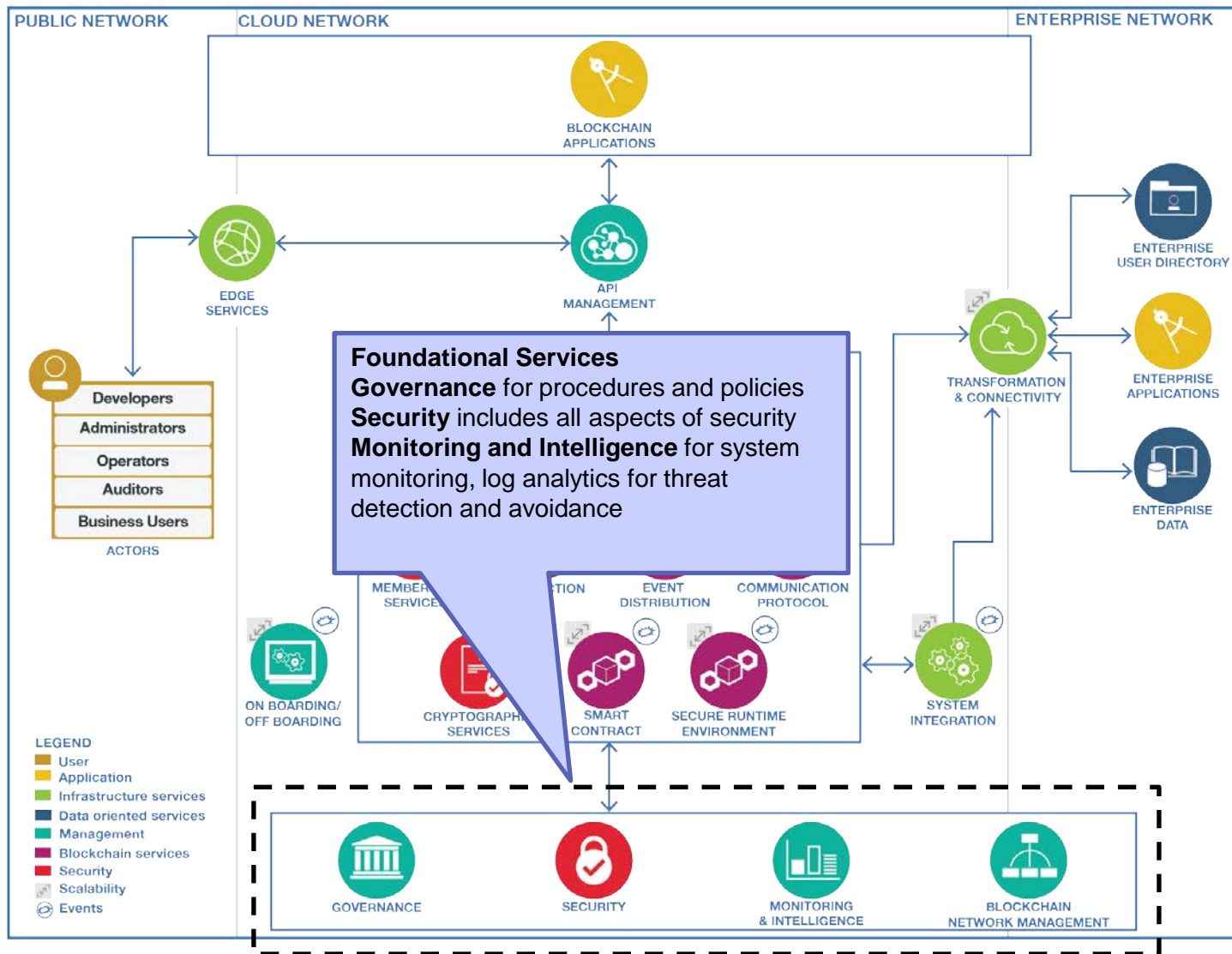
## Architecture Overview – Enterprise Network



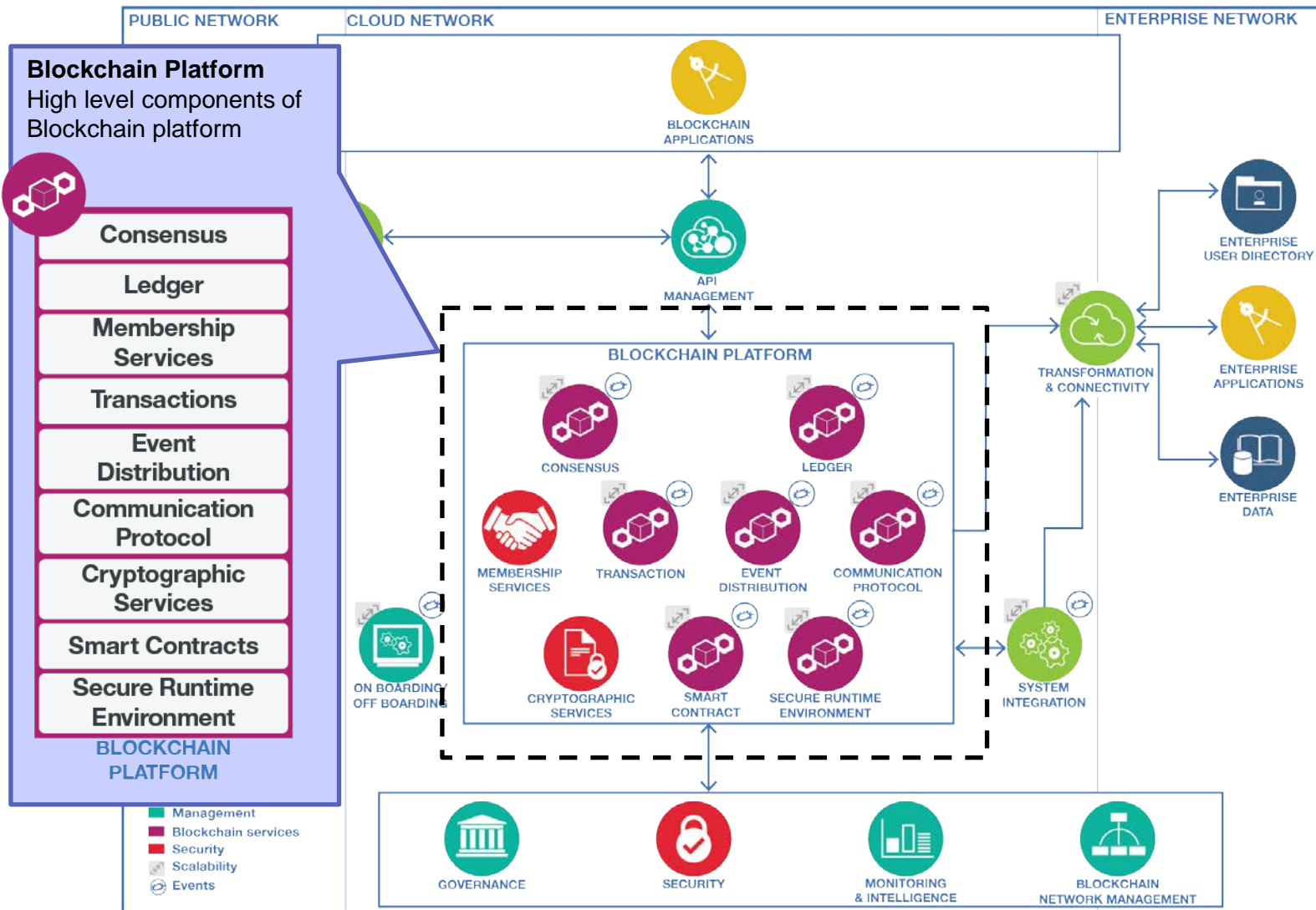


# Cloud Customer Reference Architecture for Blockchain

## Architecture Overview – Foundational Services



## Architecture Overview – Blockchain Platform



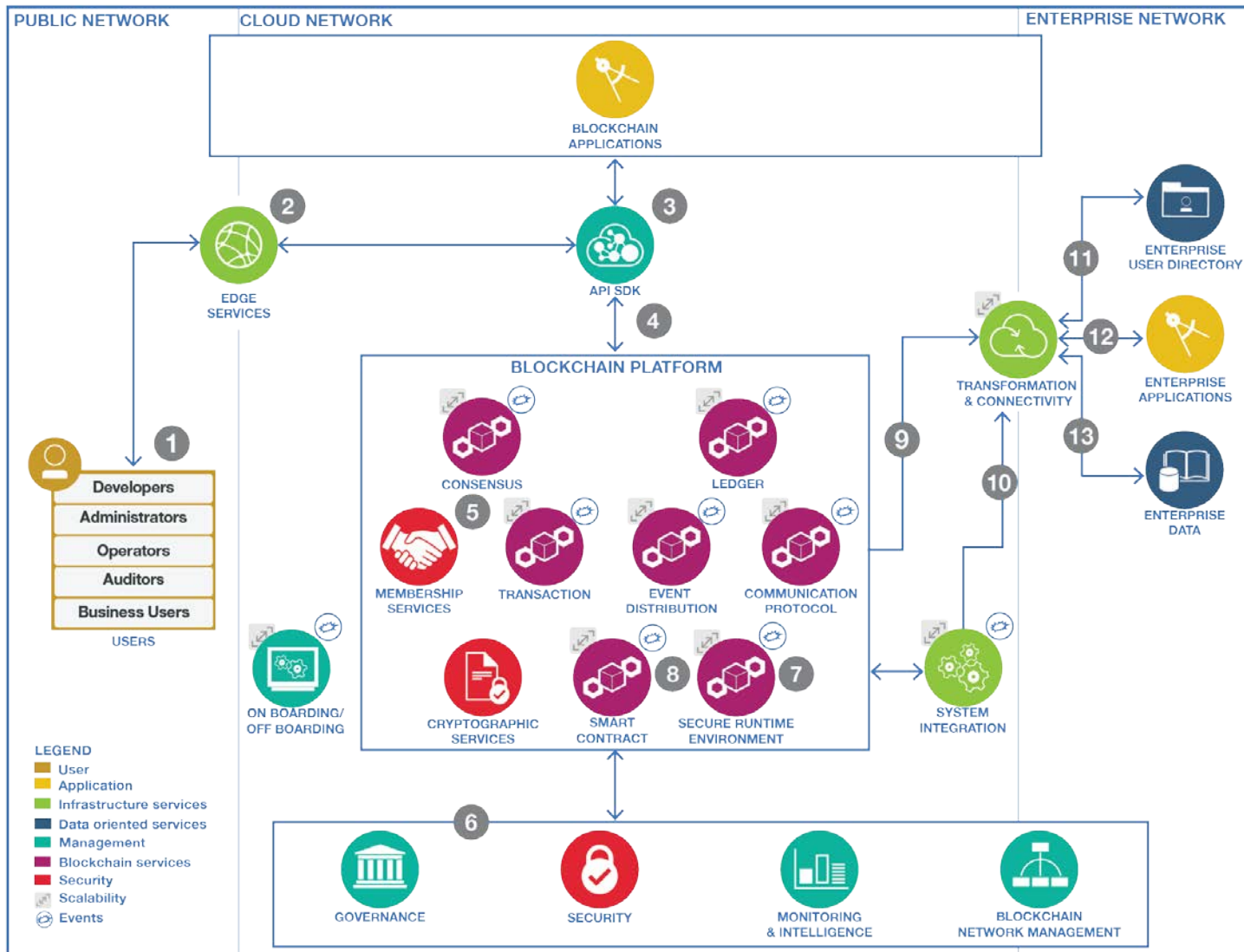
# Cloud Customer Reference Architecture for Blockchain

## Blockchain Options and Cloud Deployment Considerations

- Permission Options
  - Permissionless
  - Permissioned
- Storage Options
  - Ledger Storage
  - Data Storage
- Cloud Deployment Considerations
  - Scalability and Elasticity
  - Data Bandwidth
  - Data Sovereignty
  - Resilience
  - Security

# Cloud Customer Reference Architecture for Blockchain

## Sample Runtime Flow – Letter of Credit



# Call to Action



## ■ *Join the CSCC Now!*

- To have an impact on customer use case based standards requirements
- To learn about all Cloud Standards within one organization
- To help define the CSCC's future roadmap
- Membership is free & easy: <http://www.cloud-council.org/become-a-member>

## ■ *Get Involved!*

- Join one or more of the CSCC Working Groups  
<http://www.cloud-council.org/workinggroups>

## ■ *Leverage CSCC Collateral*

- Visit <http://www.cloud-council.org/resource-hub>

# Additional Resources from the CSCC

- Webinar: Introduction to Blockchain Technology and Hyperledger (May 2017)  
<http://www.cloud-council.org/webinars/CSCC-Webinar-Hyperledger-Advancing-Blockchain-Technology-for-Business-5-17-17.pdf>
- Whitepaper: Practical Guide to Cloud Computing  
<http://www.cloud-council.org/deliverables/practical-guide-to-cloud-computing.htm>
- Whitepaper: Security for Cloud Computing: 10 Steps to Ensure Success  
<http://www.cloud-council.org/deliverables/security-for-cloud-computing-10-steps-to-ensure-success.htm>
- Whitepaper: Practical Guide to Cloud Service Agreements  
<http://www.cloud-council.org/deliverables/practical-guide-to-cloud-service-agreements.htm>

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# Thank You!

**Join the conversation**



[www.cloud-council.org](http://www.cloud-council.org)