



构建区块链服务平台

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# About Me

- [Baohua Yang](#)
  - Senior Researcher, IBM
  - Open-Source contributor
- Cloud, BigData, Blockchain
- Favorite languages: JPG (Javascript, Python, Golang)

- Content

A faint, light gray outline of a world map serves as the background for the slide content.

About Blockchain

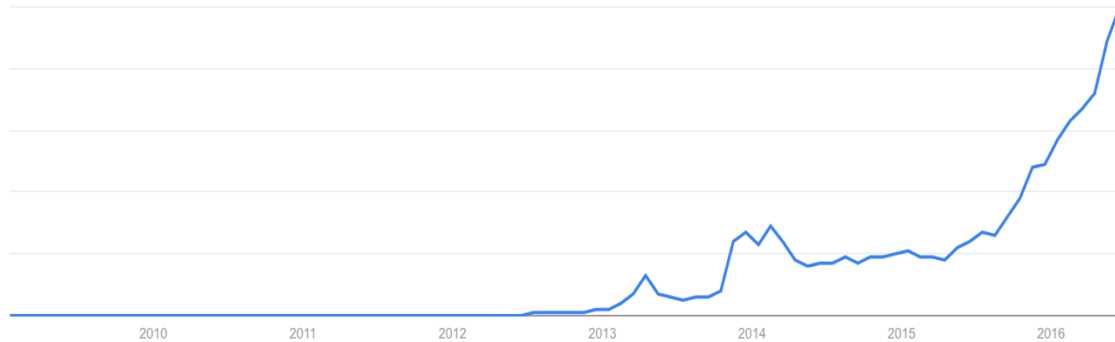
Platform Design

Implementation and Operation

Demo

# Brief History of Blockchain

- 1494: Double Entry Bookkeeping
- 1998 ~: Crypto-currency
  - Double-spend
- 2008: bitcoin
  - 2009 online
  - 2013 explode
  - 2014 mining
- 2014: Blockchain
  - Transaction
  - Block
  - Chain
- 2015: smart contract/ledger
- 2016: Application/Scenarios



# What is Blockchain

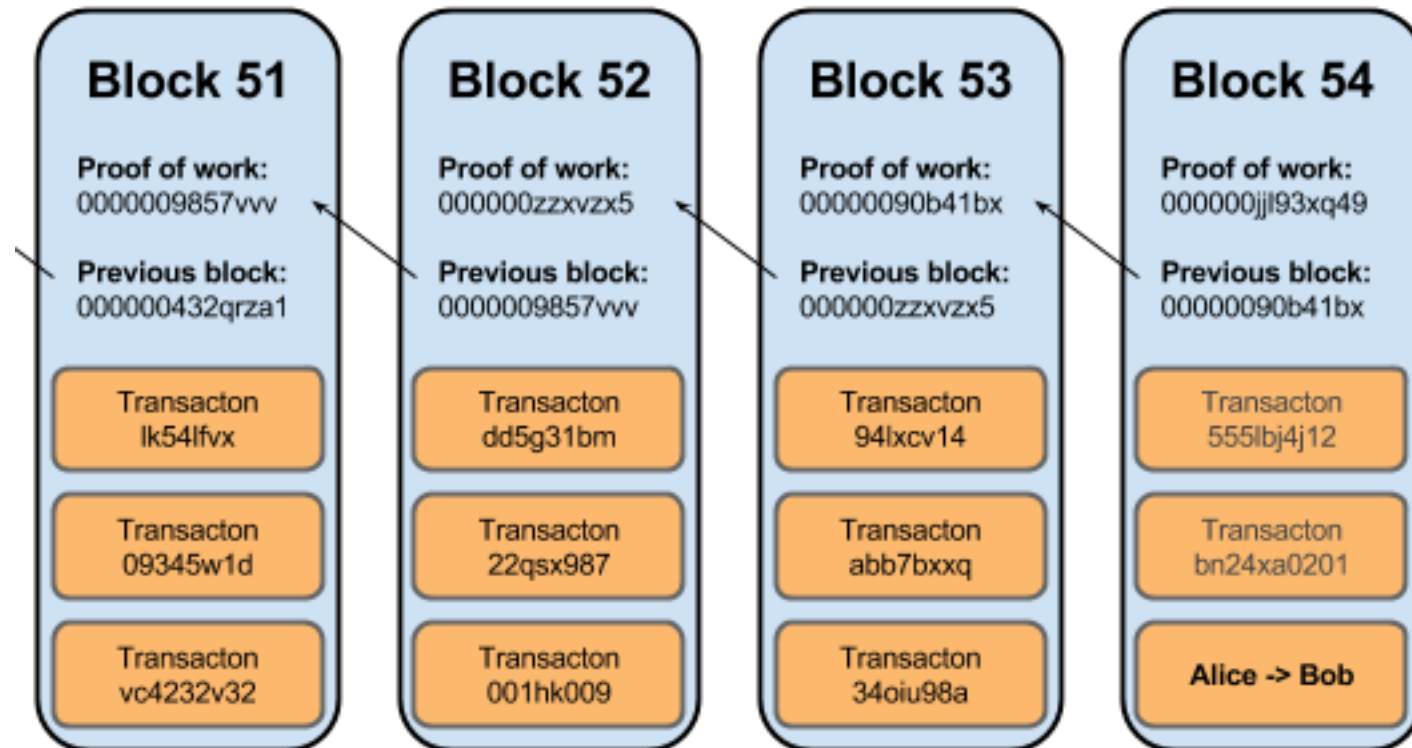
**Decentralized**  
去中心化

**Smart Contract**  
智能合约

- 多方达成可信记录和可信合约的机制

**immutable**  
不可篡改

# Example Structure




# Related projects


- 公有链（Public）
  - 比特币（Bitcoin）区块链
  - 以太坊（Ethereum）区块链
- 联盟链（Consortium）
  - 超级账本（Hyperledger）
  - 其它：Chain 等
- 私有链（Private）

# Business Architecture


- 基础设施层 fabric
  - 提供可靠的分布式账本设施
- 中间平台层 middle-platform
  - 抽象分布式账本的记账和计算能力
- 应用层 application
  - 商业应用



应用：金融、征  
信...



中间层：行业平  
台



基础设施：分布  
式记账本



# Applications

- 金融服务
- （跨境）贸易
- 资产权属
- 资源共享
- 供应链与物联网
- 其它应用

# Applications

- **BitShare:** 基于区块链的证券发行平台，号称每秒达到 10 万笔交易。
- **纳斯达克 Linq:** 探索使用区块链作为“纳斯达克私有市场”（公司在IPO前的股份交易市场）的交易记录系统。
- **Circle:** 由区块链充当支付网络，允许用户快速进行跨币种的快速汇款。
- **Ripple:** 实现多币种低成本实时交易。
- **Factom:** 为安存正信公证服务定制区块链解决方案。
- **OpenBazaar:** 在无中介的情形下，实现安全电商交易。
- **Skuchain:** 创建基于区块链的新型供应链解决方案，实现商品流与资金流同步，解决假货问题。

# More Tutorials

- [区块链技术指南](#)
- [hyperledger.org](http://hyperledger.org)
- [ethereum.org](http://ethereum.org)
- [bitcoin.org](http://bitcoin.org)



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# Microsoft Azure: Blockchain as a Service



## BaaS for enterprises and business networks

With intelligence services and tools, Azure is the cloud platform to develop, test and deploy blockchain applications. [Try Azure DevTest Labs](#) to explore BaaS.



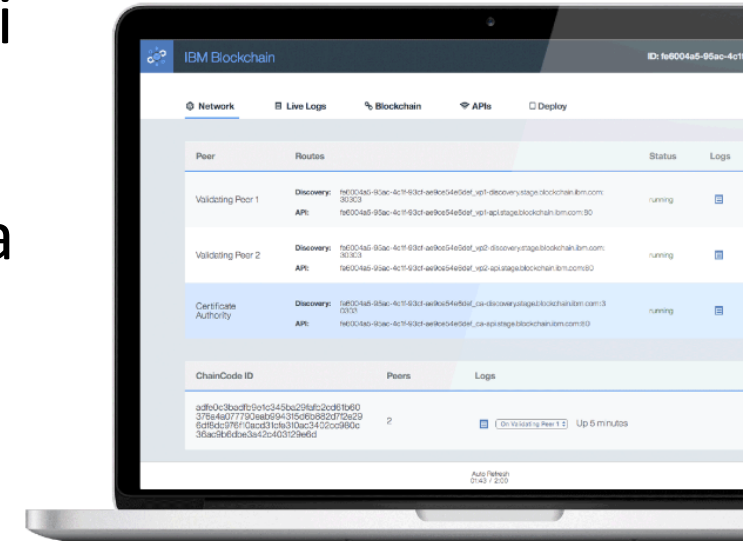
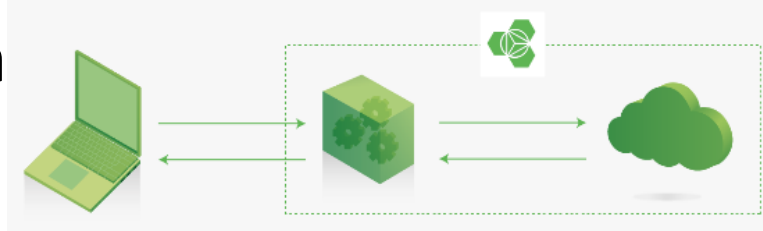
## BaaS for developers and partners

Find developer tools and blockchain-compatible cloud services to quickly bring solutions to market and at scale. [Get started using blockchain with Solidity and Smart Contracts.](#)

# IBM Bluemix: Blockchain as a Service

- Create and manage a blockchain network in a few minutes. Deploy chaincode smart contracts and use the live log to view progress of transacti

- The architecture and technology sta  
on



# Design Requirements

- High performance: Response in seconds
- Scalability: Support thousands of chains
- Configurable: Customized service for users, manageable for operators
- Automatics: self-life-cycle, minimize human effort
- Operational: Easy to integrate with operation tools
- Platform support: Easy to deploy on Cloud
- Physical Resource: Run on top of X86, Power, Z, with baremetal or virtualized environment



# Design Principles

- Micro-service: Means we decouple various functions to individual micro services. No service will crash others whatever it does.
- Failure-resilience: Means the service should be tolerant for failure, such as database crash.
- Scalability: Try best to distribute the services, and to mitigate SPoF.

- Content

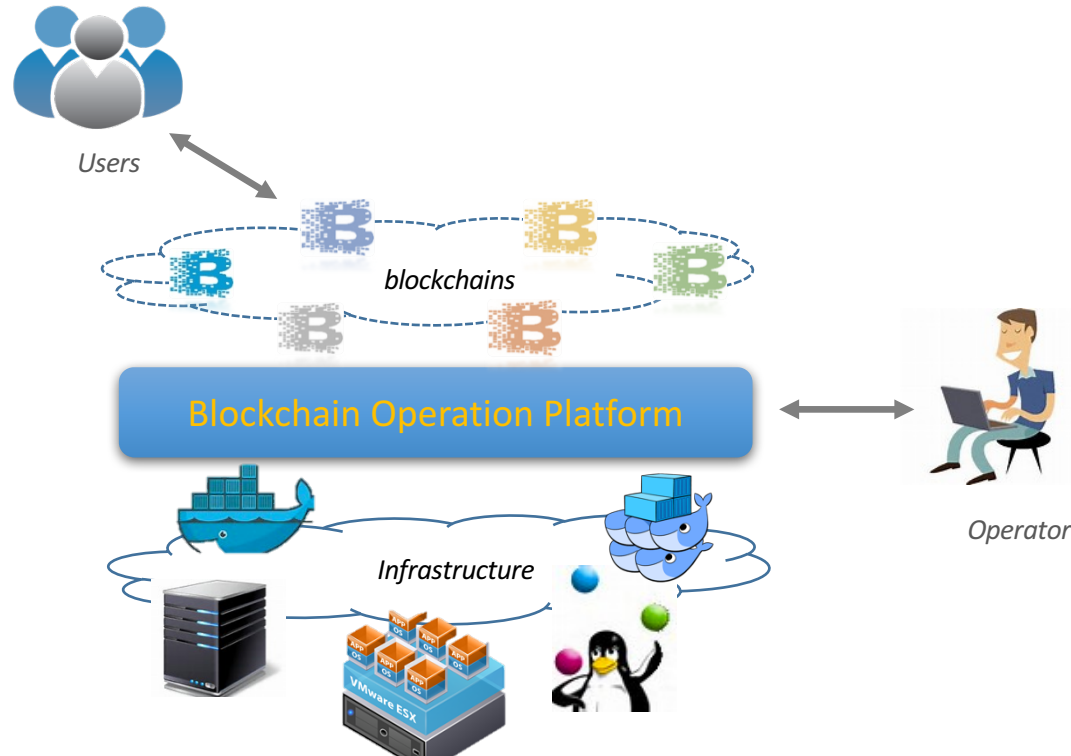
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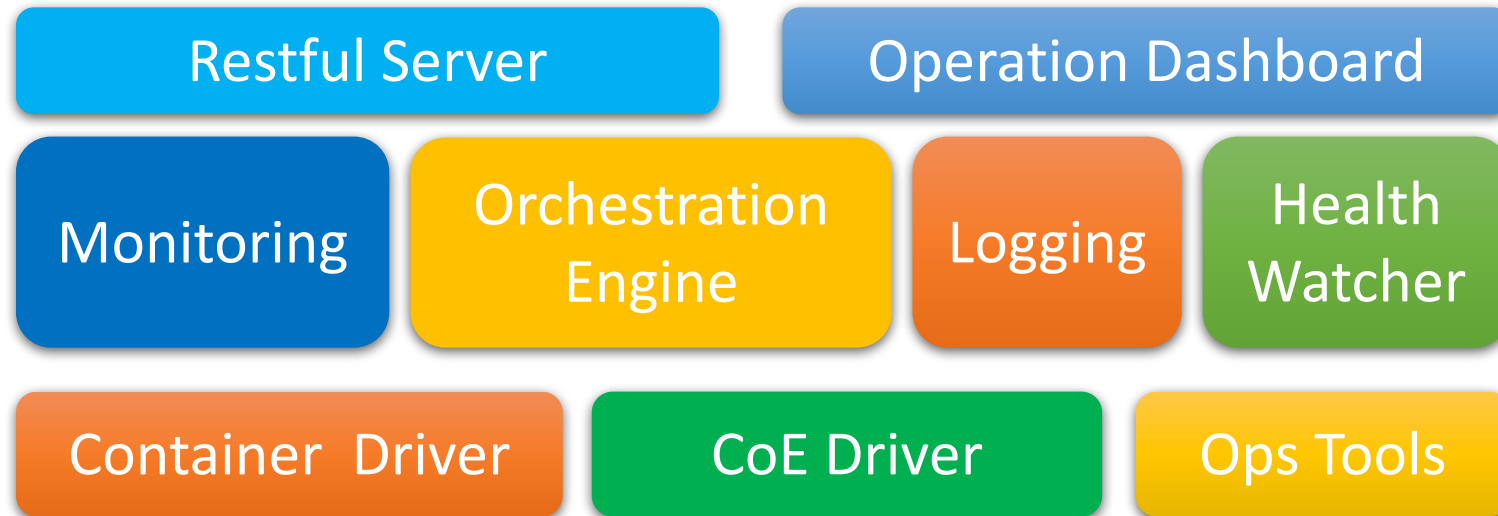
# Service Scenarios



Scenario #1: **Developers** can test their smart contracts on provisioned chains through a portal.

Scenario #2: **Operators** can configure and monitor the system flexibly at runtime through a dashboard, with automatic mode support.

# Core Architecture



# 区块链技术选型

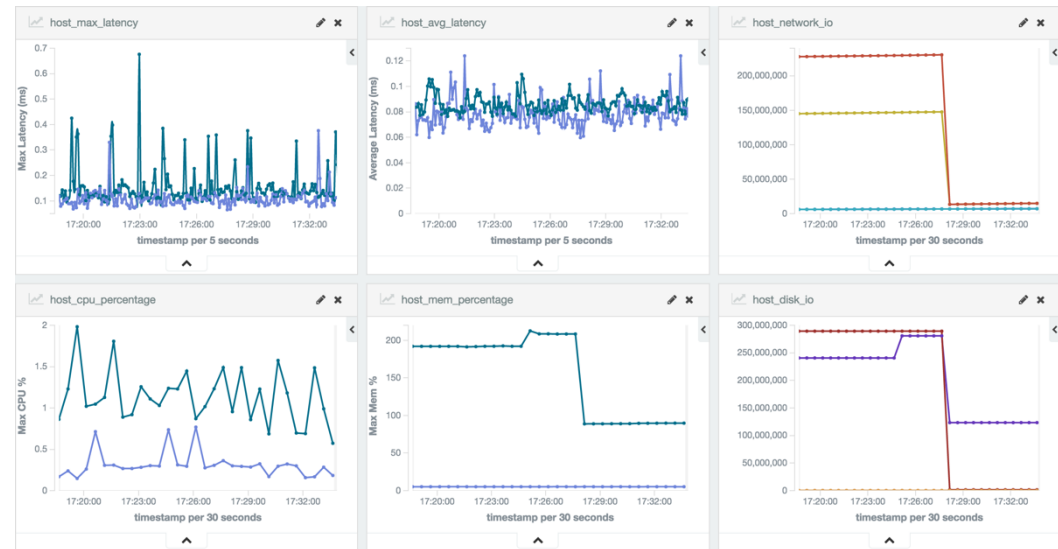
特性	比特币 (bitcoin)	以太坊 (Ethereum)	超级账本 (HyperLedger)
功能	比特币支撑平台	智能合约支撑平台	商业应用支撑平台
属性	公有	公有	联盟
隐私性	完全公开 (可匿名)	完全公开 (可匿名)	联盟内部公开 (可匿名)
智能合约	较弱	Solidity, 图灵完备	多种: Go, Java, Node 等, 图灵完备
权限管理	无	无	支持
一致性	PoW	PoW、PoS	多种, PBFT 等
性能	受限	受限	可扩展
开发者	比特币社区	以太坊社区	Hyperledger 社区 (大型科技、金融企业)
生产支持	较稳定	演进中, 分叉	演进中, 17年初 1.0 release

# Related Projects

- Containerization
  - Fabric-SDK-Python (<https://github.com/hyperledger/fabric-sdk-py>)
  - Cello (<https://github.com/yeasy/cello>)
  - Op-Tools (Open-sourcing)
- 
- Welcome for more Pythoner to join!

# Operation statistics

- Running
  - Half a year
- Users
  - From tens of organizations
- Chains
  - Thousands of chains



# Demo Time



# Q&A

