Oracle Blockchain
Consensus to Boost The Business
February 2019

Ivan Delic
Solution Engineer
Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, timing and pricing of any features or functionality described for Oracle’s products may change and remains at the sole discretion of Oracle Corporation.
Agenda

1. Blockchain Evolution
2. Enterprise Blockchain
3. Oracle Blockchain
1. Blockchain Evolution
Blockchain Evolution

Bitcoin is a cryptocurrency, a form of electronic cash without a central bank that can be sent from user to user on the peer-to-peer network.

Blockchain is an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way.
Peer-to-peer Network

user A

node

user B
Node and transactions

Transaction

Node

Transaction
The Transaction

25a80501bd77907e0ea054da7e4d4e20abd8118925c131e2d40e29579f35d72

145TkJuQu9cdPD8weAljgxXEra7c1mRD9m → 3H5YUw5MCYMyfkdzv1BmDclrgUBSok3e4

1.47821589 BTC

user A

user B

Summary

<table>
<thead>
<tr>
<th>Size</th>
<th>190 (bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>760</td>
</tr>
<tr>
<td>Received Time</td>
<td>2019-02-18 10:47:01</td>
</tr>
<tr>
<td>Included In Blocks</td>
<td>563580 (2019-02-18 10:48:21 + 1 minutes)</td>
</tr>
<tr>
<td>Confirmations</td>
<td>3</td>
</tr>
<tr>
<td>Visualize</td>
<td>View Tree Chart</td>
</tr>
</tbody>
</table>

Inputs and Outputs

| Total Input     | 1.47871589 BTC |
| Total Output    | 1.47821589 BTC |
| Fees            | 0.0005 BTC     |
| Fee per byte    | 263.158 sat/B  |
| Fee per weight unit | 65.789 sat/WU  |
| Estimated BTC Transacted | 1.47821589 BTC |

* https://www.blockchain.com/btc/tx/25a80501bd77907e0ea054da7e4d4e20abd8118925c131e2d40e29579f35d72
Transaction Gossip

user A
Transaction Blocks

memory pool

Sharing new transactions
Creating Blocks

transactions

memory pool

blockchain
Creating Blocks

transactions

hash SHA-256

nonce (just another number)

blah0de1blah2blah3

this1is2random3
Creating Blocks

transactions

00000000random3

blah0de1blah2blah3

80085
Consensus

+12.5 BTC

Cha-ching
### Blockchain

<table>
<thead>
<tr>
<th>Height</th>
<th>Age</th>
<th>Transactions</th>
<th>Miner</th>
<th>Size (bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>563599</td>
<td>1 minute</td>
<td>141</td>
<td>SlushPool</td>
<td>106,251</td>
</tr>
<tr>
<td>563598</td>
<td>1 minute</td>
<td>2699</td>
<td>BitClub Network</td>
<td>1,005,684</td>
</tr>
<tr>
<td>563597</td>
<td>9 minutes</td>
<td>2303</td>
<td>BTC.com</td>
<td>1,020,812</td>
</tr>
<tr>
<td>563596</td>
<td>14 minutes</td>
<td>1521</td>
<td>AntPool</td>
<td>542,927</td>
</tr>
<tr>
<td>563595</td>
<td>16 minutes</td>
<td>2894</td>
<td>Bitcoin.com</td>
<td>1,244,236</td>
</tr>
</tbody>
</table>
The Result

user A

user B
2. Enterprise Blockchain
What is Enterprise Blockchain?

• System for maintaining distributed ledgers
• Asset maintaining ledger
• Allows multiple parties who may not fully trust one another to do business securely
• Reduces need for third-party intermediaries
• Near real-time and unalterable records
Types of Blockchain

**Permissionless**
- Anyone can join the network
- Bitcoin, Ethereum...
- Consensus: PoW (Mining)

**Permissioned**
- Closed ecosystem, members are invited to join
- Hyperledger Fabric, R3 Corda
- Consensus: SBFT

**Public Permissioned**
- Combination
Permissioned Blockchain Benefits

**Trust**
Ensure data is reliable & tamper-proof

**Transparency**
Parties have real time access to a single source of truth to avoid fraud.

**Reduce Intermediary**
Avoid unnecessary delays and transaction fees.

**Eliminate Manual Processes**
To reduce risk of human errors due to manual processes
How Does Enterprise Blockchain Work?
Key Components of Enterprise Blockchain

Applications
- Register users
- Invoke smart contracts
- Consume events

Smart Contracts
- Business logic to update the ledger
- Query data
- Optionally, publish events

Blockchain Infrastructure
- Network of nodes
- Distributed Ledger
Enterprise Blockchain in Action?

• **Trusted intermediary, e.g.: Visa/MC, SWIFT**
  – Issues: cost, latency, single-point-of-failure
  – Blockchain can remove the need for intermediary and replace it with secure protocols

• **Separate records stored by all the different entities**
  – Issues: reconciliation costly and error prone
  – Blockchain’s distributed ledger is a single source of truth – no reconciliation needed
Oracle Blockchain
Oracle Blockchain

- Oracle Blockchain is based upon Hyperledger Fabric
- Provides a permissioned blockchain model with membership services
- Uses smart contracts for automating business processes
- Focuses on a scalable implementation with confidentiality/privacy provisions
Consensus

- **Endorsement**
  - Determine whether to accept or reject a transaction

- **Ordering**
  - Sort all transactions within a time period into a sequence (Block)

- **Validation**
  - Verify endorsement satisfy policy
Oracle Blockchain Architecture

REST APIs for Integrations

Open-Source Hyperledger Fabric
Smart Contracts, Consensus, Privacy, Distributed Ledger

Pre-assembled Infrastructure and PaaS Services
Managed Containers, Block Storage, Object Storage, Event Hub, Identity Cloud Services

Oracle PaaS
Oracle SaaS
Oracle On Premises App
3rd Party On-premises Apps
3rd Party Cloud Apps
B2B Integrations

Admin UI
Data Services

Oracle PaaS
Oracle SaaS
Oracle On Premises App
3rd Party On-premises Apps
3rd Party Cloud Apps
B2B Integrations

REST APIs for Integrations

Open-Source Hyperledger Fabric
Smart Contracts, Consensus, Privacy, Distributed Ledger

Pre-assembled Infrastructure and PaaS Services
Managed Containers, Block Storage, Object Storage, Event Hub, Identity Cloud Services

Oracle PaaS
Oracle SaaS
Oracle On Premises App
3rd Party On-premises Apps
3rd Party Cloud Apps
B2B Integrations

Admin UI
Data Services
Oracle Blockchain Cloud Provisioning
Oracle Blockchain Channel Topography
Blockchain Stats

$945 Million spent in 2017 - Blockchain Technology Investments Will Reach $9.7 Billion by 2021

$2.1 billion: Global spending on blockchain solutions in 2019

42.8%: The expansion of the blockchain space every year to 2022

22%: of industry CIOs are in a planning stage or experimenting with blockchain, and another 43% have it on their radar but have not initiated plans

3x: The number of blockchain-related LinkedIn job postings more than tripled over the last year.
Where Can You Apply Blockchain?

• Questions to ask to see if blockchain is applicable
  – Does my business process crosses divisional or organizational boundaries?
  – Is there less than full trust among transacting parties?
  – Does it involve intermediaries, possibly charging expensive fees?
  – Is there a need to improve traceability or audit trail?
  – Do we need real time visibility of the current state across multiple organizations?

• http://doyouneedablockchain.com/
Global Loyalty Network

**Enhance Customer Experience**
- Can use your country points in other countries.
- Typical use cases – payments, offline/online shopping, remittance
- No complex transfers that take weeks or months to complete

**Increase Operational Excellence**
- All participating companies simultaneously store identical transaction data -> enables accurate settlement without additional reconciliations

**Create Business Value**
- Good way to consume debt
- New business model based on exchange of digital currencies between global financial institutions
- Your customers → My customers → Our customers
Thank You

• Learn More
  - oracle.com/blockchain
• Try
  - cloud.oracle.com/blockchain