The Hedera Governing Council

Building the future together.
Adoption to Date

- **Transactions**: 246,820,359
- **Total Accounts**: 44,402

![Hedera Council Nodes Map](image)

* Tiers is the number of transactions submitted through that node. A node with a zero may still be running and validating transactions correctly, just not submitting new transactions.

**HBAR Price**
- Hedera Network: $0.0506
- Binance: $0.0509 (+0.18%)
- Okex: $0.0509 (+0.20%)
- Bitfinex: $0.0510 (0.00%)

**Transaction Volume**
- 1,573,569 txns, 12.21%
## Adoption to Date

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Description</th>
<th>Value Proposition</th>
<th>Example</th>
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<tbody>
<tr>
<td>CBDC</td>
<td>Build compliant and performant central bank digital</td>
<td>Hedera provides a global and scalable messaging layer for nodes operated by</td>
<td>Project New Dawn InterWork Alliance Start-up (Confidential)</td>
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<td></td>
<td>currencies on a distributed architecture.</td>
<td>permissioned entities.</td>
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<td>Stable Coin</td>
<td>Create crypto asset with stable market value for peer to</td>
<td>Hedera provides a global and scalable messaging layer for nodes operated by</td>
<td>Enterprise (Confidential) Carbon Council Member</td>
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<td>peer payments.</td>
<td>permissioned entities.</td>
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<td>Digital Identity</td>
<td>Establish verifiable credentials for any person or entity.</td>
<td>Hedera provides highly performant method for establishing and verifying credentials through the Hedera DID SDK.</td>
<td>MyEarthID</td>
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<tr>
<td>Proof of Compliance</td>
<td>Verifiably prove user information capture and deletion.</td>
<td>Hedera proof of action microservice generates cryptographically verifiable proofs of data capture and deletion.</td>
<td>Manetu</td>
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<tr>
<td>Auditable Logs</td>
<td>Applications prove events to third parties to improve</td>
<td>Hedera proof of action microservice provides a simple API to generate cryptographic proofs for any app event.</td>
<td>AdsDax Coupon Bureau Global Top 10 University (Confidential)</td>
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<td>trust and auditability of data.</td>
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<td>Enterprise Integration</td>
<td>Extend core enterprise applications &amp; middleware with</td>
<td>Hedera proof of action microservice together with an auditable log provides a</td>
<td>Global Auto-Manufacturer (Confidential)</td>
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<td>verifiable proof of transactions between corporates silos</td>
<td>decentralized means to validate transactions between business partners</td>
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<td>and business partners</td>
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<td>Network Interoperability</td>
<td>Easily enable atomic swaps between distinct</td>
<td>Hedera integrates with leading permissioned DLTs like Fabric and Corda to provide a universal ordering service.</td>
<td>Enterprise (Confidential) Insurance Consortium</td>
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<td>permissioned networks with Corda or Hyperledger</td>
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<td></td>
<td>Fabric.</td>
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Pluggable Consensus with HCS

Hedera Consensus Service provides auditable log of transaction for distinct networks and applications.

Permissioned networks now share a single consensus engine, enabling:
• Custom data access and encryption
• Public trust
• Verifiable timestamps
• Decentralized, shared service
• Finality of transaction order
• High performance

Hedera supports integrations between the Hedera Consensus Service, Hyperledger Fabric, and R3’s Corda.
Hedera mainnet

Hedera mirrornet

HCS Message Submission

- Message
- TopicID
- Submitting Account
Hedera mainnet

Hedera mirrornet

HCS Message Response
- Consensus Timestamp
- Sequence Number
- Running Hash
Lifecycle of a transaction

1. Transaction proposed to Fabric peer
2. Client application broadcast transaction to orderer

Hedera Hashgraph

Consensus nodes

Mirror nodes
Lifecycle of a transaction

3. Transaction fragmented into messages, associated with topicID

4. Messages submitted to topic using HCS
Lifecycle of a transaction

1. Event reaches Consensus, receiving consensus timestamp and state proof.

2. Event propagates to the Consensus nodes.
Lifecycle of a transaction

1. Notify of message order
   Message + TopicId + timestamp + sequenceNumber + runningHash + state proof (optional)
Lifecycle of a transaction

1. **Client**
2. **Fabric peer**
3. **Fabric orderer**
4. **HCS plug-in**
5. **Consensus nodes**
6. **Mirror nodes**

**Steps:**

1. **Transaction reassembled, put in block**
2. **Ordered transactions given to peers**
3. **Blocks appended to ledger**
4. **Hedera Hashgraph**

hedera.com
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HCS-based Orderer

- Broadcast transaction to orderer
- Deliver ordered blocks

Orderer

Common
- Config handling
- Channel mgmt
- Common txn handling
- Block cutter

AtomicBroadcast

HCS Plug-in
- Consenter
- Chain
- Txn handling

Hedera SDK

Submit messages to mainnet
Notify of consensus messages from mirror node
Configuration changes

Channel related common configuration

- configtx.yaml
- configtxgen reads in configtx.yaml and generates genesis block / channel config update request txn for orderers to consume
- example config items
  - ConsensusType – decides which plug-in to use for a channel
  - list of Kafka broker addresses for Kafka plug-in

Per orderer configuration

- orderer.yaml
- the orderer executable reads orderer.yaml during bootstrapping
- example config items:
  - tls cert / private key
  - retry config for Kafka plug-in
Configuration changes - configtx.yaml

- New ConsensusType - hcs
- Channel id <-> HCS topic id
Configuration changes - orderer.yaml

- Mainnet node id / node addresses
- Associated account / key for message submission to topics
- Mirror node address
To get started visit:

docs.hedera.com/hyperledger-fabric-hcs