

## Blockchain Glossary

### **Anchor Peer**

A peer node on a channel that all other peers can discover and communicate with. Each member on a channel has an anchor peer (or multiple anchor peers to prevent single point of failure), allowing for peers belonging to different Members to discover all existing peers on a channel.

### **Asset**

An asset can be anything of value. A house is an example of a physical asset, and a mortgage is an example of non-physical asset. Assets within Hyperledger Composer can be defined to encompass any physical or non-physical asset.

### **Block**

An ordered set of transactions that is cryptographically linked to the preceding blocks on a channel

### **Business Network Model**

The business network model describes the assets, participants, and transactions in the business network. The model is in effect the static object structure of the overall business network.

### **Business Card**

Convenient packaging of identity and connection profile that contains everything you need to connect to a blockchain business network. Each one of these cards refers to a single participant and single business network. Similar to an ATM card.

### **Certificate Authority**

Provides identity services to participants on the network

### **Chain**

The ledger's chain is a transaction log structured as hash-linked blocks of transactions. Peers receive blocks of transactions from the ordering service, mark the block's transactions as valid or invalid based on endorsement policies and concurrency violations, and append the block to the hash chain on the peer's file system.

### **ChainCode**

Chaincode is software, running on a ledger, to encode assets and the transaction instructions (business logic) for modifying the assets. ChainCode can be instantiated, installed or both (see below)

### **Channel**

A channel is a private blockchain overlay which allows for data isolation and confidentiality. A channel-specific ledger is shared across the peers in the channel, and transacting parties must be properly authenticated to a channel in order to interact with it. Channels are defined by a Configuration-Block

### **Composer Playground**

The Hyperledger Composer Playground is a web tool for defining and testing Hyperledger Composer models and scripts. Sample business networks can be imported to learn more about Hyperledger Composer and business network archives can be exported for local editing or later use. Application developers can define assets, participants and transactions, implement transaction processor scripts, and test by populating registries and involving transactions.

**Configuration Block**

Contains the configuration data defining members and policies for a system chain (ordering service) or channel. Any configuration modifications to a channel or overall network (e.g. a member leaving or joining) will result in a new configuration block being appended to the appropriate chain. This block will contain the contents of the genesis block, plus the delta.

**Consensus**

A broader term overarching the entire transactional flow, which serves to generate an agreement on the order and to confirm the correctness of the set of transactions constituting a block. There are many types of consensus algorithms: proof of work (bitcoin, Ethereum), proof of stake (Nxt), Proof of Elapsed Time (Hyperledger, Sawtooth)

**Current State**

The current state of the ledger represents the latest values for all keys ever included in its chain transaction log. Peers commit the latest values to ledger current state for each valid transaction included in a processed block. Since current state represents all latest key values known to the channel, it is sometimes referred to as World State. Chaincode executes transaction proposals against current state data.

**Endorsement**

Refers to the process where specific peer nodes execute a chaincode transaction and return a proposal response to the client application. The proposal response includes the chaincode execution response message, results (read set and write set), and events, as well as a signature to serve as proof of the peer's chaincode execution. Chaincode applications have corresponding endorsement policies, in which the endorsing peers are specified.

**Hyperledger Fabric**

Hyperledger Fabric is a blockchain framework implementation and one of the Hyperledger projects hosted by The Linux Foundation. Intended as a foundation for developing applications or solutions with a modular architecture, Hyperledger Fabric allows components, such as consensus and membership services, to be plug-and-play. Hyperledger Fabric leverages container technology to host smart contracts called "chaincode" that comprise the application logic of the system. Hyperledger Fabric was initially contributed by Digital Asset and IBM, as a result of the first hackathon.

**Hyperledger Composer**

A suite of high level application abstractions for business networks that emphasizes business-centric vocab for quick solution creation. Allows the user to model business networks, test and expose via APIs. This is a fully open part of the Linux Foundation

**Genesis Block**

The configuration block that initializes a blockchain network or channel, and also serves as the first block on a chain.

**Gossip Protocol**

The gossip data dissemination protocol performs three functions: 1) manages peer discovery and channel membership; 2) disseminates ledger data across all peers on the channel; 3) syncs ledger state across all peers on the channel. Refer to the [gossip](#) topic (above) for more details.

## **IBM Blockchain Platform**

The IBM Blockchain Platform provides a managed, full stack blockchain-as-a-service (BaaS) offering delivered through the IBM Cloud, allowing members to develop, govern, and operate a network with the performance and security necessary for regulated industries. The IBM Blockchain Platform leverages Hyperledger Fabric to enable a new kind of distributed business network founded on the principles of finality, trust, and privacy.

<https://www.ibm.com/blockchain/platform/>

### **Starter Plan (beta as of 4/17/18)**

A no cost 30-day trial with IBM Blockchain Platform that utilizes an easy to use UI that simplifies the blockchain journey of developing, governing, and operating a network.

### **Enterprise Plan**

Get all the features of starter plan, plus everything you need for a full production environment; including HSM availability, fault tolerant ordering service, added layers of security and premium support.

### **Enterprise Plus Plan**

Get all the features of Enterprise plan, plus the highest performance, isolation and scalability for the most demanding production workloads in regulated industries.

## **Install (Chaincode)**

The process of placing a chaincode on a peer's file system. Chaincode must be installed before instantiated

## **Instantiate (Chaincode)**

The process of starting and initializing a chaincode application on a specific channel. After instantiation, peers that have the chaincode installed can accept chaincode invocations.

## **Invoke (Chaincode)**

Used to call chaincode functions. A client application invokes chaincode by sending a transaction proposal to a peer. The peer will execute the chaincode and return an endorsed proposal response to the client application. The client application will gather enough proposal responses to satisfy an endorsement policy, and will then submit the transaction results for ordering, validation, and commit. The client application may choose not to submit the transaction results. For example, if the invoke only queried the ledger, the client application typically would not submit the read-only transaction, unless there is desire to log the read on the ledger for audit purpose. The invoke includes a channel identifier, the chaincode function to invoke, and an array of arguments.

## **Member /Founder**

A legally separate entity that owns a unique root certificate for the network. Network components such as peer nodes and application clients will be linked to a member.

## **Network Provider**

Governs the network: channels, membership for the consortium of network members or designated authorities

## **Network Consumer**

Operates a set of peers and certificate authorities on the network, this represents an organization on the business network. This is different than the business consumer who hosts the application and integration logic that invokes blockchain transactions.

## **Node**

### **Commit Node**

Maintains ledger and state, commits transactions and may hold chaincode

### **Order Node**

Approves the inclusion of transaction blocks into the ledger and communicates with committing and endorsing peer nodes. Does not hold smart contract OR ledger

### **Endorse Node**

Specialized committing peer that receives a transaction proposal for endorsement, responds granting or denying endorsement and MUST hold smart contract

## **Orderer/Ordering Service**

A defined collective of nodes that orders transactions into a block. The ordering service exists independent of the peer processes and orders transactions on a first-come-first-serve basis for all channels on the network. The ordering service is designed to support pluggable implementations beyond the out-of-the-box SOLO and Kafka varieties. The ordering service is a common binding for the overall network; it contains the cryptographic identity material tied to each member.

## **Participant**

Participants represent the organizations or people who take part in the digital business network. Participants are defined in the business network model.

## **Peer**

A network entity that maintains a ledger and runs chaincode containers in order to perform read/write operations to the ledger. Peers are owned and maintained by members.

## **Secure Service Container**

Provides simplified mechanism for fast deployment and management of packaged solutions as well as tamper protection during application installation and runtime. It ensures confidentiality of data and code running within the appliance both at flight and at rest. Management is provided via Remote APIs and web interfaces. There is NO root access, the only access is through APIs

## **Smart Contract**

A computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a **contract**. **Smart contracts** allow the performance of credible transactions without third parties. These transactions are trackable and irreversible.

## **State Database**

Current state data is stored in a state database for efficient reads and queries from chaincode. Supported databases include levelDB and couchDB.

## **Transaction**









Transactions are submitted by a participant to affect the assets held in the asset registries on the Hyperledger blockchain. Transactions with a business network are defined in the business network model, and their operations are defined in the transaction processor function file.

## World State

An ordinary database that stores the latest values for all known key values the channel.









## Definition Slides

### Actors in a blockchain solution

Blockchain Architect		Responsible for the architecture and design of the blockchain solution
Blockchain User		The business user, operating in a business network. This role interacts with the Blockchain using an application. They are not aware of the Blockchain.
Blockchain Regulator		The overall authority in a business network. Specifically, regulators may require broad access to the ledger's contents.
Blockchain Developer		The developer of applications and smart contracts that interact with the Blockchain and are used by Blockchain users.
Blockchain Operator		Manages and monitors the Blockchain network. Each business in the network has a Blockchain Network operator.
Membership Services		Manages the different types of certificates required to run a permissioned Blockchain.
Traditional Processing Platform		An existing computer system which may be used by the Blockchain to augment processing. This system may also need to initiate requests into the Blockchain.
Traditional Data Sources		An existing data system which may provide data to influence the behavior of smart contracts.

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### Components in a blockchain solution

Ledger		A ledger is a channel's chain and current state data which is maintained by each peer on the channel.
Smart Contract		Software running on a ledger, to encode assets and the transaction instructions (business logic) for modifying the assets.
Peer Network		A broader term overarching the entire transactional flow, which serves to generate an agreement on the order and to confirm the correctness of the set of transactions constituting a block.
Membership		Membership Services authenticates, authorizes, and manages identities on a permissioned blockchain network.
Events		Creates notifications of significant operations on the blockchain (e.g. a new block), as well as notifications related to smart contracts.
Systems Management		Provides the ability to create, change and monitor blockchain components
Wallet		Securely manages a user's security credentials
Systems Integration		Responsible for integrating Blockchain bi-directionally with external systems. Not part of blockchain, but used with it.

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