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Blockchain Platforms — Ethereum Vs Hyperledger

Many engineering teams are currently working away on blockchain PoCs to churn out the next killer app; however, most of them have not spent enough time on evaluating the development blockchain platform to see if it is the right fit for their application. Although there are many blockchain platforms in the market now, some of them are fresh out of their research labs and others are slightly tested out in the industry. The two most talked about platforms are Ethereum and Hyperledger—each with their own set of benefits and limitations. In this note, I will try to compare these two popular platforms to present a general overview to help teams pick the right one for their proposed application. Choosing the right platform can assist in driving the product development without any hurdles and can prevent technical road blocks in the future.

Ethereum

Ethereum is an open source platform that enables developers to build and deploy decentralised applications. Similar to Bitcoin, Ethereum is a comprehensive platform with support for smart contracts and a complete programming language. Solidity helps in creating customized contract agreements that are executed when the stipulated events occur. The programming potential is enormous and a large number of token based applications are being built on this platform. Since it was first complete Turing machine, evolved out of Bitcoin, it also supports crypto currency, Ether. Ether can easily be converted to other cryptocurrencies using an exchange. For consensus, Ethereum uses a proof of work (PoW) protocol but is planning to update to proof of stake (PoS).

It has defined the first industry pseudo standard for tokens, ERC20, which is in use for most common token development. In fact, all

tokenized application use this format for each of exchange and transferability. Of course, there are new standards, ERC223 (merged transfer), ERC621 (token supply), ERC721 (non-fungible), ERC998 (non-fungible & composable), ERC827 (token approval) for applications that are specific and need a more robust way of handling tokens.

The other interesting aspect of Ethereum is the transaction cost in gas units. A transaction in Ethereum smart contract can invoke data reads and writes, do other high end computations like using cryptographic primitives, make calls or send messages to other contracts, etc. Each of these operations has a cost, it is measured in gas. The gas unit consumed by a transaction must be paid for in Ether, the native crypto currency of Ethereum. The originator of the transaction usually pays this cost to the node which is successful in completing the transaction based on the consensus.

Comparatively, Ethereum has long industry standing as its credit; it is time-tested and proven for many successful tokenization projects. Ether is a highly traded crypto currency and has been gaining new users on daily basis. Ethereum environment is rich and comes complete with a wallet, command line tools, testing environment and host of GUI apps. A solid user community and a continuously evolving set of open source tools are a big positive for this platform.

Parameter	***Ethereum***	***Hyperledger***
Purpose	Generic applications	Business Applications
Type	Public	Private / Permissioned
Transparency	Open	Closed
Transaction Cost	Gas	None
Architecture	Distributed - Blockchain	Customizable – DLT
Crypto Currency	Ether	None
Custom Roles	No	Yes
Consensus	PoW PoS	Practical BFT Proof of Elapsed Time (PoET) Custom
Storage	Limited	Unlimited
Latency	High	Low
Flexibility	Limited	Plug-n-Play
Scalability	Yes	Limited
Smart Contract	Solidity	ChainCode
Programming Language	Solidity	GoLang, Java, Javascript
Database	Native store	CouchDB
Crypto / Token Support	Yes	No
Performance	Medium	High
Privacy	Low	High
Code Base	Open Source	Open Source
Platform Components	EVM Gas GUI apps CLI Wallet Etherscan	Fabric Indy Sawtooth Iroha Burrow Composer Cello Caliper Quilt Explorer
Supporting Groups	Microsoft & Others	IBM, Linux Foundation

Ethereum Vs Hyperledger

Hyperledger

Hyperledger is not a specific technology, but rather a group of blockchain & DLT based projects under the Linux Foundation banner for the collaborative development. There are multiple frameworks under Hyperledger, each of which has slightly different characteristics. It also comes with a host of tools which help in development.

- Hyperledger Fabric—a permissioned blockchain providing a modular architecture with a support for execution of Smart Contracts and configurable consensus and membership services (MSP). Fabric network has peer nodes which execute smart contracts written in chaincode. Fabric supports smart contract execution in golang, Javascript and Java, and is potentially more flexible than a static smart contract language.

- Hyperledger Sawtooth—a modular platform for building, deploying, and running DLTs; uses Proof of Elapsed Time (PoET) consensus, which targets large distributed validator populations with minimal resource consumption.
- Hyperledger Iroha—is a distributed ledger project that was designed to be simple and easy to incorporate into infrastructural projects requiring distributed ledger technology.
- Hyperledger Indy—provides tools, libraries and reusable components for interoperable digital identities rooted on blockchains or other distributed ledgers.
- Hyperledger Burrow—provides a modular blockchain client with a permission smart contract interpreter partially developed to the specification of the Ethereum Vital Machine (EVM).

Hyperledger Tools:

- Hyperledger Caliper—a benchmark tool for performance measurement of specific blockchain implementation using a set of predefined use cases.
- Hyperledger Explorer—view, invoke, deploy or query blocks, transactions and associated data.
- Hyperledger Cello—deployment tool for the blockchain ecosystem to reduce the effort required for creating, managing and terminating blockchains.
- Hyperledger Composer—collaboration tool for accelerating the development of smart contracts and their deployment across a distributed ledger
- Hyperledger Quilt—offers interoperability between ledger systems by implementing ILP, which is primarily a payments protocol and is designed to transfer value across distributed ledgers and non-distributed ledgers.

Hyperledger supports CouchDB for storing world state and for full data rich queries. Membership Service Providers (MSPs) allow organizations

to define customized identity, roles and authentication.

Given its open source modular framework, Hyperledger can be used to build specific blockchains, as it enables a mix-and-match approach of the platform features.

Based on the application requirements, an appropriate blockchain platform need to be selected. Spending time on evaluating the platform upfront will go a long way in easing out the technical pains at a later stage.

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