Properties of Ethereum tools:

1) Remix:

→ web-based environment for the development and testing of contracts using solidity

→ Can use both in browsers as well as locally.

→ Uses metamask to connect ethereum framework.

2) Truffle

→ develop and test ethereum based application.

→ Truffle has built-in smart ~~contract~~ compilation which enables ethereum developers to manage, deploy and link binaries.

3) Metamask.

→ browser-based tool designed for Ethereum.

→ It is a wallet that function as a browser extension

→ Metamask allows you to interact with ethereum framework in a hassle free manner.

→ used to store keys for ether.

→ Secca allows secure user interface that allows for smooth management of developer identities and signing bc transactions

4) Solidity

→ primary programming language used to write sc on ethereum framework.

→ It is Statically typed, high level, contract-oriented programming language

→ Stores all programming logic that occurs within the Ethereum Bc.

→ Supports libraries, inheritance and complex types

→ Similar to Javascript and identical to C programming.

5) Ganache.

→ Ethereum development tool that is a part of the truffle suit.

→ It can be used to deploy contracts, develop DApps and runs tests

→ available both as desktop application and command line tool.

→ feature - perform unlimited testing operations without any gas costs.

Architecture of HyperLFA.

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Other Applications of BC

Government

→ There are various applications of BC which are currently being researched and can support government function and can take the current model of e-government to next level.

→ Govt or e-govt is a platform where information and communication technology are used to deliver public service to citizens.

→ Many govts are researching the possibility of using BC tech for managing and delivering public services.

Voting

→ Voting in any government is key function and allows citizens to participate in democratic election process

→ In order to overcome security and privacy issues, BC based voting systems are introduced as end to end security & transparency in the process

→ Zero knowledge proofs can also be used on the bc to protect votes' privacy on bc.

Citizen identification (ID card)

→ The BC serves as a platform where govt is providing various services such as pensions, taxation or benefits and a single ID is being used for accessing all these services

→ There are several benefits such as privacy and control over the usage of identity information.

Health

→ BC provides an immutable, auditable and transparent system that traditional peer to peer networks cannot.

→ BC provides a cost-effective & simpler infrastructure.

→ With the adaptability of BC in health sectors, benefits can be realized, ranging from cost saving, increased trust, high availability and preventing the distribution of counter fit medicines.

→ BC are providing digital currency as an incentive for mining to solve scientific problems that can help to find cures for certain diseases

Finance.

→ BC has many app in finance industry.

→ Financial organizations are researching to find ways to adapt BC technology primarily due to its highly desired potential to save cost.

Insurance

→ BC Technology can help to stop fradulent claims, increase the speed of claim and enable transparency

→ It can also withhold payment if the smart contract after evaluating conditions of payment concludes that payment should not be released.

Media

→ Critical issues in the media industry revolve around the content, distribution, rights managements and royalty payments of artists.

→ BC can provide a network where digital music is cryptographically guaranteed to be owned by the consumers to pay for it.

Hyperledger Fabric Archi

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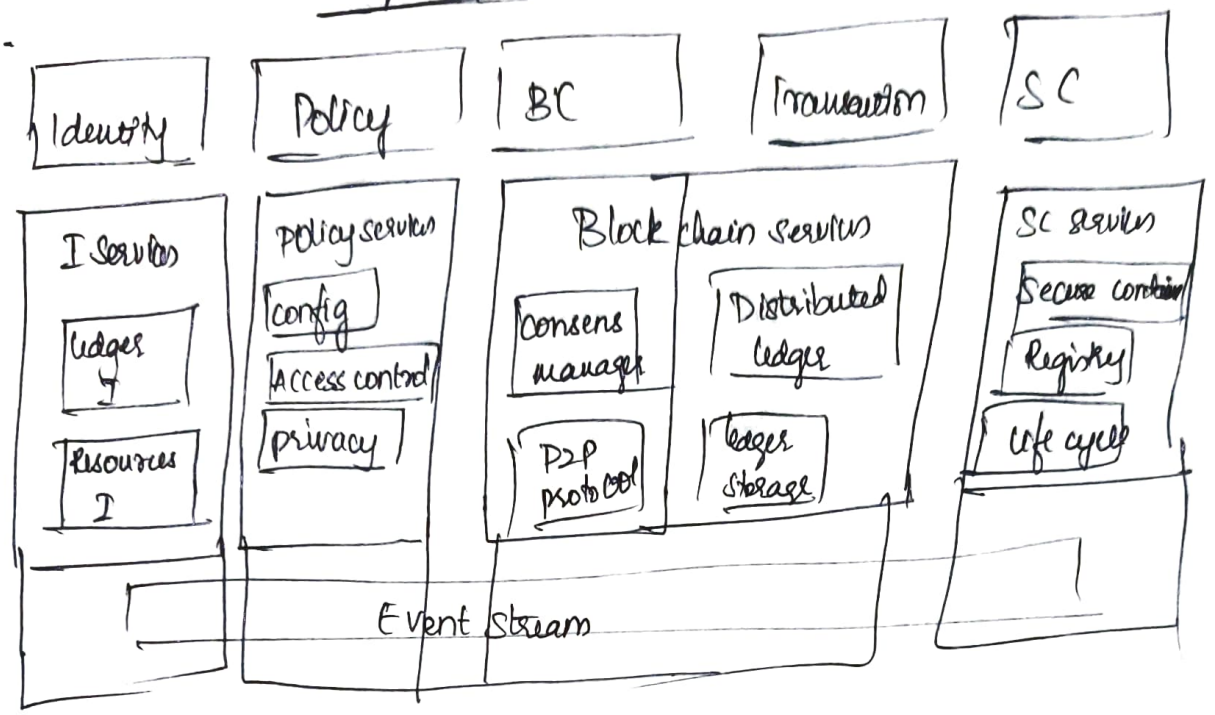

→ We have top 5 level components which provide various services.

From component pov the ledger contains various elements.

→ Consensus Layer: These services are responsible for facilitating the agreement proces blw the participants on the bc network.

→ Smart contract: responsible for implementing business logic as per req of the user.

→ Communication layer: responsible for message transission and exchange blw the nodes on the bc network

→ Security & crypto layer: responsible for providing a capability to allows various cryptographic algorithms, provides privacy, confidentiality and non-repudiations services

→ Data Stores: This layer provides an ability to use different data stores for storing state of ledger.

→ Policy services: ability to manage diff policies required for the BC network

→ API and SDK's: allows client and application to interact with BC

SDK provide mechanisms to deploy and execute chaincode, query block and monitor events on bc.

Design goals of hyperledger fabric

→ Modular approach

- Functions related to storage, policy, chaincode, access control, consensus and many other bc services should be modular and pluggable.
- Users should be able to easily remove and add different modules that meets the requirements of the business

→ Privacy and Confidentiality

- Transactions on the network are visible to only those who are allowed to view it.
- Privacy and confidentiality are of absolute importance in business bc.
- Users will be able to choose appropriate mo dules according to their business req.

→ Scalability

- when this requirement is met it will allow reasonable transaction throughput which will be sufficient for all busines req and also for large number of users.

→ Deterministic transactions.

- Core requirement.
- Transaction should produce same result everytime regardless of when and where the transaction is executed.
- It is a key requirement.

→ Identity

- In some scenario if a user wants to hide their identity, the hyperledger is expected to provide this functionality
- Identity provides privacy and confidentiality services that is used to handle the access control functionality.

→ Auditability

- All immutable audit trail of all identities, related operations and any changes is kept.

→ Interoperability

- There should be a common set of standards that all pc can follow in order to allow communication b/w ledgers.
- Expected that a protocol will be developed that will allow exchange of info b/w many fabrics.

→ Portability

- Concerned with the ability to run across multiple platforms and environments without the need to change anything at code level.

→ Rich data queries.

- BC network should allow rich queries to run on the network.
- this is used to query the current state of ledger using traditional query language.
- Allows for wider adoption and ease of use.

~~fabric~~