

Smart Contracts / Ethereum

* Ethereum Network:

=> Ethereum is a decentralized, open source blockchain platform that allows developers to build and deploy decentralized application.

It operates on a peer-to-peer network, where multiple nodes validate transaction.

Ethereum introduced the concept of smart contracts where the terms of the agreement are written into code.

The native cryptocurrency of the Ethereum network is Ether which is used as fuel for running decentralized application.

Ethereum allows developers to create DApps that run on its blockchain.

Ethereum has transitioned from Proof of Work to Proof of Stake

Consensus mechanism called Ethereum 2.0.

→ Use case of Ethereum:

- 1 Decentralized Finance: Platforms like Uniswap, Aave and Compound.
- 2 Decentralized Autonomous Organizations (DAOs): Ethereum enables the creation DAOs which are organization governed by smart contracts.
- 3 Supply Chain Management.
- 4 Gaming: Games like Cryptokitties
- 5 Tokenization of Assets

→ Advantages:

- 1 Decentralization: Ethereum eliminates the need for a central authority.
- 2 Security: Transaction and data stored on Ethereum are immutable and tamper-proof.

3 Automation: Smart Contracts allow for the automation of transaction and processes.

4 Scalability and Efficiency: Ethereum 2.0's Consensus mechanism is increased Scalability and reduced energy consumption.

5 Innovation Hub

* Solidity:

=> Solidity is a high-level programming language specifically designed for writing smart contracts in Ethereum blockchain.

It is used to create contracts that control the behavior of accounts and manage decentralized application.

Solidity is designed to run on the Ethereum Virtual Machine.

The EVM executes smart contracts which written in Solidity.

Solidity's syntax is similar to popular programming languages like Javascript, Python and C++

Solidity is a statically typed language meaning variables must be defined with its data types

Solidity supports reusable libraries, supports contract inheritance etc.

-> Features of Solidity:

- 1 Libraries: Allows the creation of libraries
- 2 Contracts
- 3 Inheritance
- 4 Custom Data Types
- 5 Function Overloading
- 6 Interfaces and Abstract Contracts.

-> Uses of Solidity:

- 1 Building Decentralized Applications
- 2 Decentralized Finance App.
- 3 Provides Automation
- 4 To Provide Global Accessibility
- 5 Decentralized Governance

* Ethereum Virtual Machine:

=> The EVM serves as the runtime environment for executing smart contract on the Ethereum blockchain.

It ensures that smart contracts can run as intended across all nodes in the network.

EVM operates in a Sandboxed environment which means it is completely isolated from the host machine and underlying system.

The EVM can solve any computational problem given enough time and resources.

EVM enables developers to create applications that are not controlled by single authority.

In the EVM, scripts refer to algorithm that dictate the behavior of smart contract.

The EVM simplifies the process of creating new token on the Ethereum blockchain.

To interact with the EVM, developers and users must have access to an Ethereum network node.

EVM ensures the integrity of the blockchain by validating and executing every transaction.

-> Features of EVM:

1 Global Decentralized Computation

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- 2 Provides Interperability
- 3 Efficient Smart Contract Execution
- 4 Security and Isolation
- 5 Gas Mechanism for Cost Efficiency
- 6 Access to Ethereum Ecosystem
- 7 Scalable and Flexible
- 8 Foundation for Inno Innovation