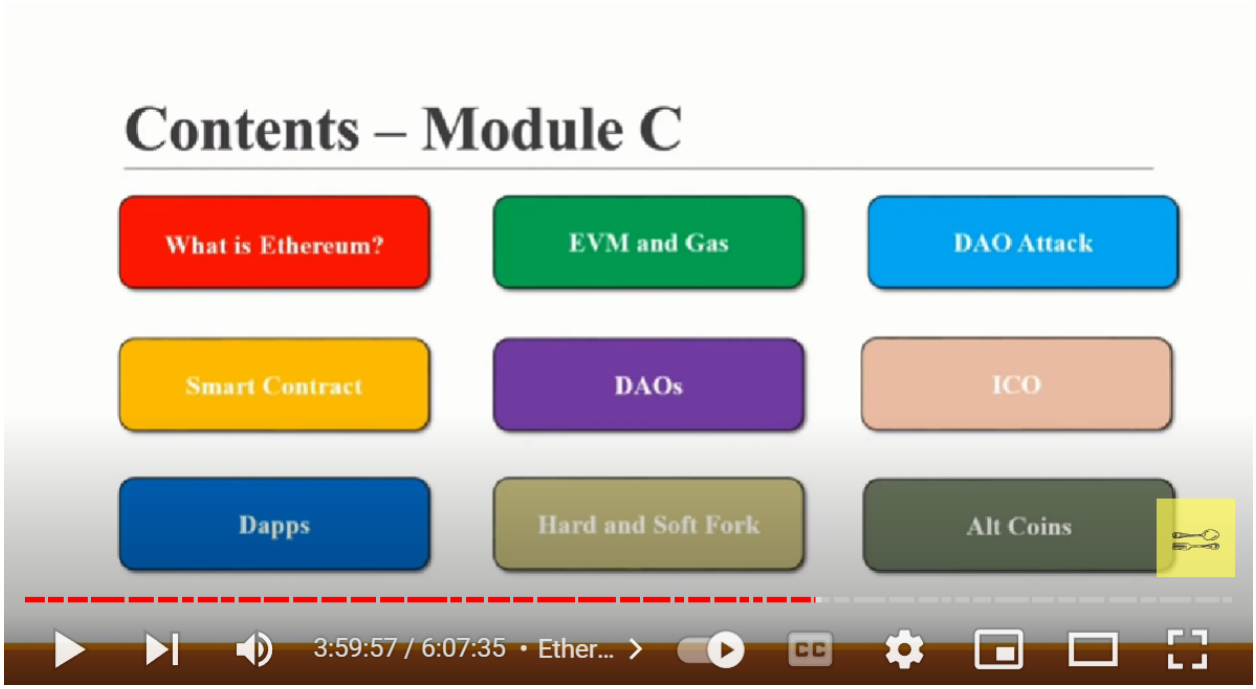
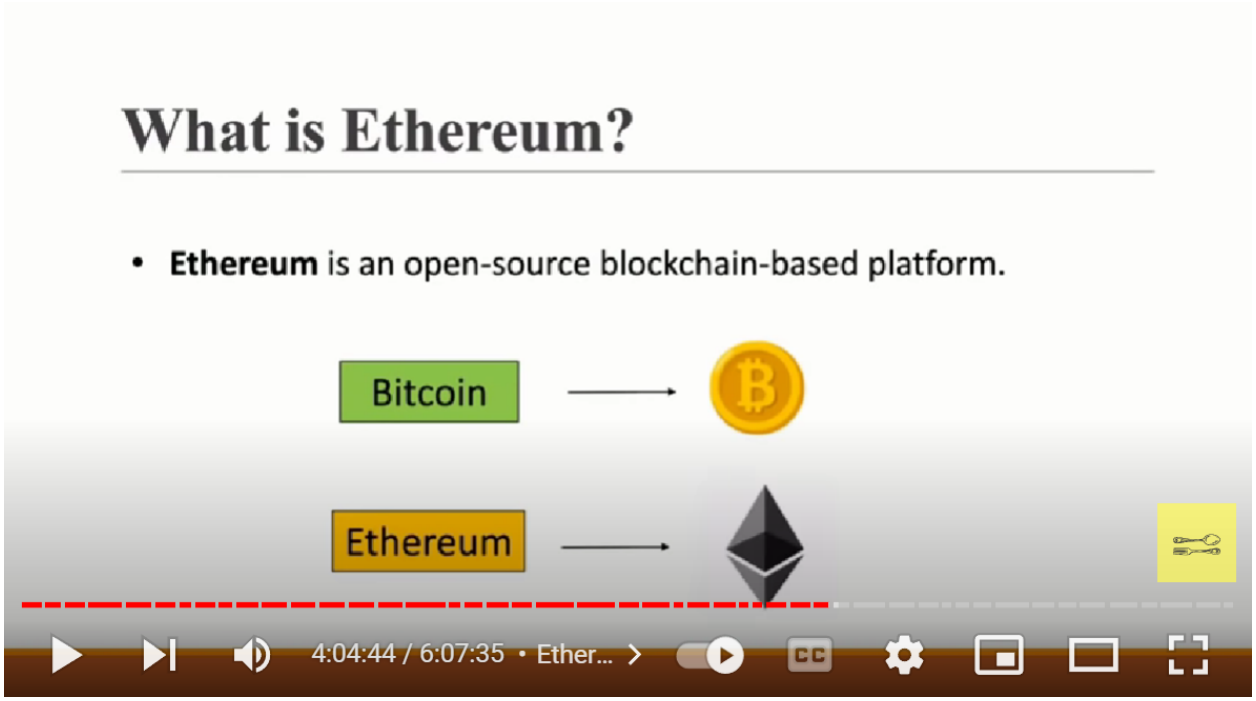
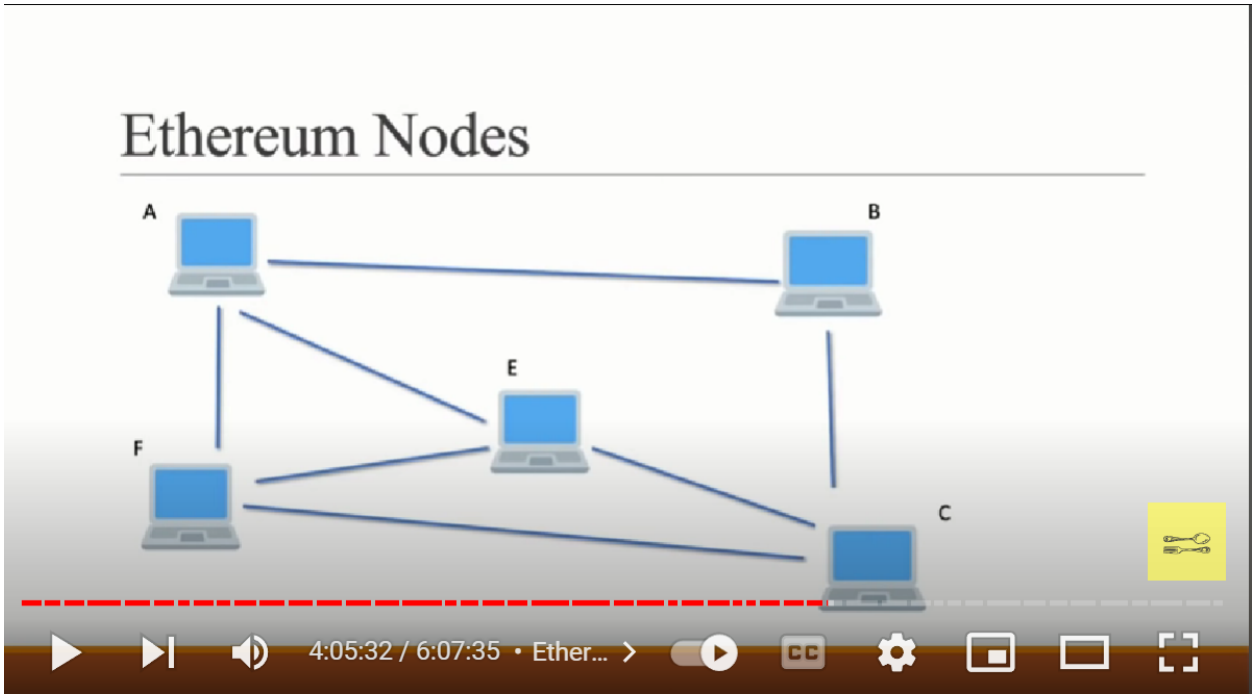
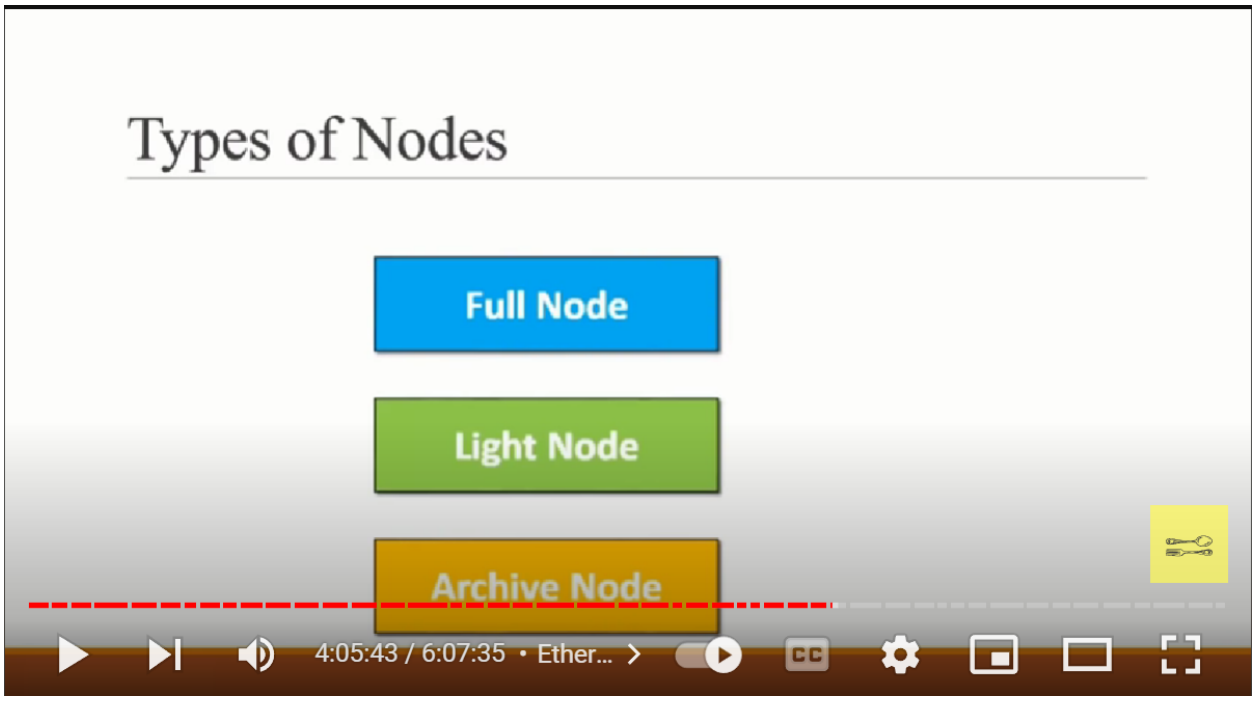
BLOCKCHAIN_MODULE-C






Ethereum Nodes
A
B
E
F
C
4:05:32 / 6:07:35 • Ether...


Types of Nodes
Full Node
Light Node
Archive Node
4:05:43 / 6:07:35 • Ether...

Full Node

- Locally stores a copy of the entire blockchain.
- Verifies and validates all the block.

Please Like and Subscribe.

4:07:30 / 6:07:35 • Ether...

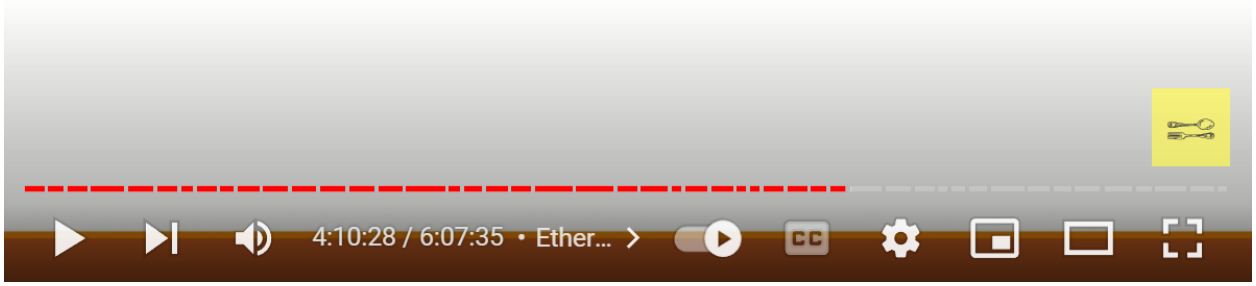
Light Node

- Stores only the block header. Depends on full node.
- For low capacity devices which cannot afford to store the gigabytes of data.

4:09:14 / 6:07:35 • Ether...

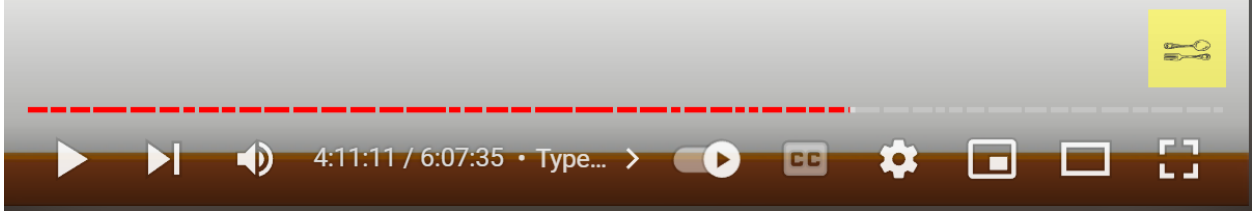
Archive Node

- Stores everything kept in the full node and built an archive of historical data.
- Requires terabytes of diskspace.

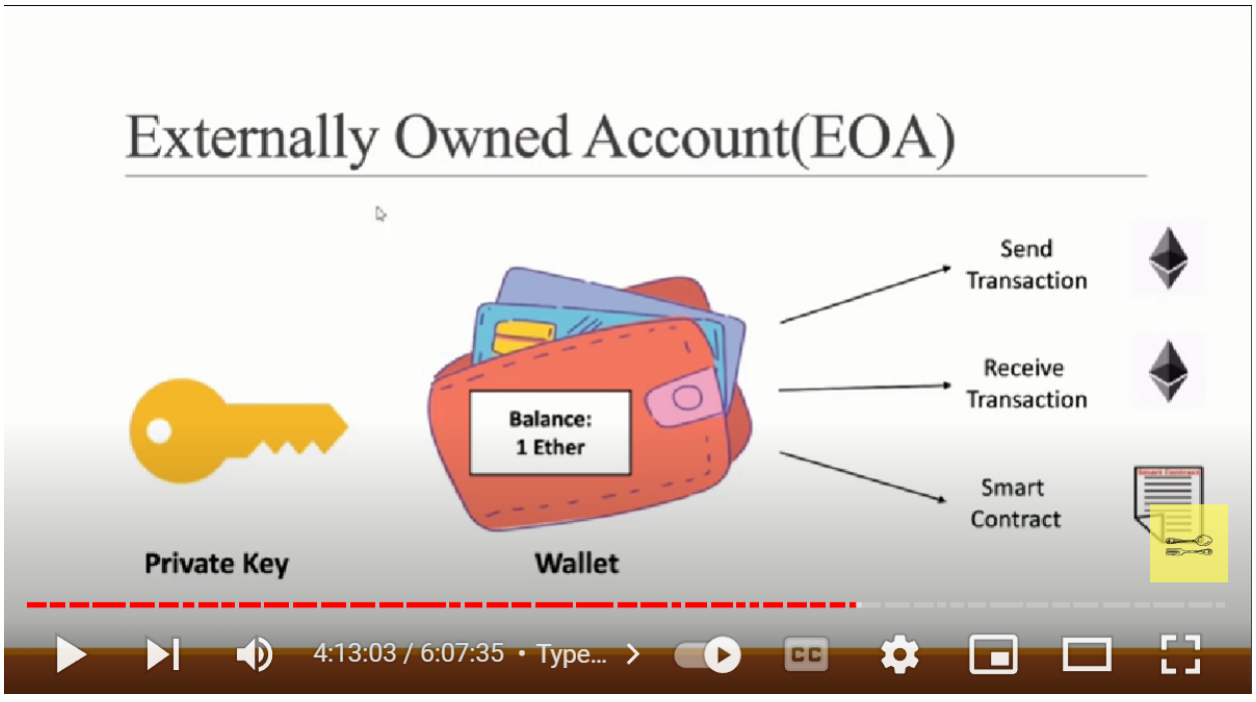


Ethereum Accounts

- An Ethereum account is an entity with an ether (ETH) balance that can send or receive transactions on Ethereum.

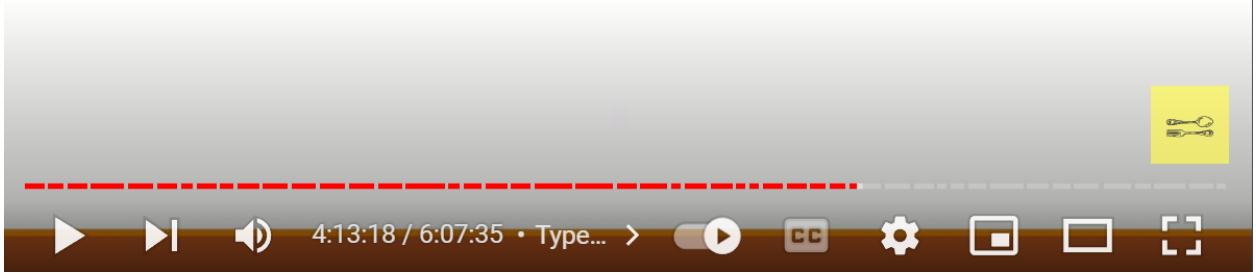



Types of Ethereum Accounts
Externally Owned Account(EOA)
Contract Account(CA)
4:11:23 / 6:07:35 • Type...

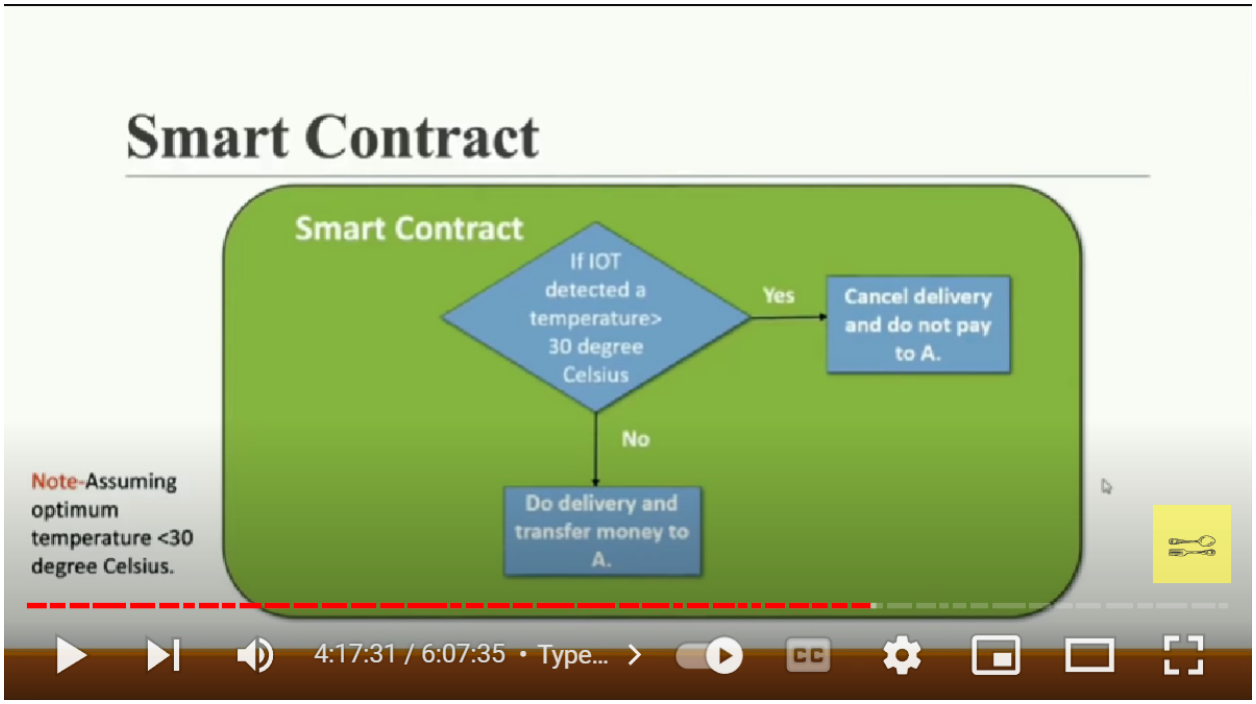

Externally Owned Account(EOA)
Send Transaction
Receive Transaction
Smart Contract
Balance: 1 Ether
Private Key
Wallet
4:13:03 / 6:07:35 • Type...

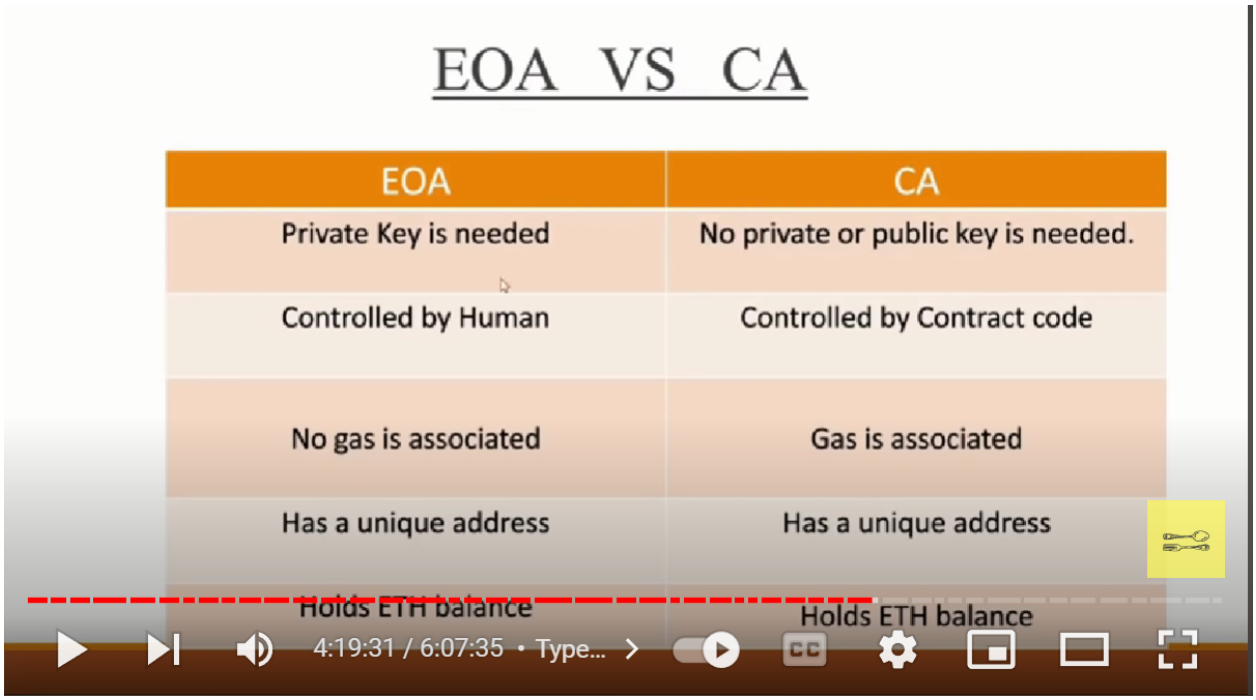
Contract Account (CA)

- Controlled by contract code.

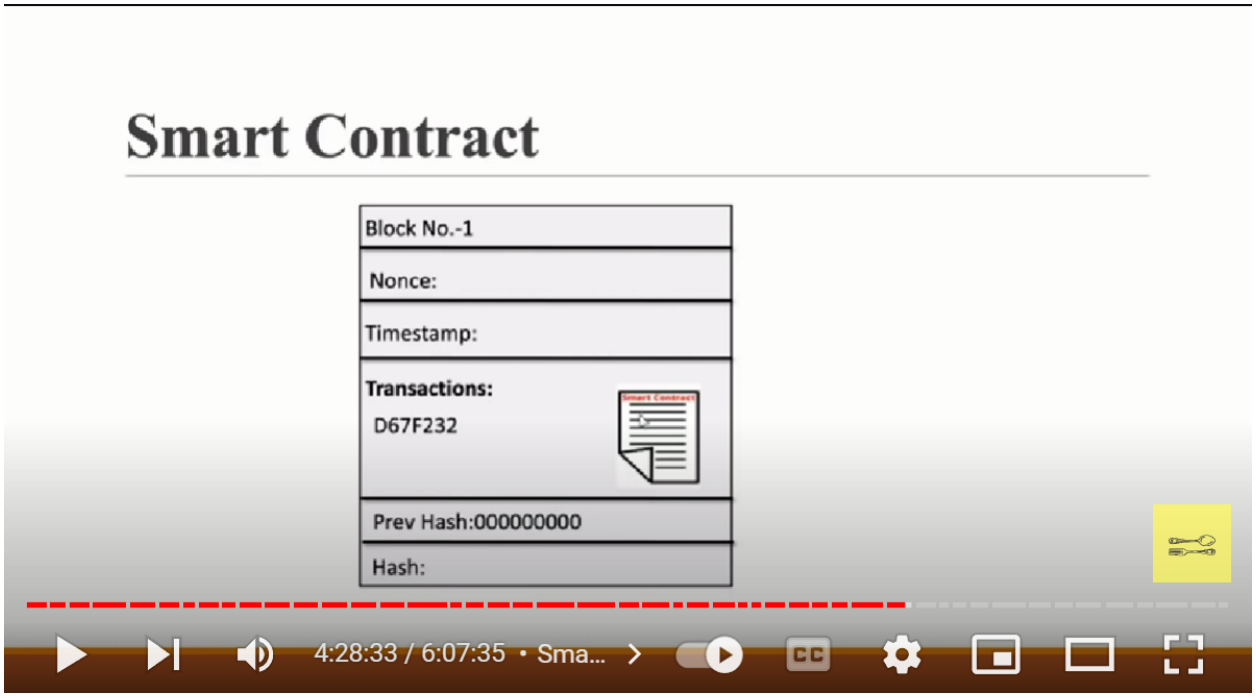


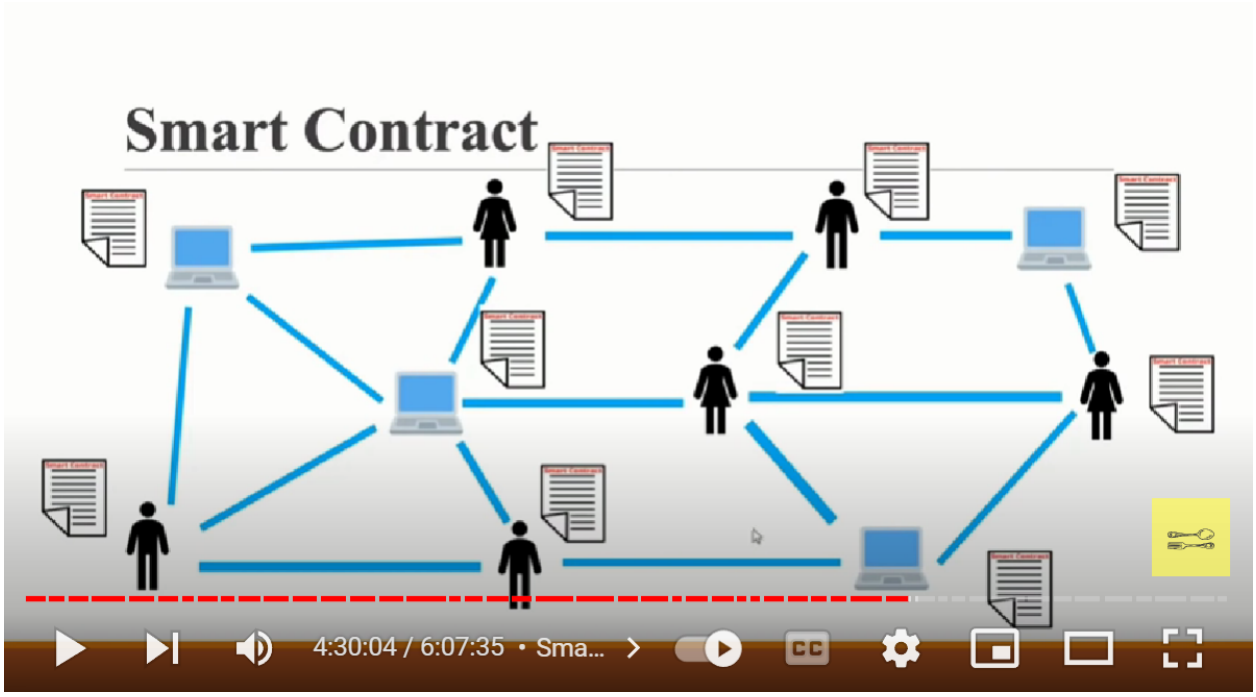
Smart Contract


Smart Contract
Smart Contract
If IOT detected a temperature> 30 degree Celsius
Yes
Cancel delivery and do not pay to A.
No
Do delivery and transfer money to A.
Note-Assuming optimum temperature <30 degree Celsius.
4:17:31 / 6:07:35 • Type...

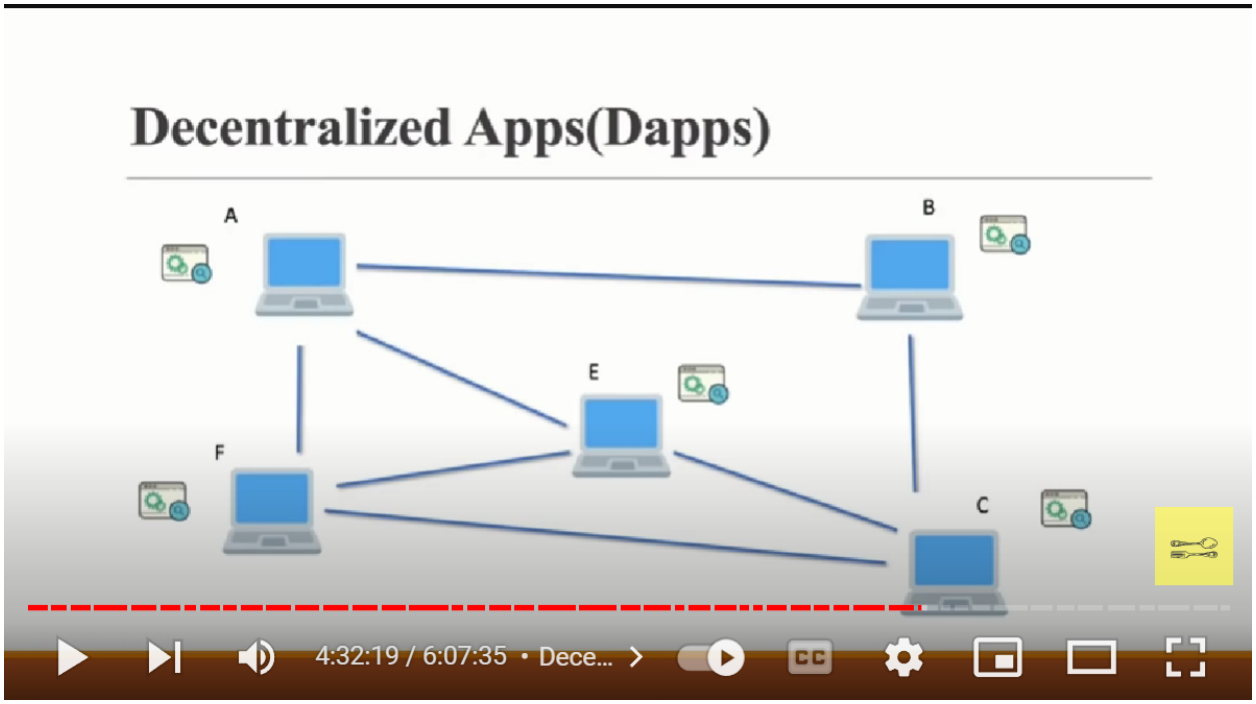

EOA VS CA
EOA
CA
Private Key is needed
No private or public key is needed.
Controlled by Human
Controlled by Contract code
No gas is associated
Gas is associated
Has a unique address
Has a unique address
Holds ETH balance
Holds ETH balance
4:19:31 / 6:07:35 • Type...

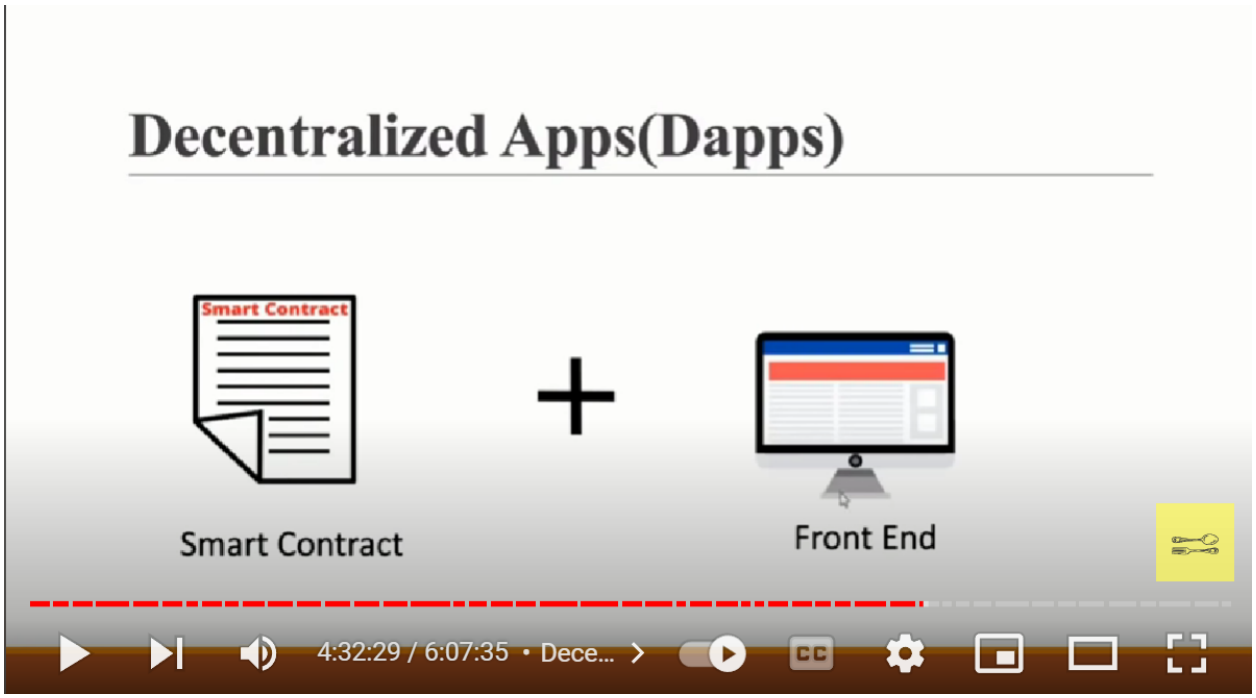

Smart Contract
Bitcoin Script
Not Turing Complete
Solidity
Turing Complete
4:25:03 / 6:07:35 • Sma...

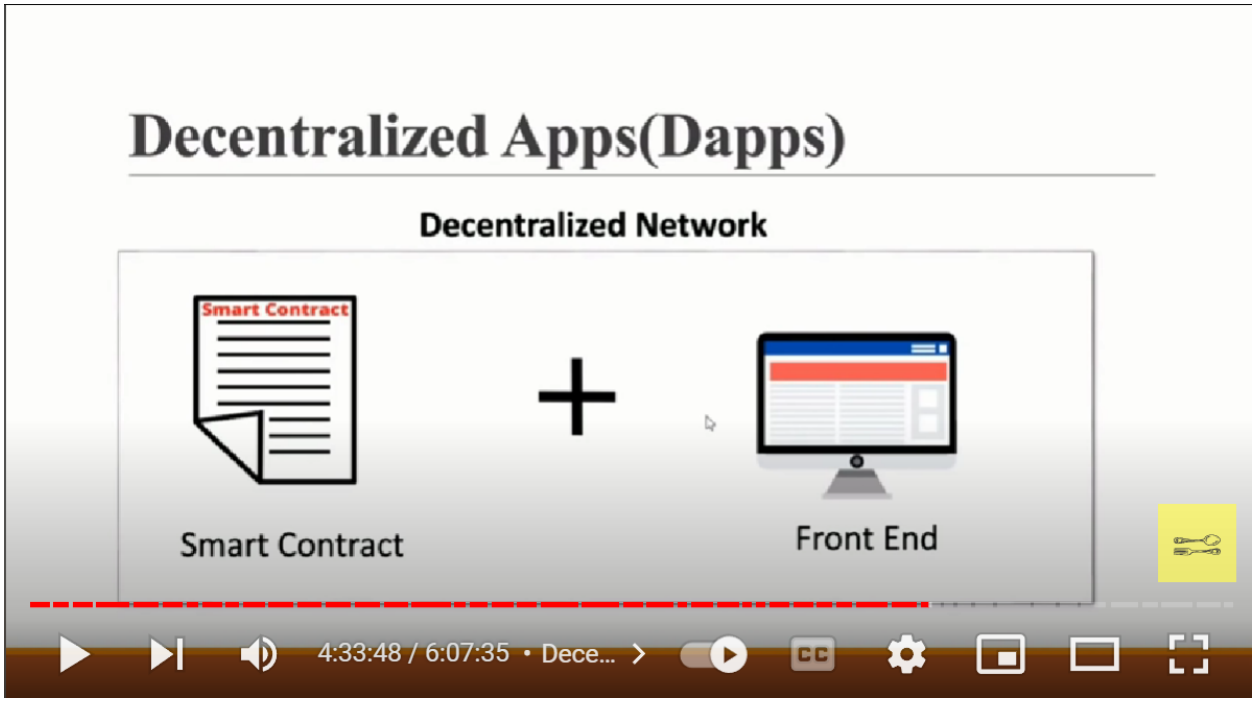

Smart Contract
Block No.-1
Nonce:
Timestamp:
Transactions:
D67F232
Prev Hash:000000000
Hash:
4:28:33 / 6:07:35 • Sma...

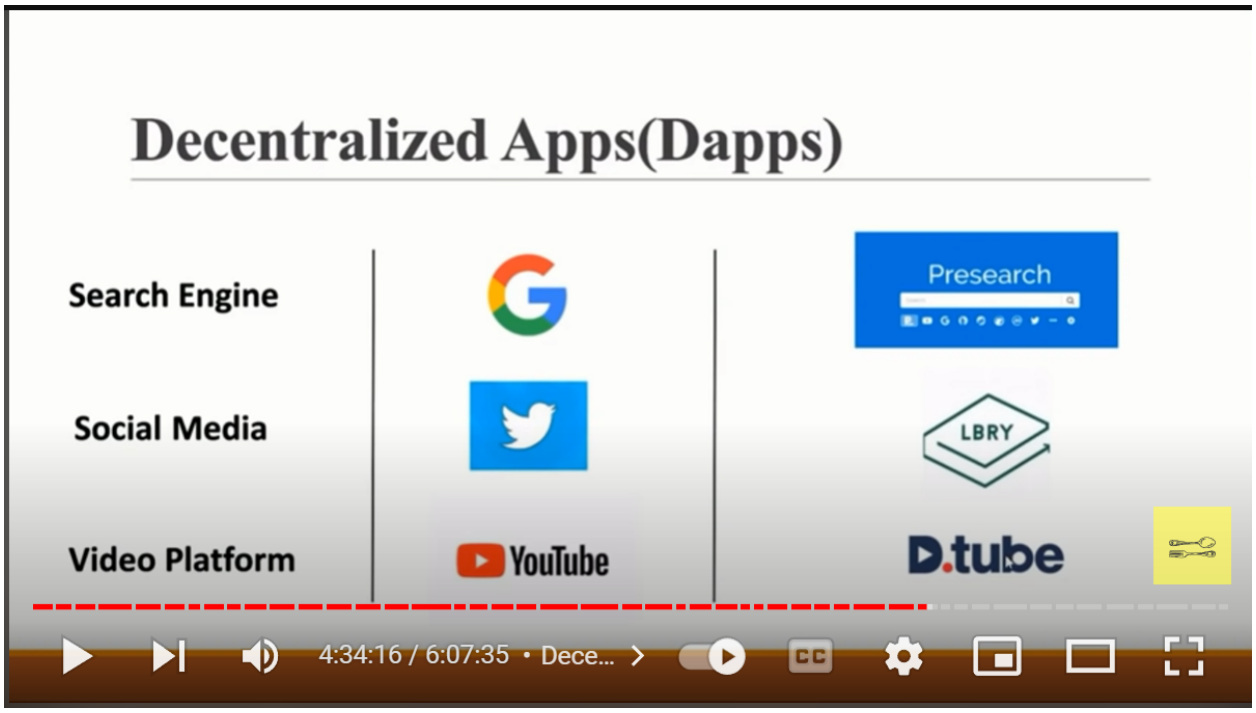

Smart Contract
4:30:04 / 6:07:35 • Sma...


Smart Contract
Each node has the following-:
• Current state of all smart contracts.
• History of both transaction and smart contract.
4:30:29 / 6:07:35 • Sma...


Decentralized Apps(Dapps)
A
B
E
F
C
4:32:19 / 6:07:35 • Dece...


Decentralized Apps(Dapps)
Smart Contract
Smart Contract
Front End
4:32:29 / 6:07:35 • Dece...

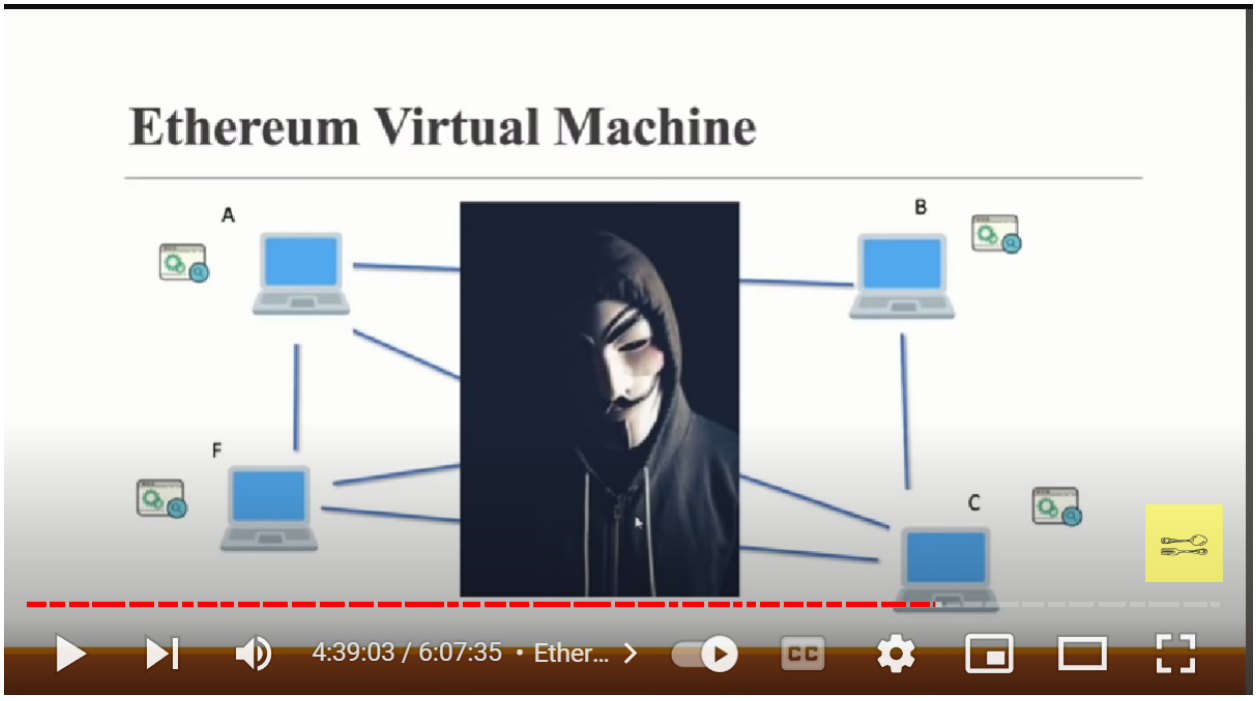

Decentralized Apps(Dapps)
Decentralized Network
Smart Contract
Smart Contract
Front End
4:33:48 / 6:07:35 • Dece...

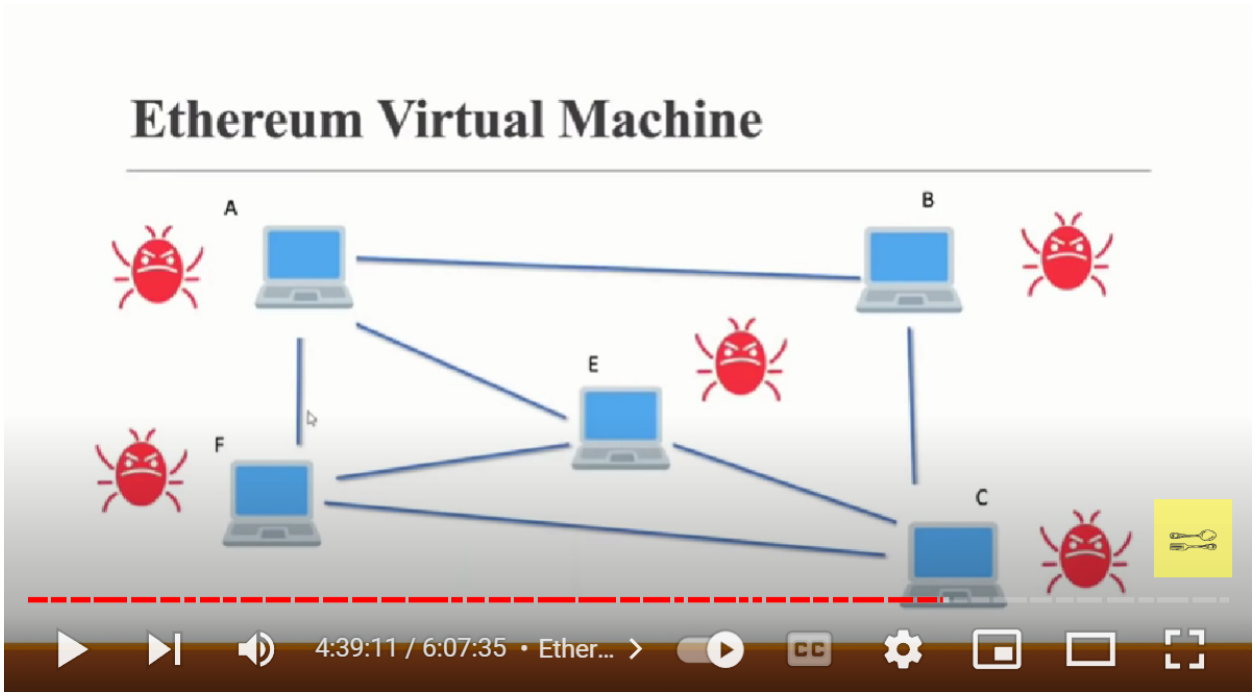

Decentralized Apps(Dapps)
Search Engine
Social Media
Video Platform
YouTube
Presearch
LBRY
D.tube
4:34:16 / 6:07:35 • Dece...

Decentralized Apps(Dapps)

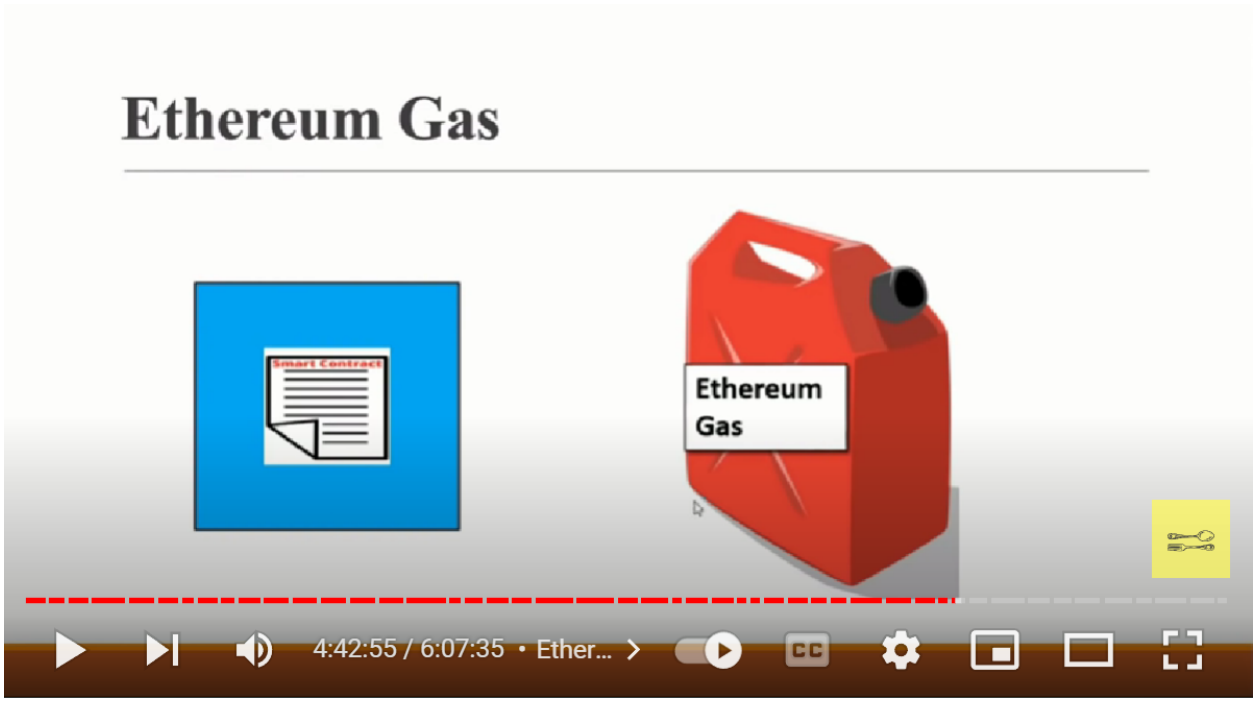
Centralized Apps	Decentralized Apps
Not Trustworthy	Trustworthy
Censorship	No censorship
You pay	They pay
Go down	Can never go down

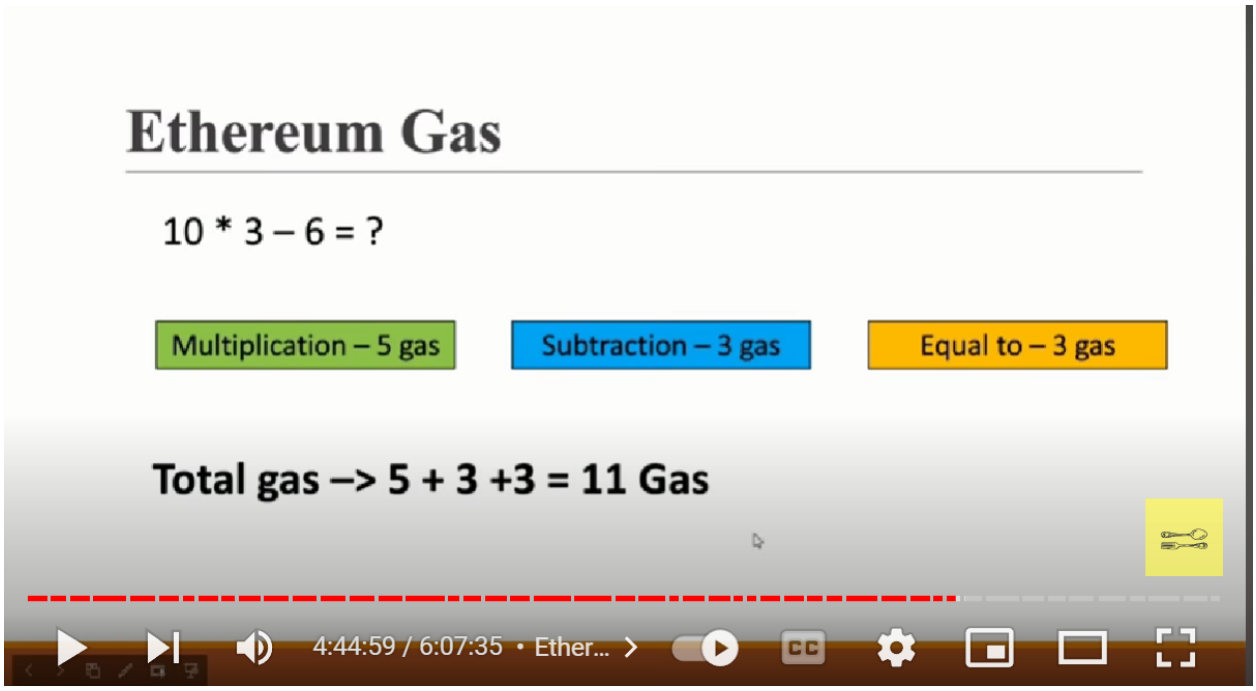
Ethereum Virtual Machine




Ethereum Virtual Machine
A
B
E
F
C
4:39:11 / 6:07:35 • Ether...


Ethereum Virtual Machine
EVM
4:41:34 / 6:07:35 • Ether...

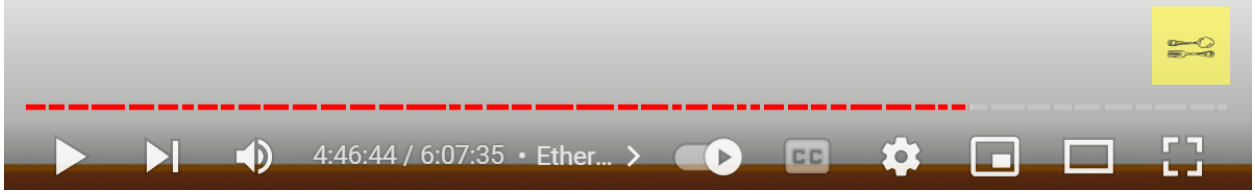

Ethereum Gas
Smart Contract
Ethereum Gas
4:42:55 / 6:07:35 • Ether...


Ethereum Gas
10 * 3 – 6 = ?
Multiplication – 5 gas
Subtraction – 3 gas
Equal to – 3 gas
Total gas –> 5 + 3 +3 = 11 Gas
4:44:59 / 6:07:35 • Ether...

Ethereum Gas

Some important points to note -

- Any transaction that modifies the blockchain costs gas.
- The user that generated the transaction pays for the gas.



Gas Price

Petrol – 10 liters

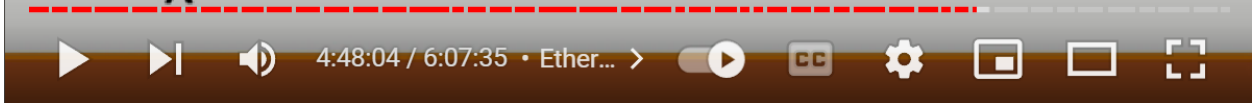
Total price= ?

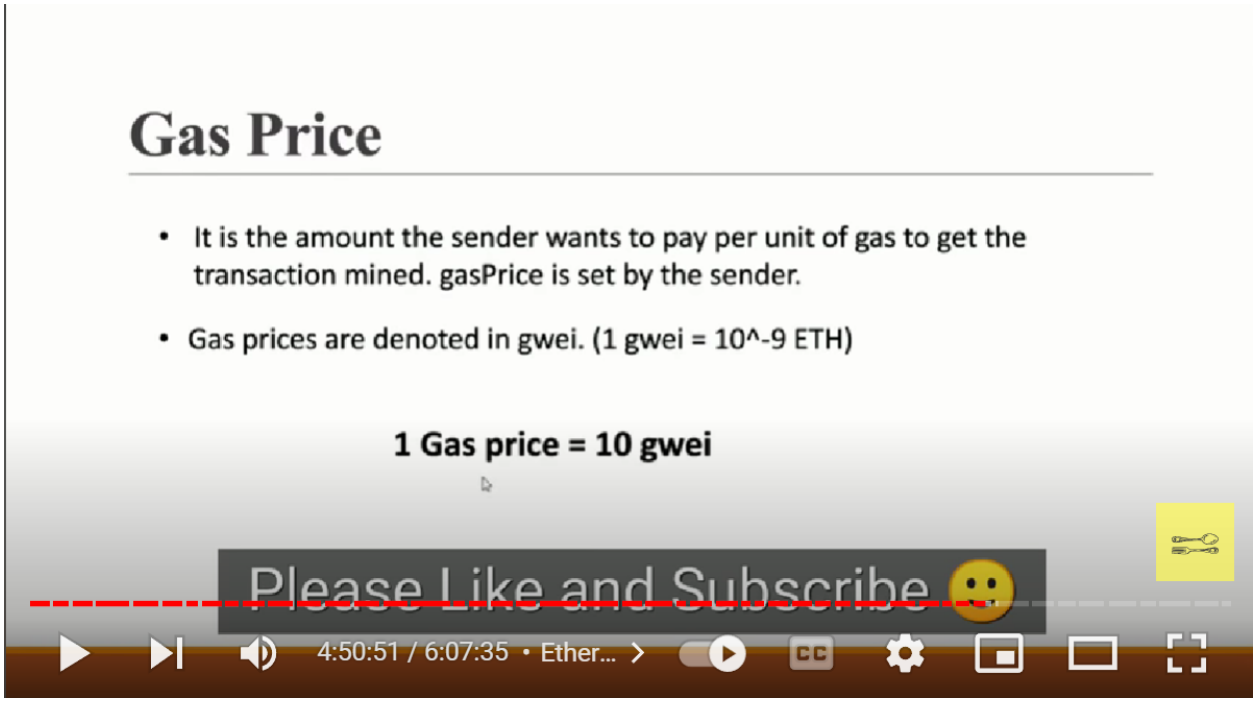
1 liter – Rs.5

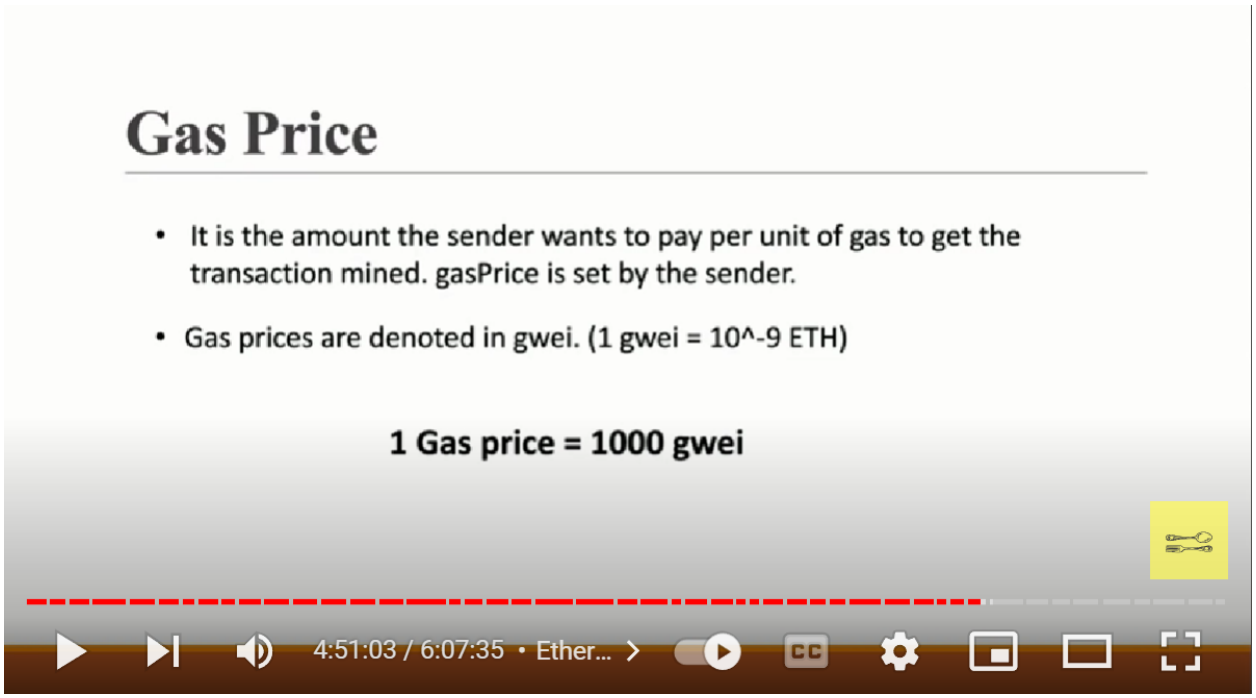
Total price= 10x5=
Rs. 50

A

B

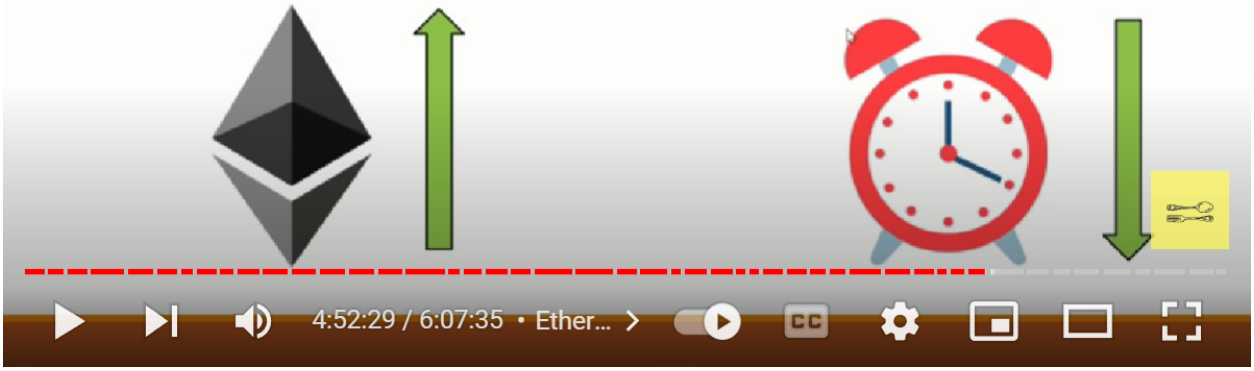



Gas Price
It is the amount the sender wants to pay per unit of gas to get the transaction mined. gasPrice is set by the sender.
Gas prices are denoted in gwei. (1 gwei = 10^-9 ETH)
1 Gas price = 10 gwei
Please Like and Subscribe
4:50:51 / 6:07:35 • Ether...


Gas Price
It is the amount the sender wants to pay per unit of gas to get the transaction mined. gasPrice is set by the sender.
Gas prices are denoted in gwei. (1 gwei = 10^-9 ETH)
1 Gas price = 1000 gwei
4:51:03 / 6:07:35 • Ether...

Gas Price

- **The higher the gas price the faster the transaction will be mined.** It just like the transaction in Bitcoin.

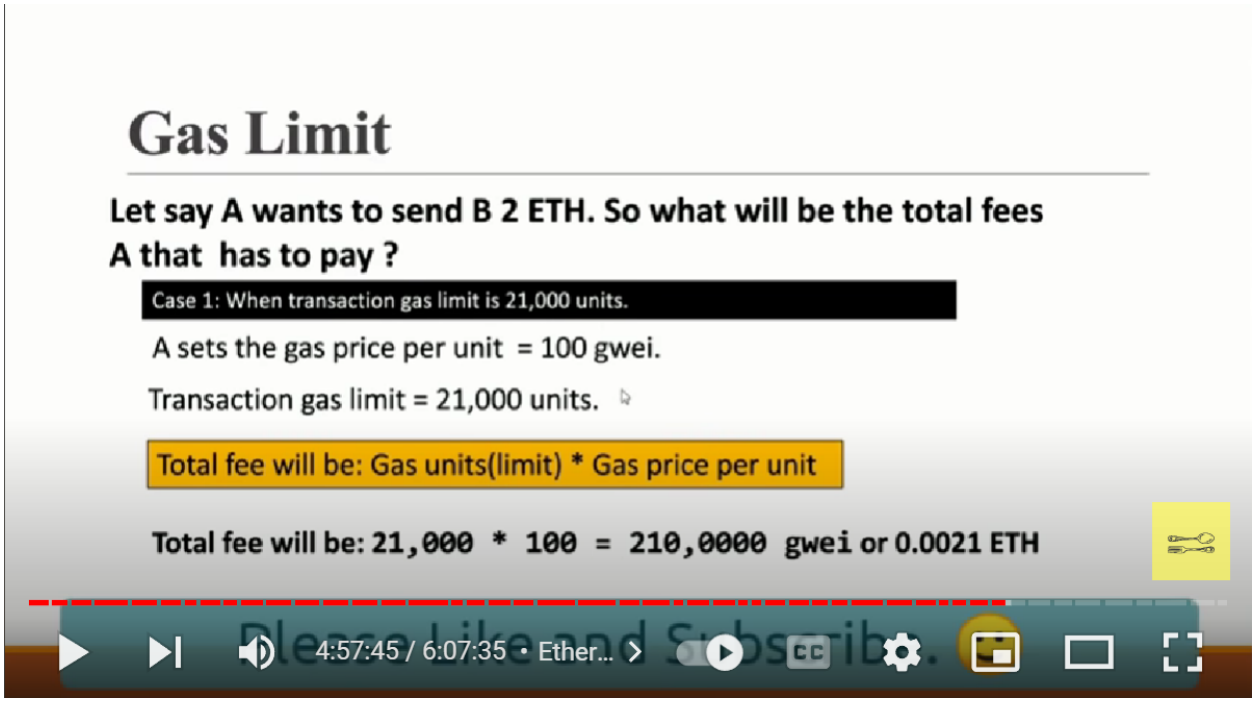


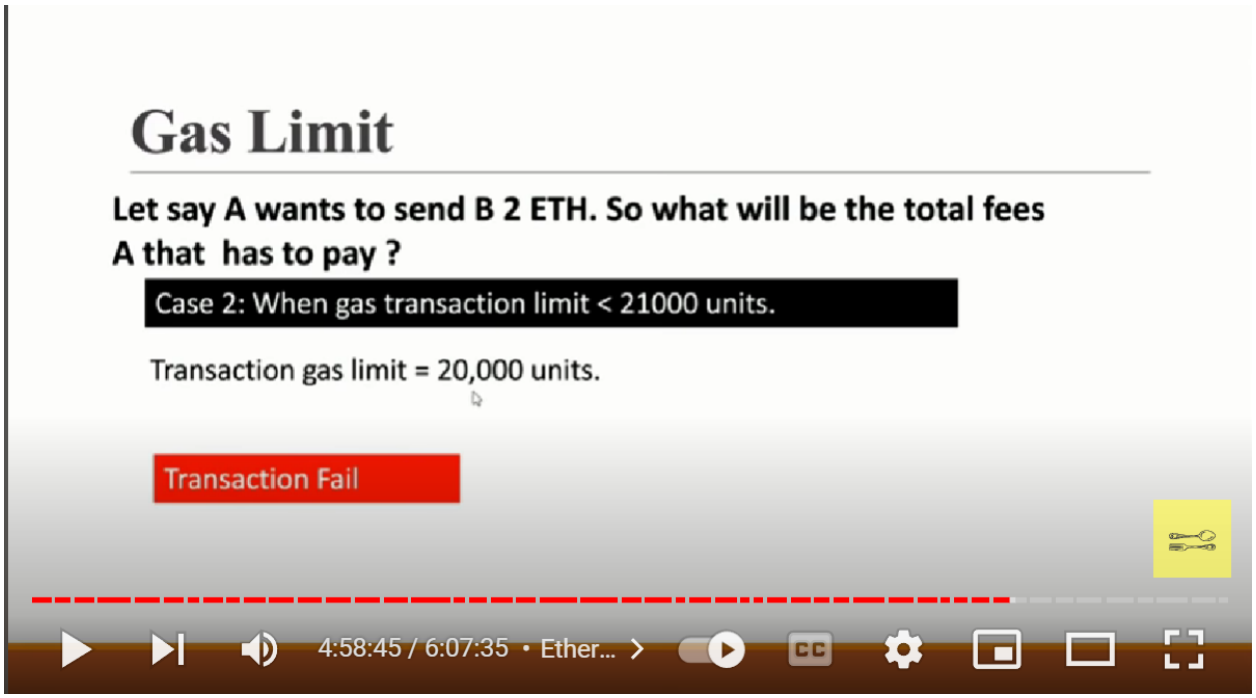
4:52:29 / 6:07:35 • Ether... >

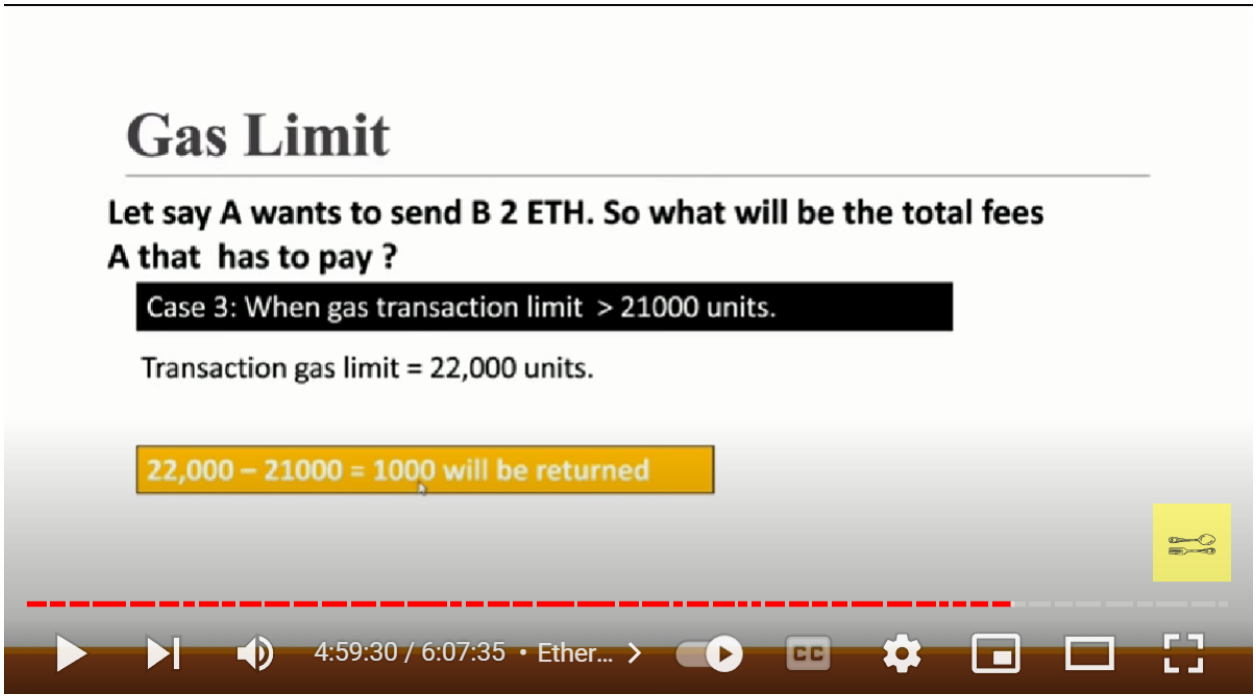
Gas Limit

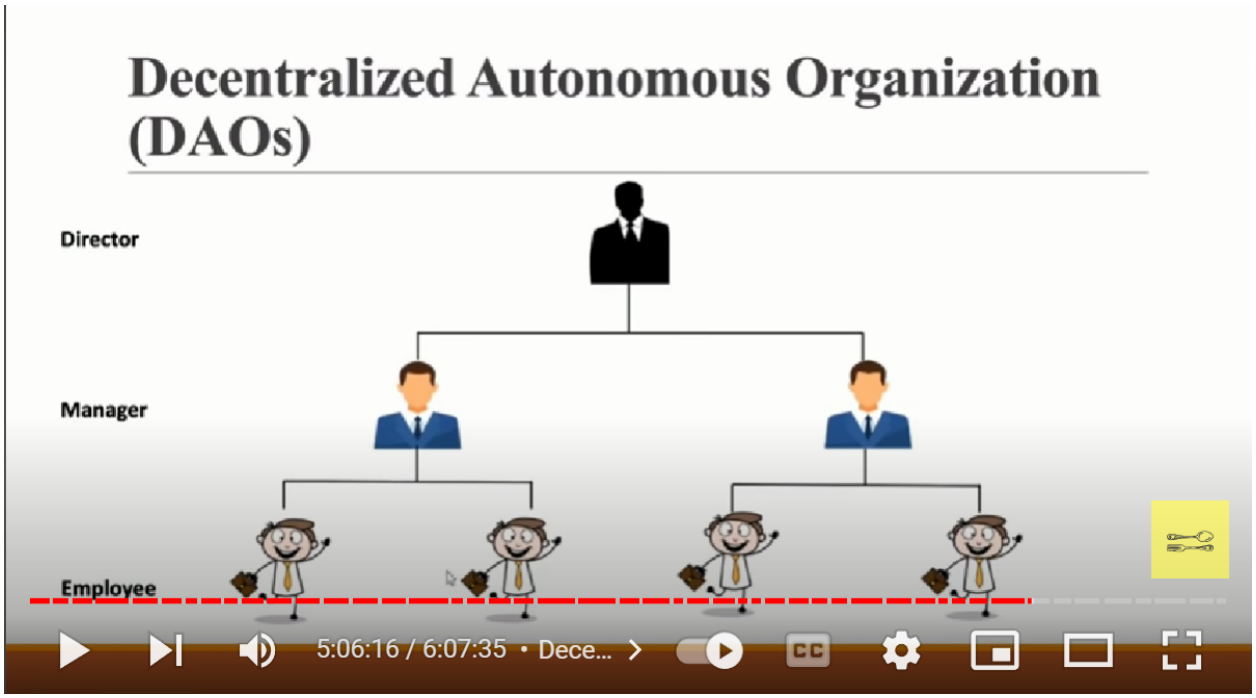
- It is the maximum gas the transaction can consume.
- Set by the sender.

4:54:27 / 6:07:35 • Ether... >

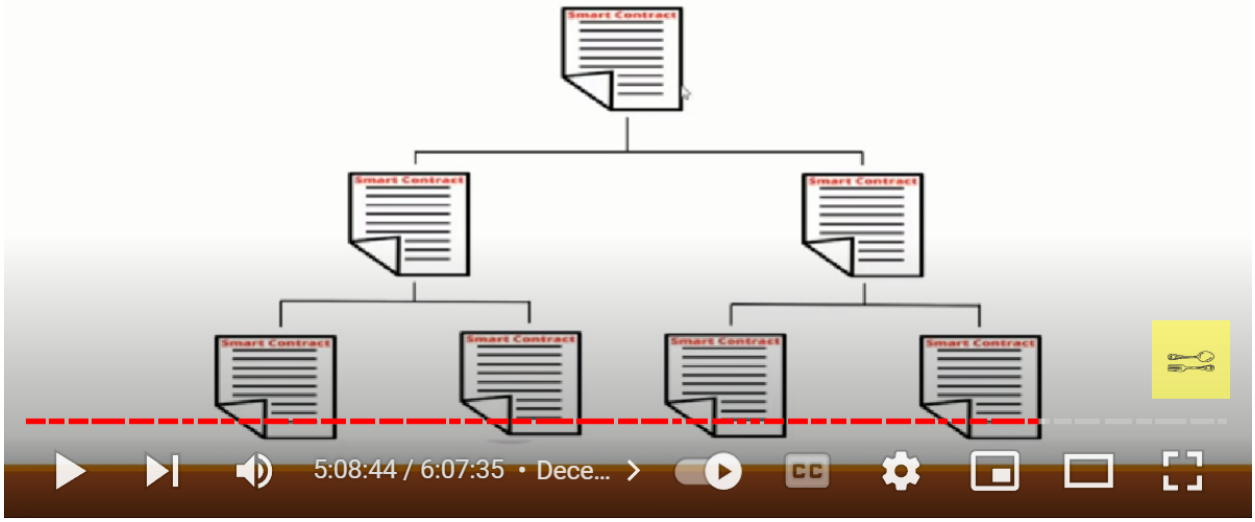

Gas Limit
Let say A wants to send B 2 ETH. So what will be the total fees A that has to pay ?
Case 1: When transaction gas limit is 21,000 units.
A sets the gas price per unit = 100 gwei.
Transaction gas limit = 21,000 units.
Total fee will be: Gas units(limit) * Gas price per unit
Total fee will be: 21,000 * 100 = 210,0000 gwei or 0.0021 ETH
4:57:45 / 6:07:35 • Ether...


Gas Limit
Let say A wants to send B 2 ETH. So what will be the total fees A that has to pay ?
Case 2: When gas transaction limit < 21000 units.
Transaction gas limit = 20,000 units.
Transaction Fail
4:58:45 / 6:07:35 • Ether...


Gas Limit
Let say A wants to send B 2 ETH. So what will be the total fees A that has to pay ?
Case 3: When gas transaction limit > 21000 units.
Transaction gas limit = 22,000 units.
22,000 – 21000 = 1000 will be returned
4:59:30 / 6:07:35 • Ether...


Decentralized Autonomous Organization (DAOs)
Director
Manager
Employee
5:06:16 / 6:07:35 • Dece...

Decentralized Autonomous Organization (DAOs)

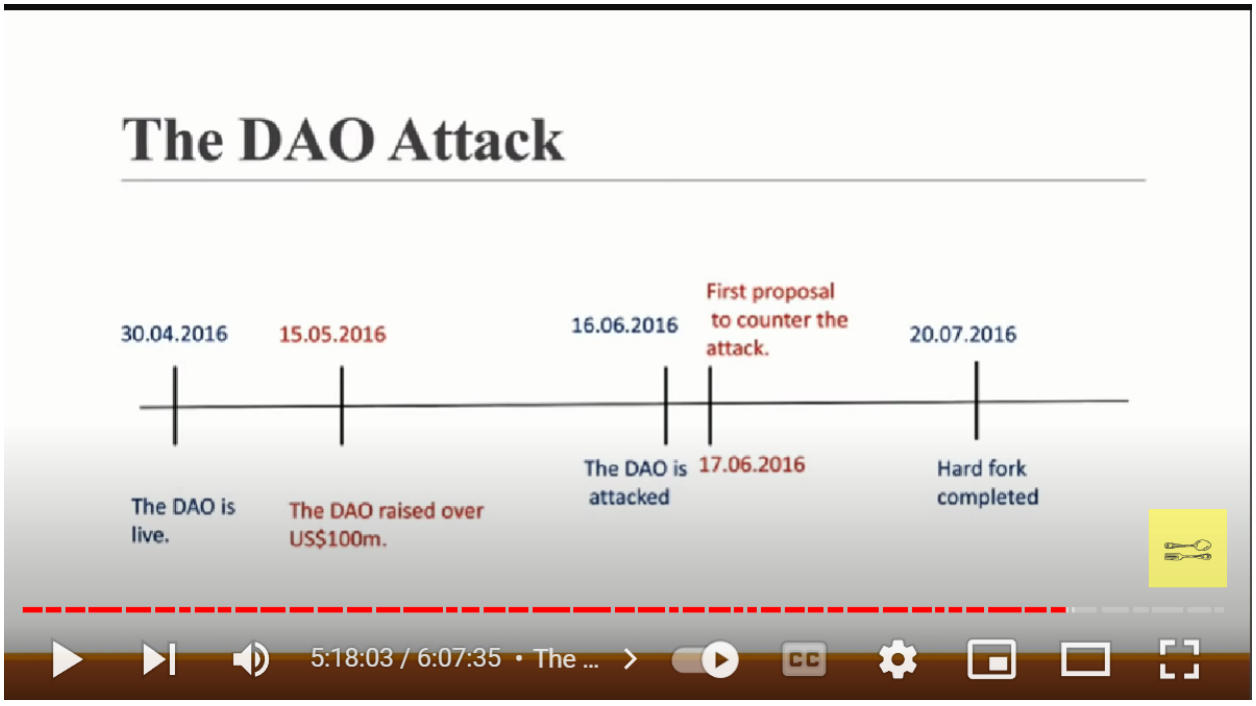


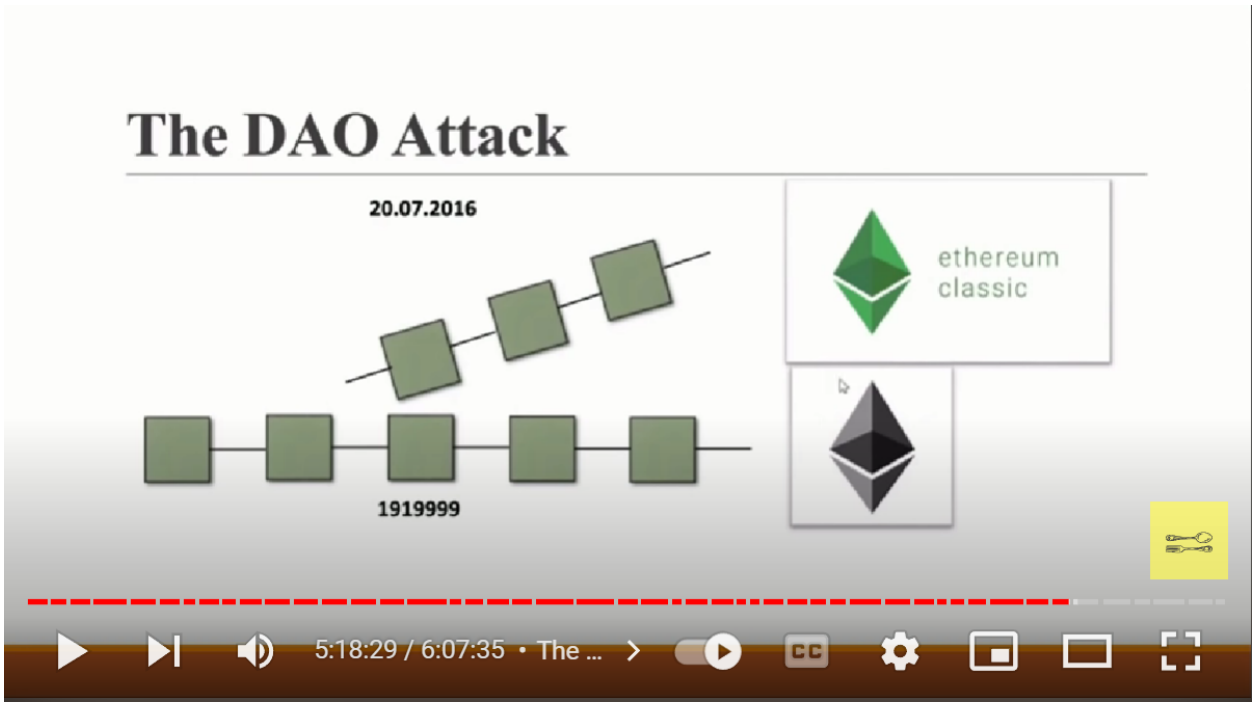
DAO vs Organization

DAO	A traditional organization
Fully democratized.	Usually hierarchical.
Voting required .	Voting may or may not require.
No trusted intermediary to count vote.	Outcome of voting must be handled manually.
Services offered are handled automatically.	Requires human handling, or centrally controlled automation.
All activity is transparent and fully public.	Activity is typically private, and limited to the public.


Decentralized Autonomous Organization (DAOs)
NGO
5:11:23 / 6:07:35 • Dece...

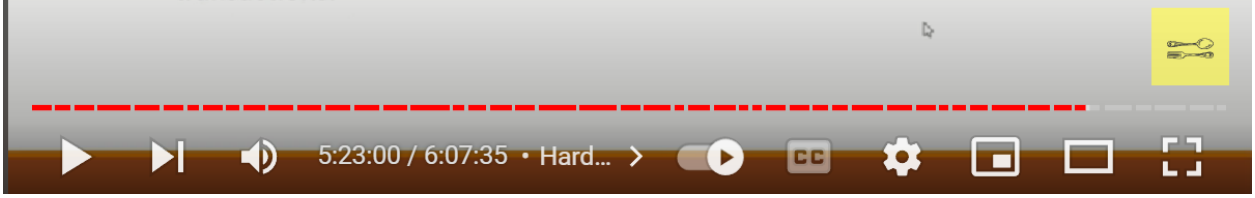

The DAO Attack
The DAO
Give Ether
DAO tokens
Investment Proposal
Vote for it
5:14:10 / 6:07:35 • The ...


The DAO Attack
30.04.2016
15.05.2016
16.06.2016
First proposal to counter the attack.
20.07.2016
The DAO is live.
The DAO raised over US$100m.
The DAO is attacked
17.06.2016
Hard fork completed
5:18:03 / 6:07:35 • The ...

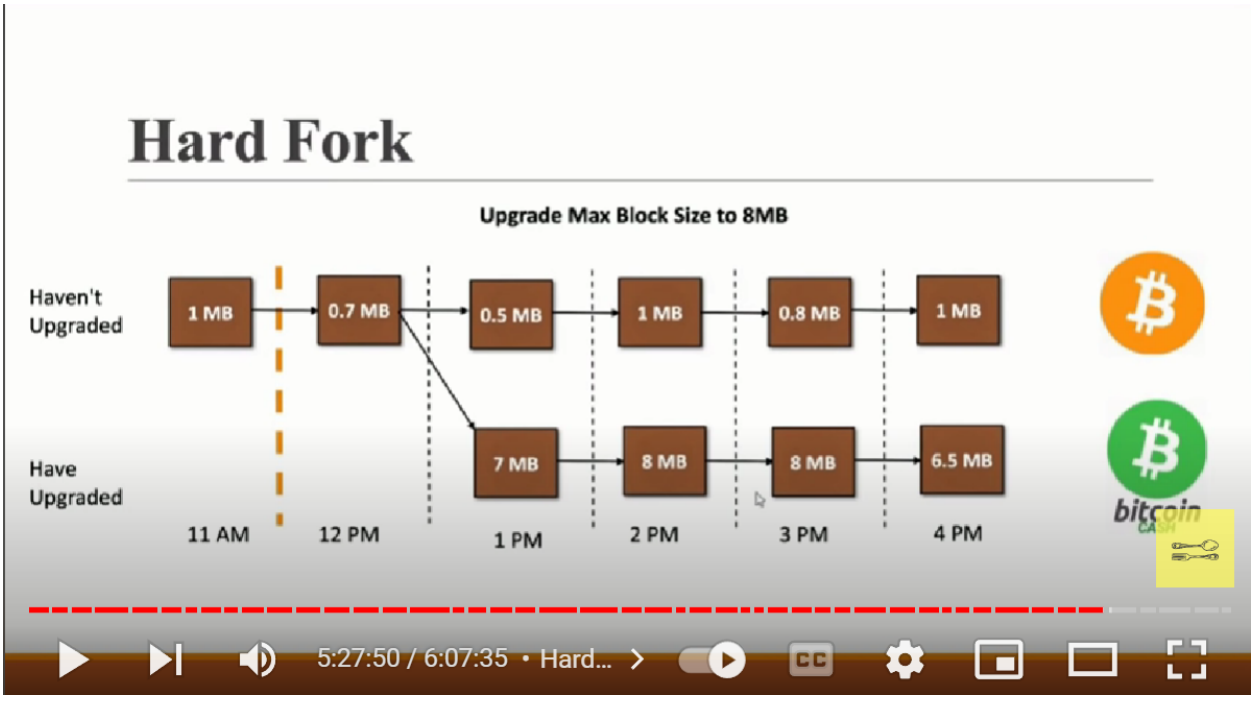

The DAO Attack
20.07.2016
1919999
ethereum classic
5:18:29 / 6:07:35 • The ...

Hard Fork

- During a hard fork, software implementing a protocol and its mining procedures is upgraded.
- Once a user upgrades their software, that version rejects all transactions from older software, effectively creating a new branch of the blockchain.
- However, those users who retain the old software continue to process transactions.

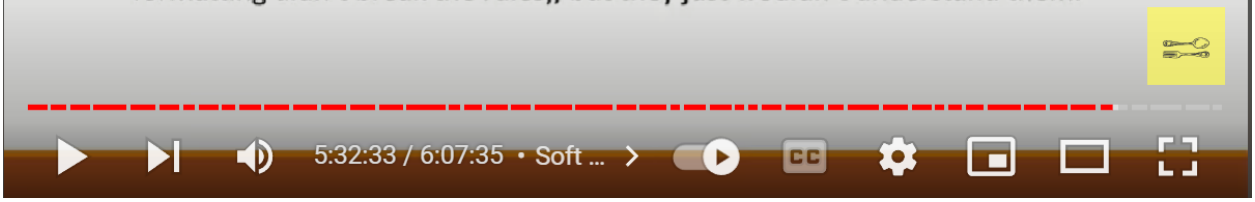


Hard Fork

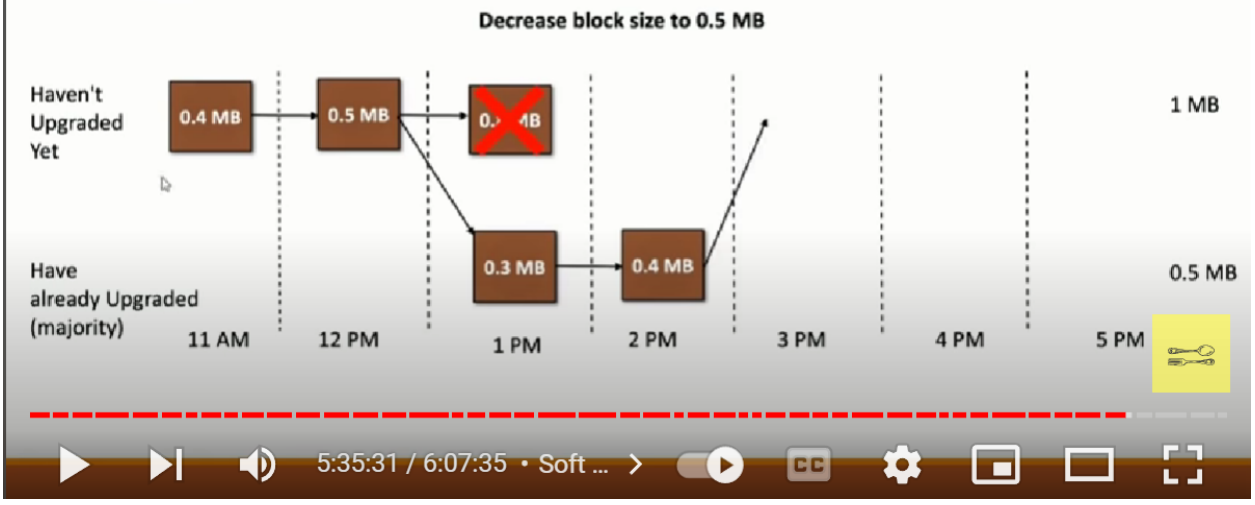


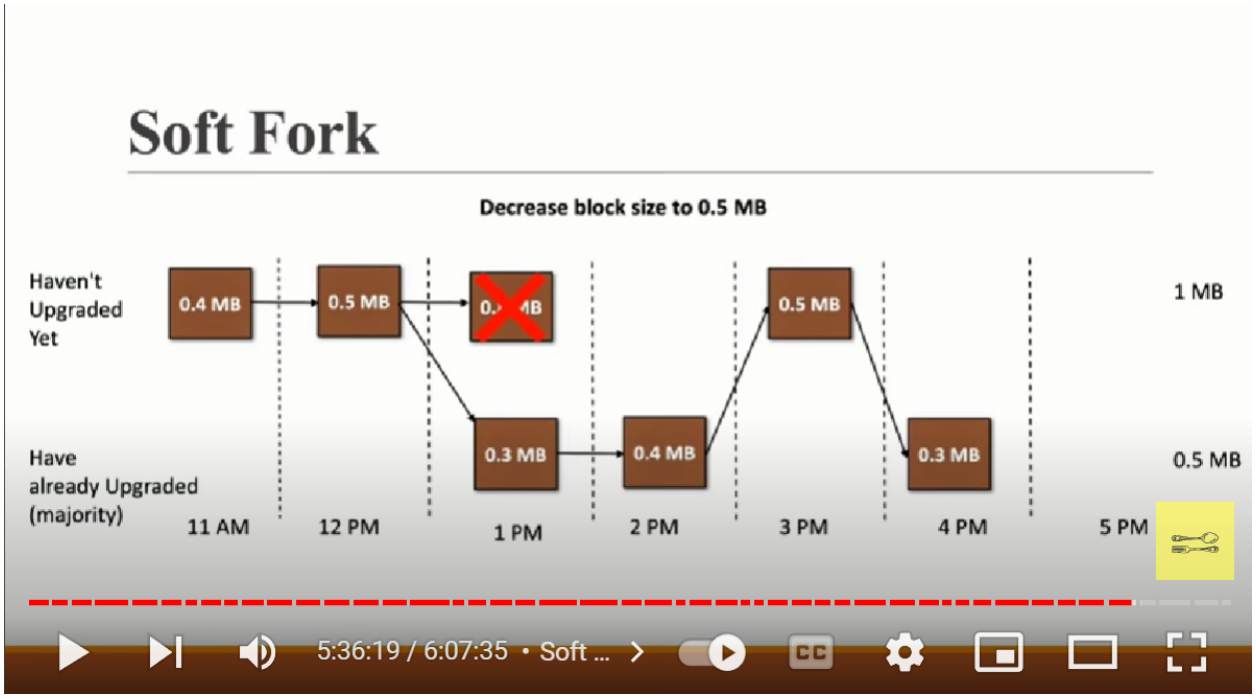
Soft Fork

- Soft forks are a change to the protocol, but the end product remains unchanged.
- A soft fork is a *backward-compatible* upgrade, meaning that the upgraded nodes can still communicate with the non-upgraded ones.
- Old nodes(not upgraded nodes) could still validate blocks and transactions (the formatting didn't break the rules), but they just wouldn't understand them.



Soft Fork




Soft Fork
Decrease block size to 0.5 MB
Haven't Upgraded Yet
Have already Upgraded (majority)
0.4 MB
0.5 MB
0.3 MB
0.4 MB
0.5 MB
0.3 MB
1 MB
0.5 MB
11 AM
12 PM
1 PM
2 PM
3 PM
4 PM
5 PM
5:36:19 / 6:07:35 • Soft ...


Initial Coin Offering (ICO)
Initial Capital
Shares
Services & Product
Profit
Cash
Shares
5:40:27 / 6:07:35 • Initia...


Initial Coin Offering (ICO)
Initial Capital
Shares
Services & Products
Profit
Token
Cash(Bitcoin/Ether)
5:42:29 / 6:07:35 • Initia...


ETH 2.0
Scalability
Security
Sustainibility
5:45:04 / 6:07:35 • Ether...

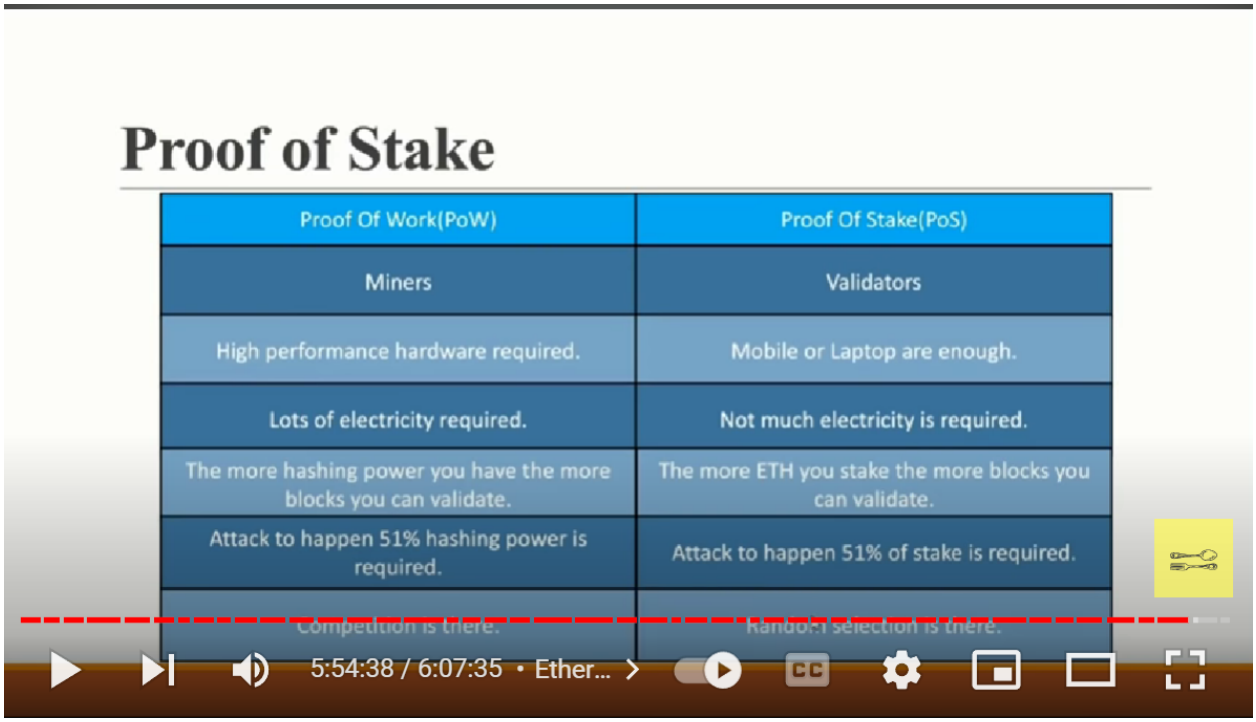
Proof of Stake

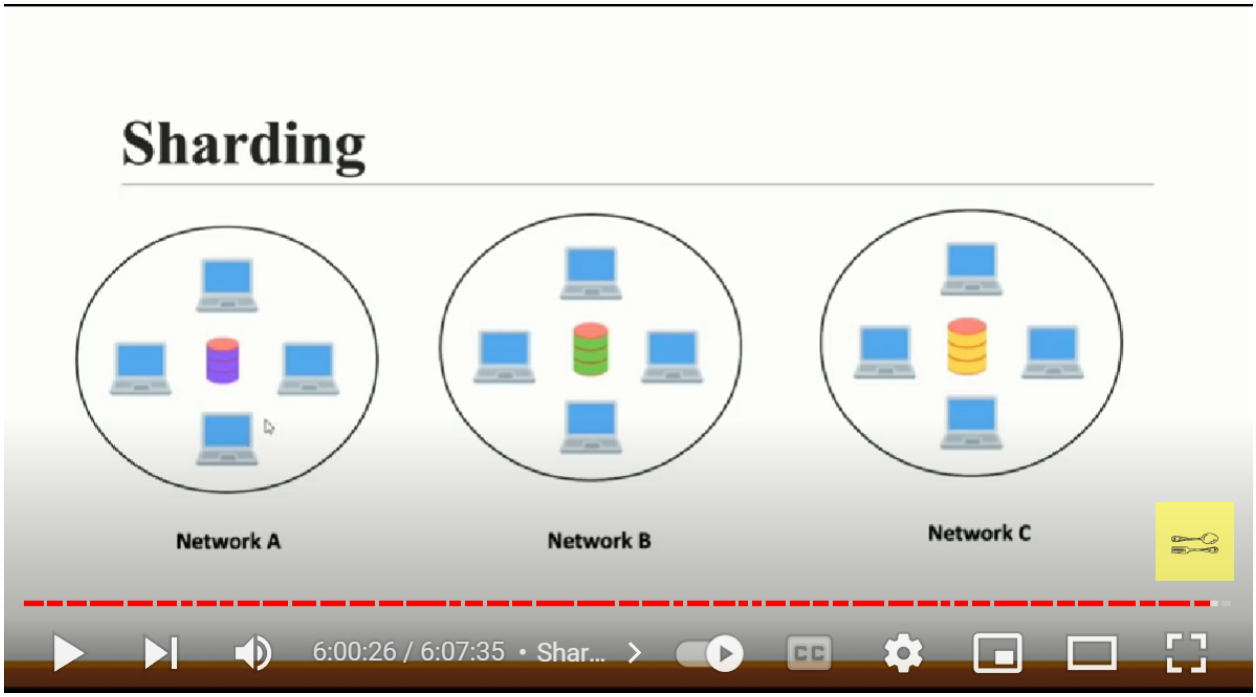
5:48:57 / 6:07:35 • Ether...

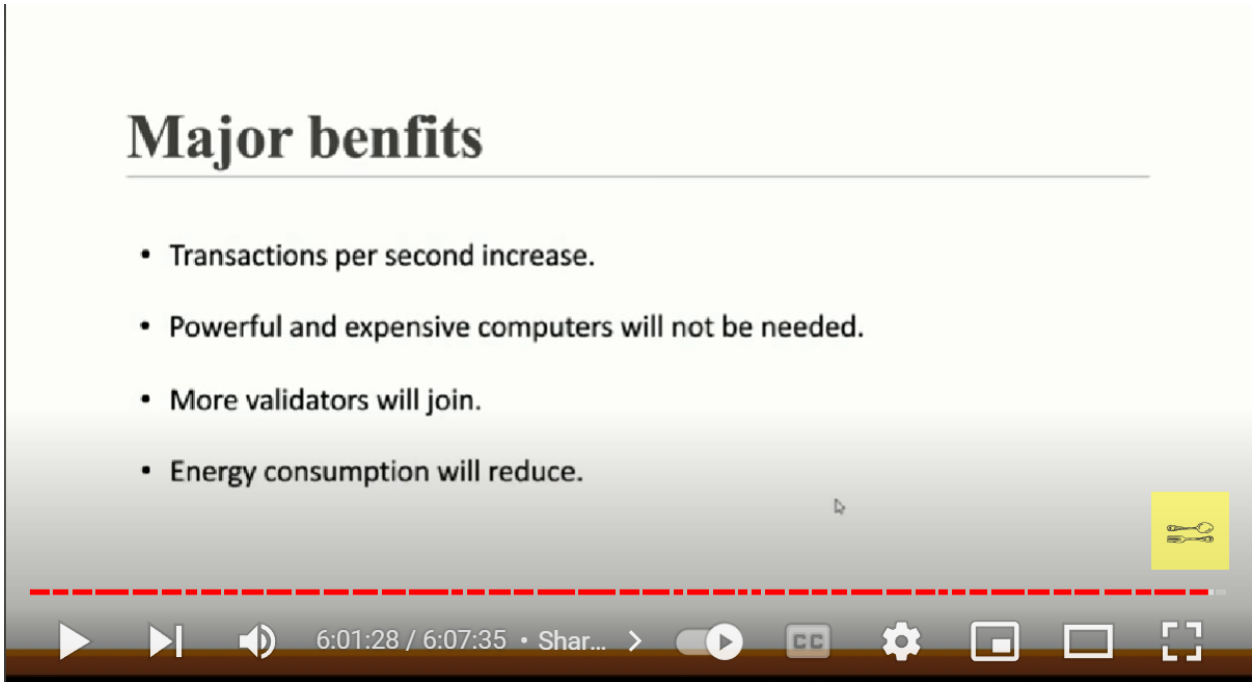
Proof of Stake

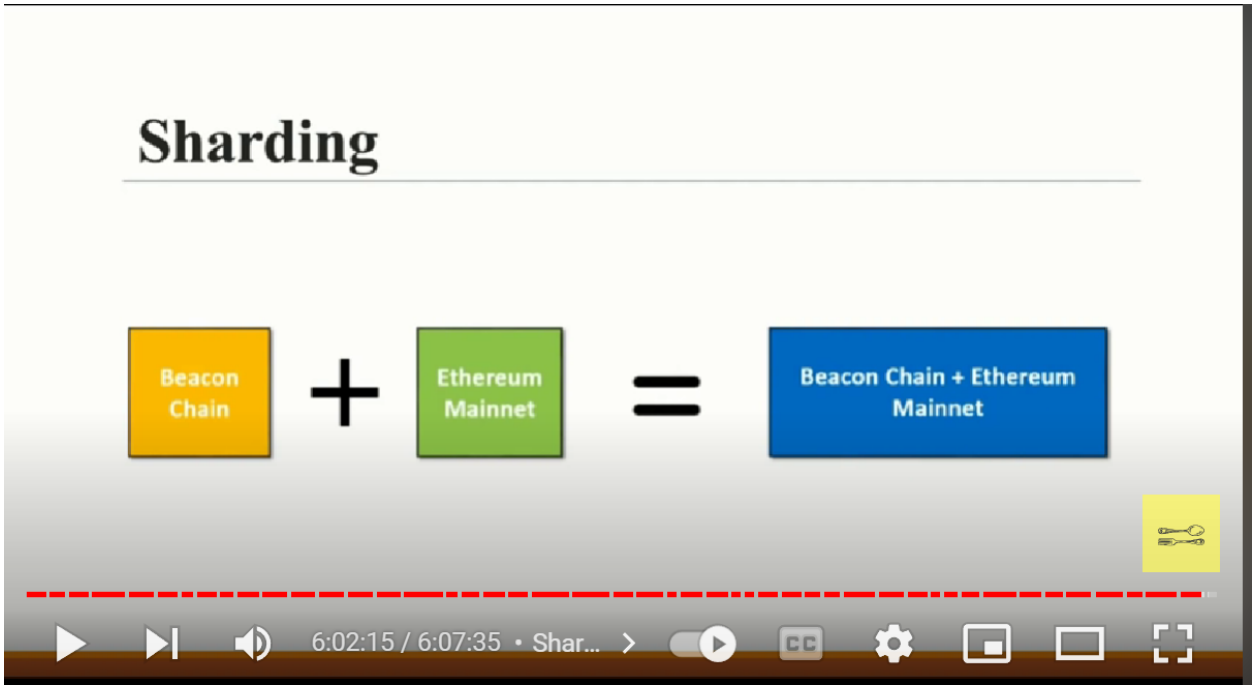
- The more ether you pay the more chances of getting randomly selected you have.

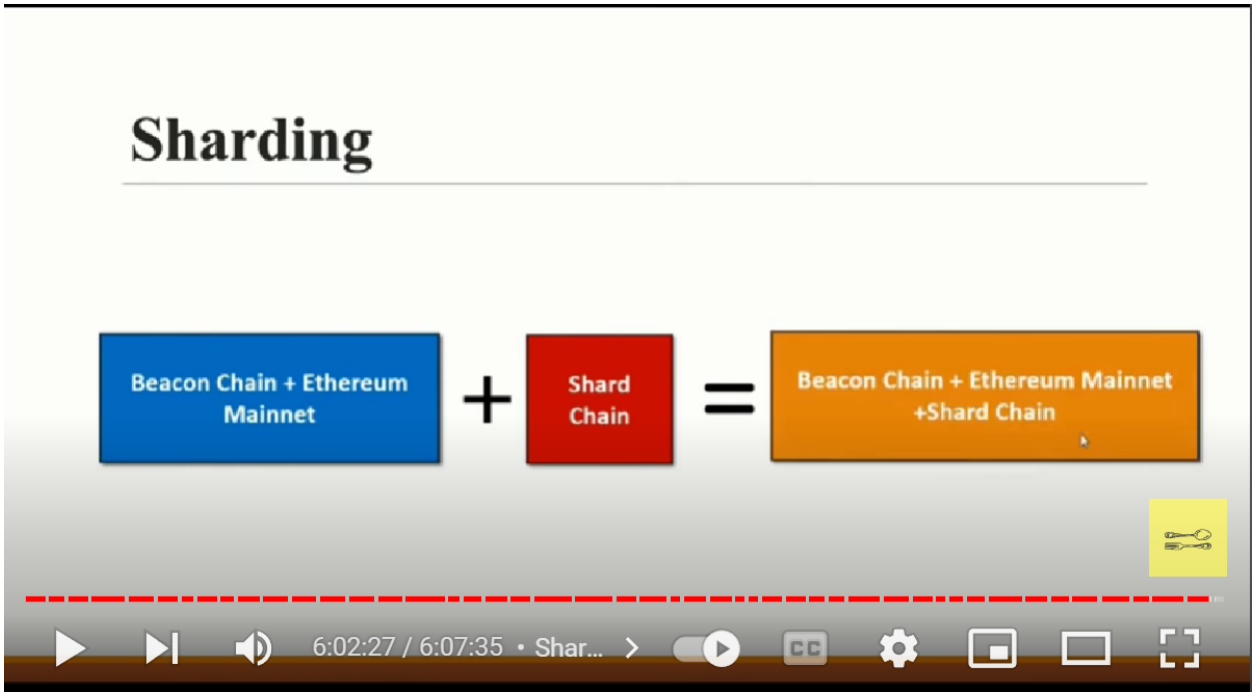
5:52:17 / 6:07:35 • Ether...

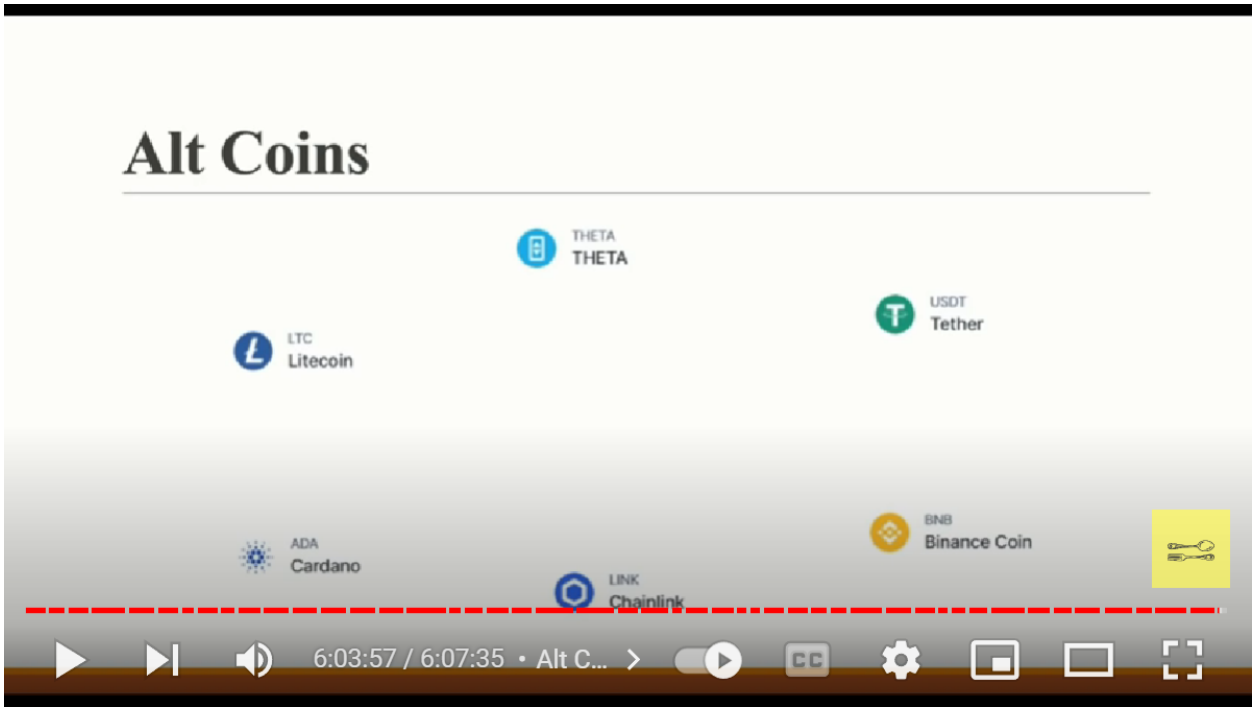

Proof of Stake
Proof Of Work(PoW)
Proof Of Stake(PoS)
Miners
Validators
High performance hardware required.
Mobile or Laptop are enough.
Lots of electricity required.
Not much electricity is required.
The more hashing power you have the more blocks you can validate.
The more ETH you stake the more blocks you can validate.
Attack to happen 51% hashing power is required.
Attack to happen 51% of stake is required.
5:54:38 / 6:07:35 • Ether...


Sharding
Network A
Network B
Network C
6:00:26 / 6:07:35 • Shar...


Major benfits
• Transactions per second increase.
• Powerful and expensive computers will not be needed.
• More validators will join.
• Energy consumption will reduce.
6:01:28 / 6:07:35 • Shar...


Sharding
Beacon Chain
Ethereum Mainnet
Beacon Chain + Ethereum Mainnet
6:02:15 / 6:07:35 • Shar...


Sharding
Beacon Chain + Ethereum Mainnet
+
Shard Chain
=
Beacon Chain + Ethereum Mainnet +Shard Chain
6:02:27 / 6:07:35 • Shar...


Alt Coins
THETA
THETA
USDT
Tether
LTC
Litecoin
BNB
Binance Coin
ADA
Cardano
LINK
Chainlink
6:03:57 / 6:07:35 • Alt C...


Alt Coins
• Consensus Protocol.
• New Capabilities.
• As of March 2021, there were almost 9,000 cryptocurrencies.
• Ethereum and Binance Coin were the largest altcoins by market capitalization as of March 2021.
6:04:52 / 6:07:35 • Alt C...