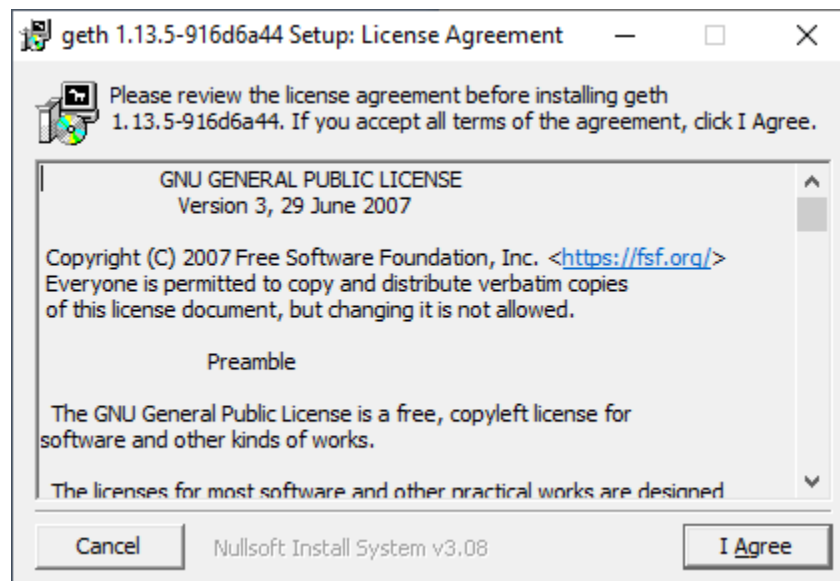
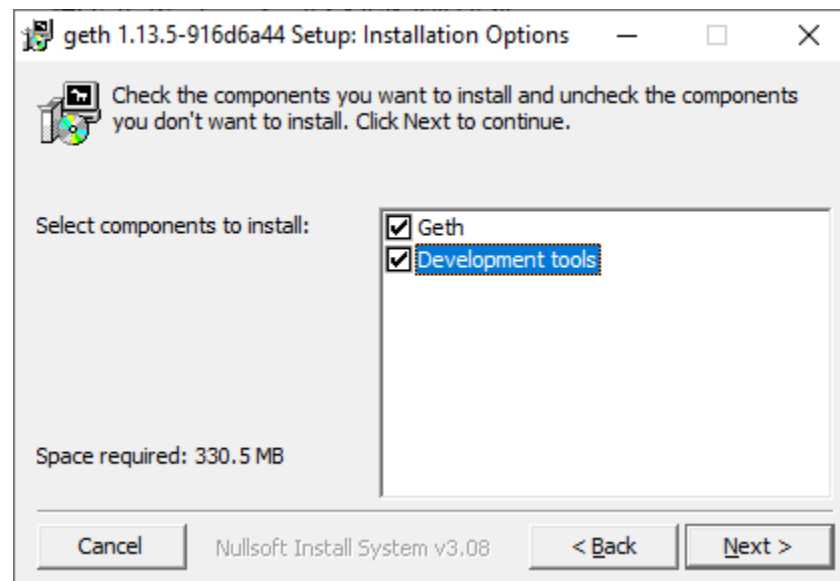
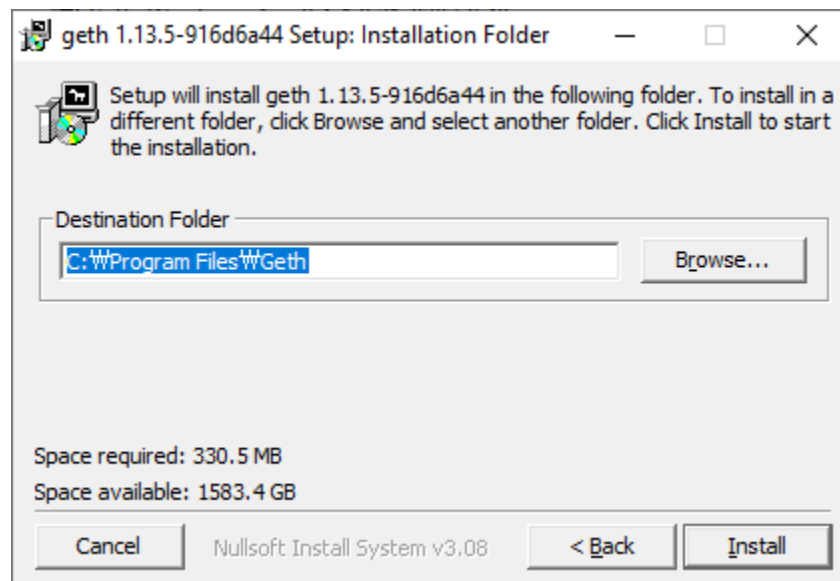
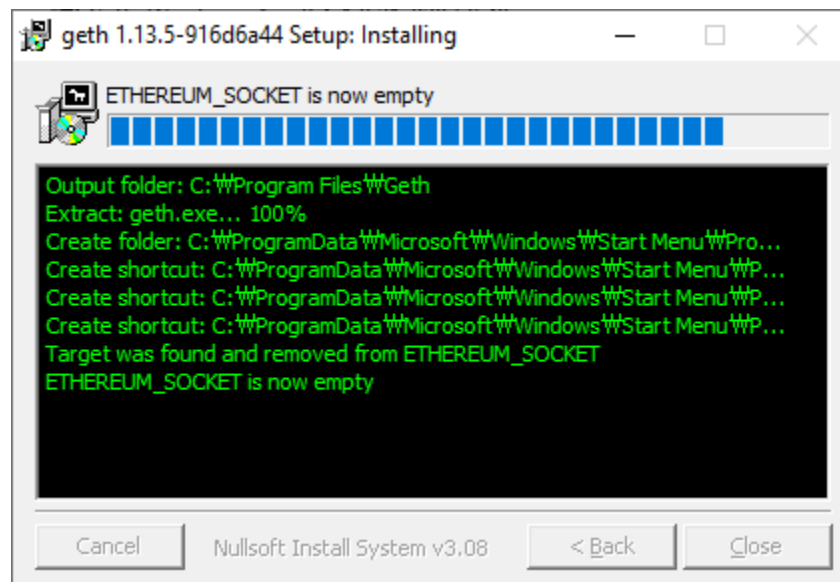


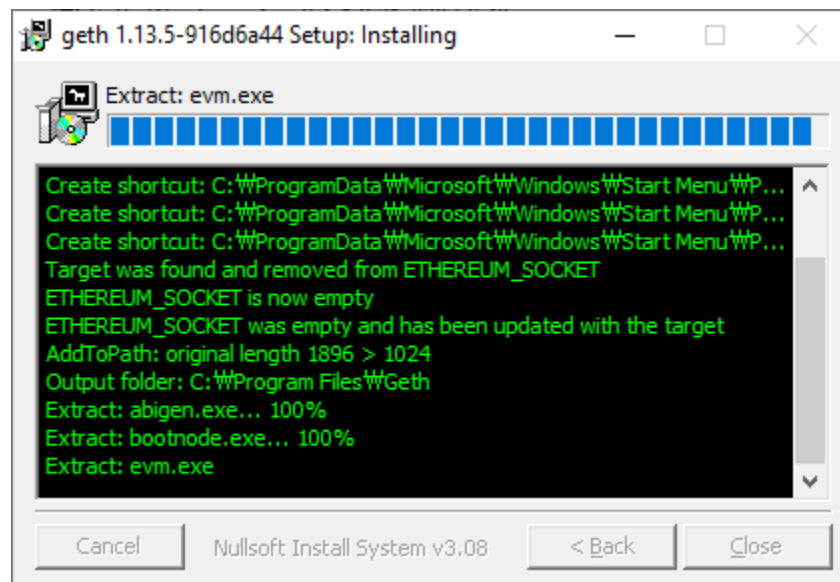
Geth-1.13.5

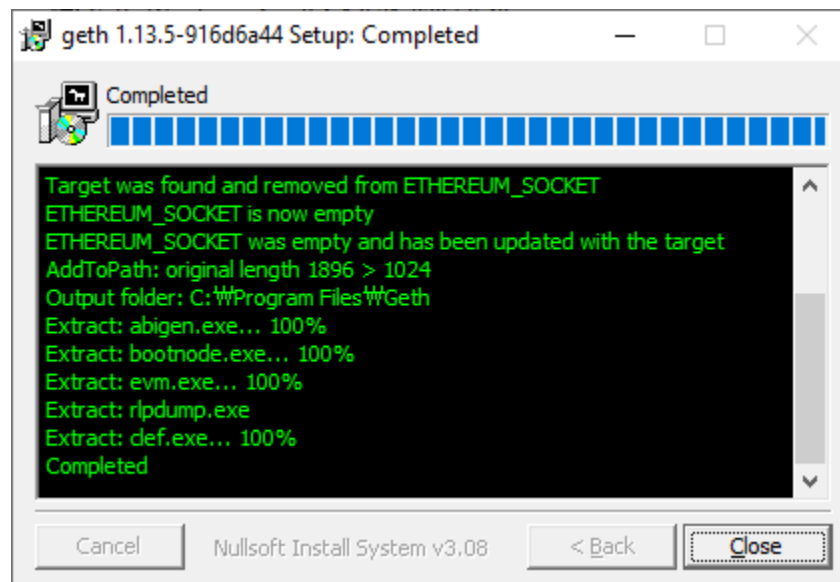










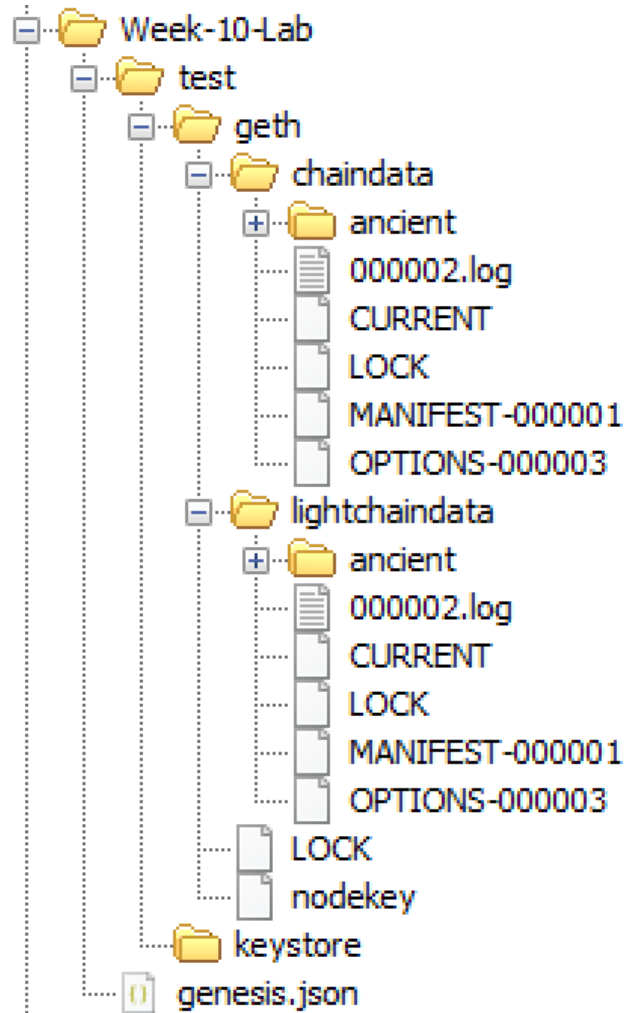


genesis.json

[illegible]



geth --datadir test init .\genesis.json

```
PS C:\Users\dkkim\Downloads\Week-10-Lab> geth --datadir test init .\genesis.json
INFO [11-22|21:35:01.745] Maximum peer count           ETH=50 LES=0 total=50
INFO [11-22|21:35:01.767] Set global gas cap           cap=50,000,000
INFO [11-22|21:35:01.768] Initializing the KZG library  backend=gokzg
INFO [11-22|21:35:01.807] Defaulting to pebble as the backing database
INFO [11-22|21:35:01.807] Allocated cache and file handles database=C:\Users\dkkim\Downloads\Week-10-Lab\test\geth\chaindata cache=16.00MiB handles=16
INFO [11-22|21:35:01.854] Opened ancient database      database=C:\Users\dkkim\Downloads\Week-10-Lab\test\geth\chaindata\ancient\chain readonly=false
INFO [11-22|21:35:01.855] State schema set to default  scheme=hash
INFO [11-22|21:35:01.855] Writing custom genesis block
INFO [11-22|21:35:01.857] Persisted trie from memory database nodes=1 size=172.00B time=1.1405ms gcnodes=0 gcsizes=0.00B gctime=0s livenodes=0 livesize=0.00B
INFO [11-22|21:35:01.867] Successfully wrote genesis state database=chaindata hash=f3321c..0c351b
INFO [11-22|21:35:01.867] Defaulting to pebble as the backing database
INFO [11-22|21:35:01.867] Allocated cache and file handles database=C:\Users\dkkim\Downloads\Week-10-Lab\test\geth\lightchaindata cache=16.00MiB handles=16
INFO [11-22|21:35:01.913] Opened ancient database      database=C:\Users\dkkim\Downloads\Week-10-Lab\test\geth\lightchaindata\ancient\chain readonly=false
INFO [11-22|21:35:01.913] State schema set to default  scheme=hash
INFO [11-22|21:35:01.913] Writing custom genesis block
INFO [11-22|21:35:01.915] Persisted trie from memory database nodes=1 size=172.00B time=1.0612ms gcnodes=0 gcsizes=0.00B gctime=0s livenodes=0 livesize=0.00B
INFO [11-22|21:35:01.924] Successfully wrote genesis state database=lightchaindata hash=f3321c..0c351b
PS C:\Users\dkkim\Downloads\Week-10-Lab> |
```





Week-10-Lab >

Name

-  test
-  genesis.json





Week-10-Lab > test >

Name

-  geth
-  keystore

Week-10-Lab > test > geth >

Name

-  chaindata
-  lightchaindata
-  LOCK
-  nodekey

Week-10-Lab > test > keystore

Name

geth --datadir test account new

```
Administrator: Windows Powe x + v
PS C:\Users\dkkim\Downloads\Week-10-Lab> geth --datadir test account new
INFO [11-22|21:49:52.079] Maximum peer count ETH=50 LES=0 total=50
Your new account is locked with a password. Please give a password. Do not forget this password.
Password:
Repeat password:

Your new key was generated

Public address of the key: 0x65C2B4dCc7F13fAcB51704a0c47e686BCf9f05D6
Path of the secret key file: test\keystore\UTC--2023-11-22T12-50-24.155933300Z--65c2b4dcc7f13facb51704a0c47e686bcf9f05d6

- You can share your public address with anyone. Others need it to interact with you.
- You must NEVER share the secret key with anyone! The key controls access to your funds!
- You must BACKUP your key file! Without the key, it's impossible to access account funds!
- You must REMEMBER your password! Without the password, it's impossible to decrypt the key!

PS C:\Users\dkkim\Downloads\Week-10-Lab> geth --datadir test account new
INFO [11-22|21:50:57.574] Maximum peer count ETH=50 LES=0 total=50
Your new account is locked with a password. Please give a password. Do not forget this password.
Password:
Repeat password:

Your new key was generated

Public address of the key: 0xC50458344ea210B03f8d8DEf736f2CB6F36dCc8E
Path of the secret key file: test\keystore\UTC--2023-11-22T12-51-02.411889300Z--c50458344ea210b03f8d8def736f2cb6f36dcc8e

- You can share your public address with anyone. Others need it to interact with you.
- You must NEVER share the secret key with anyone! The key controls access to your funds!
- You must BACKUP your key file! Without the key, it's impossible to access account funds!
- You must REMEMBER your password! Without the password, it's impossible to decrypt the key!

PS C:\Users\dkkim\Downloads\Week-10-Lab> |
```

```
c:\...> geth --datadir test account new
```

```
INFO [11-22|21:49:52.079] Maximum peer count
```

```
ETH=50 LES=0 total=50
```

```
Your new account is locked with a password. Please give a password. Do not forget this password.
```

```
Password: aa
```

```
Repeat password:
```

```
Your new key was generated
```

```
Public address of the key: 0x65C2B4dCc7F13fAcB51704a0c47e686BCf9f05D6
```

```
Path of the secret key file: test\keystore\UTC--2023-11-22T12-50-24.155933300Z--  
65c2b4dcc7f13facb51704a0c47e686bcf9f05d6
```

```
c:\...> geth --datadir test account new
```

```
INFO [11-22|21:50:57.574] Maximum peer count
```

```
ETH=50 LES=0 total=50
```

```
Your new account is locked with a password. Please give a password. Do not forget this password.
```

```
Password: bb
```

```
Repeat password:
```

```
Your new key was generated
```

```
Public address of the key: 0xC50458344ea210B03f8d8DEf736f2CB6F36dCc8E
```

```
Path of the secret key file: test\keystore\UTC--2023-11-22T12-51-02.411889300Z--  
c50458344ea210b03f8d8def736f2cb6f36dcc8e
```

```
- ...
```

```
c:\...>
```

Geth-1.9.21

Error ?

```
c:\...> geth --datadir test --nodiscover --rpc --rpcport 8545 --allow-insecure-unlock console
```

Incorrect Usage: flag provided but not defined: -rpc

```
c:\...> geth --datadir test --nodiscover --http --http.addr "localhost" --http.port "8545" --allow-insecure-unlock console
```

Fatal: Failed to register the Ethereum service: **ethash** is only supported as a historical component of already merged networks

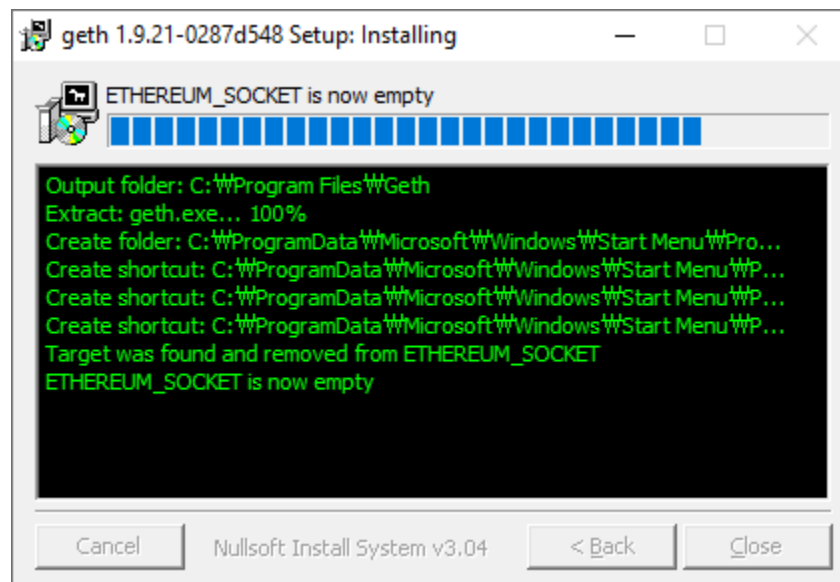
- Consider Alternative Consensus Algorithms

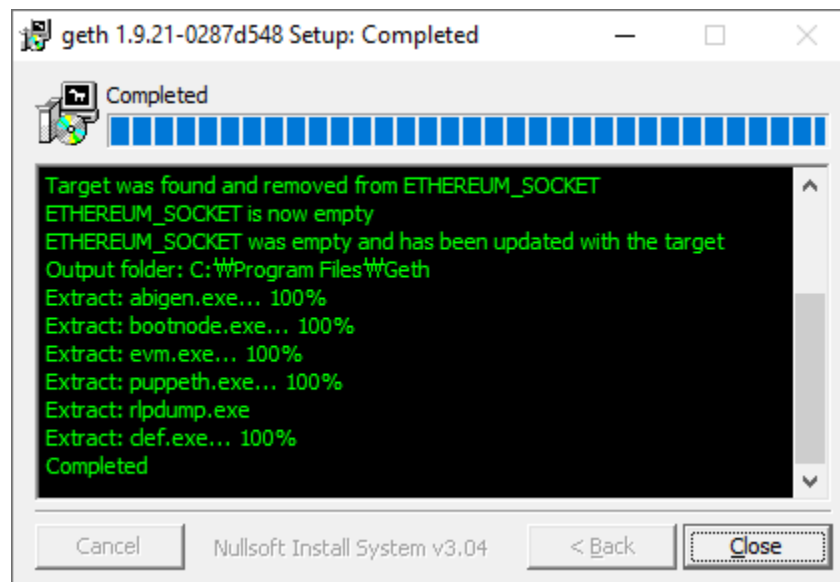
If you continue to face issues, consider using an alternative consensus algorithm like **Clique** (**Proof of Authority**) for your private network.

It's often simpler to set up and manage in a private environment.

```
// genesis.json for PoA
```

```
"config": {  
  "chainId": 1234,  
  "clique": {  
    "period": 15,  
    "epoch": 30000  
  }  
},
```





```
c:\...> geth version
```

```
Geth
```

```
Version: 1.9.21-stable
```

```
Git Commit: 0287d54847d3297f3ced62cd83a4c95ccbe0045b
```

```
Git Commit Date: 20200909
```

```
Architecture: amd64
```

```
Protocol Versions: [65 64 63]
```

```
Go Version: go1.15
```

```
Operating System: windows
```

```
GOPATH=C:\Users\dkkim\go
```

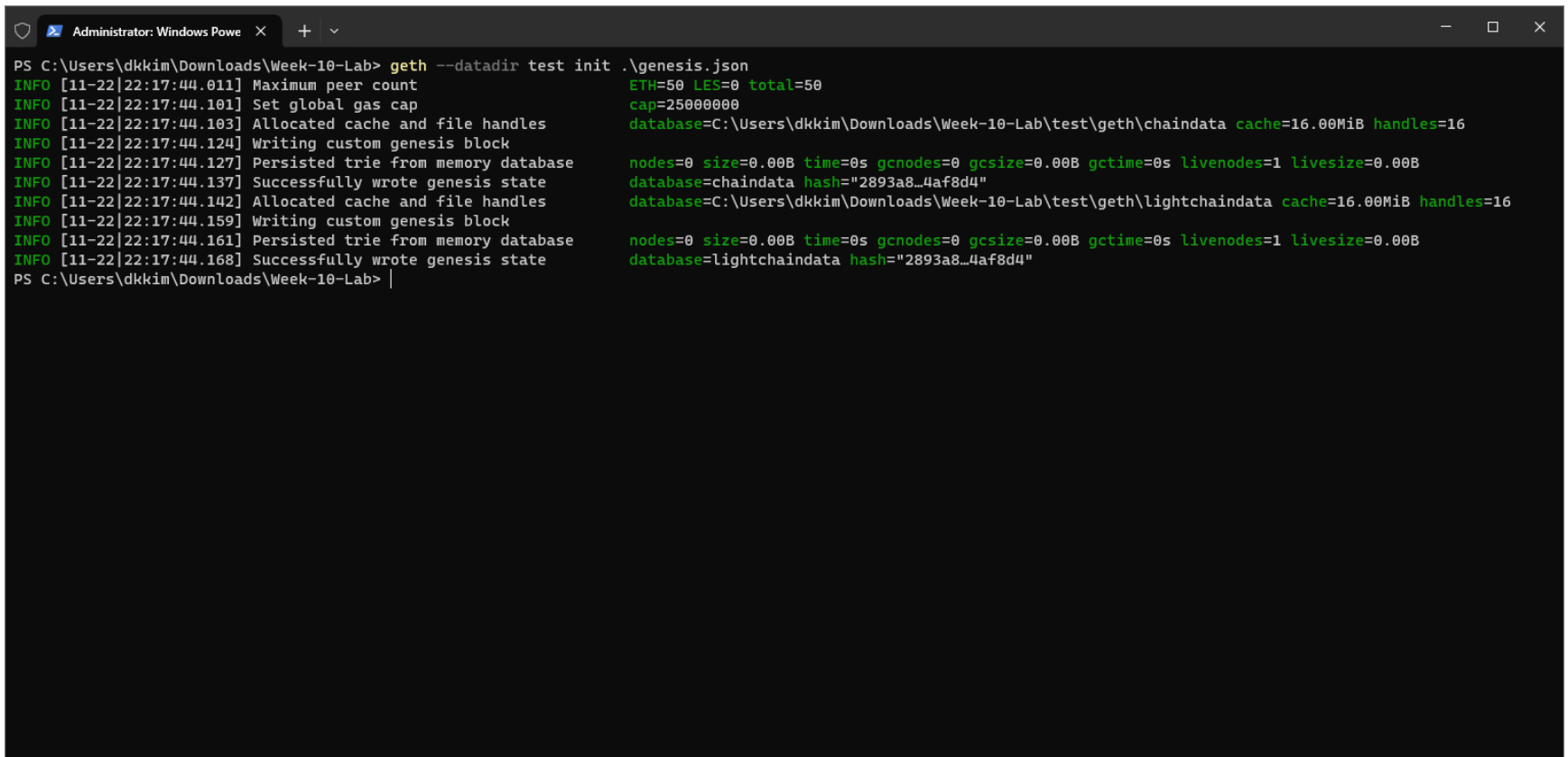
```
GOROOT=go
```

```
c:\...>
```

genesis.json

[illegible]

```
geth --datadir test init .\genesis.json
```



```
Administrator: Windows Powe
PS C:\Users\dkkim\Downloads\Week-10-Lab> geth --datadir test init .\genesis.json
INFO [11-22|22:17:44.011] Maximum peer count          ETH=50 LES=0 total=50
INFO [11-22|22:17:44.101] Set global gas cap          cap=250000000
INFO [11-22|22:17:44.103] Allocated cache and file handles database=C:\Users\dkkim\Downloads\Week-10-Lab\test\geth\chaindata cache=16.00MiB handles=16
INFO [11-22|22:17:44.124] Writing custom genesis block
INFO [11-22|22:17:44.127] Persisted trie from memory database nodes=0 size=0.00B time=0s gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [11-22|22:17:44.137] Successfully wrote genesis state database=chaindata hash="2893a8...4af8d4"
INFO [11-22|22:17:44.142] Allocated cache and file handles database=C:\Users\dkkim\Downloads\Week-10-Lab\test\geth\lightchaindata cache=16.00MiB handles=16
INFO [11-22|22:17:44.159] Writing custom genesis block
INFO [11-22|22:17:44.161] Persisted trie from memory database nodes=0 size=0.00B time=0s gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [11-22|22:17:44.168] Successfully wrote genesis state database=lightchaindata hash="2893a8...4af8d4"
PS C:\Users\dkkim\Downloads\Week-10-Lab> |
```

geth --datadir test account new

```
Administrator: Windows Powe
PS C:\Users\dkkim\Downloads\Week-10-Lab> geth --datadir test account new
INFO [11-22|22:19:54.712] Maximum peer count      ETH=50 LES=0 total=50
Your new account is locked with a password. Please give a password. Do not forget this password.
Password:
Repeat password:

Your new key was generated

Public address of the key:  0x76B891d8f28dd880A01cda363026712a10Cb6586
Path of the secret key file: test\keystore\UTC--2023-11-22T13-20-00.800056000Z--76b891d8f28dd880a01cda363026712a10cb6586

- You can share your public address with anyone. Others need it to interact with you.
- You must NEVER share the secret key with anyone! The key controls access to your funds!
- You must BACKUP your key file! Without the key, it's impossible to access account funds!
- You must REMEMBER your password! Without the password, it's impossible to decrypt the key!

PS C:\Users\dkkim\Downloads\Week-10-Lab> geth --datadir test account new
INFO [11-22|22:20:04.607] Maximum peer count      ETH=50 LES=0 total=50
Your new account is locked with a password. Please give a password. Do not forget this password.
Password:
Repeat password:

Your new key was generated

Public address of the key:  0x8B028a9c76Cce60C24c7925A1E0691dC93aAB081
Path of the secret key file: test\keystore\UTC--2023-11-22T13-20-07.774745400Z--8b028a9c76cce60c24c7925a1e0691dc93aab081

- You can share your public address with anyone. Others need it to interact with you.
- You must NEVER share the secret key with anyone! The key controls access to your funds!
- You must BACKUP your key file! Without the key, it's impossible to access account funds!
- You must REMEMBER your password! Without the password, it's impossible to decrypt the key!

PS C:\Users\dkkim\Downloads\Week-10-Lab> |
```

```
--rpcapi "admin,eth,debug,miner,net,txpool,personal,web3,db,shh"
```

```
...
```

```
INFO [11-22|22:22:27.017] Started P2P networking  
self=enode://8bb0570b81595f8223aed288485efa0781654aaf78ecc860c0ca665d7f848c8784  
84a9579025ecd4f31fb2154c3a4e2ab5893c75b889b45799a11e87b1643f1b@127.0.0.1:30303
```

```
INFO [11-22|22:22:27.020] IPC endpoint opened  
url=\\.pipe\geth.ipc
```

```
ERROR[11-22|22:22:27.031] Unavailable modules in HTTP API list  
unavailable="[db shh]" available="[admin debug web3 eth txpool personal ethash  
miner net]"
```

```
INFO [11-22|22:22:27.038] HTTP server started  
endpoint=127.0.0.1:8545 cors=* vhosts=localhost
```

```
INFO [11-22|22:22:27.094] Etherbase automatically configured  
address=0x76B891d8f28dd880A01cda363026712a10Cb6586
```

```
Welcome to the Geth JavaScript console!
```

```
...
```

```
c:\...> geth
```

```
--networkid 1234 --datadir test
```

```
--rpc --rpcport 8545 --rpccorsdomain "*"
```

```
--rpcapi "admin,eth,debug,miner,net,txpool,personal,web3"
```

```
--allow-insecure-unlock console 2>> eth.log
```

```
...
```

```
INFO [11-22|22:22:27.020] IPC endpoint opened
```

```
url=\\.pipe\geth.ipc
```

```
ERROR[11-22|22:22:27.031] Unavailable modules in HTTP API list  
ethash miner net]"
```

```
unavailable="[db shh]" available="[admin debug web3 eth txpool personal
```

```
INFO [11-22|22:22:27.038] HTTP server started
```

```
endpoint=127.0.0.1:8545 cors=* vhosts=localhost
```

```
INFO [11-22|22:22:27.094] Etherbase automatically configured
```

```
address=0x76B891d8f28dd880A01cda363026712a10Cb6586
```

```
Welcome to the Geth JavaScript console!
```

```
instance: Geth/v1.9.21-stable-0287d548/windows-amd64/go1.15
```

```
coinbase: 0x76b891d8f28dd880a01cda363026712a10cb6586
```

```
> eth
```

```
> personal
```

```
> web3
```

```
> admin
```

```
> eth.accounts
```

```
["0x76b891d8f28dd880a01cda363026712a10cb6586", "0x8b028a9c76cce60c24c7925a1e0691dc93aab081"]
```

```
>
```

...

```
INFO [11-22|22:22:26.984] Starting peer-to-peer node      instance=Geth/v1.9.21-stable-0287d548/windows-amd64/go1.15

INFO [11-22|22:22:27.012] New local node record              seq=1 id=d09fd334ecb0ccce ip=127.0.0.1
  udp=30303 tcp=30303

INFO [11-22|22:22:27.017] Started P2P networking
  self=enode://8bb0570b81595f8223aed288485efa0781654aaf78ecc860c0ca665d7f848c878484a9579025ecd4f31fb2154c3a4e2ab5893c75b889b45799a11e87b1643f1b@127.0.0.1:30303

INFO [11-22|22:22:27.020] IPC endpoint opened                url=\\.\\pipe\\geth.ipc

ERROR[11-22|22:22:27.031] Unavailable modules in HTTP API list  unavailable="[db shh]"
  available="[admin debug web3 eth txpool personal ethash miner net]"

INFO [11-22|22:22:27.038] HTTP server started                endpoint=127.0.0.1:8545 cors=*
  vhosts=localhost

INFO [11-22|22:22:27.094] Etherbase automatically configured
  address=0x76B891d8f28dd880A01cda363026712a10Cb6586
```

Welcome to the Geth JavaScript console!

```
instance: Geth/v1.9.21-stable-0287d548/windows-amd64/go1.15
coinbase: 0x76b891d8f28dd880a01cda363026712a10cb6586
at block: 0 (Thu Jan 01 1970 09:00:00 GMT+0900 (KST))
  datadir: C:\Users\dkkim\Downloads\Week-10-Lab\test
  modules: admin:1.0 debug:1.0 eth:1.0 ethash:1.0 miner:1.0 net:1.0 personal:1.0 rpc:1.0 txpool:1.0
           web3:1.0
```

...

* 2nd Terminal

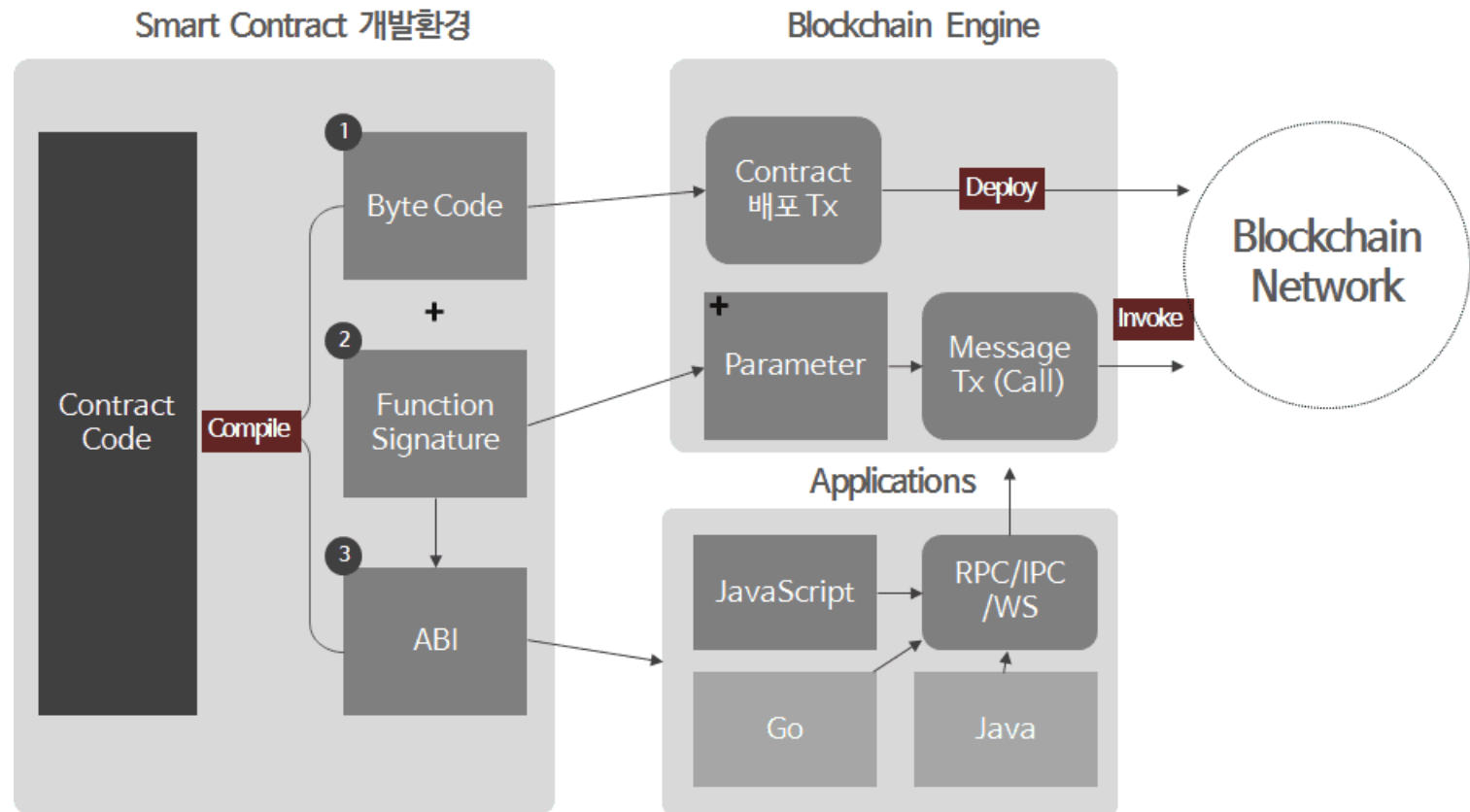
```
c:\...> geth attach http://localhost:8545  
Welcome to the Geth JavaScript console!
```

```
instance: Geth/v1.9.21-stable-0287d548/windows-amd64/go1.15  
coinbase: 0x76b891d8f28dd880a01cda363026712a10cb6586  
at block: 0 (Thu Jan 01 1970 09:00:00 GMT+0900 (KST))  
  datadir: C:\Users\dkkim\Downloads\Week-10-Lab\test  
  modules: admin:1.0 debug:1.0 eth:1.0 miner:1.0 net:1.0 personal:1.0 rpc:1.0  
           txpool:1.0 web3:1.0
```

```
> eth  
> personal  
> web3  
> admin
```

```
> eth.accounts
```


Lab 1 : geth



Ethereum Lab Env

- Ethereum network
 - Geth
 - Ganache
- Wallet
 - metamask
- dApp developemnt
 - Remix

geth

- Install geth
 - <https://geth.ethereum.org/downloads/>
 - `geth-windows-amd64-1.9.21-0287d548.exe`

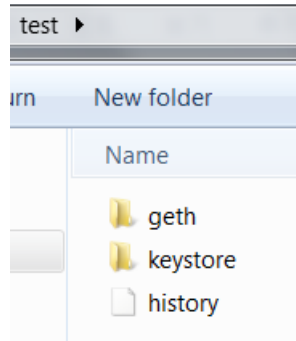
Genesis.json

[illegible]

generate genesis block

- `cd downloads\lab`
 - `genesis.json`

```
c:\...> geth --datadir test init .\genesis.json
```



```
c:\...> geth --datadir test account new
```



```
c:\...> geth version
```

```
c:\...> geth --datadir test init .\genesis.json
```

```
c:\...> dir test
```

```
c:\...> dir test\keystore
```

```
c:\...> geth --datadir test account new
```

```
c:\...> dir test\keystore
```

geth commands

```
c:\...> geth --networkid 1234 --datadir test --rpc --rpcport 8545 --rpccorsdomain
      "*" --rpcapi "admin,eth,debug,miner,net,txpool,personal,web3" --allow-insecure-
      unlock console 2>> eth.log
```

> eth

> personal

> eth.accounts

> personal.newAccount("c")

> eth.getBalance(eth.accounts[0])

> eth.blockNumber

> miner.start()

>

> miner.stop()

> admin.nodeInfo.enode

- `eth.getBalance(eth.accounts[0])`
- `eth.getBalance(eth.accounts[1])`
- `eth.sendTransaction({from:eth.accounts[0], to:eth.accounts[1], value:web3.toWei(50, "ether")})`
- `txpool`
- `web3.fromWei(eth.getBalance(eth.accounts[0]))`
- `web3.fromWei(eth.getBalance(eth.accounts[1]))`

* in 2nd terminal

`c:\...> geth attach http://localhost:8545`

```
>
> eth.accounts
> personal.newAccount("c")
> eth.accounts
>
```

- Open new terminal

```
c:\...> geth attach http://localhost:8545
```

```
> admin.nodeInfo.enode
```

```
"enode://d6fd99fbba345503a36871a2a7eac55b7a77343d5b377533a22540eff3cfbf04b707cf1e386af36b5d3b247d05adec72c9d857c8a9d5a0ddf75f099cb5e71725@220.67.100.130:30303"
```

```
>
```

```
> eth.accounts
```

```
> personal.newAccount("c")
```

```
> eth.accounts
```

```
> net.peerCount
```

```
> exit
```

Add Neighbor Peers

```
> admin.nodeInfo.enode  
"enode://d6f...725@220.67.100.130:30303"
```

```
> admin.addPeer("enode://...")  
> admin.addPeer("enode://d6f...725@220.67.100.130:30303")
```

```
> net.peerCount  
> admin.peers  
> admin.addPeer
```

- Run geth at 4 Computers

- 1th Computer

```
$ geth --datadir test init ./genesis.json  
$ geth --networkid 1234 --datadir test --port 30331 console 2>> ./geth.log  
> admin.nodeInfo.enode  
aaa... = enode://...  
>
```

...

- 3th Computer

```
$ geth --networkid 1234 --datadir test --port 30333 console 2>> ./geth.log  
> admin.nodeInfo.enode  
ccc...
```

- 4th Computer

```
$ geth --datadir test init ./genesis.json
```

```
$ geth --networkid 1234 --datadir test --port 30334 console 2>> ./geth.log
```

```
> net.peerCount
```

```
> admin.peers
```

```
// admin.addPeer("enode://...")
```

```
> admin.addPeer("aaa...")
```

```
> admin.addPeer("bbb...")
```

```
> admin.addPeer("ccc...")
```

```
> net.peerCount
```

```
> admin.peers
```

```
>
```

Lab

- Create account
- Check balance
- Transfer ether
- Start mining
- Check block number
- ...

Geth + MetaMask


```
geth --networkid 1234 --datadir test --rpc --rpcport 8545 ...
```

Networks > Add a network > Add a network manually



A malicious network provider can lie about the state of the blockchain and record your network activity. Only add custom networks you trust.

Network name

MyGeth

New RPC URL

http://127.0.0.1:8545/

Chain ID ⓘ

1234

Currency symbol

TST

The network with chain ID 1234 may use a different currency symbol (FITFI) than the one you have entered. Please verify before continuing.

Block explorer URL (Optional)




Cancel

Save

Import account from Geth to MetaMask

Week-10-Geth-Lab > test > keystore

Name

-  UTC--2023-12-05T07-51-36.065607300Z--c406ab480daa2d39281b73913d62e284bd468971
-  UTC--2023-12-05T08-14-49.426214600Z--e6ba8ef5d310dfd86c50e3878ec50a977a98d8d8
-  UTC--2023-12-05T10-41-44.549349500Z--41a9c282492c028964547c29b35e9724c235f9a5

Select an account



Q Search accounts



Account 1

0x41A9c...5F9A5

0 TST ⋮

0 TST



Creaone

0x75cF9...D1F9f

0 TST ⋮

0 TST



Account 3

0xB9bcf...A655C

0 TST ⋮

0 TST

Imported

+ Add account or hardware wallet



Add account



+ Add a new account

📄 Import account

🔑 Add hardware wallet

<Import account×

Imported accounts won't be associated with your MetaMask Secret Recovery Phrase. Learn more about imported accounts [here](#)

Select Type Private Key ▾

Enter your private key string here:


.....


←

CancelImport

```
>>> privHex = private_key.hex()
>>> privHex
'0x31487dc6524ed46ef818fb0052929a0fb331bca509ae8f09b077138100ef145c'
```

c406ab480daa2d39281b73913d62e284bd468971

 **Account 4** ▾

0xc406A...68971 

55 TST



Buy & Sell



Send



Swap



Bridge



Portfolio

Import account from Geth to MetaMask

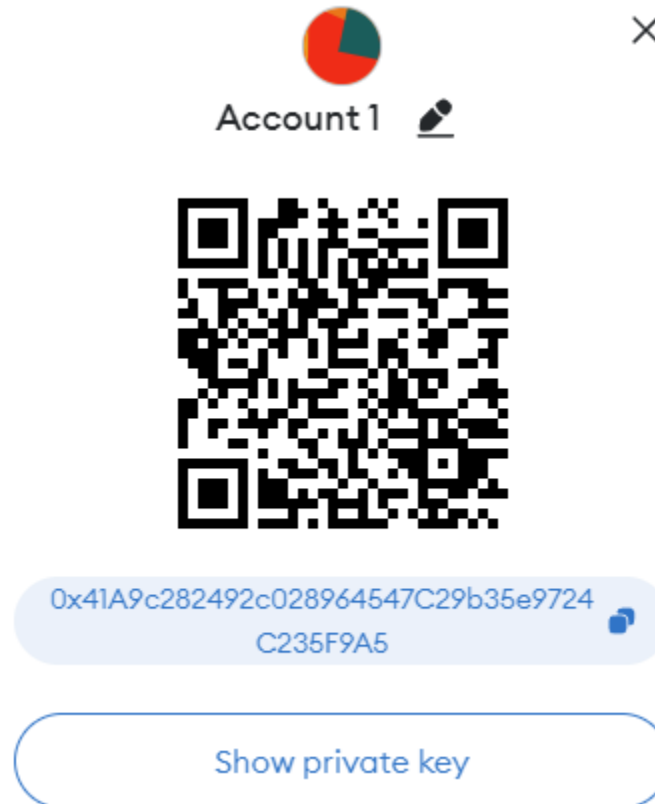
```
c:\...> pip install web3
c:\...> python
>>> import binascii
>>> from web3.auto import w3
>>> with open("test/keystore/UTC-...-c406ab480daa2d39281b73913d62e284bd468971") as keyfile:
    encrypted_key = keyfile.read()
    privKey = w3.eth.account.decrypt(encrypted_key, 'c')

>>> privKey
b'1H}\xc6RN\xd4n\xfb\x18\xfb...\x00\xef\x14\\'

# Convert bytes to hexadecimal string
>>> privHex = privKey.hex()
>>> privHex
'0x31487dc6524ed46ef818fb0052929a0fb331bca509ae8f09b077138100ef145c'

>>> binascii.b2a_hex(privKey)
b'31487dc6524ed46ef818fb0052929a0fb331bca509ae8f09b077138100ef145c'
>>> exit()
```

Get PrivateKey in MetaMask





Show private key



Account 1

0x41A9c...5F9A5 

Enter your password

.....



Warning: Never disclose this key.
Anyone with your private keys can
steal any assets held in your
account.

Cancel

Confirm

Keep your private key safe ✕

Your Private Key provides **full access to your wallet and funds.**

Do not share this with anyone. MetaMask Support will not request this, **but phishers might.**



Hold to reveal Private Key



Show private key



Account 1

0x41A9c...5F9A5 

Private key for Account 1

0a837279408c18264141981a5a12a578f
0cc5012e6907f9ed84bf7fe06ffa779



Warning: Never disclose this key. Anyone with your private keys can steal any assets held in your account.

Done

Import account from MetaMask to Geth

```
> web3.personal.importRawKey(PrivKey, Password)
```

```
> eth.accounts
```

```
>
```

```
// import account from MetaMask to Geth
```

```
// web3.personal.importRawKey(PrivKey, Password)
```

```
0x41A9c282492c028964547C29b35e9724C235F9A5
```

```
0a837279408c18264141981a5a12a578f0cc5012e6907f9ed84bf7fe06ffa779
```

```
> web3.personal.importRawKey("0a83...79", "c")
```

```
"0x41a9c282492c028964547c29b35e9724c235f9a5"
```

```
> eth.accounts
```

```
> eth.accounts[0]
```

```
"0xc406ab480daa2d39281b73913d62e284bd468971"
```

```
> personal.unlockAccount("0xc406ab480daa2d39281b73913d62e284bd468971")
```

Account in Geth

- `c:\...> geth account list --keystore <directory-path>`
 - List all Ethereum accounts from the given keystore directory
 - `c:\...> geth account list --keystore ./test/keystore`
- `c:\...> geth account new --keystore <directory-path>`
 - Create a new Ethereum account in the given keystore directory
- `c:\...> geth account import <private-key-file> --keystore <directory-path>`
 - Create a new Ethereum account with the given private key in the given keystore directory
- All Ethereum keystore files are password protected
 - Geth does not offer commands to export private key out of an Ethereum account
- If you really want to get the private key
 - Import the keystore file to MetaMask wallet
 - Export the private key from MetaMask wallet

Import account from Geth to MetaMask

```
c:\...> pip install web3
c:\...> python
>>> import binascii
>>> from web3.auto import w3
>>> with open("test/keystore/UTC-...-c406ab480daa2d39281b73913d62e284bd468971") as keyfile:
    encrypted_key = keyfile.read()
    privKey = w3.eth.account.decrypt(encrypted_key, 'c')

>>> privKey
b'1H}\xc6RN\xd4n\xfb\x18\xfb...\x00\xef\x14\\'

# Convert bytes to hexadecimal string
>>> privHex = privKey.hex()
>>> privHex
'0x31487dc6524ed46ef818fb0052929a0fb331bca509ae8f09b077138100ef145c'

>>> binascii.b2a_hex(privKey)
b'31487dc6524ed46ef818fb0052929a0fb331bca509ae8f09b077138100ef145c'
>>> exit()
```