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Blockchain Lab Experiment 05

Aim :- Develop a private Blockchain platform Ethereum using Geth.

Lab Objectives: To learn to setup private Ethereum blockchain using GETH.

Lab Outcomes (LO): Develop and deploy smart contracts on Ethereum test network (LO3)

Task to be performed: (Write an application in GETH by referring to the
<https://cse.iitk.ac.in/users/dwivedi/Blockchain/geth.pdf>)

Step - 1: Installing Geth on Ubuntu

Step - 2 : Check the version of Geth on the Terminal

Step - 3: Create a Private Ethereum Network

Step - 4: Establish a Peer-Peer Connection between the nodes along with the bootnode

Step - 5 : Exploring the network by attaching JavaScript console to Node 1

Tools & Libraries used:

- GITH and metamask

Steps :-

Step 1: Installing Geth on Ubuntu

sudo apt update

```
Student@Student-virtual-machine:~/Student $ sudo apt update
Ign:1 cdrom://Ubuntu 22.04.4 LTS _Jammy Jellyfish_ - Release amd64 (20240220) ja
mmy InRelease
Hit:2 cdrom://Ubuntu 22.04.4 LTS _Jammy Jellyfish_ - Release amd64 (20240220) ja
mmy Release
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:5 http://us.archive.ubuntu.com/ubuntu jammy InRelease
Hit:6 http://us.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:7 http://us.archive.ubuntu.com/ubuntu jammy-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
47 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

```
Sudo dpkg --configure -a
```

```
Student@Student-virtual-machine: ~/Student$ sudo dpkg --configure -a
Setting up initramfs-tools (0.140ubuntu13.4) ...
update-initramfs: deferring update (trigger activated)
Processing triggers for initramfs-tools (0.140ubuntu13.4) ...
update-initramfs: Generating /boot/initrd.img-6.5.0-18-generic
```

```
sudo apt install software-properties-common
```

```
Student@Student-virtual-machine: ~/Student$ sudo apt install software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
software-properties-common is already the newest version (0.99.22.9).
software-properties-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 47 not upgraded.
```

```
sudo add-apt-repository -y ppa:ethereum/ethereum
```

```
Student@Student-virtual-machine:~/Student$ sudo add-apt-repository -y ppa:ethereum/ethereum
Repository: 'deb https://ppa.launchpadcontent.net/ethereum/ethereum/ubuntu/ jammy main'
More info: https://launchpad.net/~ethereum/+archive/ubuntu/ethereum
Adding repository.
Adding deb entry to /etc/apt/sources.list.d/ethereum-ubuntu-ethereum-jammy.list
Adding disabled deb-src entry to /etc/apt/sources.list.d/ethereum-ubuntu-ethereum-jammy.list
Adding key to /etc/apt/trusted.gpg.d/ethereum-ubuntu-ethereum.gpg with fingerprint 2A518C819BE37D2C203
194401C52189C923F6CA9
Ign:1 cdrom://Ubuntu 22.04.4 LTS _Jammy Jellyfish_ - Release amd64 (20240220) jammy InRelease
Hit:2 cdrom://Ubuntu 22.04.4 LTS _Jammy Jellyfish_ - Release amd64 (20240220) jammy Release
Hit:3 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:5 https://ppa.launchpadcontent.net/ethereum/ethereum/ubuntu jammy InRelease [17.5 kB]
Get:6 https://ppa.launchpadcontent.net/ethereum/ethereum/ubuntu jammy/main amd64 Packages [2,548 B]
Get:7 https://ppa.launchpadcontent.net/ethereum/ethereum/ubuntu jammy/main Translation-en [772 B]
Hit:8 http://us.archive.ubuntu.com/ubuntu jammy InRelease
Hit:9 http://us.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:10 http://us.archive.ubuntu.com/ubuntu jammy-backports InRelease
Fetched 20.9 kB in 22s (941 B/s)
Reading package lists... Done
```

```
sudo apt install geth
```

```
Student@Student-virtual-machine:~/Student$ sudo apt install geth
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  geth
0 upgraded, 1 newly installed, 0 to remove and 47 not upgraded.
Need to get 12.6 MB of archives.
After this operation, 41.3 MB of additional disk space will be used.
Get:1 https://ppa.launchpadcontent.net/ethereum/ethereum/ubuntu jammy/main amd64 geth amd64 1.13.14+build29502+jammy [12.6 MB]
Fetched 12.6 MB in 30s (420 kB/s)
Selecting previously unselected package geth.
(Reading database ... 163138 files and directories currently installed.)
Preparing to unpack .../geth_1.13.14+build29502+jammy_amd64.deb ...
Unpacking geth (1.13.14+build29502+jammy) ...
Setting up geth (1.13.14+build29502+jammy) ...
```

2. Step - 2: Create a Private Ethereum Network

1. Create a folder named, private_ethereum_setup

```
Student@-Student-virtual-machine:~/Student$ mkdir private_ethereum_setup
```

2. Create 2 subfolders named node1 and node2 in the folder private_ethereum_setup

```
Student@-Student-virtual-machine:~/Student$ cd private_ethereum_setup
Student@-Student-virtual-machine:~/Student/private_ethereum-setup$ mkdir node1 node2
Student@-Student-virtual-machine:~/Student/private_ethereum-setup$ █
```

3. Create 2 accounts in the folder corresponding to node1 and node2

```
Student@-Student-virtual-machine:~/Student/private_ethereum-setup$ geth --datadir node1 account new
INFO [03-17|13:50:31.812] Maximum peer count                                     ETH=50 total=50
INFO [03-17|13:50:31.817] Smartcard socket not found, disabling      err="stat /run/pcscd/pcscd.comm: no
such file or directory"
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: 0x341EEB11a2A0051C6B43f49f2D82F697827B777e
Path of the secret key file: node1/keystore/UTC--2024-03-17T17-50-49.931027598Z--341eeb11a2a0051c6b43f
49f2d82f697827b777e

- 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!
```

4. Create a genesis.json file in the folder, private_ethereum_setup

```
nano genesis.json
```

```
Student@Student-virtual-machine:~/Student/private-ethereum-setup$ sudo apt-get install bootnode
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
bootnode is already the newest version (1.13.14+build29502+jammy).
0 upgraded, 0 newly installed, 0 to remove and 46 not upgraded.
```

4. Step - 4: Establish a Peer-Peer Connection between the nodes along with the bootnode

1. On the first Terminal, Use boot.key to run the boot node

```
Student@-Student-virtual-machine:~/Student/private-ethereum-setup$ bootnode -verbosity 5 -nodekey boot.key -addr 127.0.0.1:30305  
enode://f13fea6e327e85219224b4df28dddde31977a4e42cde53b6a7dc2eedb2578fce62d9fa2  
2cdbee46f49264518b5758a1608604357d26e8b883a49f04d86bbb97@127.0.0.1:0?discport=30  
305  
Note: you're using cmd/bootnode, a developer tool.  
We recommend using a regular node as bootstrap node for production deployments.  
INFO [03-23|11:52:28.189] New local node record seq=1,711,209  
,148,154 id=b0761d93e7ee1acf ip=<nil> udp=0 tcp=0
```

First node gets connected to bootnode

```

02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:18.902] << FINDNODE/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:18.903] >> NEIGHBORS/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:19.403] << FINDNODE/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:19.404] >> NEIGHBORS/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:19.904] << FINDNODE/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:19.905] >> NEIGHBORS/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:20.112] >> PING/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:20.113] << PONG/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:20.113] >> ENRREQUEST/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
TRACE[03-23|01:37:20.114] << ENRRESPONSE/v4
02bf85 addr=127.0.0.1:30306 err=<nil> id=11d8322cec
DEBUG[03-23|01:37:20.114] Revalidated node b=16 id=11d83
22cec02bf85 checks=1

```

Second node also gets connected to bootnode

```

831bd460aa219b9 addr=127.0.0.1:30307 err=<nil> id=5
TRACE[03-23|01:40:59.646] << PING/v4
831bd460aa219b9 addr=127.0.0.1:30307 err=<nil> id=5
TRACE[03-23|01:40:59.646] >> PONG/v4
831bd460aa219b9 addr=127.0.0.1:30307 err=<nil> id=5
TRACE[03-23|01:40:59.647] << ENRREQUEST/v4
831bd460aa219b9 addr=127.0.0.1:30307 err=<nil> id=5
TRACE[03-23|01:40:59.647] >> ENRRESPONSE/v4
831bd460aa219b9 addr=127.0.0.1:30307 err=<nil> id=5
TRACE[03-23|01:40:59.803] << FINDNODE/v4
831bd460aa219b9 addr=127.0.0.1:30307 err=<nil> id=1
1d8322cec02bf85 addr=127.0.0.1:30306 err=<nil> id=1
TRACE[03-23|01:40:59.804] >> NEIGHBORS/v4
1d8322cec02bf85 addr=127.0.0.1:30306 err=<nil> id=1
TRACE[03-23|01:41:00.051] << FINDNODE/v4
831bd460aa219b9 addr=127.0.0.1:30307 err=<nil> id=5
TRACE[03-23|01:41:00.051] >> NEIGHBORS/v4
831bd460aa219b9 addr=127.0.0.1:30307 err=<nil> id=5
TRACE[03-23|01:41:00.308] << FINDNODE/v4
1d8322cec02bf85 addr=127.0.0.1:30306 err=<nil> id=1
TRACE[03-23|01:41:00.309] >> NEIGHBORS/v4
1d8322cec02bf85 addr=127.0.0.1:30306 err=<nil>

```

2. On the second Terminal, Run Node 1

```

Student@Student-virtual-machine:~/Student/private-ethereum-setup$ geth --datadir no
de1 --port 30306 --bootnodes enode://f13fea6e327e85219224b4df28ddde31977a4e42cd
e53b6a7dc2eedb2578fce62d9fa22cdbee46f49264518b5758a1608604357d26e8b883a49f04d86
bbb97@127.0.0.1:30305 --networkid 15 --keystore "./node1/keystore" --unlock 0x3
41EEB11a2A0051C6B43f49f2D82F697827B777e --password "./node1/password.txt" --auth
rpc.port 8551 --mine --miner.etherbase 0x341EEB11a2A0051C6B43f49f2D82F697827B777
e console
INFO [03-23|11:54:18.797] Maximum peer count          ETH=50 LES=0
total=50
INFO [03-23|11:54:18.822] Smartcard socket not found, disabling err="stat /ru
n/pcscd/pcscd.comm: no such file or directory"
WARN [03-23|11:54:19.098] Sanitizing cache to Go's GC limits provided=1024
updated=640
INFO [03-23|11:54:19.126] Set global gas cap          cap=50,000,00
0
INFO [03-23|11:54:19.177] Allocated trie memory caches clean=96.00Mi
B dirty=160.00MiB
INFO [03-23|11:54:19.397] Using pebble as the backing database
INFO [03-23|11:54:19.397] Allocated cache and file handles database=/hom

```

```

peercount=0 tried=0 static=1
admin.peers

[INFO [03-23|01:39:26.226] Looking for peers
peercount=0 tried=0 static=1
[FO [03-23|01:39:36.245] Looking for peers
peercount=0 tried=1 static=1
[FO [03-23|01:39:46.302] Looking for peers
peercount=0 tried=0 static=1
[FO [03-23|01:39:56.322] Looking for peers
peercount=0 tried=0 static=1
[FO [03-23|01:40:06.343] Looking for peers
peercount=0 tried=1 static=1
[FO [03-23|01:40:17.252] Looking for peers
peercount=1 tried=0 static=1
[FO [03-23|01:40:27.507] Looking for peers
peercount=1 tried=0 static=1
[FO [03-23|01:40:37.509] Looking for peers
peercount=1 tried=1 static=1
[FO [03-23|01:40:47.771] Looking for peers
peercount=1 tried=0 static=1
[FO [03-23|01:40:47.771] Looking for peers

```

3. On the third Terminal, Run Node 2

```

Student@Student-virtual-machine:~/Student/private-ethereum-setup$ geth --datadir no
de2 --port 30307 --bootnodes enode://f13fea6e327e85219224b4df28ddde31977a4e42cd
e53b6a7dc2eedb2578fce62d9fa22cdbee46f49264518b5758a1608604357d26e8b883a49f04d86
bbb97@127.0.0.1:30305 --networkid 15 --keystore "./node2/keystore" --unlock 0xB
D66a740BcD4F3fc5135D2A0Bffa9b2a0B39561 --password "./node2/password.txt" --auth
rpc.port 8553 console

```

5. Step - 5 : Exploring the network by attaching JavaScript console to Node 1

1. Fetch network status

```
> net
{
  listening: true,
  peerCount: 1,
  version: "15",
  getListening: function(callback),
  getPeerCount: function(callback),
  getVersion: function(callback)
}
> INFO [03-23|12:39:20.607] Generating DAG in progress
epoch=0 percentage=63 elapsed=7m11.937s
```

- 2. To list the nodes in the network
- 4. To fetch the number of blocks mined

```
> web3.eth.blockNumber  
0  
> INFO [03-23|12:15:29.133] Looking for peers  
tried=0 static=0
```

5. To check the balance of the accounts

```
> ethINFO [03-23|12:18:50.325] Looking for peers
t=1 tried=0 static=0
> eth.getBalance(eth.accounts[0])
1e+24
> INFO [03-23|12:19:00.410] Looking for peers
tried=0 static=0
> eth.getBalance(eth.accounts[0])
1e+24
> INFO [03-23|12:18:52.994] Looking for peers
peercount=1 tried=0 static=0
peer> INFO [03-23|12:19:03.168] Looking for peers
peercount=1 tried=0 static=0
> [REDACTED]
```

6. To check the balance of the accounts in either

```
ercount=1 tried=0 static=0
INFO [03-23|12:20:42.380] Looking for peers
ercount=1 tried=0 static=0
INFO [03-23|12:20:52.833] Looking for peers
ercount=1 tried=0 static=0
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
1000000
> INFO [03-23|12:21:02.911] Looking for peers
peercount=1 tried=0 static=0
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")INFO
pe [03-23|12:20:34.537] Looking for peers
pe peercount=1 tried=0 static=0
pe 1000000
> INFO [03-23|12:20:46.148] Looking for peers
peercount=1 tried=0 static=0
INFO [03-23|12:20:56.357] Looking for peers
peercount=1 tried=0 static=0
```

7. To fetch the details of the latest mined block

8. To fetch the details of a specific block

```
ms err="the method eth_protocolVersion does not exist/is not available"

accounts: ["0x341eeb11a2a0051c6b43f49f2d82f697827b777e"],
blockNumber: 194,
coinbase: "0x341eeb11a2a0051c6b43f49f2d82f697827b777e",
compile: {
  lll: function(),
  serpent: function(),
  solidity: function()
},
defaultAccount: undefined,
defaultBlock: "latest",
gasPrice: 1000000000,
hashrate: 0,
maxPriorityFeePerGas: 1000000000,
mining: true,
pendingTransactions: [],
IARN [03-23|13:45:17.718] Served eth_protocolVersion           reqid=74 duration="5.029µs"
err="the method eth_protocolVersion does not exist/is not available"
protocolVersion: undefined,
syncing: false,
call: Function(),
chainId: function(),
contract: function(abi),
createAccesslist: function(),
estimateGas: function(),
feeHistory: function(),
fillTransaction: function(),
filter: function(options, callback, filterCreationErrorCallback),
getAccounts: function(callback),
getBalance: function(),
getBlock: function(),
getBlockByHash: function(),
getBlockByNumber: function().
```

9. To check the account balance of the peer machine, provide their Public Key

```

}
> eth.getBalance("0x341eeb11a2a0051c6b43f49f2d82f697827b777e")
1.0005499999996999997e+24
> 
```

10. Fetch the details of the peers in the network

```

> admin.peers
[{
  caps: ["eth/66", "eth/67", "eth/68", "snap/1"],
  enode: "enode://61875eab0bac067411350ae3db4ce535ed7b032d2936c862b2792d2207b5
3806459efcd53a26a6fcc5dc7897e81d93983d98b2eb26d12971da473eb62936e45@127.0.0.1:5
3066",
  id: "5831bd460aa219b97fe32390379d01ee24080938eb34d6aec3bf9d59cc4b8b2b",
  name: "Geth/v1.11.6-stable-ea9e62ca/linux-amd64/go1.20.3",
  network: {
    inbound: true,
    localAddress: "127.0.0.1:30306",
    remoteAddress: "127.0.0.1:53066",
    static: false,
    trusted: false
  },
  protocols: {
    eth: {
      version: 68
    },
    snap: {
      version: 1
    }
  }
} ] 
```

11. Perform Transactions between peers in the network

```

> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3
fcb5135D2A0Bfffa9b2a0B39561INFO [03-23|13:55:18.576] Generating DAG in progress
e
> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3
fcb5135D2A0Bfffa9b2a0B39561"INFO [03-23|13:55:19.368] Looking for peers
> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3
fcb5135D2A0Bfffa9b2a0B39561", VINFO [03-23|13:55:22.934] Generating DAG in progress
> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3
fcb5135D2A0Bfffa9b2a0B39561", valueINFO [03-23|13:55:27.232] Generating DAG in progress
> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3
fcb5135D2A0Bfffa9b2a0B39561", value:INFO [03-23|13:55:29.618] Looking for peers
> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3
fcb5135D2A0Bfffa9b2a0B39561", value:3INFO [03-23|13:55:31.281] Generating DAG in progress
> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3
fcb5135D2A0Bfffa9b2a0B39561", value:300000})
WARN [03-23|13:55:36.109] Caller gas above allowance, capping requested=105,439,533 cap=5
0,000,000
INFO [03-23|13:55:36.280] Generating DAG in progress epoch=1 percentage=99 elaps
ed=19m48.984s
INFO [03-23|13:55:36.285] Generated ethash verification cache epoch=1 elapsed=19m48.989s
INFO [03-23|13:55:36.490] Setting new local account address=0x341EEB11a2A0051C6
B43f49f2D82F697827B777e
INFO [03-23|13:55:36.723] Submitted transaction hash=0xe38a578d8562041e26f0
d04e12daac4e3a244ace21eb5a7a36a4e9e153744b7a from=0x341EEB11a2A0051C6B43f49f2D82F697827B777e n
once=0 recipient=0xBD66a740BcD4F3fcb5135D2A0Bfffa9b2a0B39561 value=300,000
"0xe38a578d8562041e26f0d04e12daac4e3a244ace21eb5a7a36a4e9e153744b7a"
> INFO [03-23|13:55:39.631] Looking for peers peercount=1 tried=0 stati
c=0
INFO [03-23|13:55:49.662] Looking for peers peercount=1 tried=0 static=
0
INFO [03-23|13:55:59.686] Looking for peers peercount=1 tried=0 static=
0
INFO [03-23|13:56:09.785] Looking for peers peercount=1 tried=0 static=
0 
```

12. Check the balances of sender and receiver 2

```

INFO [03-23|13:59:50.553] Looking for peers
ied=0 static=0
INFO [03-23|14:00:00.577] Looking for peers
ied=0 static=0
INFO [03-23|14:00:10.599] Looking for peers
ied=0 static=0
> eth.getBalance(eth.accounts[0])
1.000492e+24
> INFO [03-23|14:00:20.624] Looking for peers
tried=0 static=0
[]

> eth.getBalance("0x341eeb11a2a0051c6b43f49f2d82f697827b777e")
1.0005499999996999997e+24
> []

```

13. To check the details of the transaction on Node 1 Terminal

```

> eth.getTransaction("0xe38a578d8562041e26f0d04e12daac4e3a244ace21eb5a7a36a4e9e15
3744b7a")
{
  blockHash: null,
  blockNumber: null,
  chainId: "0x4d2",
  from: "0x341eeb11a2a0051c6b43f49f2d82f697827b777e",
  gas: 21000,
  gasPrice: 1000000000,
  hash: "0xe38a578d8562041e26f0d04e12daac4e3a244ace21eb5a7a36a4e9e153744b7a",
  input: "0x",
  nonce: 0,
  r: "0x36b06b3c1b405d54dad77c0da53cf86e39e084d5b4450f588737995327e5fff",
  s: "0x4f7195a8f00ae7c9f61f8548a4dc3459a1dc6f41006e9422b4e863055bf17e64",
  to: "0xbd66a740bcd4f3fc5135d2a0bffa9b2a0b39561",
  transactionIndex: null,
  type: "0x0",
  v: "0x9c7",
  value: 300000
}
> INFO [03-23|14:03:41.287] Looking for peers
tried=0 static=0
                                         peercount=1

> eth.getTransaction("0x36240d811271004c07387b5605b64fd8b826bafc79fdb110525c4a6dca21511")
{
  blockHash: null,
  blockNumber: null,
  chainId: "0x4d2",
  from: "0x341eeb11a2a0051c6b43f49f2d82f697827b777e",
  gas: 21000,
  gasPrice: 1000000000,
  hash: "0x36240d811271004c07387b5605b64fd8b826bafc79fdb110525c4a6dca21511",
  input: "0x",
  nonce: 2,
  r: "0xa2a7de2e2209665eb4d6ada224919ae9c940363a6fb46cbf827358844b5beaf7",
  s: "0x707c67989b051c79c5725a6419e96f8eb47291c266881184bc94af2b25b96eab",
  to: "0xbd66a740bcd4f3fc5135d2a0bffa9b2a0b39561",
  transactionIndex: null,
  type: "0x0",
  v: "0x9c7",
  value: 2359640274234
}
> INFO [03-23|14:35:50.340] Looking for peers
                                         peercount=1 tried=0 static=0

```

14. To get the details of the block in which the transaction is added

15. To check the contents in the Mempool - Transaction Pool

```
> txpool.content
{
  pending: {
    0x341EEB11a2A0051C6B43f49f2D82F697827B777e: {
      0: {
        blockHash: INFO [03-23|14:00:50.735] Looking for peers
        peercount=1 tried=0 static=0
      null,
        blockNumber: null,
        chainId: "0x4d2",
        from: "0x341eeb11a2a0051c6b43f49f2d82f697827b777e",
        gas: "0x5208",
        gasPrice: "0x3b9aca00",
        hash: "0xe38a578d8562041e26f0d04e12daac4e3a244ace21eb5a7a36a4e9e153744b7a",
        input: "0x",
        nonce: "0x0",
        r: "0x36b06b3c1b405d54dad77c0da53cf86e39e084d5b4450f588737995327e5fff",
        s: "0x4f7195a8f00ae7c9f61f8548a4dc3459a1dc6f41006e9422b4e863055bf17e64",
        to: "0xbd66a740bcd4f3fc5135d2a0bffa9b2a0b39561",
        transactionIndex: null,
        type: "0x0",
        v: "0x9c7",
        value: "0x493e0"
      }
    }
  },
  queued: []
}
>
```

16. To check the status of the Mempool - Transaction Pool

```
> txpool.status
{
  pending: 1,
  queued: 0
}
> INFO [03-23|14:04:21.407] Looking for peers
tried=0 static=0
peercount=1
```

17. To check the transactions initiated by a client, which are in the pool.

```
> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3fc5135D2
A0Bffa9b2a0B39561", value:INFO [03-23|14:32:39.355] Looking for peers
peercount=1
> eth.sendTransaction({from:"0x341EEB11a2A0051C6B43f49f2D82F697827B777e", to:"0xBD66a740BcD4F3fc5135D2
A0Bffa9b2a0B39561", value:2359640274234})
WARN [03-23|14:32:43.875] Caller gas above allowance, capping
requested=102,493,964 cap=50,000,000
INFO [03-23|14:32:43.938] Submitted transaction
hash=0x36240d811271004c07387b5605b64
fdab8826bafc79fb1d10525c4a6dca21511 from=0x341EEB11a2A0051C6B43f49f2D82F697827B777e nonce=2 recipient=0
xBD66a740BcD4F3fc5135D2A0Bffa9b2a0B39561 value=2,359,640,274,234
"0x36240d811271004c07387b5605b64fd88b826bafc79fb1d10525c4a6dca21511"
> INFO [03-23|14:32:49.398] Looking for peers
INFO [03-23|14:32:59.443] Looking for peers
peercount=1 tried=0 static=0
> txpool.inspect
{
  pending: {
    0x341EEB11a2A0051C6B43f49f2D82F697827B777e: {
      2: "0xBD66a740BcD4F3fc5135D2A0Bffa9b2a0B39561: 2359640274234 wei + 21000 gas x 1000000000 wei"
    }
  },
  queued: []
}
> INFO [03-23|14:33:09.508] Looking for peers
peercount=1 tried=0 static=0
```