

# Activity Day - Ethereum Client Installation

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```
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1 {
2   "config": {
3     "chainId": 5777,
4     "homesteadBlock": 0,
5     "eip150Block": 0,
6     "eip155Block": 0,
7     "eip158Block": 0,
8     "byzantiumBlock": 0,
9     "constantinopleBlock": 0,
10    "petersburgBlock": 0,
11    "ethash": {}
12  },
13  "gasLimit": "0x47b760",
14  "difficulty": "0x44",
15  "alloc": {}
16 }
~
~
~
~
~
~
<ftware/custom/geth/genesis.json" [noel] 16L, 342C          2,1      All
```

Figure 1 Configuration file content which defines genesis block

```
gokul ~/Software/custom/geth
$ tree .
.
├── COPYING
├── data
│   ├── geth
│   │   ├── chaindata
│   │   │   ├── 000001.log
│   │   │   ├── CURRENT
│   │   │   ├── LOCK
│   │   │   ├── LOG
│   │   │   └── MANIFEST-000000
│   │   ├── lightchaindata
│   │   │   ├── 000001.log
│   │   │   ├── CURRENT
│   │   │   ├── LOCK
│   │   │   ├── LOG
│   │   │   └── MANIFEST-000000
│   │   ├── LOCK
│   │   └── nodekey
│   └── keystore
│       └── UTC--2021-09-23T14-03-03.858401619Z--4478a36f538816ee718d48c1d17cf2deddd55f46
├── genesis.json
└── geth

5 directories, 16 files
gokul ~/Software/custom/geth
$
```

Figure 2 File structure of client

```

gokul ~/Software/custom/geth
$ ./geth --datadir data account new
INFO [09-23|19:32:57.023] Maximum peer count          ETH=50 LES=0 total=50
INFO [09-23|19:32:57.023] 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: 0x4478a36f538816eE718D48c1d17cf2deDdd55f46
Path of the secret key file: data/keystore/UTC--2021-09-23T14-03-03.858401619Z--4478a36f538816ee718d48c1d17cf2deddd55f46

- 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!

```

Figure 3 Creating new account

```

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$ ./geth --identity "ABC" --networkid "5777" --datadir "data" --http --http.port "8545" --unlock "0" --http.corsdomain "*" --http.api "miner,eth,net,web3,personal" --allow-insecure-unlock --nodiscover --miner.etherbase "0"
INFO [09-23|19:38:59.223] Maximum peer count          ETH=50 LES=0 total=50
INFO [09-23|19:38:59.223] Smartcard socket not found, disabling  err="stat /run/pcscd/pcscd.comm: no such file or directory"
WARN [09-23|19:38:59.223] -----
WARN [09-23|19:38:59.223] Referring to accounts by order in the keystore folder is dangerous!
WARN [09-23|19:38:59.223] This functionality is deprecated and will be removed in the future!
WARN [09-23|19:38:59.223] Please use explicit addresses! (can search via 'geth account list')
WARN [09-23|19:38:59.223] -----
INFO [09-23|19:38:59.224] Set global gas cap          cap=50,000,000
INFO [09-23|19:38:59.224] Allocated trie memory caches  clean=154.00MiB dirty=256.00MiB
INFO [09-23|19:38:59.224] Allocated cache and file handles  database=/home/gokul/Software/custom/geth/data/geth/chaindata cache=512.00MiB handles=524,288
INFO [09-23|19:38:59.248] Opened ancient database  database=/home/gokul/Software/custom/geth/data/geth/chaindata/ancient readonly=false
INFO [09-23|19:38:59.248] Initialised chain configuration  config={ChainID: 5777 Homestead: 0 DAO: <nil> DAOSupport: false EIP150: 0 EIP155: 0 EIP158: 0 Byzantium: 0 Constantinople: 0 Petersburg: 0 Istanbul: <nil>, Muir Glacier: <nil>, Berlin: <nil>, London: <nil>, Engine: ethash}
INFO [09-23|19:38:59.248] Disk storage enabled for ethash caches  dir=/home/gokul/Software/custom/geth/data/geth/ethash count=3
INFO [09-23|19:38:59.248] Disk storage enabled for ethash DAGs  dir=/home/gokul/.ethash count=2
INFO [09-23|19:38:59.248] Initialising Ethereum protocol  network=5777 dbversion=<nil>
INFO [09-23|19:38:59.249] Loaded most recent local header  number=0 hash=a52950..55bbb6 td=68 age=52y5mo3w
INFO [09-23|19:38:59.249] Loaded most recent local full block  number=0 hash=a52950..55bbb6 td=68 age=52y5mo3w
INFO [09-23|19:38:59.249] Loaded most recent local fast block  number=0 hash=a52950..55bbb6 td=68 age=52y5mo3w
WARN [09-23|19:38:59.249] Failed to load snapshot, regenerating  err="missing or corrupted snapshot"
INFO [09-23|19:38:59.249] Rebuilding state snapshot
INFO [09-23|19:38:59.250] Regenerated local transaction journal  transactions=0 accounts=0
INFO [09-23|19:38:59.250] Resuming state snapshot generation  root=56e81f..63b421 accounts=0 slots=0 storage=0.00B elapsed="381.312µs"
INFO [09-23|19:38:59.250] Generated state snapshot  accounts=0 slots=0 storage=0.00B elapsed="626.493µs"
INFO [09-23|19:38:59.250] Gasprice oracle is ignoring threshold set threshold=2
WARN [09-23|19:38:59.250] Error reading unclean shutdown markers  error="leveldb: not found"
INFO [09-23|19:38:59.250] Starting peer-to-peer node  instance=Geth/ABC/v1.10.8-stable-26675454/linux-amd64/go1.16.4
INFO [09-23|19:38:59.258] New local node record  seq1 id=e0b0ff317fb8737e ip=127.0.0.1 udp=0 tcp=30303
INFO [09-23|19:38:59.258] Started P2P networking  self="enode://a507066d8c414dfc164bead3e0e933cbc93419d4c265ea050d8a41f76409208fbc375143888fd03299dd9b3514365cc75f8064262a0e3821bae3eb2a722a07e6@127.0.0.1:30303?discport=0"
INFO [09-23|19:38:59.259] IPC endpoint opened  url=/home/gokul/Software/custom/geth/data/geth.ipc
INFO [09-23|19:38:59.259] HTTP server started  endpoint=127.0.0.1:8545 prefix= cors=* vhosts=localhost
WARN [09-23|19:38:59.259] -----
WARN [09-23|19:38:59.259] Referring to accounts by order in the keystore folder is dangerous!
WARN [09-23|19:38:59.259] This functionality is deprecated and will be removed in the future!
WARN [09-23|19:38:59.259] Please use explicit addresses! (can search via 'geth account list')
WARN [09-23|19:38:59.259] -----
Unlocking account 0 | Attempt 1/3
Password:
INFO [09-23|19:39:32.603] Unlocked account  address=0x4478a36f538816eE718D48c1d17cf2deDdd55f46

```

Figure 4 Starting the node ABC and logging in with password

```
gokul ~/Software/custom/geth/data
$ ls
geth geth.ipc keystore
gokul ~/Software/custom/geth/data
$ ../geth attach geth.ipc
Welcome to the Geth JavaScript console!

instance: Geth/ABC/v1.10.8-stable-26675454/linux-amd64/go1.16.4
coinbase: 0x4478a36f538816ee718d48c1d17cf2deddd55f46
at block: 353 (Thu Sep 23 2021 19:57:14 GMT+0530 (IST))
datadir: /home/gokul/Software/custom/geth/data
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

To exit, press ctrl-c
> miner.start()
null
>
> [M#oI]
```

Figure 5 attaching geth.ipc socket to start mining

```
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1 [|||||] 100.0% 5 [|||||] 99.4%
2 [|||||] 100.0% 6 [|||||] 99.3%
3 [|||||] 99.3% 7 [|||||] 99.3%
4 [|||||] 100.0% 8 [|||||] 99.3%
Mem[|||||] 1.28G/7.60G Tasks: 111, 302 thr; 8 running
Swap[|||||] 512K/2.00G Load average: 6.02 2.62 2.68
Uptime: 01:19:02

PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
5841 gokul 20 0 4385M 1249M 1047M R 100. 16.0 11:20.57 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5852 gokul 20 0 4385M 1249M 1047M R 100. 16.0 11:20.57 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5848 gokul 20 0 4385M 1249M 1047M R 100. 16.0 11:17.48 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5847 gokul 20 0 4385M 1249M 1047M R 100. 16.0 9:47.08 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5843 gokul 20 0 4385M 1249M 1047M R 99.4 16.0 9:02.19 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5844 gokul 20 0 4385M 1249M 1047M R 98.8 16.0 11:07.49 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5845 gokul 20 0 4385M 1249M 1047M R 98.1 16.0 5:21.62 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5850 gokul 20 0 4385M 1249M 1047M S 58.2 16.0 11:03.55 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
6874 gokul 20 0 4385M 1249M 1047M R 41.2 16.0 6:20.70 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5842 gokul 20 0 4385M 1249M 1047M S 0.0 16.0 0:03.61 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5853 gokul 20 0 4385M 1249M 1047M S 0.0 16.0 10:10.52 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5846 gokul 20 0 4385M 1249M 1047M S 0.0 16.0 0:00.00 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5849 gokul 20 0 4385M 1249M 1047M S 0.0 16.0 0:00.00 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5851 gokul 20 0 4385M 1249M 1047M S 0.0 16.0 0:00.00 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
5854 gokul 20 0 4385M 1249M 1047M S 0.0 16.0 5:16.28 ./geth --identity ABC --networkid 5777 --datadir data --http --http.port 8545 --unlock 0 --http.corsdomain *
7775 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7776 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.02 ../geth attach geth.ipc
7777 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7778 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7779 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7780 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7781 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7782 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7783 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.01 ../geth attach geth.ipc
7784 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7785 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.00 ../geth attach geth.ipc
7786 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.01 ../geth attach geth.ipc
7774 gokul 20 0 1587M 38512 22632 S 0.0 0.5 0:00.24 ../geth attach geth.ipc

F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice F8Nice F9Kill F10Quit
```

Figure 6 CPU getting tasked due to mining process



```
getui@linuxbox: ~/Software/custom/geth
INFO [09-23] 19:52:11.518] Commit new mining work
INFO [09-23] 19:52:11.932] Successfully sealed new block
INFO [09-23] 19:52:11.932] ⚡ block reached canonical chain
INFO [09-23] 19:52:11.932] ⚡ mined potential block
INFO [09-23] 19:52:11.933] Commit new mining work
INFO [09-23] 19:52:11.935] Successfully sealed new block
INFO [09-23] 19:52:11.936] ⚡ block reached canonical chain
INFO [09-23] 19:52:11.936] ⚡ mined potential block
INFO [09-23] 19:52:11.937] Commit new mining work
INFO [09-23] 19:52:12.159] Generating DAG in progress
INFO [09-23] 19:52:12.538] Successfully sealed new block
INFO [09-23] 19:52:12.538] ⚡ block reached canonical chain
INFO [09-23] 19:52:12.538] ⚡ mined potential block
INFO [09-23] 19:52:12.539] Commit new mining work
INFO [09-23] 19:52:13.590] Generating DAG in progress
INFO [09-23] 19:52:14.372] Successfully sealed new block
INFO [09-23] 19:52:14.372] ⚡ block reached canonical chain
INFO [09-23] 19:52:14.372] ⚡ mined potential block
INFO [09-23] 19:52:14.372] Commit new mining work
INFO [09-23] 19:52:15.056] Generating DAG in progress
INFO [09-23] 19:52:15.792] Successfully sealed new block
INFO [09-23] 19:52:15.792] ⚡ block reached canonical chain
INFO [09-23] 19:52:15.792] ⚡ mined potential block
INFO [09-23] 19:52:15.808] Commit new mining work
INFO [09-23] 19:52:16.411] Generating DAG in progress
INFO [09-23] 19:52:16.620] Successfully sealed new block
INFO [09-23] 19:52:16.621] ⚡ block reached canonical chain
INFO [09-23] 19:52:16.621] ⚡ mined potential block
INFO [09-23] 19:52:16.635] Commit new mining work
INFO [09-23] 19:52:17.713] Successfully sealed new block
INFO [09-23] 19:52:17.714] ⚡ block reached canonical chain
INFO [09-23] 19:52:17.714] ⚡ mined potential block
INFO [09-23] 19:52:17.714] Commit new mining work
INFO [09-23] 19:52:17.779] Generating DAG in progress
INFO [09-23] 19:52:18.028] Successfully sealed new block
INFO [09-23] 19:52:18.028] ⚡ block reached canonical chain
INFO [09-23] 19:52:18.029] ⚡ mined potential block
INFO [09-23] 19:52:18.029] Commit new mining work
INFO [09-23] 19:52:19.182] Successfully sealed new block
INFO [09-23] 19:52:19.183] ⚡ block reached canonical chain
INFO [09-23] 19:52:19.183] ⚡ mined potential block
INFO [09-23] 19:52:19.184] Commit new mining work
INFO [09-23] 19:52:19.184] ⚡ block reached canonical chain
INFO [09-23] 19:52:19.184] ⚡ mined potential block
number=33 sealhash=8309920..c1109c uncles=0 txs=0 gas=0 fees=0 elapsed="230.220µs"
number=55 sealhash=85b920..c1160c hash=7422b9..f7b546 elapsed=414.470ms
number=48 hash=a30558..be76fd
number=55 hash=7422b9..f7b546
number=56 sealhash=c7ada6..1d0c3b uncles=0 txs=0 gas=0 fees=0 elapsed="217.589µs"
number=56 sealhash=c7ada6..1d0c3b hash=a68de7..54af24 elapsed=2.555ms
number=49 hash=e23546..284986
number=56 hash=a68de7..54af24
number=57 sealhash=14d96b..4611be uncles=0 txs=0 gas=0 fees=0 elapsed="211.838µs"
epoch=1 percentage=36 elapsed=56.345s
number=57 sealhash=14d96b..4611be hash=b1562d..a4917b elapsed=601.210ms
number=50 hash=afe7e..c42be4
number=57 hash=b1562d..a4917b
number=58 sealhash=7ce052..ff1980 uncles=0 txs=0 gas=0 fees=0 elapsed="230.317µs"
epoch=1 percentage=37 elapsed=57.776s
number=58 sealhash=7ce052..ff1980 hash=b2826d..3429ca elapsed=1.833s
number=51 hash=cdb356..dfe749
number=58 hash=b2826d..3429ca
number=59 sealhash=b1fbb5..7bb43b uncles=0 txs=0 gas=0 fees=0 elapsed="231.74µs"
epoch=1 percentage=38 elapsed=59.242s
number=59 sealhash=b1fbb5..7bb43b hash=c3a9a3..ab4768 elapsed=1.419s
number=52 hash=1c904a..c40c83
number=59 hash=c3a9a3..ab4768
number=60 sealhash=58c5e6..d86eae uncles=0 txs=0 gas=0 fees=0 elapsed="286.998µs"
epoch=1 percentage=39 elapsed=1m0.597s
number=60 sealhash=58c5e6..d86eae hash=20b26d..b5c1fd elapsed=812.791ms
number=53 hash=fe052d..ede2a9
number=60 hash=20b26d..b5c1fd
number=61 sealhash=e70355..35d171 uncles=0 txs=0 gas=0 fees=0 elapsed="305.781µs"
number=61 sealhash=e70355..35d171 hash=1d116c..a8b207 elapsed=1.078s
number=54 hash=d6df11..47a10b
number=61 hash=1d116c..a8b207
number=62 sealhash=25e7b3..66b7a9 uncles=0 txs=0 gas=0 fees=0 elapsed="229.561µs"
epoch=1 percentage=40 elapsed=1m1.965s
number=62 sealhash=25e7b3..66b7a9 hash=a40cbc..2dcaaf elapsed=313.982ms
number=65 hash=7422b9..f7b546
number=62 hash=a40cbc..2dcaaf
number=63 sealhash=9ac197..311e1a uncles=0 txs=0 gas=0 fees=0 elapsed="260.944µs"
number=63 sealhash=9ac197..311e1a hash=680508..045739 elapsed=1.153s
number=56 hash=a68de7..54af24
number=63 hash=680508..045739
number=64 sealhash=4c8390..a7c782 uncles=0 txs=0 gas=0 fees=0 elapsed="314.189µs"
```

Figure 7 mining blocks