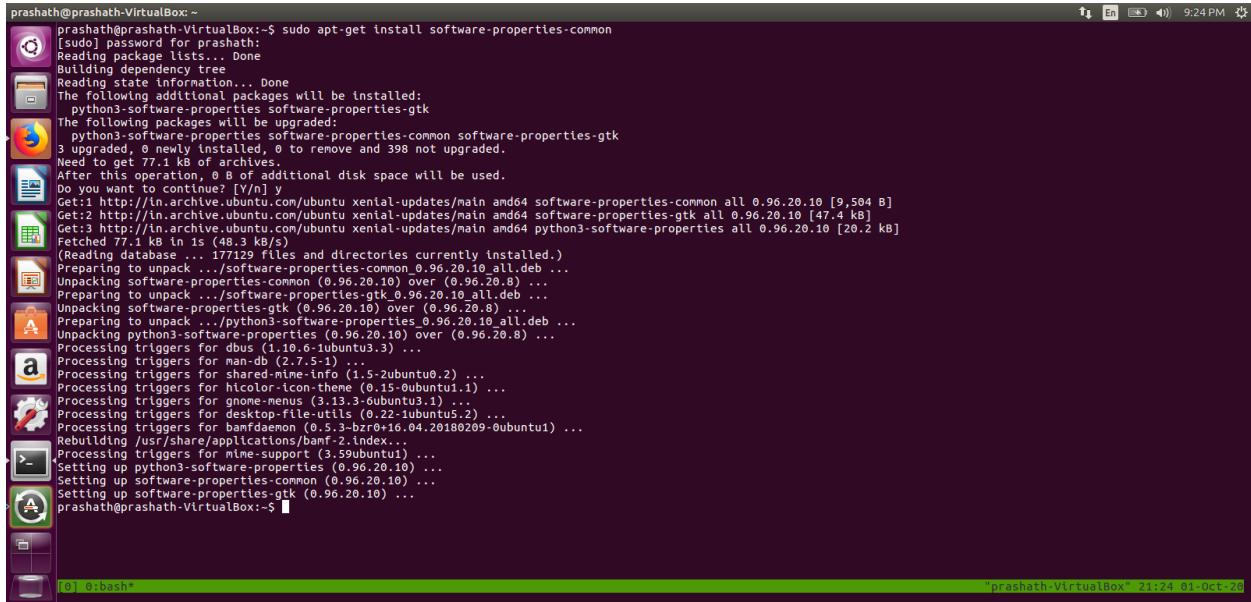
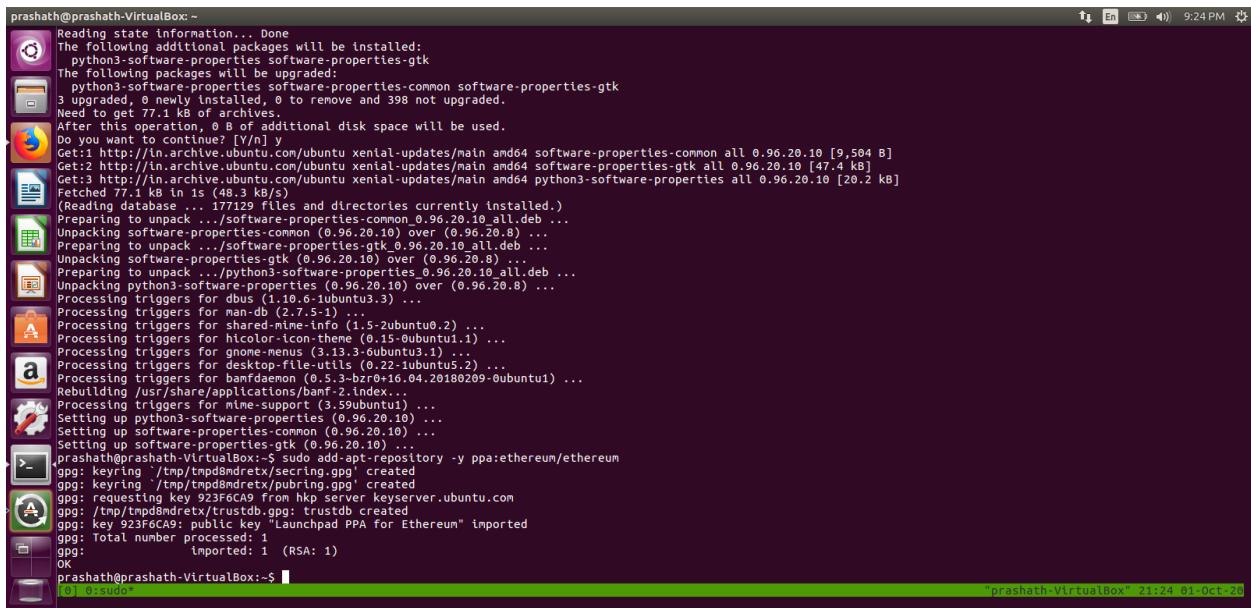


Design an Ethereum Private Blockchain

Setting up Environment



```
prashath@prashath-VirtualBox:~$ sudo apt-get install software-properties-common
[sudo] password for prashath:
Reading package lists... Done
Building dependency tree...
The following additional packages will be installed:
  python3-software-properties software-properties-gtk
The following packages will be upgraded:
  python3-software-properties software-properties-common software-properties-gtk
3 upgraded, 0 newly installed, 0 to remove and 398 not upgraded.
Need to get 77.1 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu xenial-updates/main amd64 software-properties-common all 0.96.20.10 [9,504 B]
Get:2 http://in.archive.ubuntu.com/ubuntu xenial-updates/main amd64 software-properties-gtk all 0.96.20.10 [47.4 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu xenial-updates/main amd64 python3-software-properties all 0.96.20.10 [26.2 kB]
Fetched 77.1 kB in 1s (48.3 kB/s)
(Reading database ... 177129 files and directories currently installed.)
Preparing to unpack .../software-properties-common_0.96.20.10_all.deb ...
Unpacking software-properties-common (0.96.20.10) over (0.96.20.8) ...
Preparing to unpack .../software-properties-gtk_0.96.20.10_all.deb ...
Unpacking software-properties-gtk (0.96.20.10) over (0.96.20.8) ...
Preparing to unpack .../python3-software-properties_0.96.20.10_all.deb ...
Unpacking python3-software-properties (0.96.20.10) over (0.96.20.8) ...
Processing triggers for dbus (1.10.6-1ubuntu3.3) ...
Processing triggers for man-db (2.7.5-1) ...
Processing triggers for shared-mime-info (1.5-2ubuntu0.2) ...
Processing triggers for hicolor-icon-theme (0.15-0ubuntu1.1) ...
Processing triggers for gnome-menu (3.13.3-6ubuntu3.1) ...
Processing triggers for desktop-file-utils (0.22-1ubuntu5.2) ...
Processing triggers for bamfdaemon (0.5.3-bzr0+16.04.20180209-0ubuntu1) ...
Rebuilding /usr/share/applications/bamf-2.index...
Processing triggers for mime-support (3.59ubuntu1) ...
Setting up python3-software-properties (0.96.20.10) ...
Setting up software-properties-common (0.96.20.10) ...
Setting up software-properties-gtk (0.96.20.10) ...
prashath@prashath-VirtualBox:~$
```



```
prashath@prashath-VirtualBox:~$ 
Reading state information... Done
The following additional packages will be installed:
  python3-software-properties software-properties-gtk
The following packages will be upgraded:
  python3-software-properties software-properties-common software-properties-gtk
3 upgraded, 0 newly installed, 0 to remove and 398 not upgraded.
Need to get 77.1 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu xenial-updates/main amd64 software-properties-common all 0.96.20.10 [9,504 B]
Get:2 http://in.archive.ubuntu.com/ubuntu xenial-updates/main amd64 software-properties-gtk all 0.96.20.10 [47.4 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu xenial-updates/main amd64 python3-software-properties all 0.96.20.10 [26.2 kB]
Fetched 77.1 kB in 1s (48.3 kB/s)
(Reading database ... 177129 files and directories currently installed.)
Preparing to unpack .../software-properties-common_0.96.20.10_all.deb ...
Unpacking software-properties-common (0.96.20.10) over (0.96.20.8) ...
Preparing to unpack .../software-properties-gtk_0.96.20.10_all.deb ...
Unpacking software-properties-gtk (0.96.20.10) over (0.96.20.8) ...
Preparing to unpack .../python3-software-properties_0.96.20.10_all.deb ...
Unpacking python3-software-properties (0.96.20.10) over (0.96.20.8) ...
Processing triggers for dbus (1.10.6-1ubuntu3.3) ...
Processing triggers for man-db (2.7.5-1) ...
Processing triggers for shared-mime-info (1.5-2ubuntu0.2) ...
Processing triggers for hicolor-icon-theme (0.15-0ubuntu1.1) ...
Processing triggers for gnome-menu (3.13.3-6ubuntu3.1) ...
Processing triggers for desktop-file-utils (0.22-1ubuntu5.2) ...
Processing triggers for bamfdaemon (0.5.3-bzr0+16.04.20180209-0ubuntu1) ...
Rebuilding /usr/share/applications/bamf-2.index...
Processing triggers for mime-support (3.59ubuntu1) ...
Setting up python3-software-properties (0.96.20.10) ...
Setting up software-properties-common (0.96.20.10) ...
Setting up software-properties-gtk (0.96.20.10) ...
prashath@prashath-VirtualBox:~$ sudo add-apt-repository -y ppa:ethereum/ethereum
gpg: keyring '/tmp/tmpd8mdretx/secreting.gpg' created
gpg: keyring '/tmp/tmpd8mdretx/pubring.gpg' created
gpg: requesting key 923F6CA9 from hkp server keyserver.ubuntu.com
gpg: key 923F6CA9: public key "Launchpad PPA for Ethereum" imported
gpg: Total number processed: 1
gpg:           imported: 1 (RSA: 1)
OK
prashath@prashath-VirtualBox:~$
```

```
prashath@prashath-VirtualBox:~$ sudo apt-get update
Get:1 http://In.archive.ubuntu.com/ubuntu xenial InRelease [247 kB]
Hit:2 http://security.ubuntu.com/ubuntu xenial-security InRelease
Get:3 http://ppa.launchpad.net/ethereum/ubuntu xenial InRelease [17.5 kB]
Get:4 http://ppa.launchpad.net/ethereum/ubuntu xenial/main amd64 Packages [6,088 B]
Hit:5 http://ppa.launchpad.net/ethereum/ubuntu xenial/main i386 Packages [6,106 B]
Get:6 http://ppa.launchpad.net/ethereum/ubuntu xenial/main Translation-en [3,000 B]
Hit:7 http://ppa.launchpad.net/ethereum/ubuntu xenial/main Translation-en [3,000 B]
Hit:8 http://In.archive.ubuntu.com/ubuntu xenial-backports InRelease
Fetched 280 kB in 3s (74.7 kB/s)
Reading package lists... Done
prashath@prashath-VirtualBox:~$
```

```
prashath@prashath-VirtualBox:~$ Get:2 http://ppa.launchpad.net/ethereum/ubuntu xenial/main amd64 bootnode amd64 1.9.22+build23638+xenial [4,861 kB]
Get:3 http://ppa.launchpad.net/ethereum/ubuntu xenial/main amd64 clef amd64 1.9.22+build23638+xenial [7,429 kB]
Get:4 http://ppa.launchpad.net/ethereum/ubuntu xenial/main amd64 evm amd64 1.9.22+build23638+xenial [4,857 kB]
Get:5 http://ppa.launchpad.net/ethereum/ubuntu xenial/main amd64 geth amd64 1.9.22+build23638+xenial [7,741 kB]
Get:6 http://ppa.launchpad.net/ethereum/ubuntu xenial/main amd64 puppet amd64 1.9.22+build23638+xenial [3,426 kB]
Get:7 http://ppa.launchpad.net/ethereum/ubuntu xenial/main amd64 rlpdump amd64 1.9.22+build23638+xenial [555 kB]
Get:8 http://ppa.launchpad.net/ethereum/ubuntu xenial/main amd64 ethereum amd64 1.9.22+build23638+xenial [1,544 B]
Fetched 33.8 MB in 5s (577 kB/s)
Selecting previously unselected package abigen.
(Reading database ... 17,029 files and directories currently installed.)
Preparing to unpack .../abigen_1.9.22+build23638+xenial_amd64.deb ...
Unpacking abigen (1.9.22+build23638+xenial) ...
Selecting previously unselected package bootnode.
Preparing to unpack .../bootnode_1.9.22+build23638+xenial_amd64.deb ...
Unpacking bootnode (1.9.22+build23638+xenial) ...
Selecting previously unselected package clef.
Preparing to unpack .../clef_1.9.22+build23638+xenial_amd64.deb ...
Unpacking clef (1.9.22+build23638+xenial) ...
Selecting previously unselected package evm.
Preparing to unpack .../evm_1.9.22+build23638+xenial_amd64.deb ...
Unpacking evm (1.9.22+build23638+xenial) ...
Selecting previously unselected package geth.
Preparing to unpack .../geth_1.9.22+build23638+xenial_amd64.deb ...
Unpacking geth (1.9.22+build23638+xenial) ...
Selecting previously unselected package puppet.
Preparing to unpack .../puppet_1.9.22+build23638+xenial_amd64.deb ...
Unpacking puppet (1.9.22+build23638+xenial) ...
Selecting previously unselected package rlpdump.
Preparing to unpack .../rlpdump_1.9.22+build23638+xenial_amd64.deb ...
Unpacking rlpdump (1.9.22+build23638+xenial) ...
Selecting previously unselected package ethereum.
Preparing to unpack .../ethereum_1.9.22+build23638+xenial_amd64.deb ...
Unpacking ethereum (1.9.22+build23638+xenial) ...
Setting up abigen (1.9.22+build23638+xenial) ...
Setting up bootnode (1.9.22+build23638+xenial) ...
Setting up clef (1.9.22+build23638+xenial) ...
Setting up evm (1.9.22+build23638+xenial) ...
Setting up geth (1.9.22+build23638+xenial) ...
Setting up puppet (1.9.22+build23638+xenial) ...
Setting up rlpdump (1.9.22+build23638+xenial) ...
Setting up ethereum (1.9.22+build23638+xenial) ...
prashath@prashath-VirtualBox:~$
```

Creating Ethereum Private Network and making a Transaction

```
prashath@prashath-VirtualBox: ~
prashath@prashath-VirtualBox:~$ mkdir private-ethereum
prashath@prashath-VirtualBox:~$ cd private-ethereum/
prashath@prashath-VirtualBox:/private-ethereum$
```

create accounts

```
prashath@prashath-VirtualBox: ~
prashath@prashath-VirtualBox:~/private-ethereum$ geth --datadir ./datadir account new
INFO [10-01|21:27:30.594] Maximum peer count           ETH=50 LES=0 total=50
INFO [10-01|21:27:30.594] 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: 0x6081a0be7e2237d5798efa6189ee0c15a6688d75
Path of the secret key file: ./datadir/keystore/UTC-2020-10-01T15-57-37.303863726Z--6081a0be7e2237d5798efa6189ee0c15a6688d75
- 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!
prashath@prashath-VirtualBox:/private-ethereum$
```

\$ geth --datadir ./datadir account new

```
prashath@prashath-VirtualBox:~$ ./private-ethereumS geth --datadir ./datadir account new
INFO [10-01|21:27:30.594] Maximum peer count                                     ETH=50 LES=0 total=50
INFO [10-01|21:27:30.594] 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: 0x6001A0Be7E2237d5798efa6189EE0C15a6688D75
Path of the secret key file: datadir/keystore/UTC--2020-10-01T15-57-37.303863726Z--6081a0be7e2237d5798efa6189ee0c15a6688D75

- 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!

prashath@prashath-VirtualBox:~$ ./private-ethereumS geth --datadir ./datadir account new
INFO [10-01|21:29:11.277] Maximum peer count                                     ETH=50 LES=0 total=50
INFO [10-01|21:29:11.277] 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: 0x7027A7ff8Ea0555Ee4Acc23743eC675d9e2ac687
Path of the secret key file: datadir/keystore/UTC--2020-10-01T15-59-16.477065633Z--7027a7ff8Ea0555Ee4acc23743eC675d9e2ac687

- 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!

prashath@prashath-VirtualBox:~$
```

genesis.json

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

```

prashath@prashath-VirtualBox:~ prashath@prashath-VirtualBox:~/private-ethereum$ geth --datadir ./datadir init genesis.json
INFO [10-01|21:36:32.859] Maximum peer count
INFO [10-01|21:36:32.859] Smartcard socket not found, disabling
INFO [10-01|21:36:32.861] Set global gas cap
INFO [10-01|21:36:32.861] Allocated cache and file handles
INFO [10-01|21:36:32.862] Writing custom genesis block
INFO [10-01|21:36:32.862] Persisted trie from memory database
INFO [10-01|21:36:32.862] Successfully wrote genesis state
INFO [10-01|21:36:32.862] Allocated cache and file handles
INFO [10-01|21:36:32.862] Writing custom genesis block
INFO [10-01|21:36:32.921] Persisted trie from memory database
INFO [10-01|21:36:32.922] Successfully wrote genesis state
prashath@prashath-VirtualBox:~/private-ethereum$ 

```

```

prashath@prashath-VirtualBox:~ prashath@prashath-VirtualBox:~/private-ethereum$ geth --datadir ./datadir console
INFO [10-01|21:36:56.645] Starting Geth on Ethereum mainnet...
INFO [10-01|21:36:56.646] Bumping default cache on mainnet...
WARN [10-01|21:36:56.646] Sanitizing cache to Go's GC limits
INFO [10-01|21:36:56.646] Maximum peer count
INFO [10-01|21:36:56.646] Smartcard socket not found, disabling
INFO [10-01|21:36:56.647] Set global gas cap
INFO [10-01|21:36:56.647] Allocated cache and file handles
INFO [10-01|21:36:56.647] Allocated trie memory caches
INFO [10-01|21:36:56.647] Allocated cache and file handles
INFO [10-01|21:36:56.800] Opened ancient database
INFO [10-01|21:36:56.800] Loading chain configuration
INFO [10-01|21:36:56.800] Multi-Petersburg, v1.0, Istanbul, Byzantium
INFO [10-01|21:36:56.801] Disk storage enabled for ethash caches
INFO [10-01|21:36:56.801] Disk storage enabled for ethash DAGs
INFO [10-01|21:36:56.801] Initialising Ethereum protocol
WARN [10-01|21:36:56.802] Upgrade blockchain database version
INFO [10-01|21:36:56.802] Loaded most recent local header
INFO [10-01|21:36:56.802] Loaded most recent local full block
INFO [10-01|21:36:56.802] Regenerated local transaction journal
INFO [10-01|21:36:56.802] Allocated fast sync bloom
INFO [10-01|21:36:56.817] Starting peer-to-peer node
INFO [10-01|21:36:56.819] Initialized fast sync bloom
INFO [10-01|21:36:56.853] New local node record
INFO [10-01|21:36:56.853] Started P2P networking
4aa99ef7b794e96addef7ba5f51d41ae15115cd127.0.0.1:30303
INFO [10-01|21:36:56.896] IPC endpoint opened
INFO [10-01|21:36:56.896] Etherbase automatically configured
Welcome to the Geth Javascript console!

instance: Geth/v1.9.22-stable-c71a7e26/linux-amd64/go1.15
coinbase: 0x6081a0be7e2237d5798efa6189ee0c15a6698d75
at block: 0 (Thu Jan 01 1970 05:30:00 GMT+0530 (IST))
datadir: /home/prashath/private-ethereum/datadir
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

> INFO [10-01|21:36:59.995] New local node record
INFO [10-01|21:37:06.866] Looking for peers
INFO [10-01|21:37:16.868] Looking for peers

```

geth --datadir ./datadir console

check eth.accounts and eth.getBalance(eth.account[0])

```
prashath@prashath-VirtualBox: ~
INFO [10-01 21:37:46.716] Maximum peer count
INFO [10-01 21:37:46.716] Smartcard socket not found, disabling
INFO [10-01 21:37:46.716] Set global gas cap
INFO [10-01 21:37:46.716] Allocated memory caches
INFO [10-01 21:37:46.716] Allocated cache and file handles
INFO [10-01 21:37:46.716] Opened ancient database
INFO [10-01 21:37:46.865] Initialised chain configuration
un: 0 Constantinople: <n1> Petersburg: <n1>, Istanbul: <n1>, Muir Glacier: <n1>, YOLO v1: <n1>, Engine: unknown
INFO [10-01 21:37:46.865] Disk storage enabled for ethash caches
INFO [10-01 21:37:46.866] Disk storage enabled for ethash DAGs
INFO [10-01 21:37:46.866] Initialising Ethereum protocol
INFO [10-01 21:37:46.869] Loaded most recent local header
INFO [10-01 21:37:46.869] Loaded most recent local full block
INFO [10-01 21:37:46.869] Loaded most recent local fast block
INFO [10-01 21:37:46.871] Loaded local transaction journal
INFO [10-01 21:37:46.871] Regenerated local transaction journal
INFO [10-01 21:37:46.885] Allocated fast sync bloom
INFO [10-01 21:37:46.886] Starting peer-to-peer node
INFO [10-01 21:37:46.888] Initialized fast sync bloom
INFO [10-01 21:37:46.952] New local node record
INFO [10-01 21:37:46.953] Started P2P networking
4aaaef96a0def7ba5f1441e1511c9d127.0.0.1:30303
INFO [10-01 21:37:46.954] IP endpoint opened
INFO [10-01 21:37:46.988] Etherbase automatically configured
Welcome to the Geth Javascript console!
a
Instance: Geth/v1.9.22-stable-c71a7e26/linux-amd64/go1.15
coinbase: 0x6081a0be72237d5798fa189ee0c15a6688d75
at block: 0 (Thu Jan 01 1970 05:30:00 GMT+0530 (IST))
datadir: /home/prashath/private-ethereum/datadir
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.accounts
[<0x00081a0be72237d5798fa189ee0c15a6688d75>, <0x7027a7ff8ea0555ee4acc23743ec675d9e2ac087>]
-> INFO [10-01 21:37:56.066] Looking for peers
-> INFO [10-01 21:38:05.640] New local node record
-> eth.TINFO [10-01 21:38:05.662] Looking for peers
-> eth.getBalance(eth.accounts[0]) [10-01 21:38:17.172] Looking for peers
-> eth.getBalance(eth.accounts[0])
[0x0]
-> INFO [10-01 21:38:27.185] Looking for peers
[0] 0: geth> 1:bash-
prashath@prashath-VirtualBox: 21:38 01-Oct-20
```

```
prashath@prashath-VirtualBox: ~
INFO [10-01|21:37:46.717] Allocated trie memory caches
INFO [10-01|21:37:46.717] Allocated cache and file handles
INFO [10-01|21:37:46.863] Opened ancient database
INFO [10-01|21:37:46.865] Initialised chain configuration
un: 0 ConstantInople: <nll> Petersburg: <nll> Istanbul: <nll>, Muir Glacier: <nll>, YOLO v1: <nll>, Engine: "unknown"
INFO [10-01|21:37:46.865] Disk storage enabled for ethash caches
INFO [10-01|21:37:46.866] Disk storage enabled for ethash DAGs
INFO [10-01|21:37:46.866] Initialising Ethereum protocol
INFO [10-01|21:37:46.869] Loaded most recent local header
INFO [10-01|21:37:46.869] Loaded most recent local full block
INFO [10-01|21:37:46.870] Loaded most recent local fast block
INFO [10-01|21:37:46.871] Loaded local transaction journal
INFO [10-01|21:37:46.871] Regenerated local transaction journal
INFO [10-01|21:37:46.885] Allocated fast sync bloom
INFO [10-01|21:37:46.886] Starting peer-to-peer node
INFO [10-01|21:37:46.889] Initialized fast sync bloom
INFO [10-01|21:37:46.954] New local node record
INFO [10-01|21:37:46.954] Started P2P networking
4aaa9ef7b794d60def7ba5f5e441ae1515cd@127.0.0.1:30303
INFO [10-01|21:37:46.954] IPC endpoint opened
INFO [10-01|21:37:46.988] Etherbase automatically configured
Welcome to the geth JavaScript console!

A instance: Geth/v1.9.22-stable-c71a7e26/linux-amd64/go1.15
coinbase: 0x6081a0be7e2237d5798efa6189ee0c15a6688d75
at block: 0 (Thu Jan 01 1970 05:30:00 +0530 (IST))
datadir: /home/prashath/private-ethereum/datadir
modules: admin:1.0 debug:1.0 eth:1.0 ethash:1.0 net:1.0 personal:1.0 rpc:1.0 txpool:1.0 web3:1.0

-> eth.accounts
[0x6081a0be7e2237d5798efa6189ee0c15a6688d75", "0x7207a7ff8ea0555ee4acc23743ec5d95d9e2ac687"]
INFO [10-01|21:37:56.960] Looking for peers
-> eth:INFO [10-01|21:38:05.640] New local node record
-> eth:INFO [10-01|21:38:06.962] Looking for peers
-> eth.getBalance(eth:INFO [10-01|21:38:17.172] Looking for peers
-> eth.getBalance(eth.accounts[0])
1e+23
-> INFO [10-01|21:38:27.185] Looking for peers
INFO [10-01|21:38:37.204] Looking for peers
-> eth.getBalance(eth.accounts[1])
1.e+23
-> INFO [10-01|21:38:37.204] Looking for peers
INFO [10-01|21:38:37.204] Looking for peers
-> eth.getBalance(eth.accounts[0])
peercount=0 tried=4 static=0
peercount=0 tried=4 static=0
clean=328.00MiB dirty=328.00MiB
database=/home/prashath/private-ethereum/datadir/geth/chaindata cache=657.00MiB handles=524288
database=/home/prashath/private-ethereum/datadir/geth/chaindata/ancient
config=[chainID: 2019 Homestead: 0 DAO: <nll> DAOsupport: false EIP150: 0 EIP155: 0 EIP158: 0 Byzantium
du=/home/prashath/private-ethereum/datadir/geth/ethash count=3
du=/home/prashath/private-ethereum/ethash count=2
versions=[64 63] network=1 dbversion=8
number=0 hash=c7303c_fie916" td=400 age=51y5m03w
number=0 hash=c7303c_fie916" td=400 age=51y5m03w
number=0 hash=c7303c_fie916" td=400 age=51y5m03w
transactions=0 dropped=0
transactions=0 accounts=0
size=656.00MiB
instance=Geth/v1.9.22-stable-c71a7e26/linux-amd64/go1.15
item=3 errorrate=0.000 elapsed=1.899ms
seq=3 tdb=ba569482381e944 lp=127.0.0.1 udp=30303 tcp=30303
self=none://cd73f7a7e2aa0baza3f48df95a6162993b25e2edde7f25e92d613e2a7a314960517ab26ae50c8e0c8e6d66f0c29e
url=/home/prashath/private-ethereum/datadir/geth.lpc
address=0x6081a0be7e2237d5798efa6189ee0c15a6688d75
prashath@prashath-VirtualBox: 21:38 01-Oct-26
```

Start Mining

```
prashath@prashath-VirtualBox: ~
INFO [10-01|21:42:40.048] Initialised chain configuration
INFO [un: 0] Constantinople: <nil> Petersburg: <nil> Istanbul: <nil>, Muir Glaciator: <nil>, YOLO v1: <nil>, Engine: unknown"
INFO [10-01|21:42:40.048] Disk storage enabled for ethash caches
INFO [10-01|21:42:40.049] Disk storage enabled for ethash DAGs
INFO [10-01|21:42:40.049] Initialising Ethereum protocol
INFO [10-01|21:42:40.054] Loaded most recent local header
INFO [10-01|21:42:40.054] Loaded most recent local full block
INFO [10-01|21:42:40.054] Loaded most recent local fast block
INFO [10-01|21:42:40.055] Loaded local transaction journal
INFO [10-01|21:42:40.055] Regenerated local transaction journal
INFO [10-01|21:42:40.097] Allocated fast sync bloom
INFO [10-01|21:42:40.097] Starting peer-to-peer node
INFO [10-01|21:42:40.098] Initialized fast sync bloom
INFO [10-01|21:42:40.187] New local node record
INFO [10-01|21:42:40.187] P2P networking
4aaa9efb7e49640def7ba5f51441e5151cdg=17.0.1:30303
INFO [10-01|21:42:40.187] IPC endpoint opened
INFO [10-01|21:42:40.228] Etherbase automatically configured
Welcome to the Geth JavaScript console!
instance: Geth/v1.9.22-stable-c71a7e26/linux-amd64/g01.15
coinbase: 0x6081ab0be7e2237d5798befa189ee0eC15a6688d75
at block: 0 (Thu Jan 01 1970 05:30:00 GMT+0530 (IST))
datadir: /home/prashath/private-ethereum/datadir
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
a > miner.start()
INFO [10-01|21:42:27.474] Starting mining threads
INFO [10-01|21:42:27.474] Transaction pool price threshold updated
null
INFO [10-01|21:42:27.475] Commit new mining work
INFO [10-01|21:42:29.396] Generating DAG in progress
INFO [10-01|21:42:30.194] Looking for peers
INFO [10-01|21:42:30.644] Generating DAG in progress
INFO [10-01|21:42:31.603] New local node record
INFO [10-01|21:42:32.102] Generating DAG in progress
INFO [10-01|21:42:33.387] Generating DAG in progress
INFO [10-01|21:42:34.591] Generating DAG in progress
INFO [10-01|21:42:35.868] Generating DAG in progress
INFO [10-01|21:42:37.146] Generating DAG in progress
INFO [10-01|21:42:38.395] Generating DAG in progress
config=[chainId: 2019 Homestead: 0 DAO: <nil> DAOSupport: False EIP150: 0 EIP155: 0 EIP158: 0 Byzantium
du=/home/prashath/private-ethereum/datadir/geth/ethash count=3
du=/home/prashath/.ethash count=2
versions=[65 64 63] network=1 dvbversion=8
number=0 hash="c7303c_fie916" td=400 age=51y5mo3w
number=0 hash="c7303c_fie916" td=400 age=51y5mo3w
number=0 hash="c7303c_fie916" td=400 age=51y5mo3w
transactions=0 dropped=0
transactions=0 accounts=0
size=656.001B
instance=Geth/v1.9.22-stable-c71a7e26/linux-amd64/g01.15
item=3 error=0 elapsed=4.832ms
seq=7 id=ba69482a381e9444 ip=127.0.0.1 udp=30303 tcp=30303
self=enode://c437fa2eaa0ba2af348d795a0162993b25e2edde7f5e92d613e2a7a314960517ab2ea5e0c8eb0d0f0c29e
url=/home/prashath/private-ethereum/datadir/geth.lpc
address=0x6081AB0BE7E2237d5798befa189EE0C15a6688d75
```

```

prashath@prashath-VirtualBox: ~
[0] 1 bash*
INFO [10-01|21:43:13.693] Generating DAG in progress
INFO [10-01|21:43:14.945] Generating DAG in progress
INFO [10-01|21:43:16.214] Generating DAG in progress
INFO [10-01|21:43:17.424] Generating DAG in progress
INFO [10-01|21:43:18.634] Generating DAG in progress
INFO [10-01|21:43:19.011] Generating DAG in progress
INFO [10-01|21:43:19.495] Looking for peers
INFO [10-01|21:43:21.222] Generating DAG in progress
INFO [10-01|21:43:22.629] Generating DAG in progress
INFO [10-01|21:43:24.259] Generating DAG in progress
INFO [10-01|21:43:25.528] Generating DAG in progress
INFO [10-01|21:43:26.755] Generating DAG in progress
INFO [10-01|21:43:28.008] Generating DAG in progress
INFO [10-01|21:43:29.929] Generating DAG in progress
INFO [10-01|21:43:30.507] Looking for peers
INFO [10-01|21:43:31.207] Generating DAG in progress
INFO [10-01|21:43:32.451] Generating DAG in progress
INFO [10-01|21:43:33.014] Generating DAG in progress
INFO [10-01|21:43:34.814] Generating DAG in progress
INFO [10-01|21:43:35.972] Generating DAG in progress
INFO [10-01|21:43:37.114] Generating DAG in progress
INFO [10-01|21:43:38.303] Generating DAG in progress
INFO [10-01|21:43:39.316] Generating DAG in progress
INFO [10-01|21:43:40.577] Looking for peers
INFO [10-01|21:43:41.411] Generating DAG in progress
INFO [10-01|21:43:42.614] Generating DAG in progress
INFO [10-01|21:43:43.800] Generating DAG in progress
INFO [10-01|21:43:44.973] Generating DAG in progress
INFO [10-01|21:43:46.180] Generating DAG in progress
INFO [10-01|21:43:47.387] Generating DAG in progress
INFO [10-01|21:43:48.599] Generating DAG in progress
INFO [10-01|21:43:49.772] Generating DAG in progress
INFO [10-01|21:43:50.577] Looking for peers
INFO [10-01|21:43:50.972] Generating DAG in progress
INFO [10-01|21:43:52.205] Generating DAG in progress
INFO [10-01|21:43:53.561] Generating DAG in progress
INFO [10-01|21:43:54.751] Generating DAG in progress
INFO [10-01|21:43:56.169] Generating DAG in progress
INFO [10-01|21:43:57.337] Generating DAG in progress
INFO [10-01|21:43:59.285] Generating DAG in progress
epoch=0 percentage=33 elapsed=44.331s
epoch=0 percentage=34 elapsed=45.558s
epoch=0 percentage=35 elapsed=46.810s
epoch=0 percentage=36 elapsed=48.079s
epoch=0 percentage=37 elapsed=49.289s
epoch=0 percentage=38 elapsed=50.566s
epoch=0 percentage=39 elapsed=51.876s
peercount=0 triled=4 statle=0
epoch=0 peercount=40 elapsed=53.087s
epoch=0 percentage=41 elapsed=54.494s
epoch=0 percentage=42 elapsed=56.174s
epoch=0 percentage=43 elapsed=57.393s
epoch=0 percentage=44 elapsed=58.620s
epoch=0 percentage=45 elapsed=59.873s
epoch=0 percentage=46 elapsed=1m1.794s
peercount=0 triled=4 statle=0
epoch=0 percentage=47 elapsed=1m3.072s
epoch=0 percentage=48 elapsed=1m4.316s
epoch=0 percentage=49 elapsed=1m5.479s
epoch=0 percentage=50 elapsed=1m6.679s
epoch=0 percentage=51 elapsed=1m7.837s
epoch=0 percentage=52 elapsed=1m8.979s
epoch=0 percentage=53 elapsed=1m10.168s
epoch=0 percentage=54 elapsed=1m11.681s
peercount=0 triled=4 statle=0
epoch=0 percentage=55 elapsed=1m13.277s
epoch=0 percentage=56 elapsed=1m14.479s
epoch=0 percentage=57 elapsed=1m15.665s
epoch=0 percentage=58 elapsed=1m16.838s
epoch=0 percentage=59 elapsed=1m18.045s
epoch=0 percentage=60 elapsed=1m19.252s
epoch=0 percentage=61 elapsed=1m20.464s
epoch=0 percentage=62 elapsed=1m21.638s
peercount=0 triled=4 statle=0
epoch=0 percentage=63 elapsed=1m22.837s
epoch=0 percentage=64 elapsed=1m24.070s
epoch=0 percentage=65 elapsed=1m25.426s
epoch=0 percentage=66 elapsed=1m26.616s
epoch=0 percentage=67 elapsed=1m28.034s
epoch=0 percentage=68 elapsed=1m29.202s
epoch=0 percentage=69 elapsed=1m31.150s

```

```

prashath@prashath-VirtualBox: ~
[0] 1 bash*
INFO [10-01|21:44:20.608] Generating DAG in progress
INFO [10-01|21:44:20.649] Looking for peers
INFO [10-01|21:44:21.804] Generating DAG in progress
INFO [10-01|21:44:23.184] Generating DAG in progress
INFO [10-01|21:44:24.589] Generating DAG in progress
INFO [10-01|21:44:25.790] Generating DAG in progress
INFO [10-01|21:44:26.988] Generating DAG in progress
INFO [10-01|21:44:28.220] Generating DAG in progress
INFO [10-01|21:44:29.410] Generating DAG in progress
INFO [10-01|21:44:30.585] Generating DAG in progress
INFO [10-01|21:44:31.610] Looking for peers
INFO [10-01|21:44:31.689] Generating DAG in progress
INFO [10-01|21:44:32.955] Generating DAG in progress
INFO [10-01|21:44:34.427] Generating DAG in progress
INFO [10-01|21:44:35.831] Generating DAG in progress
INFO [10-01|21:44:37.212] Generating DAG in progress
INFO [10-01|21:44:37.215] Generated ethash verification cache
INFO [10-01|21:44:40.649] Generating DAG in progress
INFO [10-01|21:44:40.731] Looking for peers
INFO [10-01|21:44:40.998] Successfully sealed new block
INFO [10-01|21:44:40.998] <mined potential block
INFO [10-01|21:44:40.998] Commit new mining work
INFO [10-01|21:44:42.071] Successfully sealed new block
INFO [10-01|21:44:42.071] <mined potential block
INFO [10-01|21:44:42.072] Commit new mining work
INFO [10-01|21:44:42.805] Successfully sealed new block
INFO [10-01|21:44:42.805] <mined potential block
INFO [10-01|21:44:42.805] Commit new mining work
INFO [10-01|21:44:43.677] Generating DAG in progress
INFO [10-01|21:44:43.681] Successfully sealed new block
INFO [10-01|21:44:43.681] <mined potential block
INFO [10-01|21:44:43.681] Commit new mining work
INFO [10-01|21:44:44.274] Successfully sealed new block
INFO [10-01|21:44:44.274] <mined potential block
INFO [10-01|21:44:44.274] Commit new mining work
INFO [10-01|21:44:44.439] Successfully sealed new block
INFO [10-01|21:44:44.439] <mined potential block
INFO [10-01|21:44:44.439] Mining too far in the future
INFO [10-01|21:44:45.130] Generating DAG in progress
INFO [10-01|21:44:46.388] Generating DAG in progress
INFO [10-01|21:44:46.451] Commit new mining work
epoch=0 percentage=86 elapsed=1m52.473s
peercount=0 triled=4 statle=0
epoch=0 percentage=87 elapsed=1m53.670s
epoch=0 percentage=88 elapsed=1m55.049s
epoch=0 percentage=89 elapsed=1m56.454s
epoch=0 percentage=90 elapsed=1m57.655s
epoch=0 percentage=91 elapsed=1m58.853s
epoch=0 percentage=92 elapsed=2m0.085s
epoch=0 percentage=93 elapsed=2m1.275s
epoch=0 percentage=94 elapsed=2m2.450s
peercount=0 triled=3 statle=0
epoch=0 percentage=95 elapsed=2m3.675s
epoch=0 peercount=96 elapsed=2m4.820s
epoch=0 percentage=97 elapsed=2m6.292s
epoch=0 percentage=98 elapsed=2m7.696s
epoch=0 percentage=99 elapsed=2m9.078s
epoch=0 elapsed=2m9.080s
epoch=1 percentage=0 elapsed=2.427s
peercount=0 triled=4 statle=0
number=1 sealhash="b69849_03e858" hash="745d28_82d5d4" elapsed=2m13.522s
number=1 hash="745d28_82d5d4"
number=2 sealhash="1c5e63_c7662b" uncles=0 txs=0 gas=0 fees=0 elapsed="107.165μs"
number=2 sealhash="1c5e63_c7662b" hash="4d8c4c_327735" elapsed=1.072s
number=2 hash="4d8c4c_327735"
number=3 sealhash="8e3e7c_102b7a" uncles=0 txs=0 gas=0 fees=0 elapsed="134.385μs"
number=3 sealhash="8e3e7c_102b7a" hash="be1ede_bebc9f" elapsed=733.450s
number=3 hash="be1ede_bebc9f"
number=4 sealhash="be10c_0efdf0" uncles=0 txs=0 gas=0 fees=0 elapsed="365.087μs"
epoch=1 sealhash="be10c_0efdf0" hash="745d28_82d5d4" elapsed=2m13.4995s
number=4 sealhash="be10c_0efdf0" hash="ff894f_aaec63" elapsed=855.285ms
number=4 hash="ff894f_aaec63"
number=5 sealhash="e099da_476df" uncles=0 txs=0 gas=0 fees=0 elapsed="90.84μs"
number=5 sealhash="e099da_476df" hash="5dd451_164839" elapsed=612.841ns
number=5 hash="5dd451_164839"
number=6 sealhash="fa0564_00457e" uncles=0 txs=0 gas=0 fees=0 elapsed="78.935μs"
number=6 sealhash="fa0564_00457e" hash="4b2c68_b77767" elapsed=164.580ms
number=6 hash="4b2c68_b77767"
wait=2s
epoch=1 percentage=2 elapsed=6.908s
epoch=1 percentage=3 elapsed=8.166s
number=7 sealhash="f3a3f0_95b2f8" uncles=0 txs=0 gas=0 fees=0 elapsed=2.011s

```

Check miner rewards for mining the block which is been credited to account[0] by default

```

prashath@prashath-VirtualBox:~ prashath@prashath-VirtualBox:~/private-ethereum$ geth --datadir ./datadir console
INFO [10-01|21:46:59.655] Starting Geth on Ethereum mainnet...
INFO [10-01|21:46:59.655] Bumping default cache on mainnet
WARN [10-01|21:46:59.655] Sanitizing cache to Go's GC limits
INFO [10-01|21:46:59.656] Maximum peer count
INFO [10-01|21:46:59.656] Shared socket not found, disabling global
INFO [10-01|21:46:59.663] Allocated trie memory caches
INFO [10-01|21:46:59.663] Allocated cache and file handles
INFO [10-01|21:46:59.663] Opened ancient database
um: 0 Constantinople: <nil> Petersburg: <nil> Istanbul: <nil>, Muir Glacier: <nil>, YOLO v1: <nil>, Engine: unknown"
INFO [10-01|21:46:59.629] Disk storage enabled for ethash DAGs
INFO [10-01|21:46:59.630] Disk storage enabled for ethash DAGs
INFO [10-01|21:46:59.632] Initialising Ethereum protocol
INFO [10-01|21:46:59.638] Loaded most recent local header
INFO [10-01|21:46:59.638] Loaded most recent local full block
INFO [10-01|21:46:59.638] Loaded most recent local fast block
INFO [10-01|21:46:59.640] Regenerated local transaction journal
INFO [10-01|21:46:59.647] Sync mode from fast sync to full sync
WARN [10-01|21:46:59.647] Starting peer-to-peer node
INFO [10-01|21:46:59.649] New local node record
INFO [10-01|21:46:59.650] Started P2P networking
4aaa9ef7b794e6c00df7ba5ff5144fa511f0107.0.0.1:30303
INFO [10-01|21:47:00.085] IPC endpoint opened
INFO [10-01|21:47:00.088] Ethereum automatically configured
Welcome to the Geth JavaScript console!
instance: Geth/v1.9.22-stable-c71a7e26/linux-amd64/go1.15
coinbase: 0x6081a0be7e2237d5798fea189ee0c15a6688d75
at block: 22 (Thu Oct 01 2020 21:45:28 GMT+0530 (IST))
datadir: /home/prashath/private-ethereum/datadir
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
> eth.getBalance(eth.accounts[0])
1.00000e+23
> 
[0] 0: geth* 1:bash- prashath-VirtualBox" 21:47 01-Oct-20

```

```

prashath@prashath-VirtualBox:~ prashath@prashath-VirtualBox:~/private-ethereum$ personal.unlockAccount(eth.accounts[0], "password")
INFO [10-01|21:48:40.336] Looking for peers
INFO [10-01|21:48:40.336] peercount=0 tried=4 static=0
true
> 
[0] 0: geth* 1:bash- prashath-VirtualBox" 21:48 01-Oct-20

```

Transaction from account[0] to account[1] 4 ethers

```
prashath@prashath-VirtualBox: ~
> eth.sendTransaction({from:eth.accounts[0], to:eth.accounts[1], value: web3.toWei(4, "ether")})
INFO [10-01|21:49:10.339] Looking for peers
INFO [10-01|21:49:10.342] Setting new local account
INFO [10-01|21:49:10.342] Submitted transaction
peercount=0 tried=4 static=0
address=0x081a0Be7E237d5798efab6189EE0C15a6688D75
fullhash=0x37b0936fa120d28be04dd64e80c06c2ab5ab14034f0b848f7107dd583842ca21 recipient=0x7027A7ff8Ea055
5Ee4Cc23743eC675d9e2ac087
"0x37b0936fa120d28be04dd64e80c06c2ab5ab14034f0b848f7107dd583842ca21"
> [0] 0: geth* 1:bash- prashath@VirtualBox" 21:49 01-Oct-20
```

```
prashath@prashath-VirtualBox: ~
> eth.getBalance(eth.accounts[1])
1.2e+3
> INFO [10-01|21:49:40.343] Looking for peers
peercount=0 tried=4 static=0
[0] 0: geth* 1:bash- prashath@VirtualBox" 21:49 01-Oct-20
```

```
prashath@prashath-VirtualBox: ~
> miner.start()
INFO [10-01|21:50:22.263] Updated mining threads threads=4
INFO [10-01|21:50:22.264] Transaction pool price threshold updated price=1000000000000
null
> INFO [10-01|21:50:22.265] Commit new mining work
INFO [10-01|21:50:22.266] Commit new mining work
INFO [10-01|21:50:24.353] Successfully sealed new block
INFO [10-01|21:50:24.354] ~mined potential block
INFO [10-01|21:50:24.355] Commit new mining work
INFO [10-01|21:50:24.356] Commit new mining work
INFO [10-01|21:50:24.485] Successfully sealed new block
INFO [10-01|21:50:24.486] ~mined potential block
INFO [10-01|21:50:24.487] Commit new mining work
INFO [10-01|21:50:24.488] Commit new mining work
INFO [10-01|21:50:25.508] Generating DAG in progress
INFO [10-01|21:50:27.127] Successfully sealed new block
INFO [10-01|21:50:27.127] ~mined potential block
INFO [10-01|21:50:27.127] Commit new mining work
INFO [10-01|21:50:27.127] Generating DAG in progress
INFO [10-01|21:50:30.437] Looking for peers
INFO [10-01|21:50:30.468] Successfully sealed new block
INFO [10-01|21:50:30.469] ~mined potential block
INFO [10-01|21:50:30.468] Commit new mining work
INFO [10-01|21:50:30.469] Generating DAG in progress
INFO [10-01|21:50:31.066] Successfully sealed new block
INFO [10-01|21:50:31.066] ~mined potential block
INFO [10-01|21:50:31.066] Commit new mining work
INFO [10-01|21:50:31.212] Successfully sealed new block
INFO [10-01|21:50:31.212] ~mined potential block
INFO [10-01|21:50:31.212] Commit new mining work
INFO [10-01|21:50:33.284] Generating DAG in progress
INFO [10-01|21:50:33.284] Successfully sealed new block
INFO [10-01|21:50:33.285] ~mined potential block
INFO [10-01|21:50:33.285] Commit new mining work
number=23 sealhash="b09699_098c15" uncles=0 txs=0 gas=0 fees=0 elapsed="282.177μs"
number=23 sealhash="38beed_478e96" uncles=0 txs=1 gas=2100 fee=2.1e-05 elapsed=1.014ms
number=23 sealhash="38beed_478e96" hash="b4d572_4467c7" elapsed=2.087s
number=23 sealhash="bd4572_4467c7" elapsed=2.087s
number=24 sealhash="89dc75_ac5ead" uncles=0 txs=0 gas=0 fees=0 elapsed="91.73μs"
number=24 sealhash="89dc75_ac5ead" uncles=0 txs=0 gas=0 fees=0 elapsed="412.999μs"
number=24 sealhash="89dc75_ac5ead" hash="844cdca_f2b122" elapsed=131.401ms
number=24 hash="844cdca_f2b122"
number=25 sealhash="36db52_e7fff4" uncles=0 txs=0 gas=0 fees=0 elapsed="69.783μs"
epoch=1 percentage=0 elapsed=2.390s
number=25 sealhash="36db52_e7fff4" hash="5691bb_f2819c" elapsed=2.641s
number=25 sealhash="5691bb_f2819c"
number=26 sealhash="999a1e_c3a73c" uncles=0 txs=0 gas=0 fees=0 elapsed="78.22μs"
epoch=1 percentage=1 elapsed=4.944s
peercount=0 trilevel=3 static=0
number=26 sealhash="999a1e_c3a73c" hash="973634_5a61fd" elapsed=3.340s
number=26 hash="973634_5a61fd"
number=27 sealhash="15547f_e2da25" uncles=0 txs=0 gas=0 fees=0 elapsed="87.279μs"
epoch=1 percentage=2 elapsed=.378s
number=27 sealhash="15547f_e2da25" hash="fceee52_bb1bf6" elapsed=597.422ms
number=27 hash="fceee52_bb1bf6"
number=28 sealhash="363df7_31e066" uncles=0 txs=0 gas=0 fees=0 elapsed="94.444μs"
number=28 sealhash="363df7_31e066" hash="cdc553_e0e624" elapsed=145.779ms
number=28 hash="cdc553_e0e624"
number=29 sealhash="a70ef1_cc0826" uncles=0 txs=0 gas=0 fees=0 elapsed="67.65μs"
epoch=1 percentage=3 elapsed=9.748s
number=29 sealhash="a70ef1_cc0826" hash="189062_889c8f" elapsed=2.072s
number=29 hash="189062_889c8f"
number=30 sealhash="d21839_016cia" uncles=0 txs=0 gas=0 fees=0 elapsed="81.216μs"
number=30 hash="d21839_016cia"

[0:0:bash* 1:bash- "prashath@prashath-VirtualBox: 21:50 01-Oct-2023
```

```
prashath@prashath-VirtualBox: ~
> eth.getBalance(eth.accounts[0])
1.000305e+23
> eth.getBalance(eth.accounts[1])
1.280046e+23
> INFO [10-01|21:55:35.370] Looking for peers
peercount=0 tried=4 static=0

[0] 0: geth* 1:bash-
"prashath-VirtualBox" 21:55 01-Oct-20
```

Transaction details

```
prashath@prashath-VirtualBox: ~
File Edit View Search Terminal Help
> eth.getTransaction("0x6cce1732ac6c8d34e50f17fd867af6c3fc78a0caa42bad5d9b3b52ebf17a74a4")
{
  blockHash: null,
  blockNumber: null,
  from: "0x0ebcb78f20279f8260bf3ef35c20a61b431502a",
  gas: 21000,
  gasPrice: 1000000000,
  hash: "0x0cce1732ac6c8d34e50f17fd867af6c3fc78a0caa42bad5d9b3b52ebf17a74a4",
  input: "0x",
  nonce: 1,
  r: "0xa3ff4f3f76d11a405687588327011d9a0fbcc5083c8e5bab44ac07926f59465eb",
  s: "0x75885b6106277c1192cdabb545b30ef1f8adabba151d9b054385cf8bc7b1d2",
  to: "0x0cce1732ac6c8d34e50f17fd867af6c3fc78a0caa42bad5d9b3b52ebf17a74a4",
  transactionIndex: null,
  v: "0xfea",
  value: 40000000000000000000000000000000
}
>
```

(0) 0: geth* 1:bash-

"prashath-VirtualBox" 22:45 01-Oct-20