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# TP ETHEREUM

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## MEMBRES

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# CLIENT ETHEREUM (GETH) :

sudo apt-get install software-properties-common

```
nadine@DESKTOP-IH5C1I5:~$ sudo apt-get install software-properties-common
[sudo] password for nadine:
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 100 not upgraded.
```

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

```
nadine@DESKTOP-IH5C1I5:~$ 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...
Found existing deb entry in /etc/apt/sources.list.d/ethereum-ubuntu-ethereum-jammy.list
Adding deb entry to /etc/apt/sources.list.d/ethereum-ubuntu-ethereum-jammy.list
Found existing deb-src entry in /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 E66CB8FE57F8218E96B13446B50ABD2EE384B
7D4
Hit:1 http://archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:4 http://archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:5 https://ppa.launchpadcontent.net/ethereum/ubuntu jammy InRelease
Hit:6 http://archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:3 https://packages.gitlab.com/gitlab/gitlab-ce/ubuntu jammy InRelease [23.3 kB]
Err:3 https://packages.gitlab.com/gitlab/gitlab-ce/ubuntu jammy InRelease
      The following signatures were invalid: EXPKEYSIG 3F01618A51312F3F GitLab B.V. (package repository signing key) <packages@gitlab.com>
Fetched 23.3 kB in 2 s (11.9 kB/s)
Reading package lists... Done
W: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: https://packages.gitlab.com/gitlab/gitlab-ce/ubuntu jammy InRelease: The following signatures were invalid: EXPKEYSIG 3F01618A51312F3F GitLab B.V. (package repository signing key) <packages@gitlab.com>
W: Failed to fetch https://packages.gitlab.com/gitlab/gitlab-ce/ubuntu/dists/jammy/InRelease  The following signatures were invalid: EXPKEYSIG 3F01618A51312F3F GitLab B.V. (package repository signing key) <packages@gitlab.com>
W: Some index files failed to download. They have been ignored, or old ones used instead.
```

sudo apt-get update

```
nadine@DESKTOP-IH5C1I5:~$ sudo apt-get update
Hit:1 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:3 https://ppa.launchpadcontent.net/ethereum/ethereum/ubuntu jammy InRelease
Hit:4 http://archive.ubuntu.com/ubuntu jammy InRelease
Hit:5 http://archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:6 http://archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:2 https://packages.gitlab.com/gitlab/gitlab-ce/ubuntu jammy InRelease [23.3 kB]
Err:2 https://packages.gitlab.com/gitlab/gitlab-ce/ubuntu jammy InRelease
      The following signatures were invalid: EXPKEYSIG 3F01618A51312F3F GitLab B.V. (package repository signing key) <packages@gitlab.com>
Fetched 23.3 kB in 2 s (11.8 kB/s)
Reading package lists... Done
W: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: https://packages.gitlab.com/gitlab/gitlab-ce/ubuntu jammy InRelease: The following signatures were invalid: EXPKEYSIG 3F01618A51312F3F GitLab B.V. (package repository signing key) <packages@gitlab.com>
W: Failed to fetch https://packages.gitlab.com/gitlab/gitlab-ce/ubuntu/dists/jammy/InRelease  The following signatures were invalid: EXPKEYSIG 3F01618A51312F3F GitLab B.V. (package repository signing key) <packages@gitlab.com>
W: Some index files failed to download. They have been ignored, or old ones used instead.
```

**sudo apt-get install ethereum**

```
nadine@DESKTOP-IH5C1I5:~$ sudo apt-get install ethereum
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  abigen bootnode clef evm geth rlpdump
The following NEW packages will be installed:
  abigen bootnode clef ethereum evm geth rlpdump
0 upgraded, 7 newly installed, 0 to remove and 183 not upgraded.
Need to get 48.9 MB of archives.
After this operation, 159 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 https://ppa.launchpadcontent.net/ethereum/ubuntu jammy/main amd64 abigen amd64 1.14.11+build30352+jammy [6778 kB]
Get:2 https://ppa.launchpadcontent.net/ethereum/ubuntu jammy/main amd64 bootnode amd64 1.14.11+build30352+jammy [6998 kB]
Get:3 https://ppa.launchpadcontent.net/ethereum/ubuntu jammy/main amd64 clef amd64 1.14.11+build30352+jammy [11.6 kB]
Get:4 https://ppa.launchpadcontent.net/ethereum/ubuntu jammy/main amd64 evm amd64 1.14.11+build30352+jammy [9399 kB]
Get:5 https://ppa.launchpadcontent.net/ethereum/ubuntu jammy/main amd64 geth amd64 1.14.11+build30352+jammy [13.4 kB]
Get:6 https://ppa.launchpadcontent.net/ethereum/ubuntu jammy/main amd64 rlpdump amd64 1.14.11+build30352+jammy [867 kB]
Get:7 https://ppa.launchpadcontent.net/ethereum/ubuntu jammy/main amd64 ethereum amd64 1.14.11+build30352+jammy [1466 B]
Fetched 48.9 MB in 36s (1343 kB/s)
Selecting previously unselected package abigen.
(Reading database ... 98137 files and directories currently installed.)
Preparing to unpack .../0-abigen_1.14.11+build30352+jammy_amd64.deb ...
Unpacking abigen (1.14.11+build30352+jammy) ...
Selecting previously unselected package bootnode.
Preparing to unpack .../1-bootnode_1.14.11+build30352+jammy_amd64.deb ...
Unpacking bootnode (1.14.11+build30352+jammy) ...
Selecting previously unselected package clef.
Preparing to unpack .../2-clef_1.14.11+build30352+jammy_amd64.deb ...
Unpacking clef (1.14.11+build30352+jammy) ...
Selecting previously unselected package evm.
Preparing to unpack .../3-evm_1.14.11+build30352+jammy_amd64.deb ...
Unpacking evm (1.14.11+build30352+jammy) ...
Selecting previously unselected package geth.
Preparing to unpack .../4-geth_1.14.11+build30352+jammy_amd64.deb ...
Unpacking geth (1.14.11+build30352+jammy) ...
Selecting previously unselected package rlpdump.
Preparing to unpack .../5-rlpdump_1.14.11+build30352+jammy_amd64.deb ...
Unpacking rlpdump (1.14.11+build30352+jammy) ...
Selecting previously unselected package ethereum.
Preparing to unpack .../6-ethereum_1.14.11+build30352+jammy_amd64.deb ...
Unpacking ethereum (1.14.11+build30352+jammy) ...
Setting up rlpdump (1.14.11+build30352+jammy) ...
Setting up clef (1.14.11+build30352+jammy) ...
Setting up bootnode (1.14.11+build30352+jammy) ...
Setting up geth (1.14.11+build30352+jammy) ...
Setting up evm (1.14.11+build30352+jammy) ...
```

## Activer Windows

## STEP 1 – CREATE THE DATADIR FOLDER

```
nadine@DESKTOP-IH5C1I5:~$ mkdir chainSkills  
nadine@DESKTOP-IH5C1I5:~$ cd chainSkills/  
nadine@DESKTOP-IH5C1I5:~/chainSkills$ mkdir -p ~/ChainSkills/miner1  
nadine@DESKTOP-IH5C1I5:~/chainSkills$ mkdir -p ~/ChainSkills/miner2  
nadine@DESKTOP-IH5C1I5:~/chainSkills$
```

## STEP 2 – CREATE THE GENESIS FILE

# STEP 3 – INITIALIZE THE PRIVATE BLOCKCHAIN

## Step 3.1 – Initialize miner #1

```
nadine@DESKTOP-IH5C1I5:~/ChainSkills$ geth --datadir ~/ChainSkills/miner1 init genesis.json
INFO [10-31|11:34:20.118] Maximum peer count          ETH=50 total=50
INFO [10-31|11:34:20.121] Smartcard socket not found, disabling   err="stat /run/pcscd/pcscd.comm: no such file or directory"
INFO [10-31|11:34:20.128] Set global gas cap           cap=50,000,000
INFO [10-31|11:34:20.129] Initializing the KZG library    backend=gokzg
INFO [10-31|11:34:20.184] Defaulting to pebble as the backing database
INFO [10-31|11:34:20.185] Allocated cache and file handles   database=/home/nadine/ChainSkills/miner1/geth/chaindata cache=16.00
MiB handles=16
INFO [10-31|11:34:20.260] Opened ancient database        database=/home/nadine/ChainSkills/miner1/geth/chaindata/ancient/cha
in readonly=false
INFO [10-31|11:34:20.260] State schema set to default      scheme=path
ERROR[10-31|11:34:20.261] Head block is not reachable
INFO [10-31|11:34:20.297] Opened ancient database        database=/home/nadine/ChainSkills/miner1/geth/chaindata/ancient/sta
te readonly=false
INFO [10-31|11:34:20.297] Writing custom genesis block
INFO [10-31|11:34:20.343] Successfully wrote genesis state
nadine@DESKTOP-IH5C1I5:~/ChainSkills$
```

Activer Windows  
database=chaindata hash=c0990b..cdd1ab Accédez aux paramètres pour activer Windows.

## Step 3.2 – Initialize miner #2

```
nadine@DESKTOP-IH5C1I5:~/ChainSkills$ geth --datadir ~/ChainSkills/miner2 init genesis.json
INFO [10-31|11:35:57.587] Maximum peer count          ETH=50 total=50
INFO [10-31|11:35:57.589] Smartcard socket not found, disabling   err="stat /run/pcscd/pcscd.comm: no such file or directory"
INFO [10-31|11:35:57.598] Set global gas cap           cap=50,000,000
INFO [10-31|11:35:57.599] Initializing the KZG library    backend=gokzg
INFO [10-31|11:35:57.658] Defaulting to pebble as the backing database
INFO [10-31|11:35:57.658] Allocated cache and file handles   database=/home/nadine/ChainSkills/miner2/geth/chaindata cache=16.00
MiB handles=16
INFO [10-31|11:35:57.722] Opened ancient database        database=/home/nadine/ChainSkills/miner2/geth/chaindata/ancient/cha
in readonly=false
INFO [10-31|11:35:57.722] State schema set to default      scheme=path
ERROR[10-31|11:35:57.723] Head block is not reachable
INFO [10-31|11:35:57.762] Opened ancient database        database=/home/nadine/ChainSkills/miner2/geth/chaindata/ancient/sta
te readonly=false
INFO [10-31|11:35:57.762] Writing custom genesis block
INFO [10-31|11:35:57.795] Successfully wrote genesis state
nadine@DESKTOP-IH5C1I5:~/ChainSkills$
```

Activer Windows  
database=chaindata hash=c0990b..cdd1ab Accédez aux paramètres pour activer Windows.

# STEP 4 – CREATE ACCOUNTS

## Step 4.1 – Accounts for miner #1

```
nadine@DESKTOP-IH5C1I5:~/ChainSkills$ geth --datadir ~/ChainSkills/miner1 account new
INFO [10-31|11:38:24.240] Maximum peer count          ETH=50 total=50
INFO [10-31|11:38:24.242] 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: 0x4155EbCb0aD26f0cD28365e0E0eE8934F8f12327
Path of the secret key file: /home/nadine/ChainSkills/miner1/keystore/UTC--2024-10-31T10-38-32.823597754Z--4155ebcb0ad26f0cd28365e0e0e
e8934f8f12327

- 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!
```

Activer Windows  
Accédez aux paramètres pour activer Windows.

### Add an additional account for testing purpose:

```
nadine@DESKTOP-IH5C1I5:~/ChainSkills$ geth --datadir ~/ChainSkills/miner1 account new
INFO [10-31|11:39:25.971] Maximum peer count          ETH=50 total=50
INFO [10-31|11:39:25.975] 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: 0xbb08051DeC91A48b8c3487e202cBC304b0572D57
Path of the secret key file: /home/nadine/ChainSkills/miner1/keystore/UTC--2024-10-31T10-39-32.144811136Z--bb08051dec91a48b8c3487e202c
bc304b0572d57

- 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!
```

Activer Windows  
Accédez aux paramètres pour activer Windows.

```

nadine@DESKTOP-IH5C1I5:~/ChainSkills$ ls -al ~/ChainSkills/miner1/keystore
total 16
drwx----- 2 nadine nadine 4096 Oct 31 11:39 .
drwxr-xr-x 4 nadine nadine 4096 Oct 31 11:34 ..
-rw----- 1 nadine nadine 491 Oct 31 11:38 UTC--2024-10-31T10-38-32.823597754Z--4155ebcb0ad26f0cd28365e0e0ee8934f8f12327
-rw----- 1 nadine nadine 491 Oct 31 11:39 UTC--2024-10-31T10-39-32.144811136Z--bb08051dec91a48b8c3487e202cbc304b0572d57
nadine@DESKTOP-IH5C1I5:~/ChainSkills$
```

```

nadine@DESKTOP-IH5C1I5:~/ChainSkills$ geth --datadir ~/ChainSkills/miner1 account list
INFO [10-31|11:41:48.023] Maximum peer count          ETH=50 total=50
INFO [10-31|11:41:48.026] Smartcard socket not found, disabling   err="stat /run/pcscd/pcscd.comm: no
such file or directory"
Account #0: {4155ebcb0ad26f0cd28365e0e0ee8934f8f12327} keystore:///home/nadine/ChainSkills/miner1/keys
tore/UTC--2024-10-31T10-38-32.823597754Z--4155ebcb0ad26f0cd28365e0e0ee8934f8f12327
Account #1: {bb08051dec91a48b8c3487e202cbc304b0572d57} keystore:///home/nadine/ChainSkills/miner1/keys
tore/UTC--2024-10-31T10-39-32.144811136Z--bb08051dec91a48b8c3487e202cbc304b0572d57
nadine@DESKTOP-IH5C1I5:~/ChainSkills$
```

## Step 4.1 – Accounts for miner #1

```

nadine@DESKTOP-IH5C1I5:~/ChainSkills$ geth --datadir ~/ChainSkills/miner2 account new
INFO [10-31|11:42:46.731] Maximum peer count          ETH=50 total=50
INFO [10-31|11:42:46.735] 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: 0x3f8958564bf52Da9dEb65cff83fc1B7562694fec
Path of the secret key file: /home/nadine/ChainSkills/miner2/keystore/UTC--2024-10-31T10-42-53.1983776
95Z--3f8958564bf52da9deb65cff83fc1b7562694fec

- 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!
```

### Add an additional account for testing purpose:

```

nadine@DESKTOP-IH5C1I5:~/ChainSkills$ geth --datadir ~/ChainSkills/miner2 account new
INFO [10-31|11:43:38.445] Maximum peer count          ETH=50 total=50
INFO [10-31|11:43:38.448] 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: 0xb03076e0AE9Aae0211525E6edBc95f215B1d4e09
Path of the secret key file: /home/nadine/ChainSkills/miner2/keystore/UTC--2024-10-31T10-43-45.1155214
04Z--b03076e0ae9aae0211525e6edbc95f215b1d4e09

- 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!
```

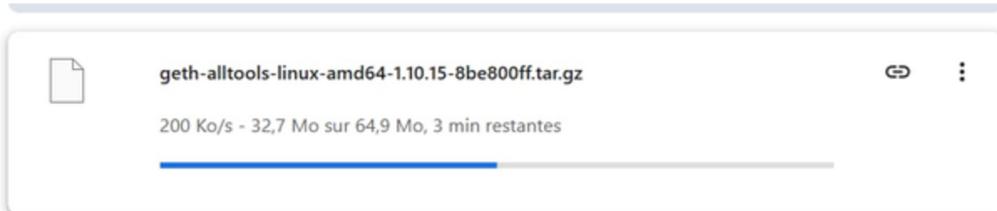
```

nadine@DESKTOP-IH5C1I5:~/ChainSkills$ geth --datadir ~/ChainSkills/miner2 account list
INFO [10-31|11:44:31.448] Maximum peer count          ETH=50 total=50
INFO [10-31|11:44:31.451] Smartcard socket not found, disabling   err="stat /run/pcscd/pcscd.comm: no
such file or directory"
Account #0: {3f8958564bf52da9deb65cff83fc1b7562694fec} keystore:///home/nadine/ChainSkills/miner2/keys
tore/UTC--2024-10-31T10-42-53.198377695Z--3f8958564bf52da9deb65cff83fc1b7562694fec
Account #1: {b03076e0ae9aae0211525e6edbc95f215b1d4e09} keystore:///home/nadine/ChainSkills/miner2/keys
tore/UTC--2024-10-31T10-43-45.115521404Z--b03076e0ae9aae0211525e6edbc95f215b1d4e09
```

# Changement de la version de Geth vers une version plus stable (1.10.15)

```
ERROR: Invalid option --name Ethereum  
nadine@DESKTOP-IH5C1I5:~$ dpkg --print-architecture  
amd64  
nadine@DESKTOP-IH5C1I5:~$ |
```

## Téléchargement de la version



## Upload downloaded tar file on a server and extract

```
nadine@DESKTOP-IH5C1I5:~$ sudo tar -xvf geth-alltools-linux-amd64-1.10.15-8be800ff.tar.gz  
geth-alltools-linux-amd64-1.10.15-8be800ff/  
geth-alltools-linux-amd64-1.10.15-8be800ff/COPYING  
geth-alltools-linux-amd64-1.10.15-8be800ff/abigen  
geth-alltools-linux-amd64-1.10.15-8be800ff/bootnode  
geth-alltools-linux-amd64-1.10.15-8be800ff/evm  
geth-alltools-linux-amd64-1.10.15-8be800ff/geth  
geth-alltools-linux-amd64-1.10.15-8be800ff/puppeth  
geth-alltools-linux-amd64-1.10.15-8be800ff/rlpdump  
geth-alltools-linux-amd64-1.10.15-8be800ff/clef  
nadine@DESKTOP-IH5C1I5:~$ |
```

```
nadine@DESKTOP-IH5C1I5:~$ cd geth-alltools-linux-amd64-1.10.15-8be800ff/  
nadine@DESKTOP-IH5C1I5:~/geth-alltools-linux-amd64-1.10.15-8be800ff$ |
```

```
nadine@DESKTOP-IH5C1I5:~/geth-alltools-linux-amd64-1.10.15-8be800ff$ sudo chmod +x geth  
nadine@DESKTOP-IH5C1I5:~/geth-alltools-linux-amd64-1.10.15-8be800ff$ |
```

```
nadine@DESKTOP-IH5C1I5:~/geth-alltools-linux-amd64-1.10.15-8be800ff$ sudo cp geth /usr/local/bin/  
nadine@DESKTOP-IH5C1I5:~/geth-alltools-linux-amd64-1.10.15-8be800ff$ |
```

```
Geth  
Version: 1.10.15-stable  
Git Commit: 8be800ffa9c4992666e2620e0ab4725a1a83352b  
Git Commit Date: 20220105  
Architecture: amd64  
Go Version: go1.17.5  
Operating System: linux  
GOPATH=  
GOROOT=go  
nadine@DESKTOP-IH5C1I5:~/geth-alltools-linux-amd64-1.10.15-8be800ff$ |
```

## STEP 5 – PREPARE THE MINERS

# Starting the miners

```
nadine@DESKTOP-IH5C1I5:~/ChainSkills/miner1$ sudo nano startminer1.sh
nadine@DESKTOP-IH5C1I5:~/ChainSkills/miner1$ cd ..
nadine@DESKTOP-IH5C1I5:~/ChainSkills$ cd miner2
nadine@DESKTOP-IH5C1I5:~/ChainSkills/miner2$ sudo nano startminer2.sh
nadine@DESKTOP-IH5C1I5:~/ChainSkills/miner2$ |
```

```
GNU nano 6.2
#!/bin/bash
geth --identity "miner2" --networkid 42 --datadir "~/ChainSkills/miner2" --nodiscover --mine --http --http.port "8043" >
```

```
nadine@DESKTOP-IH5C1I5:~/ChainSkills/miner1$ sudo chmod +x startminer1.sh
nadine@DESKTOP-IH5C1I5:~/ChainSkills/miner1$ |
```

```
INFO [12-04|21:02:53.042] Loaded most recent local full block
INFO [12-04|21:02:53.042] Loaded most recent local fast block
WARN [12-04|21:02:53.044] Loaded snapshot journal
INFO [12-04|21:02:53.047] Loaded local transaction journal
INFO [12-04|21:02:53.047] Regenerated local transaction journal
INFO [12-04|21:02:53.049] Gasprice oracle is ignoring threshold set threshold=2
WARN [12-04|21:02:53.050] Unclean shutdown detected
WARN [12-04|21:02:53.050] Unclean shutdown detected
INFO [12-04|21:02:53.050] Starting peer-to-peer node
INFO [12-04|21:02:53.169] New local node record
INFO [12-04|21:02:53.169] Started P2P networking
fbdd46c4a275e2f78ce8264c06@127.0.0.1:30303?discover=0"
INFO [12-04|21:02:53.172] IPC endpoint opened
INFO [12-04|21:02:53.173] HTTP server started
WARN [12-04|21:02:53.197] -----
WARN [12-04|21:02:53.197] Referring to accounts by order in the keystore Folder is dangerous!
WARN [12-04|21:02:53.197] This functionality is deprecated and will be removed in the future!
WARN [12-04|21:02:53.197] Please use explicit addresses! (can search via 'geth account list')
WARN [12-04|21:02:53.197] -----
INFO [12-04|21:02:54.807] Unlocked account
INFO [12-04|21:02:54.807] Transaction pool price threshold updated
INFO [12-04|21:02:54.807] Updated mining threads
INFO [12-04|21:02:54.807] Transaction pool price threshold updated
INFO [12-04|21:02:54.807] Etherbase automatically configured
INFO [12-04|21:02:54.807] Commit new mining work
INFO [12-04|21:02:55.490] Updated mining threads
INFO [12-04|21:09:06.964] Successfully sealed new block
INFO [12-04|21:09:06.964] \ mined potential block
INFO [12-04|21:09:06.964] Commit new mining work
INFO [12-04|21:09:07.208] Successfully sealed new block
INFO [12-04|21:09:07.270] \ mined potential block
INFO [12-04|21:09:07.299] Commit new mining work
INFO [12-04|21:09:07.968] Successfully sealed new block
INFO [12-04|21:09:07.968] \ mined potential block
INFO [12-04|21:09:07.968] Commit new mining work
INFO [12-04|21:09:08.846] Successfully sealed new block
INFO [12-04|21:09:08.846] \ mined potential block
INFO [12-04|21:09:08.846] Commit new mining work
INFO [12-04|21:09:11.289] Successfully sealed new block
INFO [12-04|21:09:11.289] \ mined potential block
INFO [12-04|21:09:11.290] Commit new mining work
INFO [12-04|21:09:12.231] Successfully sealed new block
INFO [12-04|21:09:12.265] \ mined potential block
INFO [12-04|21:09:12.271] Commit new mining work
INFO [12-04|21:09:16.811] Successfully sealed new block
number=0 hash=536497...937dd9 td=1 age=5y4mo16h
number=430 hash=d4f092...59ac8e td=62,503,980 age=4m47s
diskroot=56e81f..63b421 dtffs=mlssing
transactions=0 dropped=0
transactions=0 accounts=0
self="enode://9cd805574cc8492d54de119a90ba559cd721dd983e1b23531438e3a4739404a70a4c89820034413b1b6ef6ee16562a
url=/home/nesrine/ChainSkills/miner1/geth.ipc
endpoint=127.0.0.1:8042 prefix= cors= vhosts=localhost
address=0x151397661b3d54804bb77569256a3cDC06Aa94F
price=1,000,000,000
threads=0
price=1,000,000,000
address=0x151397661b3d54804bb77569256a3cDC06Aa94F
numbers=1 sealhash=6169e4..59610f uncles=0 txs=0 gas=0 fees=0 elapsed="113.102µs"
threads=3
address=0x151397661b3d54804bb77569256a3cDC06Aa94F
numbers=1 sealhash=6169e4..59610f hash=c69ebc..7e6f2c elapsed=6m12.156s
numbers=1 hash=c69ebc..7e6f2c
numbers=2 sealhash=51345e..2e06fd uncles=0 txs=0 gas=0 fees=0 elapsed="143.299µs"
numbers=2 sealhash=51345e..2e06fd hash=68c7ab..370666 elapsed=243.597ms
numbers=2 hash=68c7ab..370666
numbers=3 sealhash=76e206..b44b8e uncles=0 txs=0 gas=0 fees=0 elapsed="122.485µs"
numbers=3 sealhash=76e296..b44b8e hash=398c73..33162c elapsed=758.563ms
numbers=3 hash=398c73..33162c
numbers=4 sealhash=a4eb94..0b6d59 uncles=0 txs=0 gas=0 fees=0 elapsed="119.944µs"
numbers=4 sealhash=a4eb94..0b6d59 hash=4e49ac..296411 elapsed=877.081ms
numbers=4 hash=4e49ac..296411
numbers=5 sealhash=114240..bb677b uncles=0 txs=0 gas=0 fees=0 elapsed="431.279µs"
numbers=5 sealhash=114240..bb677b hash=1ee5be..73c087 elapsed=2.443s
numbers=5 hash=1ee5be..73c087
numbers=6 sealhash=a97bb6..fc54e uncles=0 txs=0 gas=0 fees=0 elapsed="214.402µs"
numbers=6 sealhash=a97bb6..fc54e hash=68521e..b5ad8a elapsed=941.270ms
numbers=6 hash=68521e..b5ad8a
numbers=7 sealhash=195046..dcfcfd uncles=0 txs=0 gas=0 fees=0 elapsed="32.673ms"
numbers=7 sealhash=195046..dcfcfd hash=97b3c0..3fd764 elapsed=4.539s
```

## Step 5.4 – Miner #1: stop

```

1/geth.ipc
Welcome to the Geth JavaScript console!

instance: Geth/miner1/v1.10.15-stable-8be800ff/linux-amd64/go1.17.5
coinbase: 0x15139766e1bd354804bb77569256a3cdc06aa94f
at block: 0 (Mon Sep 02 2019 05:36:26 GMT+0200 (CEST))
datadir: /home/nesrine/ChainSkills/miner1
modules: admin:1.0 debug:1.0 eth:1.0 ethash:1.0 miner:1.0 net:1.0 pe
rpc:1.0 txpool:1.0 web3:1.0

To exit, press ctrl-d or type exit
> miner.start()
null
> mmmminer.stop()
ReferenceError: mmmminer is not defined
    at <eval>:1:1(0)

> mminer.stop()
ReferenceError: mminer is not defined
    at <eval>:1:1(0)

> miner.stop()
null
>

```

## Step 5.5 – Miner #2: setup

```

nesrine@nesrine-VirtualBox:~/ChainSkills$ geth --datadir ./miner2 account list
INFO [12-04|22:05:45.473] Maximum peer count          ETH=50 LES=0 total=50
INFO [12-04|22:05:45.473] Smartcard socket not found, disabling      err="stat /run/pcscd/pcscd.comm: no such file or directory"
INFO [12-04|22:05:45.476] Set global gas cap           cap=50,000,000
Account #: {0ca12d760e5f4cb4fabab0e02542d45edb196b27} keystore:///home/nesrine/ChainSkills/miner2/keystore/UTC--2024-12-04T21-05-27.922085619Z--0ca12d760e5f4cb4fabab0e02542d45edb196b27
27
Account #1: {3bcdffb7bcbccfc4ae16678e5a19e7471ed92ca} keystore:///home/nesrine/ChainSkills/miner2/keystore/UTC--2024-12-04T21-05-38.624316936Z--3bcdffb7bcbccfc4ae16678e5a19e7471ed92ca
nesrine@nesrine-VirtualBox:~/ChainSkills$ ./startminer1.sh
bash: ./startminer1.sh: Aucun fichier ou dossier de ce type
nesrine@nesrine-VirtualBox:~/ChainSkills$ cd miner2
nesrine@nesrine-VirtualBox:~/ChainSkills/miner2$ ./startminer2.sh
INFO [12-04|22:06:09.366] Maximum peer count          ETH=50 LES=0 total=50
INFO [12-04|22:06:09.366] Smartcard socket not found, disabling      err="stat /run/pcscd/pcscd.comm: no such file or directory"
INFO [12-04|22:06:09.367] Set global gas cap           cap=50,000,000
INFO [12-04|22:06:09.368] Allocated trie memory caches
INFO [12-04|22:06:09.368] Allocated cache and file handles
INFO [12-04|22:06:09.551] Opened ancient database
INFO [12-04|22:06:09.553] Initialised chain configuration
ntnople: <nll>, Petersburg: <nll>, Istanbul: <nll>, Muir Glacier: <nll>, Berlin: <nll>, London: <nll>, Arrow Glacier: <nll>, MergeFork: <nll>, Engine: unknown"
INFO [12-04|22:06:09.553] Disk storage enabled for ethash caches
INFO [12-04|22:06:09.554] Disk storage enabled for ethash DAGs
INFO [12-04|22:06:09.554] Initialising Ethereum protocol
INFO [12-04|22:06:09.554] Loaded most recent local header
INFO [12-04|22:06:09.555] Loaded most recent local full block
INFO [12-04|22:06:09.555] Loaded most recent local fast block
WARN [12-04|22:06:09.555] Failed to load snapshot, regenerating
INFO [12-04|22:06:09.555] Rebuilding state snapshot
INFO [12-04|22:06:09.556] Resuming state snapshot generation
INFO [12-04|22:06:09.556] Generated state snapshot
INFO [12-04|22:06:09.557] Regenerated local transaction journal
INFO [12-04|22:06:09.559] Gasprice oracle is ignoring threshold set
HARN [12-04|22:06:09.559] Error reading unclean shutdown markers
INFO [12-04|22:06:09.559] Starting peer-to-peer node
INFO [12-04|22:06:09.636] New local node record
INFO [12-04|22:06:09.636] Started P2P networking
Se7c3aab4a168725847bd6eb1f@127.0.0.1:30304?discport=0"
INFO [12-04|22:06:09.636] IP endpoint opened
INFO [12-04|22:06:09.637] HTTP server started
HARN [12-04|22:06:09.639] -----
HARN [12-04|22:06:09.639] Referring to accounts by order in the keystore folder is dangerous!
HARN [12-04|22:06:09.639] This functionality is deprecated and will be removed in the future!
HARN [12-04|22:06:09.639] Please use explicit addresses! (can search via 'geth account list')
HARN [12-04|22:06:09.639] -----
INFO [12-04|22:06:10.408] Unlocked account
address=0x0c12d760e5f4cb4fabab0e02542d45edb196b27

```

## Step 5.6 – Miner #2: JavaScript console

```
nesrine@nesrine-VirtualBox:~/ChainSkills/miner2$ geth attach ~/ChainSkills/miner2/geth.ipc
Welcome to the Geth JavaScript console!

instance: Geth/miner2/v1.10.15-stable-8be800ff/linux-amd64/go1.17.5
coinbase: 0x0ca12d760e5f4cb4faba0be02542d45edb196b27
at block: 0 (Mon Sep 02 2019 05:36:26 GMT+0200 (CEST))
datadir: /home/nesrine/ChainSkills/miner2
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-d or type exit
> miner.start()
null
>
```

## STEP 6 – SEND ETHERS WITHIN MINER #1

### Step 6.1 – Start the miner and its console

```
INFO [12-04|20:35:54.998] ↗ block reached canonical chain
INFO [12-04|20:35:54.998] ↘ mined potential block
INFO [12-04|20:35:54.999] Commit new mining work
INFO [12-04|20:35:55.935] Successfully sealed new block
INFO [12-04|20:35:55.936] ↗ block reached canonical chain
INFO [12-04|20:35:55.936] Commit new mining work
INFO [12-04|20:35:55.936] ↘ mined potential block
INFO [12-04|20:35:58.010] Successfully sealed new block
INFO [12-04|20:35:58.010] ↗ block reached canonical chain
INFO [12-04|20:35:58.010] ↘ mined potential block
INFO [12-04|20:35:58.011] Commit new mining work
INFO [12-04|20:35:58.258] Successfully sealed new block
INFO [12-04|20:35:58.258] ↗ block reached canonical chain
INFO [12-04|20:35:58.259] Commit new mining work
INFO [12-04|20:35:58.259] ↘ mined potential block
INFO [12-04|20:35:59.814] Successfully sealed new block
INFO [12-04|20:35:59.814] ↗ block reached canonical chain
INFO [12-04|20:35:59.814] ↘ mined potential block
INFO [12-04|20:35:59.814] Commit new mining work
INFO [12-04|20:36:00.692] Successfully sealed new block
INFO [12-04|20:36:00.692] ↗ block reached canonical chain
INFO [12-04|20:36:00.692] ↘ mined potential block
INFO [12-04|20:36:00.692] Commit new mining work
INFO [12-04|20:36:00.692] ↗ block reached canonical chain
INFO [12-04|20:36:00.692] ↘ mined potential block
INFO [12-04|20:36:02.933] Successfully sealed new block
INFO [12-04|20:36:02.933] ↗ block reached canonical chain
INFO [12-04|20:36:02.933] ↘ mined potential block
INFO [12-04|20:36:02.934] Commit new mining work
INFO [12-04|20:36:03.222] Successfully sealed new block
INFO [12-04|20:36:03.228] ↗ block reached canonical chain
INFO [12-04|20:36:03.229] Commit new mining work
INFO [12-04|20:36:03.229] ↘ mined potential block
^[[INFO [12-04|20:36:06.994] Successfully sealed new block
INFO [12-04|20:36:06.994] ↗ block reached canonical chain
INFO [12-04|20:36:06.994] ↘ mined potential block
number=47 hash=1f2345..ba48d0
number=54 hash=950be4..34fbf0
number=55 sealhash=a51e29..875671 uncles=0 txs=0 gas=0 fees=0 elapsed="225.513µs"
number=55 sealhash=a51e29..875671 hash=000ccc..d31a83 elapsed=936.802ms
number=48 hash=9f0e81..588b4b
number=56 sealhash=d72923..29bddc uncles=0 txs=0 gas=0 fees=0 elapsed="876.79µs"
number=55 hash=000ccc..d31a83
number=56 sealhash=d72923..29bddc hash=020595..07e88b elapsed=2.074s
number=49 hash=fbbbc9..82123b
number=56 hash=020595..07e88b
number=57 sealhash=c39d3b..5e355a uncles=0 txs=0 gas=0 fees=0 elapsed="95.65µs"
number=57 sealhash=c39d3b..5e355a hash=462b4d..fad20e elapsed=247.377ms
number=50 hash=bd53a3..6cda0b
number=58 sealhash=b5d6f8..503476 uncles=0 txs=0 gas=0 fees=0 elapsed="416.136µs"
number=57 hash=462b4d..fad20e
number=58 sealhash=b5d6f8..503476 hash=b845e5..e7b232 elapsed=1.555s
number=51 hash=d84d81..86cc23
number=58 hash=b845e5..e7b232
number=59 sealhash=dc5adb..9be3eb uncles=0 txs=0 gas=0 fees=0 elapsed="133.361µs"
number=59 sealhash=dc5adb..9be3eb hash=b0e765..6b2eed elapsed=877.784ms
number=52 hash=de7917..93045d
number=59 hash=b0e765..6b2eed
number=60 sealhash=f8b97d..1b118c uncles=0 txs=0 gas=0 fees=0 elapsed="148.249µs"
number=60 sealhash=f8b97d..1b118c hash=9039c4..2f0d30 elapsed=2.240s
number=53 hash=86bb99..eb8242
number=60 hash=9039c4..2f0d30
number=61 sealhash=e71b96..d566b4 uncles=0 txs=0 gas=0 fees=0 elapsed="527.637µs"
number=61 sealhash=e71b96..d566b4 hash=00698e..c97a57 elapsed=288.593ms
number=54 hash=950be4..34fbf0
number=62 sealhash=f91e1d..ab76ea uncles=0 txs=0 gas=0 fees=0 elapsed=1.283ms
number=61 hash=00698e..c97a57
number=62 sealhash=f91e1d..ab76ea hash=6f3602..3106ad elapsed=3.766s
number=55 hash=000ccc..d31a83
number=62 hash=6f3602..3106ad
```

## Step 6.2 – Check balances

```
To exit, press ctrl-d or type exit
> miner.start()
null
> eth.accounts
undefined
> eth.coinbase
"0x15139766e1bd354804bb77569256a3cdc06aa94f"
> eth.accounts
["0x15139766e1bd354804bb77569256a3cdc06aa94f"]
> eth.getBalance(eth.coinbase)
51500000000000000000000000000000
```

```
> web3.fromWei(eth.getBalance(eth.coinbase))
45
>
```

## Step 6.3 – Stop mining

```
1/geth.ipc
Welcome to the Geth JavaScript console!

instance: Geth/miner1/v1.10.15-stable-8be800ff/linux-amd64/go1.17.5
coinbase: 0x15139766e1bd354804bb77569256a3cdc06aa94f
at block: 0 (Mon Sep 02 2019 05:36:26 GMT+0200 (CEST))
  datadir: /home/nesrine/ChainSkills/miner1
  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-d or type exit
> miner.start()
null
> mmmminer.stop()
ReferenceError: mmmminer is not defined
    at <eval>:1:1(0)

> mminer.stop()
ReferenceError: mminer is not defined
    at <eval>:1:1(0)

> miner.stop()
null
>
```

## Step 6.4 – Send ethers

```
> eth.sendTransaction({from: eth.accounts[0], to: eth.accounts[1], value: web3.t  
oWei(10,  
..... "ether")})  
"0x4bdf4ce3d5496ffea4480e858dc5cf236255e983d1b307ba6a857126f9694fc3"  
> █
```

```
> eth.pendingTransactions  
[  
  {  
    blockHash: null,  
    blockNumber: null,  
    from: "0x15139766e1bd354804bb77569256a3cdc06aa94f",  
    gas: 21000,  
    gasPrice: 10000000000,  
    hash: "0x4bdf4ce3d5496ffea4480e858dc5cf236255e983d1b307ba6a857126f9694fc3",  
    input: "0x",  
    nonce: 0,  
    r: "0xeb58476ce5cf915dd1dde7e8da44bc748ba82f4043b6e1b2e43f6ceda337857",  
    s: "0x206b5311db6a972e4dbc3cf861df4f130000a97e26ea4480a3d3ddb663656372",  
    to: "0xa871159fa0210b629f75420ef113fb739333e1af",  
    transactionIndex: null,  
    type: "0x0",  
    v: "0x78",  
    value: 10000000000000000000000000000000  
  }]  
> █
```

## Step 6.4 – Send ethers

```
> miner.start()  
null  
> eth.pendingTransactions  
[]  
> █
```

```
> web3.fromWei( eth.getBalance(eth.accounts[1]))  
10  
> █
```

## STEP 7 – SEND ETHERS WITHIN MINER #2

```
nesrine@nesrine-VirtualBox:~$ geth attach ~/ChainSkills/miner2/geth.ipc  
Welcome to the Geth JavaScript console!  
  
instance: Geth/miner2/v1.10.15-stable-8be800ff/linux-amd64/go1.17.5  
coinbase: 0x0ca12d760e5f4cb4faba0be02542d45edb196b27  
at block: 56 (Wed Dec 04 2024 22:16:42 GMT+0100 (CET))  
datadir: /home/nesrine/ChainSkills/miner2  
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-d or type exit  
> █
```

## STEP 8 – SEND ETHERS BETWEEN NODES OF THE PRIVATE BLOCKCHAIN

### Step 8.2 – Check balance from miner #2

```
> web3.fromWei(eth.getBalance(eth.accounts[0]))  
940  
> web3.fromWei(eth.getBalance(eth.accounts[1]))  
0  
>
```

### Step 8.3 – Send Ethers from miner #1

```
> eth.sendTransaction({from: eth.coinbase, to: '3bcdafb7bcbccfc4ae16678e5a19e7471ed92ca', value: web3.toWei(5,"ether")})  
"0x5bd449f91033352159537c07d4ece06d2abdaea52db0c2079ec76b5ebbaa0f7b"  
>
```

### Step 8.4 – Check balance from miner #1

```
> web3.fromWei( eth.getBalance("3bcdafb7bcbccfc4ae16678e5a19e7471ed92ca"))  
5  
>
```

### Step 8.5 – Check balance from miner #2

```
> web3.fromWei( eth.getBalance(eth.accounts[1]))  
0  
>
```

# PARTIE 2 TP ETHEREUM

## STEP 1- CLEAN MINERS

### Step 1.1 – Stop miners

```
> miner.stop()
null
>
```

```
63b4Z1
INFO [12-04|22:59:54.892] Persisted trie from memory database      nodes=0 size=
0.00B   time=923ns    gcnodes=0    gcsize=0.00B    gctime=0s      livenode
s=251 livesize=35.89KiB
INFO [12-04|22:59:54.892] Writing clean trie cache to disk      path=/home/ne
srine/ChainSkills/miner1/geth/triecache threads=3
INFO [12-04|22:59:54.894] Persisted the clean trie cache      path=/home/ne
srine/ChainSkills/miner1/geth/triecache elapsed=1.757ms
INFO [12-04|22:59:54.894] Blockchain stopped
nesrine@nesrine-VirtualBox:~/ChainSkills/miner1$
```

### Step 1.2 – Delete the chaindata

```
nesrine@nesrine-VirtualBox:~/ChainSkills/miner1$ rm -rf ~ChainSkills/miner1/geth
n
nesrine@nesrine-VirtualBox:~/ChainSkills/miner1$ rm -rf ~ChainSkills/miner2/geth
n
nesrine@nesrine-VirtualBox:~/ChainSkills/miner1$
```

### Step 1.3 – Initialize miners

```
nesrine@nesrine-VirtualBox:~/ChainSkills$ geth --datadir ~/ChainSkills/miner1 init genesis.json
INFO [12-04|23:03:39.568] Maximum peer count          ETH=50 LES=0
total=50
INFO [12-04|23:03:39.568] Smartcard socket not found, disabling      err="stat /run/pcscd/pcscd.comm: no such file or directory"
INFO [12-04|23:03:39.569] Set global gas cap          cap=50,000,00
0
INFO [12-04|23:03:39.569] Allocated cache and file handles      database=/home/nesrine/ChainSkills/miner1/geth/chaindata cache=16.00MiB handles=16
INFO [12-04|23:03:39.663] Persisted trie from memory database      nodes=0 size=
0.00B time="3.292µs" gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [12-04|23:03:39.664] Successfully wrote genesis state      database=chaindata hash=536497..937dd9
INFO [12-04|23:03:39.664] Allocated cache and file handles      database=/home/nesrine/ChainSkills/miner1/geth/lightchaindata cache=16.00MiB handles=16
INFO [12-04|23:03:39.761] Persisted trie from memory database      nodes=0 size=
0.00B time="2.582µs" gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [12-04|23:03:39.762] Successfully wrote genesis state      database=lightchaindata hash=536497..937dd9
nesrine@nesrine-VirtualBox:~/ChainSkills$
```

```

nesrine@nesrine-VirtualBox:~/ChainSkills$ geth --datadir ~/ChainSkills/miner2 init genesis.json
INFO [12-04|23:04:31.704] Maximum peer count total=50                                     ETH=50 LES=0
INFO [12-04|23:04:31.704] Smartcard socket not found, disabling n/pcscd/pcscd.comm: no such file or directory" err="stat /run/pcscd/pcscd.comm: no such file or directory"
INFO [12-04|23:04:31.705] Set global gas cap 0                                         cap=50,000,00
INFO [12-04|23:04:31.705] Allocated cache and file handles database=/home/nesrine/ChainSkills/miner2/geth/chaindata cache=16.00MiB handles=16
INFO [12-04|23:04:31.812] Persisted trie from memory database nodes=0 size=0.00B time="330.92µs" gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [12-04|23:04:31.832] Successfully wrote genesis state database=chaindata hash=536497..937dd9
INFO [12-04|23:04:31.832] Allocated cache and file handles database=/home/nesrine/ChainSkills/miner2/geth/lightchaindata cache=16.00MiB handles=16
INFO [12-04|23:04:31.923] Persisted trie from memory database nodes=0 size=0.00B time="2.963µs" gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [12-04|23:04:31.923] Successfully wrote genesis state database=lightchaindata hash=536497..937dd9
nesrine@nesrine-VirtualBox:~/ChainSkills$
```

## STEP 2 GET NODE INFO FROM MINER #1

### Step 2.1 Node info for miner #1

**start the miner #1:**

```

INFO [12-04|23:05:56.084] HTTP server started endpoint=127.0.0.1:8042 prefix= cors= vhosts=localhost
WARN [12-04|23:05:56.085] -----
WARN [12-04|23:05:56.085] Referring to accounts by order in the keystore folder is dangerous!
WARN [12-04|23:05:56.085] This functionality is deprecated and will be removed in the future!
WARN [12-04|23:05:56.085] Please use explicit addresses! (can search via `geth account list`)
WARN [12-04|23:05:56.085] -----
INFO [12-04|23:05:56.875] Unlocked account address=0x15139766E1bd354804bb77569256a3cDC06Aa94F
INFO [12-04|23:05:56.876] Transaction pool price threshold updated price=1,000,00,000
INFO [12-04|23:05:56.876] Updated mining threads threads=0
INFO [12-04|23:05:56.876] Transaction pool price threshold updated price=1,000,00,000
INFO [12-04|23:05:56.876] Etherbase automatically configured address=0x15139766E1bd354804bb77569256a3cDC06Aa94F
INFO [12-04|23:05:56.876] Commit new mining work number=784 sealhash=a0526d..9a16d1 uncles=0 txs=0 gas=0 fees=0 elapsed="137.703µs"
```

**start the Geth console:**

**Stop the mining to avoid generating too much blocks**

```
[INFO] nesrine@nesrine-VirtualBox:~/ChainSkills$ geth attach ~/ChainSkills/miner1/geth.ipc
126 Welcome to the Geth JavaScript console!
[INFO]
63b4instance: Geth/miner1/v1.10.15-stable-8be800ff/linux-amd64/go1.17.5
[INFO] coinbase: 0x15139766e1bd354804bb77569256a3cdc06aa94f
0.00at block: 783 (Wed Dec 04 2024 22:58:49 GMT+0100 (CET))
126 datadir: /home/nesrine/ChainSkills/miner1
[INFO] modules: admin:1.0 debug:1.0 eth:1.0 ethash:1.0 miner:1.0 net:1.0 personal:1.0
srinrpc:1.0 txpool:1.0 web3:1.0
[INFO]
nesrineTo exit, press ctrl-d or type exit
[INFO]> miner.stop()
nesrine>null
>
Crypto & IGL4
Concepts
> web3.fromWei( eth.getBalance("3bcdfbdb7bcbccfc4ae16678e5a1
[INFO]
```

**Retrieve the node information:**

```
> admin.nodeInfo.enode
"enode://9cd805574cc8492a45cbbd54de119a90ba559cd721dd983e1b23531438e3a4739404a70
a4ac89820034413b1b6ef6ee16562aafbdd46c4a275e2f78ce8264c06@127.0.0.1:30303?discpo
rt=0"
> [REDACTED]
```

**start the miner #2:**

```
0.0.1:8044 prefix= cors= vhosts=localhost
WARN [12-04|23:11:59.103] -----
-----
WARN [12-04|23:11:59.103] Referring to accounts by order in the keystore folder
is dangerous!
WARN [12-04|23:11:59.103] This functionality is deprecated and will be removed i
n the future!
WARN [12-04|23:11:59.103] Please use explicit addresses! (can search via `geth a
ccount list`)
WARN [12-04|23:11:59.103] -----
-----
INFO [12-04|23:11:59.794] Unlocked account                                address=0x0cA
12d760E5F4cB4FaBa0Be02542d45eDB196b27
INFO [12-04|23:11:59.795] Transaction pool price threshold updated price=1,000,0
00,000
INFO [12-04|23:11:59.795] Updated mining threads                           threads=0
INFO [12-04|23:11:59.795] Transaction pool price threshold updated price=1,000,0
00,000
INFO [12-04|23:11:59.795] Etherbase automatically configured      address=0x0cA
12d760E5F4cB4FaBa0Be02542d45eDB196b27
INFO [12-04|23:11:59.795] Commit new mining work                         number=693 se
alhash=7b3cb7..27c2ee uncles=0 txs=0 gas=0 fees=0 elapsed="482.578µs"
```

## Step 2.2 Node info for miner #2

**start the Geth console:**

**Stop the mining to avoid generating too much blocks**

```
nesrine@nesrine-VirtualBox:~/ChainSkills$ geth attach ~/ChainSkills/miner2/geth.ipc
Welcome to the Geth JavaScript console!

instance: Geth/miner2/v1.10.15-stable-8be800ff/linux-amd64/go1.17.5
coinbase: 0x0ca12d760e5f4cb4faba0be02542d45edb196b27
at block: 692 (Wed Dec 04 2024 22:58:17 GMT+0100 (CET))
datadir: /home/nesrine/ChainSkills/miner2
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-d or type exit
> minor.stop()
ReferenceError: minor is not defined
    at <eval>:1:1(0)

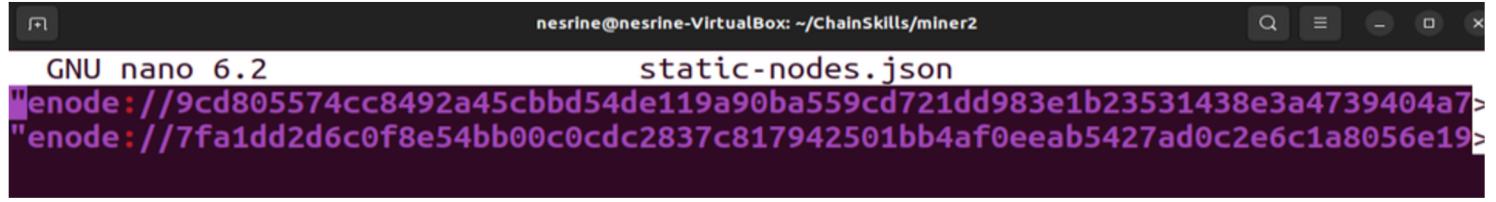
> miner.stop()
null
> █
```

**Retrieve the node information:**

```
> admin.nodeInfo.enode
"enode://7fa1dd2d6c0f8e54bb00c0cdc2837c817942501bb4af0eeab5427ad0c2e6c1a8056e199
2d33f1df255140c1ab81f1a1c68d8215e7c3aab4a168725847bd6eb1f@127.0.0.1:30304?discpo
rt=0"
>
```

## STEP 3 – PAIR THE NODES

```
nesrine@nesrine-VirtualBox:~/ChainSkills$ cd miner1
nesrine@nesrine-VirtualBox:~/ChainSkills/miner1$ sudo nano static-node.json
[sudo] Mot de passe de nesrine :
nesrine@nesrine-VirtualBox:~/ChainSkills/miner1$ cd ..
nesrine@nesrine-VirtualBox:~/ChainSkills$ cd miner2
nesrine@nesrine-VirtualBox:~/ChainSkills/miner2$ sudo nano static-nodes.json
nesrine@nesrine-VirtualBox:~/ChainSkills/miner2$
```



The screenshot shows a terminal window with the title "nesrine@nesrine-VirtualBox: ~/ChainSkills/miner2". The window contains the command "nano static-nodes.json" followed by two lines of JSON data representing Ethereum nodes:

```
GNU nano 6.2
static-nodes.json
"enode://9cd805574cc8492a45cbbd54de119a90ba559cd721dd983e1b23531438e3a4739404a7>
"enode://7fa1dd2d6c0f8e54bb00c0cdc2837c817942501bb4af0eeab5427ad0c2e6c1a8056e19>
```

## STEP 4 – RESTART YOUR MINERS

## **STEP 5 – CHECK THE SYNCHRONISATION PROCESS**

**Step 5.1 – Check from miner #1**

**Step 5.2 – Check from miner #2**

## **STEP 6 -VALIDATE THE SYNCHRONISATION**

**Step 6.1 – Send ethers from Miner #1 to Miner #2**

**Step 6.2 – Send ethers from Miner #2 to Miner #1**