KINGSLAND
SCHOOL OF BLOCKCHAIN

Mine Ethereum in a Pool

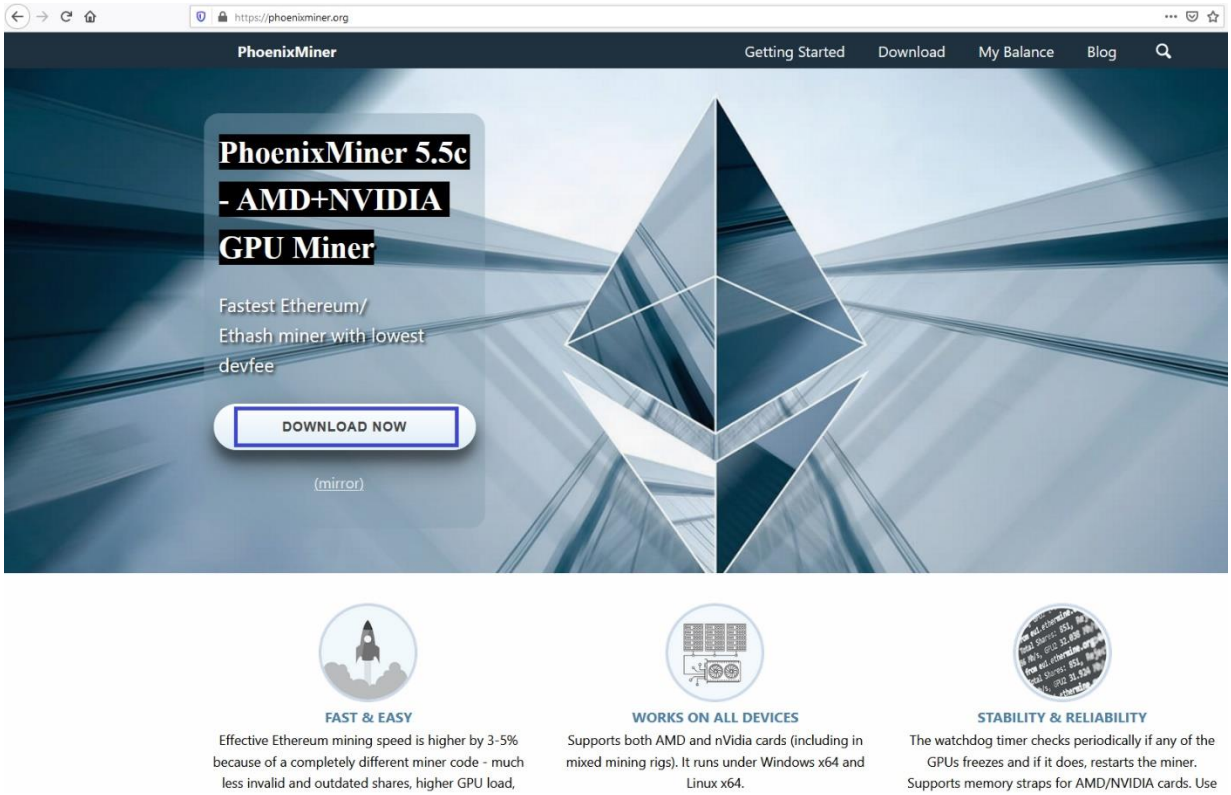
Exercise

In this exercise, you will learn how to mine Ethereum with PhoenixMiner. This is the one of most popular Ethereum miners and the successor of a Claymore miner. You will learn how to set up the miner and participate in the mining process.

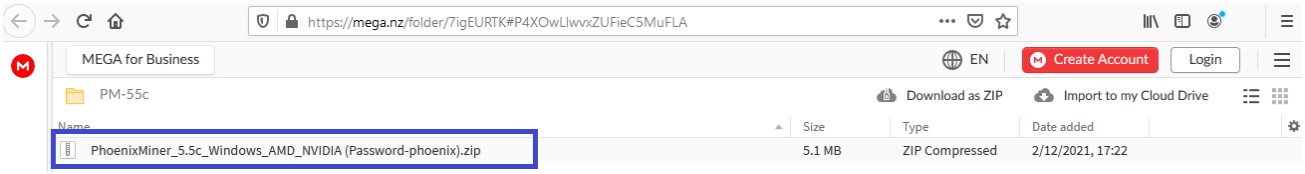
First, you will need **PhoenixMiner**. Also, you will need to install an appropriate **GPU driver** (AMD/NVIDIA) for your device.

1. Download PhoenixMiner

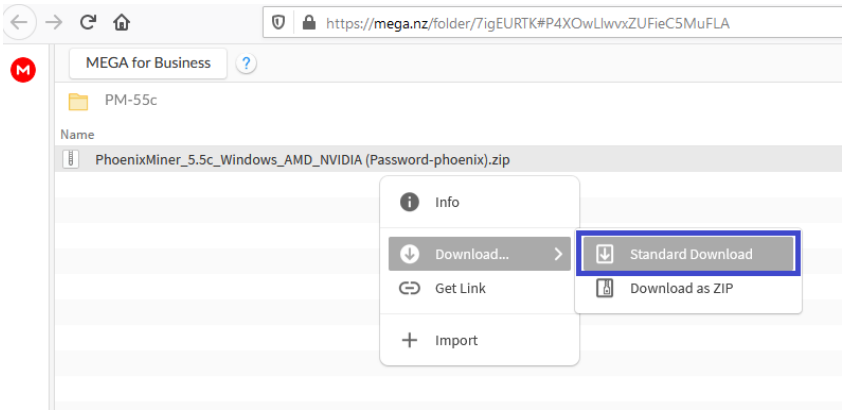
1. Go to PhoenixMiner's website: https://phoenixminer.org/ and download "**PhoenixMiner 5.5c - AMD+NVIDIA GPU Miner** ". Click on the "Download Now" button.



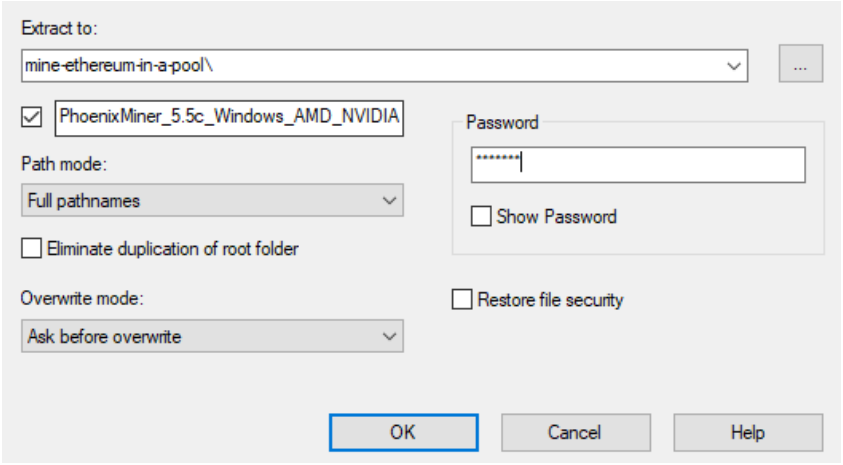
2. You will be redirected to the internet file storage.



3. Right click on the file to download.



4. **Unzip** the downloaded file. To unzip use a password: "**phoenix**". You can find it in the name of the file.



2. Setup the Miner

1. Create a **bat** file for example mine_eth.bat and there write the parameters to set up the mining process.
2. Determine your graphics card. If you have **NVIDIA**, proceed to the next step.

   Otherwise, if you have **AMD**, you need to issue these commands on a terminal first or put the commands in your .bat file to unlock non-default settings for the AMD video card:

```
setx GPU_FORCE_64BIT_PTR 0
setx GPU_MAX_HEAP_SIZE 100
setx GPU_USE_SYNC_OBJECTS 1
setx GPU_MAX_ALLOC_PERCENT 100
setx GPU_SINGLE_ALLOC_PERCENT 100
setx GPU_IMAGE_DMA 1
setx GPU_ENABLE_LARGE_ALLOCATION 1
```

3. Setup the command. Type **each command with only a single space in between the parameters**; otherwise, the regex function of the miner can cause problems during launch.
   - First, type the name of the start executable file
     - `PhoenixMiner.exe (or use the full path)`
   - Then set the name and address of the Ethereum mining pool
     - `-pool eth-eu1.nanopool.org:9999`
   - Then write your wallet address and miner name after “-wal”.
     - `-wal {Your Ethereum Address}/CryptoMiner`
   - Add the password for the Ethereum pool (default: **x**)
     - `-pass x`

   `Putting it all together:`

   `PhoenixMiner.exe -pool eth-eu1.nanopool.org:9999 -wal YOUR_WALLET/YOUR_WORKER -pass x`

4. Then set the “**-proto**” value – it selects the kind of stratum protocol for the ethash pool. We will mine in Nanopool, so the value we need is “**-proto 2**”.
5. Then we have to set the ethash coin to use for devfee to avoid switching DAGs. In our case it is Ethereum: “**-coin eth**”
6. You can set the “**-gser**” value. It controls the serializing of the DAG creation on multiple GPUs (0 - no serializing, all GPUs generate the DAG simultaneously, this is the default; 1 - partial overlap of DAG generation on each GPU; 2 - no overlap (each GPU waits until the previous one has finished generating the DAG); 3-10 - from 1 to 8 seconds delay after each GPU DAG generation before the next one). For better stability, you can choose option 2: “**-gser 2**”.
7. Now we will set the "**-gt**" value. This is the GPU tuning parameter (6 to 400). The default is 15. You can change the tuning parameter interactively with the "**+**" and "**-**" keys in the miner’s console window. You may **specify** this option per-GPU. If you don’t specify "-gt" or you specify value 0, the miner will use auto-tuning to determine the best GT value. In our example we use "**-gt 55**". You have to **experiment** with the different values to find the best option for your exact configuration.
8. One of the most important things in mining is stability and automation of the process. The next command helps you to keep the system running if something goes wrong. Set **“-rmode 2”.** It selects the restart mode when a GPU crashes or freezes: **0** -disabled - miner will shut down instead of restarting. **1** – restart with the same command line options - this is the default, **2 – reboot** (shut down miner and execute "**reboot.bat**").

   Choose option 2 “**-rmode 2**” it will close the miner and execute "**reboot.bat**" file (see further down) if something went wrong with the GPU.
9. By default, the PhoenixMiner is coming with an already setup reboot.bat file. There is a command “**shutdown /r /t 10 /f**” which means the computer will reboot after 10 seconds. The parameter “/f” forces running applications to close without warning users. **Caution:** Using the “**/f”** option might result in loss of unsaved data.

10. Heat and cooling are very important things in the world of crypto mining, so let’s take care of your GPU’s fans.
    First set “-**tt 69**”. This is the **target GPU temperature** and your computer will try to keep it for this card.

11. Set the fan control max temperature (0 for default) with “**-tmax**” value. Set “**-tmax 69**”. If this feature is not supported by the driver, "-ttli" is set to the same temperature instead.

12. The “**-ttli <n>**” value lower GPU usage when GPU temperature is above n deg C. The default value is 0, which means do not lower the usage regardless of the GPU temperature. This option is useful whenever -tmax is not working. If you are using both "-tt" and "-ttli" options, the temperature in "-tt" should be **lower** than the "-ttli" to avoid throttling the GPUs without using the fans to properly cool them first. Set “**-ttli 87**”.

13. Now set the “**-tstop <n>**” value. It pause a GPU when temp is >= n deg C (0 for default; i.e. off). Set “**-tstop 91**”.

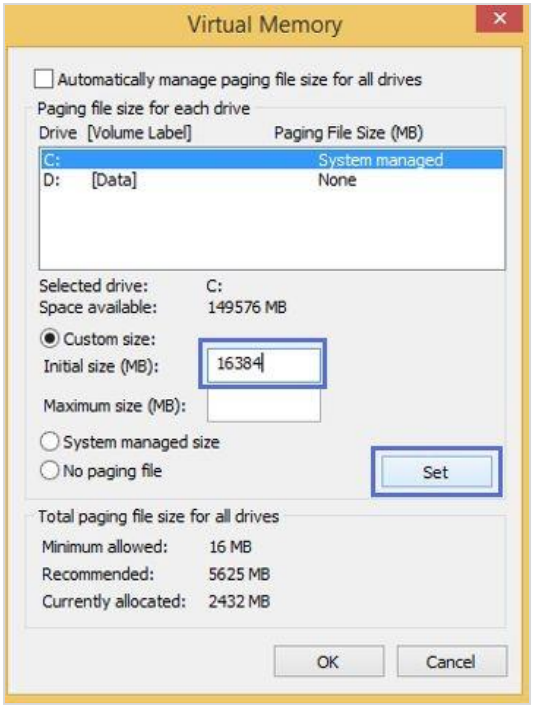
14. Then set “**-tstart <n>**”. It says when to resume a GPU when temp is <= n deg C (0 for default; i.e. off). Set it to “**-tstart 85**”.

15. Then let’s set the monitoring option “**-hstats** <n>”. It controls the level of hardware monitoring: 0 - temperature and fan speed only; 1 - temperature, fan speed, and power (the default); 2 - full (include core/memory clocks, voltages, P-states). Choose option 2 “**-hstats** 2”.

14. Putting all the commands together, you'll end up with something like this. Don't forget to change the sections in **red** to your personal parameters (wallet address):

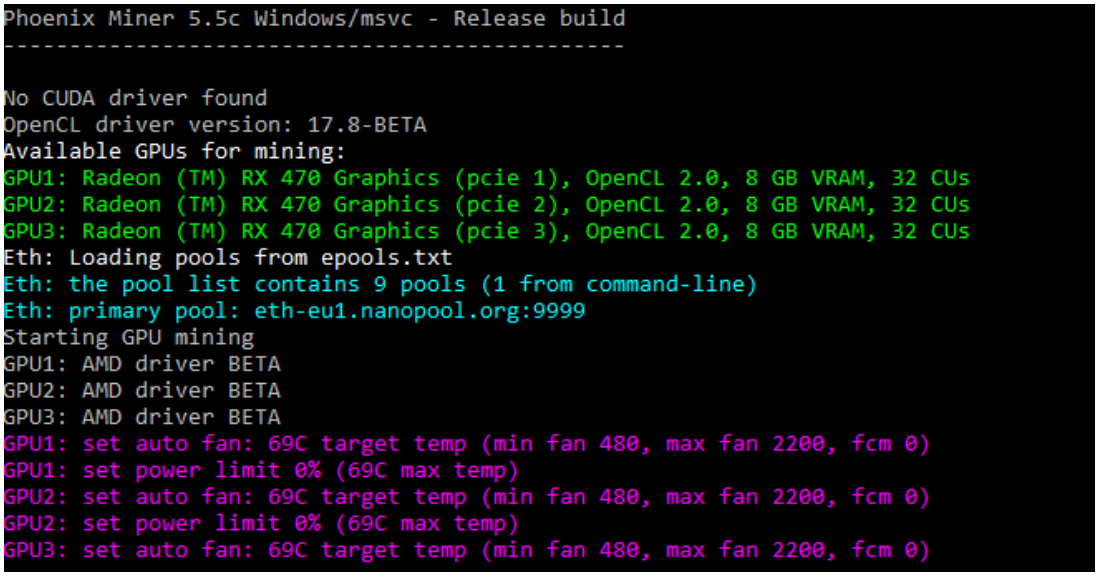
```
PhoenixMiner.exe -pool eth-eu1.nanopool.org:9999 -wal
YOUR_WALLET/YOUR_WORKER -pass x -proto 2 -coin eth -gser 2
-gt 55 -rmode 2 -tt 69 -tmax 69 -ttli 87 -tstop 91 -tstart
85 -hstats 2
```

13. For multi-GPU systems, set **Virtual Memory** size in Windows **at least 16 GB**.

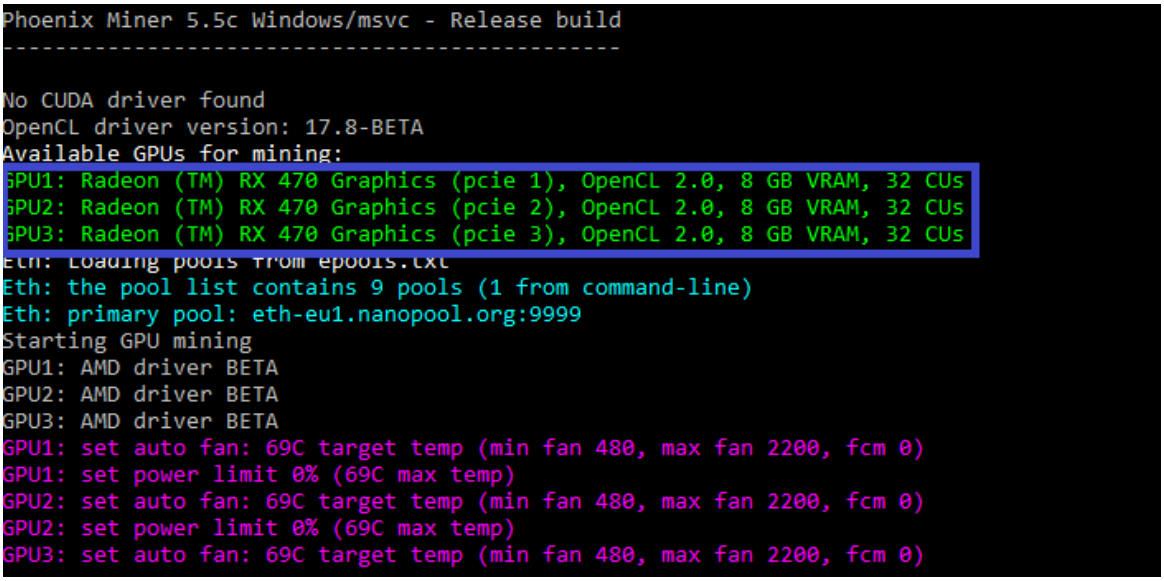


3. Let's Mine Some ETH

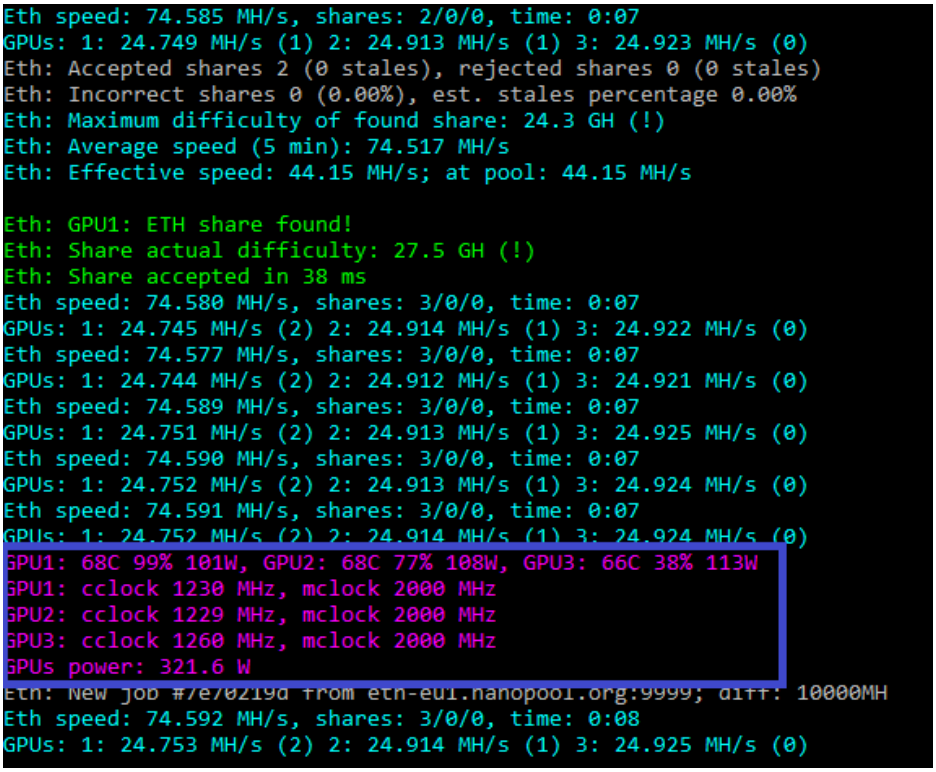
1. Time to start the miner. Open a directory where you extracted the **zip** contents from **Step 1** and run the script (your .bat file). You will see something similar to this screen.



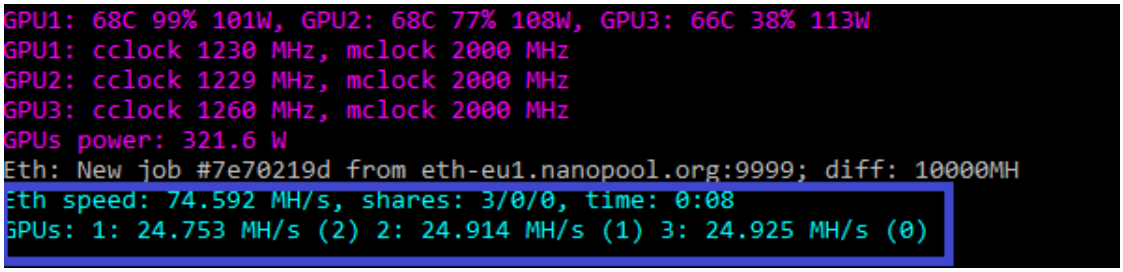
2. These are your GPUs available for mining.



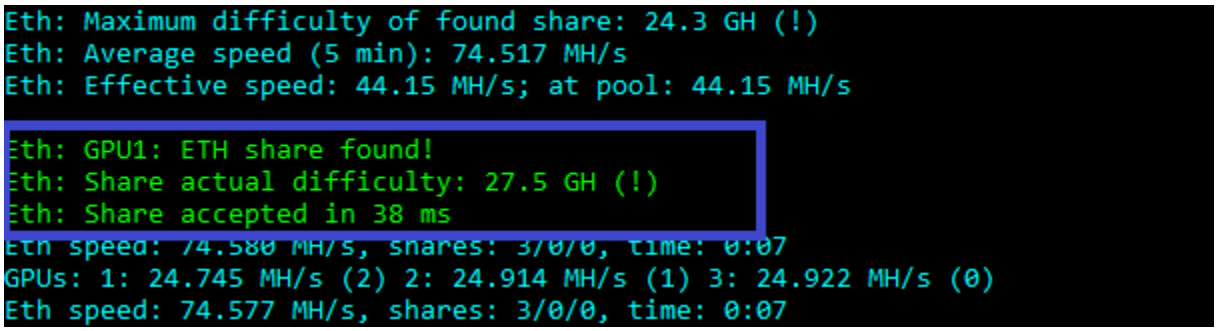
3. This data is about **temperature** and **fan speed** for each GPU. This is system dependent.



4. Also, you can see the **total mining speed** and **speed for each card**.

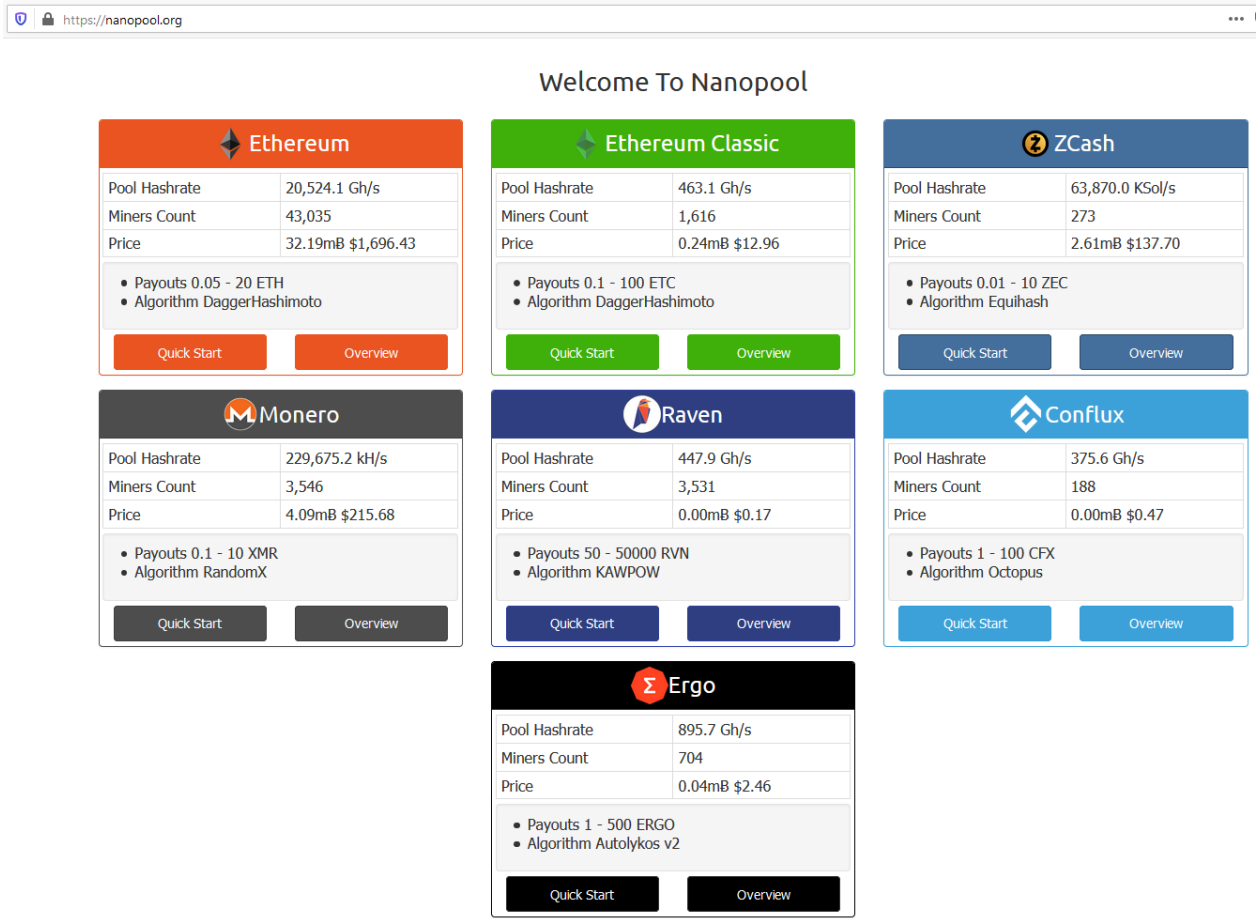


5. Finally, we **found the shares** in “ETH”. Shares are **successfully accepted** by the pools.

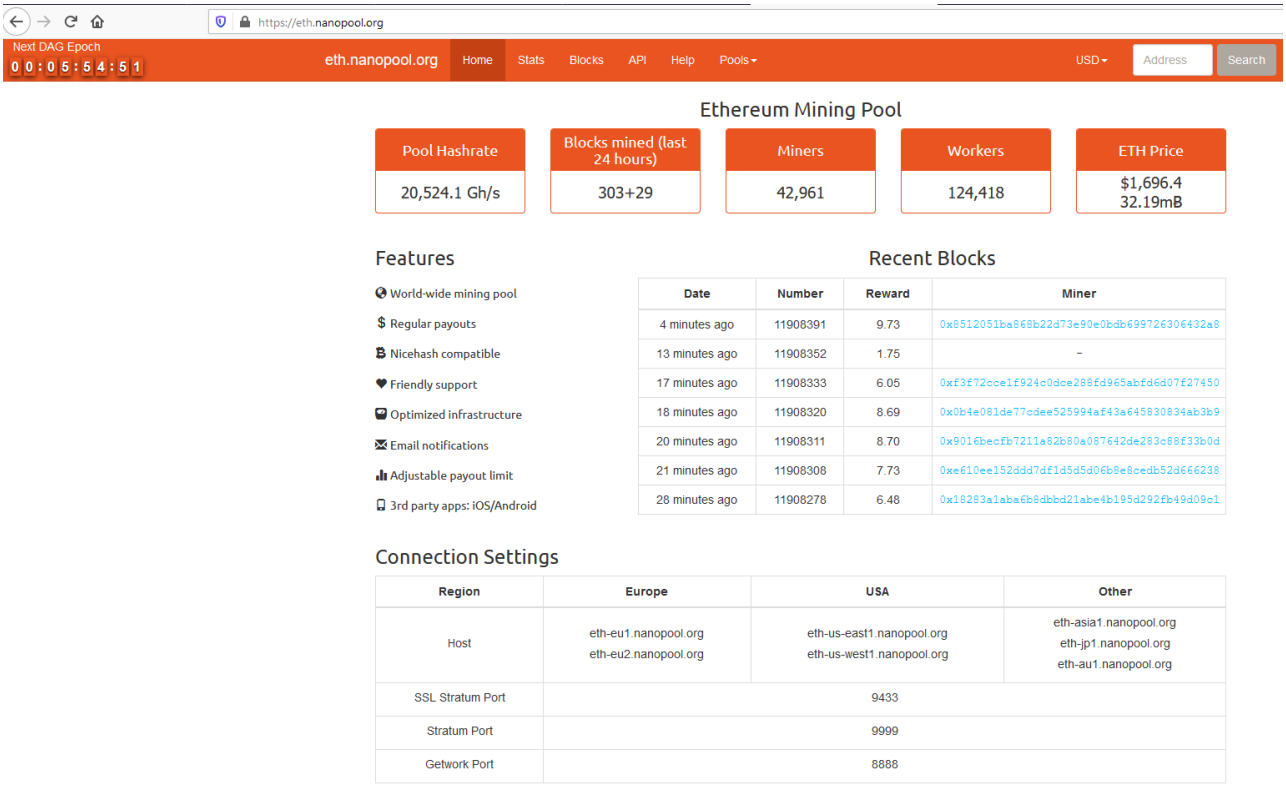


4. Let's See the Pool Statistics

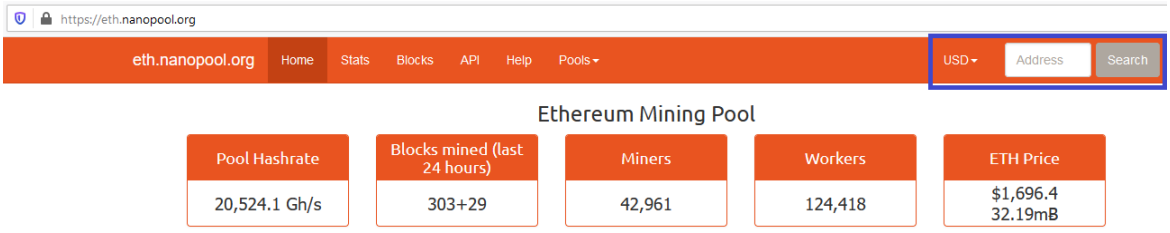
1. Go to https://nanopool.org/ and choose Ethereum. Click on the **Ethereum** header name.



2. You will see mining statistics here.


https://eth.nanopool.org
Next DAG Epoch
00:05:54:51
eth.nanopool.org
Home
Stats
Blocks
API
Help
Pools
USD
Address
Search
Ethereum Mining Pool
Pool Hashrate
20,524.1 Gh/s
Blocks mined (last 24 hours)
303+29
Miners
42,961
Workers
124,418
ETH Price
$1,696.4
32.19mB
Features
World-wide mining pool
Regular payouts
Nicehash compatible
Friendly support
Optimized infrastructure
Email notifications
Adjustable payout limit
3rd party apps: iOS/Android
Recent Blocks
Date
Number
Reward
Miner
4 minutes ago
11908391
9.73
0x8512051ba868b22d73e90e0bdb699726306432a8
13 minutes ago
11908352
1.75
-
17 minutes ago
11908333
6.05
0xf3f72cce1f924c0dce288fd965abfd6d07f27450
18 minutes ago
11908320
8.69
0x0b4e081de77cdee525994af43a645830834ab3b9
20 minutes ago
11908311
8.70
0x9016becfb7211a82b80a087642de283c88f33b0d
21 minutes ago
11908308
7.73
0xe610ee152ddd7df1d5d5d06b8e8cedb52d666238
28 minutes ago
11908278
6.48
0x18283a1aba6b8dbbd21abe4b195d292fb49d09c1
Connection Settings
Region
Europe
USA
Other
Host
eth-eu1.nanopool.org
eth-eu2.nanopool.org
eth-us-east1.nanopool.org
eth-us-west1.nanopool.org
eth-asia1.nanopool.org
eth-jp1.nanopool.org
eth-au1.nanopool.org
SSL Stratum Port
9433
Stratum Port
9999
Getwork Port
8888

3. Copy and paste your **ETH address**. The mined Ethereum coins will be transferred here. The default minimum payout is 0.1 ETH. Then click "**Search**".

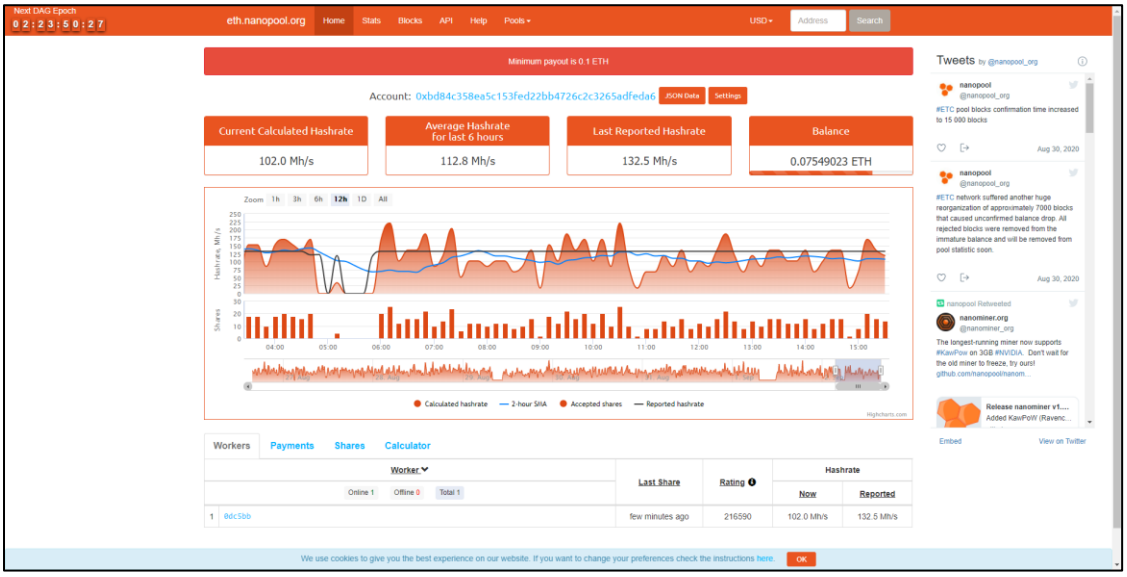


4. You can see the pool address and stratum port we have used in the bat file.

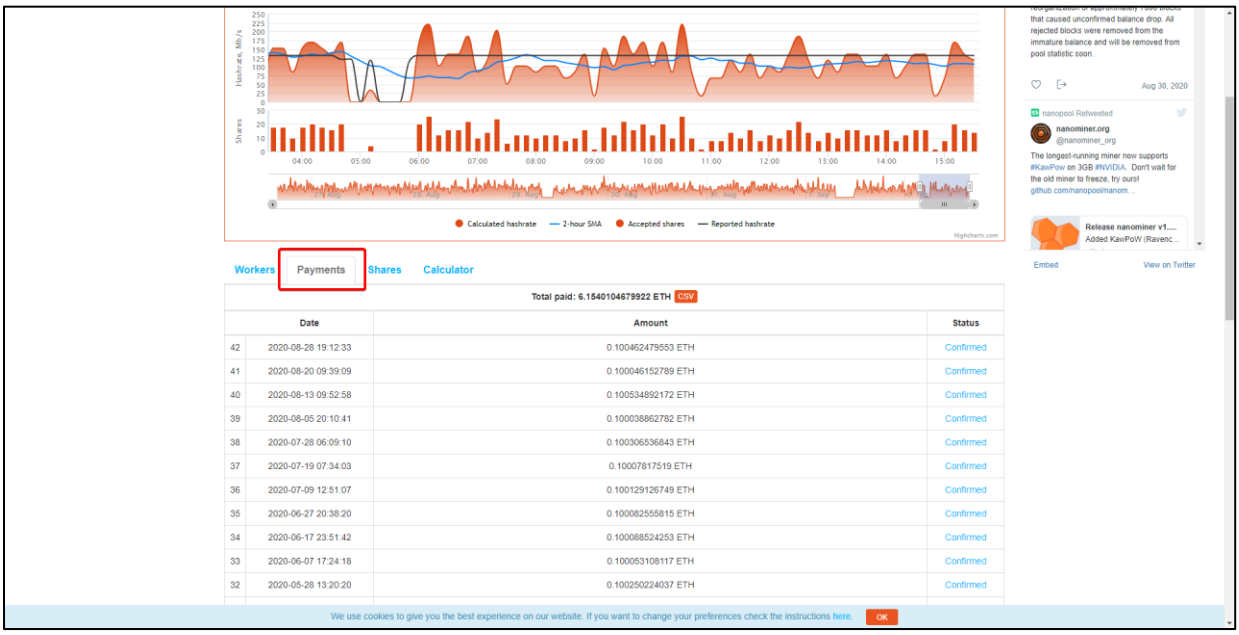
Connection Settings

Region	Europe	USA	Other
Host	eth-eu1.nanopool.org eth-eu2.nanopool.org	eth-us-east1.nanopool.org eth-us-west1.nanopool.org	eth-asia1.nanopool.org eth-jp1.nanopool.org eth-au1.nanopool.org
SSL Stratum Port	9433		
Stratum Port	9999		
Getwork Port	8888		

5. Here is the statistic for your mining activity. The info of your Workers, Payments, Shares and Calculator for mined coins. In **Workers** section you can see the Online and Offline miners. Furthermore, the most important things are the time of your **Last Accepted Share**, and **Hashrate**.



6. Here is the payment history.



5. Your Task is to do Experiments with the Miner.

1. Try different arguments for the commands. Experiment with "-**gt**" value or runtime press "**+/-**" keys. What has changed? What is the optimal value for your configuration?

2. Experiment with temperature options "-**tt**", "-**tstop**", "-**ttli**", "-**tstart**".
   What are your observations?

What to Submit?

Create a **zip file** (e.g. **your-name-eth-mining-exercise.zip**) holding the following:

1. A "**txt**" file with your answers to section 5.
2. A screenshot of your ETH mining statistics page.

Submit your zip file as **homework** at the course platform.