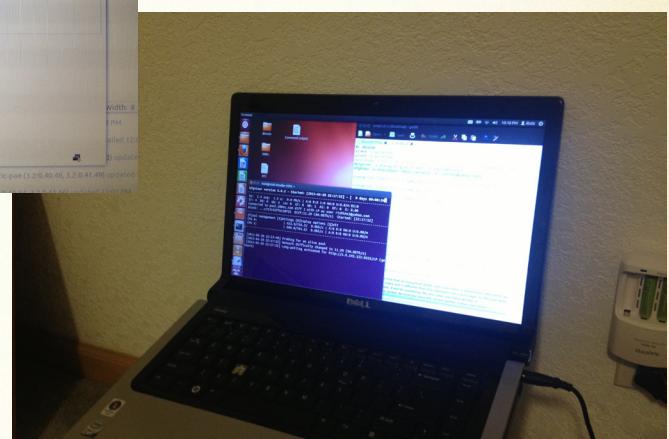
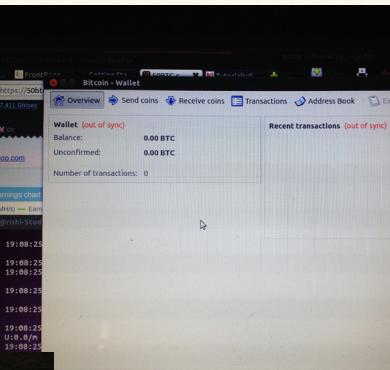
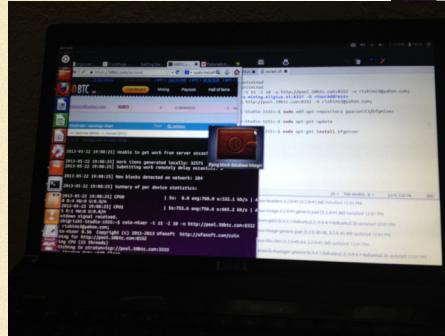


HOME-MADE BITCOIN SERVER

-BY RISHIDHAR REDDY BOMMU

- LINUX UBUNTU
- PPA STORAGE
- CPU VS. GPU
- FURTHER READING



INTRODUCTION

Bitcoin (BTC) is a digital currency first described in a 2008 paper by pseudonymous developer Satoshi Nakamoto, who called it a peer-to-peer, electronic cash system. Bitcoin creation and transfer is based on an open source cryptographic protocol and is not managed by any central authority. Each bitcoin is subdivided into 100 million smaller units called satoshis, defined by eight decimal places. Bitcoins can be transferred through a computer or smart phone without an intermediate financial institution. The processing of bitcoin transactions is automated by servers called bitcoin miners. These servers communicate over an internet-based network and confirm transactions by adding them to a ledger which is updated and archived periodically. In addition to archiving transactions each new ledger update creates some newly-minted bitcoins.

GOALS

One of my main goals for this project is to create an efficient set-up and command shell script that will allow for any user from beginner to expert to quickly create their own bitcoin server with very little hassle. I would like my project to be an open-source guide for anybody looking to avoid the hours of mindless research required to make a bitcoin server, and rather make it a fun and an efficient experience.

SUMMARY OF PROJECT

To create a P2P connection through a bitcoin server and mine the digital currency of bitcoin. Allowing limited hardware and time to create an efficient way to mine. Only must require electricity input and output of a providing source of money.



SET-UP AND PRE-LINUX CONFIGURATION

Explanation of hardware setup and initial software required to allow smooth command shell bitcoin mining

This set-up will take into assumption that there is no GUI interface. All set-up and production will be done on the command shell. This tutorial will be taking place on the command shell of Ubuntu Linux. Ubuntu Linux Desktop version and Server version will both work, However the Server version is recommended so that one's computer can focus its resources only at the task at hand.

Set-up- <http://www.ubuntu.com>

If you haven't already, installed a version of linux (link given above) or any form of linux that you feel comfortable using, do so now.

After installing linux you need to set-up a bitcoin client and virtual wallet. Creating a virtual wallet will help one have an address where you can receive your virtual currency once its mined. The address can also be your wallet to exchange trade and

buy the virtual currency also.

Set-up- <http://bitcoin.org/en/>

You can download your bitcoin client on the above url. Although this client will not help you mine bitcoins, it will help you have a way to receive them and have the original transaction stack.

The next step will be to setup a personal package archive and download the miner software. Personal Package Archives are ways Ubuntu Linux downloads data for use. The first step will be to download a miner and then install it. The below commands will help you install these miners, The one on the left uses CPU acceleration and the one on the right uses GPU acceleration.

INSTALLING MINER

BFG MINER

1. [ppa:unit3/bfgminer](https://bfgminer.com/)
2. sudo apt-get update
3. sudo apt-get install bfgminer

Coin-miner

1. Download from [ubasoft](http://ubasoft.com)
2. run the ./configure script
3. sudo apt-get update

POOLING

Maximizing chances to make money and reducing luck in the business equation

Now that you have a miner installed, You are ready to start mining for bitcoins. However, Bitcoins are given in an amount of 40 bitcoins at once. Which are stored in blocks. These blocks are what a miner decodes. If one chooses to go head on and try to find the lucky block that contains 40 bitcoins. One may take more than 2 years to just find one bitcoin.

To reduce such levels of unpre-

dictably, it is smart to start mining with a pool. Pooling is a simple term where a group of miners come together and mine, in hopes that they will be able to find the block faster. After the block is found, the bitcoins are separated equally between the users. Although the pay out maybe low, the system of pooling is more reliable in making currency.

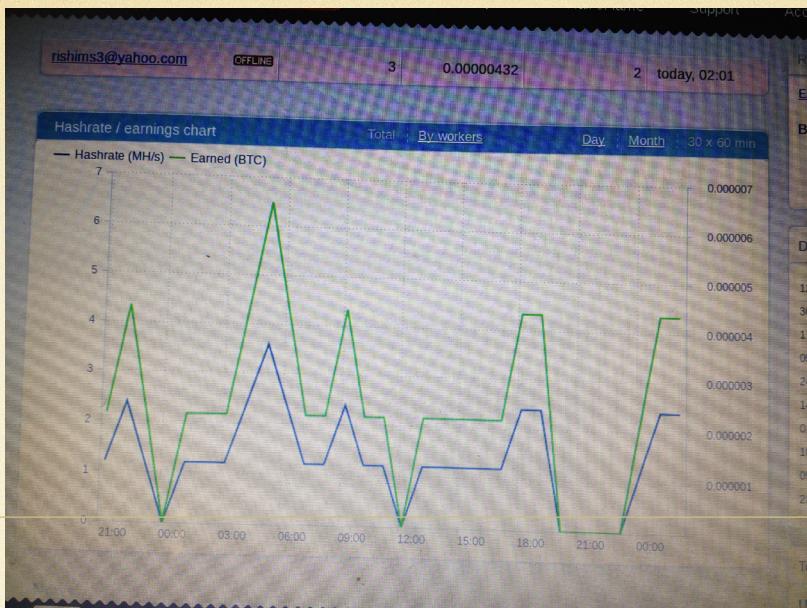
For this tutorial we will use
Mining command

50btc pool to mine coins.

url- <https://50btc.com>

Make an account in the following website pool, and remember the user name, it will be important in guiding your earned bitcoins to a location you can access. After making an account, enter the below command to start mining. You have successfully setup your first bitcoin miner after this step.

1. [coin-miner -t 15 -I 10 -o http://pool.50btc.com:8332 -u <pool address>;](https://50btc.com)
2. [bfgminer -o http://pool.50btc.com:8332 -O <pool address>;](https://50btc.com)



CPU VERSUS GPU ACCELERATION AND EFFICIENCY

Maximizing efficiency

After using your first bitcoin miner, you will realize that your daily income is quite low. To increase your decoding speed you will need to understand the difference between CPU and GPU acceleration. In the bitcoin system blocks are decoded through a process of finding two prime variables whose product equals the hash code block variable. Your computer uses either your computer processing unit or your graphics processing unit to do these computations. Depending on your systems hardware it will be wise to use a different type of miner.

Bfgminer was the original CPU accelerating client, using this will help you if you don't have a graphics card. If you want to do GPU acceleration then coin-miner would be right client to maximize efficiency. In the long run it is considered that GPU acceleration will out power the CPU acceleration client. This has been proven throughout the computations of multiple tests.

After trying to maximize your computer to its ultimate income, you will realize that it still may not be enough. If you want to increase your income, there are special chips that are made for such a cause. Butterfly Labs and a student from NYU are both releasing custom builds that are being made to mine bitcoins. Although they may not be heavy force gaming computers, these computers only have one task... to mine bitcoins. They are considered to range from \$500 all the way to several thousands of dollars.

The algorithm that runs the bitcoin system makes sure that there is only a set number of bitcoins going into the system. Knowing this having stronger computers might increase your income, however if everybody uses stronger computers, the amount of income for everybody will not increase. If such is the case the block in the bitcoin system will only become harder to decode.

MINING RESOURCES

links to miner resources, pooling sources, and further reading.

<http://en.wikipedia.org/wiki/Bitcoin> -information
<http://bitcoin.org/en/> -official website
<https://50btc.com> -pooling
<http://ABCPool.co> -pooling
<http://BitClockers.com> -pooling
<http://BitcoinPool.com> -pooling
<http://Bitparking.com> -pooling
<https://github.com/ckolivas/cgminer> -miner
<https://github.com/luke-jr/bfgminer> -miner
<https://github.com/Diablo-D3/DiabloMiner> -miner
<http://ufasoft.com/coin/> -miner
<http://www.theverge.com/2013/2/1/3941768/new-chips-mine-bitcoins-50-times-faster-news>
<http://www.butterflylabs.com> - hardware

After Note

You have successfully setup your bitcoin server and may have tried to maximize its efficiency. The bitcoin system is still very new, and is susceptible to crashes in value and faith. Mining bitcoins is like any investment, one must put in time and money, in interest of making profit, however must understand that loss might also factor into this equation.



BTC

COIN-MINER

```
rishi@rishi-Studio-1555:~ [2013-05-22 19:08:25] Runtime: 44 hrs : 50 mins : 32 secs  
[2013-05-22 19:08:25] Average hashrate: 1.5 Megahash/s  
[2013-05-22 19:08:25] Solved blocks: 0  
[2013-05-22 19:08:25] Best share difficulty: 20  
[2013-05-22 19:08:25] Queued work requests: 9718  
[2013-05-22 19:08:25] Submissions: 50  
[2013-05-22 19:08:25] Accepted shares: 5  
[2013-05-22 19:08:25] Rejected shares: 5  
[2013-05-22 19:08:25] Accepted difficulty shares: 45  
[2013-05-22 19:08:25] Rejected difficulty shares: 5  
[2013-05-22 19:08:25] Reject ratio: 10.0%  
[2013-05-22 19:08:25] Hardware errors: 0  
[2013-05-22 19:08:25] Efficiency (accepted shares * difficulty / 2 KB): 0.01  
[2013-05-22 19:08:25] Utility (accepted shares / min): 0.02/min  
[2013-05-22 19:08:25] Discarded work due to new blocks: 18028  
[2013-05-22 19:08:25] Stale submissions discarded due to new blocks: 0  
[2013-05-22 19:08:25] Unable to get work from server occasions: 0  
[2013-05-22 19:08:25] Work items generated locally: 32571  
[2013-05-22 19:08:25] Submitting work remotely delay occasions: 0  
[2013-05-22 19:08:25] New blocks detected on network: 284  
[2013-05-22 19:08:25] Summary of per device statistics:  
[2013-05-22 19:08:25] CPU0 | Ss: 0.0 avg:760.0 u:532.1 kh/s | A:0 R:0 U:0.0/m B5:0  
[2013-05-22 19:08:25] CPU1 | Ss:753.6 avg:750.0 u:665.2 kh/s | A:0 R:1 U:0.0/m B5:0  
[2013-05-22 19:08:25] Shutdown signal received.  
rishi@rishi-Studio-1555:~$ coin-miner -t 15 -I 10 -o http://pool.50btc.com:8332  
-u rishims3@yahoo.com;  
coin-miner 0.56 Copyright (c) 2011-2013 Utsoft http://utsoft.com/coin  
Mining for http://pool.50btc.com:8332  
Using CPU (15 threads)  
Switching to stratum+tcp://pool.50btc.com:3333  
1.319 MHash/s 15 CPU threads
```

BFG-MINER

```
#bfgminer -o mining.etc@192.168.1.100 -u http://pool.50btc.com:8332  
rishi@rishi-Studio-1555:~ [2013-05-20 22:17:52] Started: [2013-05-20 22:17:52] - [ 0 days 00:00:21]  
-----  
Ss: 1.4 avg: 1.3 u: 0.0 Mh/s | A:0 R:0 S:0 HW:0 U:0.0/m B5:0  
ST: 4 DN: 0 GW: 0 LW: 0 GF: 0 NB: 1 A5: 0 RF: 0 E: 0.00  
Connected to pool.50btc.com diff 1 with LP as user rishims3@yahoo.com  
Block: ...c727c41ff6158f15 Diff:11.2M (80.08Th/s) Started: [22:17:52]  
-----  
[P]ool management [S]ettings [D]isplay options [Q]uit  
CPU 0: | 623.9/755.2/ 0.0kh/s | A:0 R:0 HW:0 U:0.00/m  
CPU 1: | 600.0/764.6/ 0.0kh/s | A:0 R:0 HW:0 U:0.00/m  
-----  
[2013-05-20 22:17:49] Probing for an alive pool  
[2013-05-20 22:17:52] Network difficulty changed to 11.2M (80.08Th/s)  
[2013-05-20 22:17:52] Long-polling activated for http://5.9.245.122:8331/LP (ge  
twork)
```



Bitcoin