Finding The Holy Grail

Or How To Make Money Mining Crypto Currency

Things I Learned...

Simplify Your Build

- 3 rigs is fun. 10+ is annoying if your configuration varies. Try to reduce variability and build for long term reliability.

Using Windows 10 Home

- Auto login with no password

- Remove all network services except IPv4

- Remove all software except Awesome Miner and MSI Afterburner (w/remote server)

- Awesome Miner management software on a dedicated management workstation

- Isolate with a hardware firewall

Things I Learned…

Don't Set Your Rig On Fire

- Avoid PCI Bridges with Molex to SATA power conversion cables if possible.
- Put no more than two PCI Bridges on a SATA/Perip power supply lead.
- Put no more than one GPU on a power supply lead.
- Inflate your constant load power budget by at least 10% over normal calculations
- Try to use 240v in and remember to derate your power by 30% and add an additional 10% for constant load. (60% effective – 12 amps on a 20 amp circuit)
- Use a watt meter until you're certain of your load.

Things I Learned…

Assume You're Doing It Wrong
- Things change very quickly.
  If you can't afford to walk away
  you can't afford to play.

- What to mine, who to partner with
  and how to remain profitable will
  change daily.

Benchmarks

GPU Gen 1
Asrock H110 Pro BTC+ Mb, G4400 CPU,
8Gb DDR4 RAM, 128Gb M.2, Win10
6x Asus Dual-GTX1060-03G, 1000 PS
Cost $2,100 (2017.08) 660w

GPU Gen 2
ASUS ROG Strix B250H Mb, G4400 CPU,
8Gb DDR4 RAM, 128Gb M.2, Win10
6x Zotac GTX 1070Ti Mini, 1200w PS
Cost $3800 (2017.12) 1050w
90% Undervolted GPUs

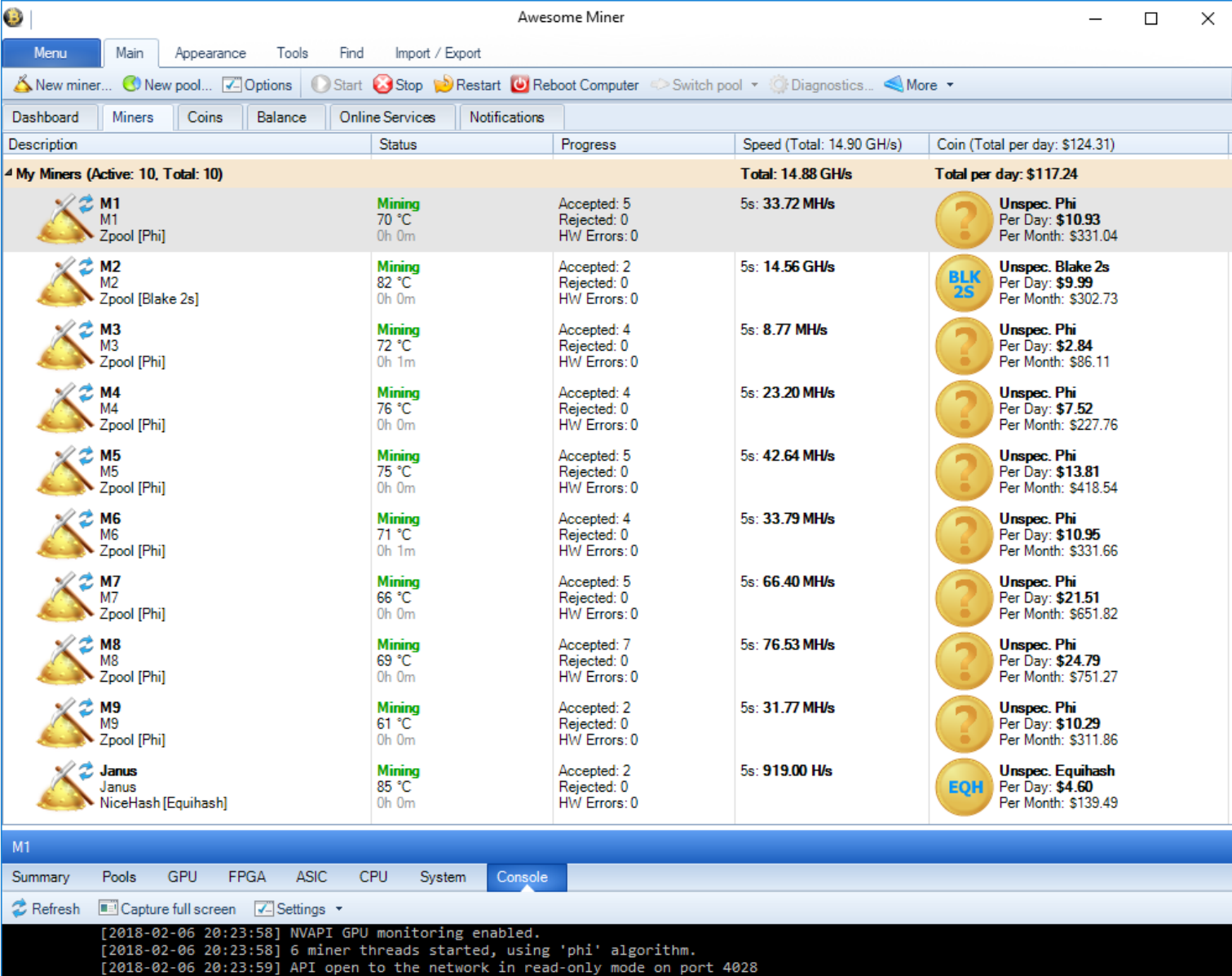**BitMain S9 Miner**, APW3++ PS
Cost $2,100 (2017.12) 1300w

Benchmark	GTX 1060	GTX 1070 TI	AMD Vega 64
Cost / Power	$223 108w	$470 155w	$600 385w
Blake 2b CCMiner 2.2.4	1.07 GH/s	2.10 GH/s	1.39 MH/s SgMiner 5.6.1
Blake 2s CCMiner 2.2.4	2.20 GH.s	4.20 GH/s	-
CryptoNight CCMiner 2.2.4	410 H/s	610 H/s	264 H/s Claymore
Decred CCMiner 2.2.4	1.59 GH/s	3.09 GH/s	801.29 MH/s SgMiner 5.6.1
Equihash Claymore Zcash	-	-	453 H/s
Ethereum Claymore	-	-	28.21 MH/s
Lyra2REv2 CCMiner 2.2.4	22.34 MH/s	44.16 MH/s	264.10 kH/s SgMiner 5.6.1
NeoScrypt	533 kH/s	933 kH/s	-
SHA-3 CCMiner 2.2.4	440 MH/s	874.18 MH/s	677 MH/s SgMiner 5.6.1

Profitability?

My profitability varies...

Here is some snapshot data:

- 6 x Gen 1 (6*1060 Rigs)
- 3 x Gen 2 (6*1070Ti Rigs)
- $124.31 per day ($3,729 m)
- 11.8kw/h * $0.07 * 720h ~$600 in power per month

- $24,000 initial investment
- $3,100 income per month
- <8 Months ROI

Questions?

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3DMgEAxVG8VEACzKHb5NQf7vJANogDCuPd

Or I Will Taunt You One More Time

Backup Slides

Some Good Links

- How does Mining really work?
  http://www.righto.com/2014/02/bitcoin-mining-hard-way-algorithms.html
  https://bitcoin.org/en/developer-guide#block-chain

- Profitability Calculators
  http://whattomine.com/coins
  http://www.mycryptobuddy.com/BitcoinMiningCalculator

- Hardware Evaluation
  https://outervision.com/power-supply-calculator

- Mining Tools
  http://awesomeminer.com/
  http://zpool.ca/

- The Best Blog Ever, Believe Me!
  https://cryptoeconomics.blog
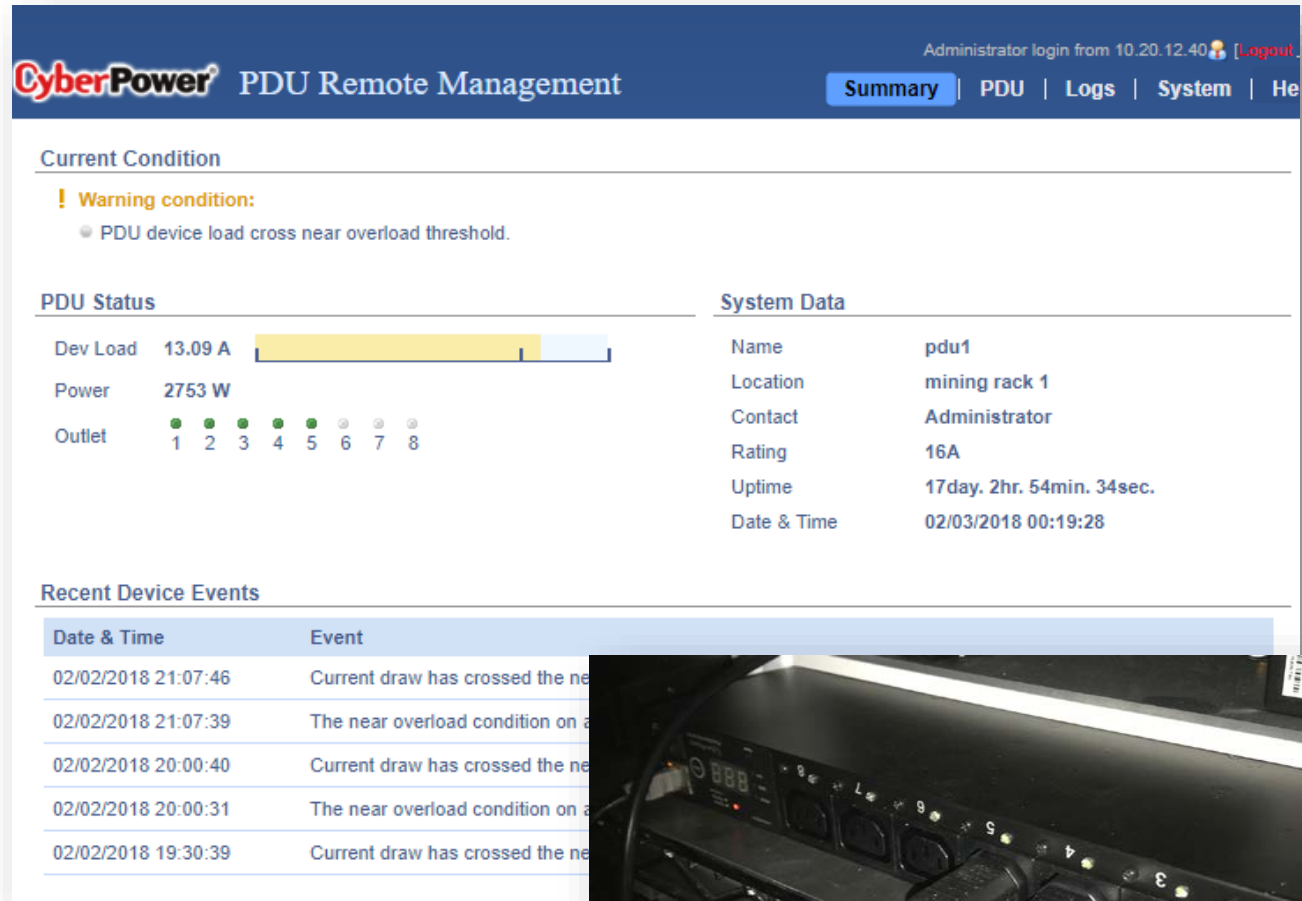
Power Distribution Unit

- How Much Power are you using?
- Remotely turn off/on individual power plugs

- 210 volts
  13.09 amps
  2753 watts

What Is Bitcoin in One Slide… Mostly

- Every Bitcoin Account is comprised of a public account number and a private key.
  The key is used to create transactions.
  My bitcoin account is **3DMgEAxVG8VEACzKHb5NQf7vJANogDCuPd**
  The private key is…. Private. With this account, you can send me bitcoin. Please feel free to do so.

- Every Bitcoin Client keeps a copy of a distributed ledger of all transactions.
  Groups of transactions are stored in a unit called a block.
  Blocks all have sequence numbers, which form a chain. The Block Chain.
  As of February 5, 2018 there were 507,877 blocks since the first "genesis" block 0.
  We get a new block about every 10 minutes (5,078,770 minutes is ~3,527 days)
  Each block is usually about 1Mb in size. These numbers are approximate…. One Page People!

- Bitcoin clients all listen for and keep track of new transactions.
  Their goal is to assemble these transactions into a block and make it part of the chain.
  They use a process called "proof of work" to figure out who gets to create the next block in the chain.
  When they create a block, they create a self-payment transaction as a reward.
  If their block is accepted, they get paid. This is part of what is called "mining".

How Difficult Is It?
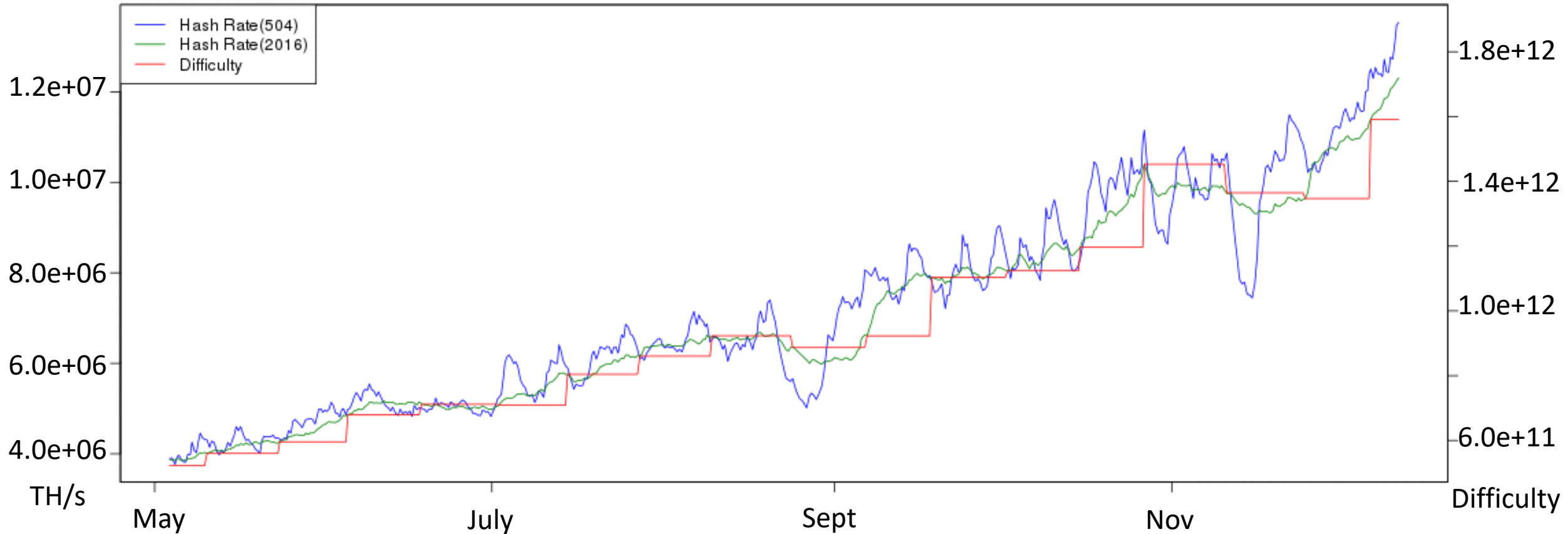
Difficulty = hashrate / (2^256 / max_target / intended_time_per_block)
              = hashrate / (2^256 / (2^208*65535) / 600)
              = hashrate / (2^48 / 65535 / 600)
              = hashrate / 7158388.055

max_target is an application constant which sets the target hash rate based on a difficulty of 1. 2^256 is SHA256.

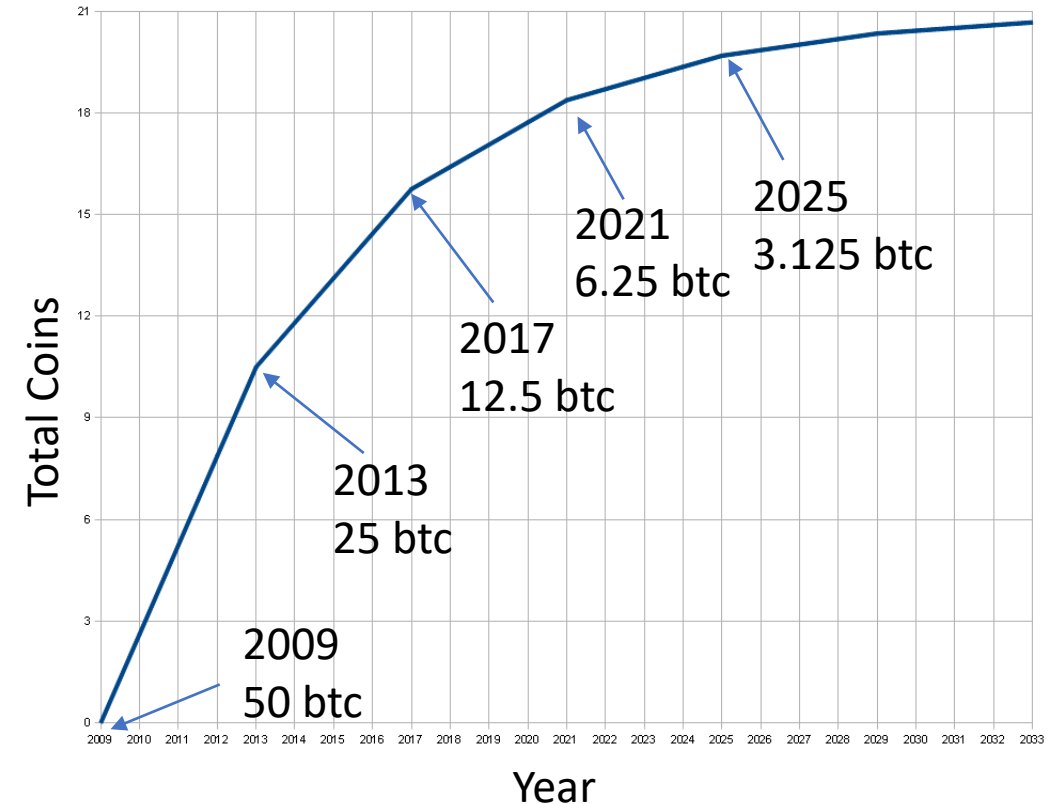**(i.e. 1,184,823,471,685 = 8,481,426,187e+09 / 7,158,388.055)**

How Many BitCoins are Produced?

There will only ever be 20,999,999.9769 Bitcoins produced.
This is because of the rule of decreasing payouts.
Starting with the first block, each miner gets paid 50 btc per block. This is cut in half every 210,000 blocks.
So…

Block	Payout	Total	Year (est)
1-210,000	50 btc	10,500,000	2009-2013
210,001-420,000	25 btc	5,250,000	2013-2017
420,001-630,000	12.5 btc	2,625,000	2017-2021
631,001-850,000	6.25 btc	1,312,500	2021-2025
850,001-1,060,000	3.125 btc	656,250	2025-2029

$$\sum_{n=0}^{\infty} \frac{210000 \times 50}{2^n} = 210000 \times 50 \times \frac{1}{1-\frac{1}{2}} = 21000000$$

This is also an approximation.

What is a BitCoin Worth?