THE SIMPLEST bitcoin BOOK EVER WRITTEN

Keysa Luna

2nd Edition

* to orange-pill: (verb) / tu' ȯr-inj-'pil/
: the act of explaining bitcoin in such a way that a pre-coiner gets it, and becomes a bitcoiner!

1 bitcoin = 100,000,000 satoshis

Includes a section on Nostr

The Simplest Bitcoin Book Ever Written

Second Edition, July 2024, Keysa Luna

First Edition, March 2022, Keysa Luna

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Do your own research. Verify, don't trust. You are solely responsible for your own decisions.

for all our children

with thanks to Satoshi and the cypherpunks

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I love the simple life,
I love nature, I love being barefoot,
I love profound conversation that sparks creativity,
connection and inspiration.
I love freedom.

And, I love bitcoin.

Love is a big word, bitcoin is worthy of big love.

It's existence is a point of bright light in this most
challenged time in human existence.

I wrote this book in the hopes of making bitcoin, and the
reasons we need it, more accessible to more seekers.

This book is a starting point, into what I, and many others,
have discovered is a phenomenally endless, life-changing
and beautiful rabbit hole!

May you be orange-pilled, may you be free,
and may you be well enriched by the journey!

738922

As I submit this 2nd Edition for print,
I reflect on the process of writing, editing, updating,
fact-checking and, most importantly,
adding the new section on Nostr,
and I am in awe.

In awe of all of you, orange-pilled, purple-pilled
and yet-to-be,
all on this journey with me,
as we march forward,
resolute in our mission to continue the work
of the cypherpunks,
the freedom lovers, the visionaries,
those who looked ahead,
who understood both the power and the danger
of the digital world left unchecked,

and who sought, and still seek, to
write the code we all need,
to live into a future of freedom.

It is up to us to use it.

Let us proceed together apace.

Onward.

851522

- **Note:** Everything presented in this little book is up for debate, discussion, updates and corrections!

- As with all things in life, there are numerous viewpoints on bitcoin, nostr, their future, and every other aspect of them both.

- Lively commentary is streamed 24/7 on nostr and twitter that bounces between confusing and clarifying!

- This entire ecosystem is an emergent, grassroots, messy, fascinating unfolding! It is by far the largest global experiment ever undertaken, with people of every race, religion, class and persuasion engaging permissionlessly together, to discover a new way forward.

- If you are inspired by such a movement, you will very likely find yourself falling down the rabbit hole with the rest of us!

- Here's to open minds and open hearts along the way…

Remember: Don't Trust, Verify

And always DYOR: Do Your Own Research!

I've developed a new open source P2P e-cash system called Bitcoin. It's completely decentralized, with no central server or trusted parties, because everything is based on crypto proof instead of trust. Give it a try, or take a look at the screenshots and design paper:

Download Bitcoin v0.1 at http://www.bitcoin.org

~ Satoshi Nakamoto 2009-02-11 22:27:00 UTC
Posted on metzdowd.com, an early cryptography mailing list

WHY WE NEED bitcoin

WE NEED bitcoin BECAUSE MONEY IS BROKEN

> *The root problem with conventional currency is all the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust. Banks must be trusted to hold our money and transfer it electronically, but they lend it out in waves of credit bubbles with barely a fraction in reserve. We have to trust them with our privacy, trust them not to let identity thieves drain our accounts.*

~ Satoshi Nakamoto 2009-02-11

- The fiat money system is broken (always has been).
- It is not sustainable (never has been).
- There is no way to fix it (never will be)

THE (NOT) GOLD STANDARD

- Many people still believe that money is backed by gold.
- It is not.
- It has not been backed by gold since 1971, when President Nixon unilaterally took the world off the gold standard (the Nixon Shock).
- See **wtfhappenedin1971.com** to get a clear picture of the damage this did.

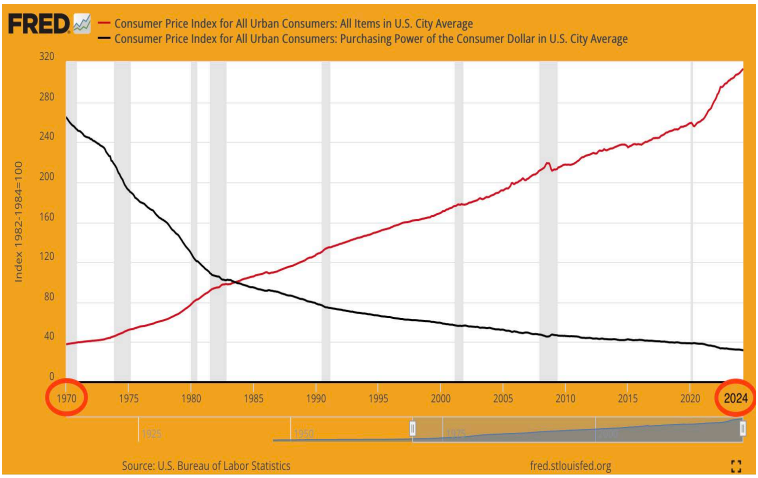


Chart showing Consumer Price Index inflation (black line) vs the purchasing power of the US dollar (red line) since 1971.

U.S. Bureau of Labor Statistics, retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CPIAUCSL, June 9, 2024.

➢ **Fun Fact:** The World Economic Forum was formed in 1971.

FIAT: (noun) /'fi:.æt/
: an authoritative or arbitrary order : DECREE
: an authoritative determination : DICTATE
: a command or act of will that creates something without or as if without further effort

~ merriam-webster.com/dictionary

FIAT : from Latin fieri «to be made, come into being»

- Fiat is money that has value only because the government says (decrees) that it does.
- Therefore people (have to) believe it does.
- **Even if they don't believe fiat has value, by law they are forced to use it and to accept it as payment for goods and services.**
- **Fiat money is printed/created out of thin air.**
- These days about 5% of all dollars are printed as cash.
- The other 95% is digitally created by banks entering numbers into a computer when they issue loans.

It costs only a few cents for the Bureau of Engraving and Printing to produce a $100 bill…

~ American Economist, Barry Eichengreen

> ***Scott Pelley of NBC '60 Minutes'**: Fair to say you simply flooded the system with money?*
>
> ***Fed Chair Jerome Powell**: Yes. We did.*
>
> *That's another way to think about it. We did.*
>
> ***Pelley**: Where does it come from?*
>
> *Do you just print it?*
>
> ***Powell**: We print it digitally. So as a central bank, we have the ability to create money digitally. And we do that by buying Treasury Bills or bonds for other government guaranteed securities. And that actually increases the money supply. We also print actual currency and we distribute that through the Federal Reserve banks.*

~ CNBC '60 Minutes' Interview, May 17, 2020
Two months after the onset of the C*vid-19 lockdown

> There's really no limit to what we can do with these lending programs that we have.

~ Fed Chair Jerome Powell
March 18, 2020 on CBS News

> Yes, there is an infinite amount of cash in the Federal Reserve. We will do whatever we need to do to make sure there's enough cash in the banking system.

~ Neel Kashkari , President of the Minneapolis Fed
March 23, 2020, CBS '60 Minutes'

> The 'we' here is five people voting on changes t monetary policy within the Federal Reserve system during FOMC meetings. 5 out of 330,000,000. That's all it takes to change US monetary policy.

~ @MartyBent, Founder of TFTC.io
Forbes Article, March 18, 2020

FROM THE HORSE'S MOUTH OF OLDE

The bank hath benefit of interest on all monies
that it creates out of nothing.

~ William Paterson, 1694
Founder of the Bank of England

All of the perplexities, confusion, and distress in America arises,
not from the defects of the Constitution or Confederation,
not from the want of honor or virtue,
so much as from downright ignorance of
the nature of coin, credit, and circulation.

~ John Adams
2nd President of the United States, 1797-1801

I believe that banking institutions are more
dangerous to our liberties than standing armies.
Already they have raised up a money aristocracy
that has set the government at defiance.
The issuing power should be taken from the banks, and
restored to the people to whom it properly belongs.

~ Thomas Jefferson
3rd President of the United States, 1801-1809

While boasting of our noble deeds were careful to conceal the ugly
fact that by an iniquitous money system we have nationalized a
system of oppression which, though more refined, is not
less cruel than the old system of chattel slavery.

~Horace Greeley
US Congressman 1848-49
Founder of The New York Tribune

Whoever controls the volume of money in any country is absolute master of all industry and commerce… when you realize that the entire system is very easily controlled, one way or another, by a few powerful men at the top, you will not have to be told how periods of inflation and depression originate.

~ James A. Garfield
20th President of the United States, Mar-Sept.1881
Assassinated in 1881

There today exists uncontrolled in the hands of a set of men a power to make dollars from nothing.

~ Thomas W. Lawson, Author 'Frenzied Finance', 1905

I was as secretive - indeed, as furtive - as any conspirator. Discovery, we knew, simply must not happen, or else all our time and effort would be wasted. If it were to be exposed that our particular group had got together and written a banking bill, that bill would have no chance whatever of passage by Congress.

~ Frank A.Vanderlip
President of the National City Bank of New York
(forerunner of Citi Bank)
~ Writing in 1935 of the secretive meeting that took place on Jekyll Island in 1910, to draft the bill that was passed as the Federal Reserve Act in 1913.

This (Federal Reserve) Act establishes the most gigantic trust on earth. When the President (Woodrow Wilson) signs the Bill, the invisible government of the Monetary Power will be legalised… The worst legislative crime of the ages is perpetrated by this banking and currency Bill.

~ Charles A. Lindbergh, Sr.
US Congressman 1907-1917

I am a most unhappy man. I have unwittingly ruined my country. A great industrial nation is controlled by its system of credit. Our system of credit is concentrated. The growth of the nation, therefore, and all our activities are in the hands of a few men. We have come to be one of the worst ruled, one of the most completely controlled and dominated governments in the civilized world. No longer a government by free opinion, no longer a government by conviction and the vote of the majority, but a government by the opinion and duress of a small group of dominant men.

~ Woodrow Wilson
28th President of the United States, 1913-1921
6 years after passing the Federal Reserve Act of 1913.

The real truth of the matter is, as you and I know, that a financial element in the large centers has owned the government of the U.S. since the days of Andrew Jackson.

~ Franklin D. Roosevelt
32nd President of the United States in a letter written on Nov. 21, 1933 to Colonel E. Mandell House

It [the depression] was not accidental. It was a carefully contrived occurrence…. The international bankers sought to bring about a condition of despair here so that they might emerge as the rulers of us all.

~ Congressman Louis T. McFadden,
Assassinated in 1936

Chairman of the House Banking and Currency Committee
Each and every time a bank makes a loan, new bank credit is created - new deposits - brand new money.

~ Graham F.Towers
Gov of the Central Bank of Canada, 1934-55

If there were no debts in our money system,
there wouldn't be any money

~ Marriner Eccles,
1941, Gov. of the Fed

I have never yet had anyone who could, through the use of logic and reason, justify the Federal government borrowing the use of its own money…
I believe the time will come when people will demand that this be changed.
I believe the time will come in this country when they will actually blame you and me and everyone else connected with the Congress for sitting idly by and permitting such an idiotic system to continue.

~ Wright Patman
US Congressman 1928-1976
Chairman, Committee on Banking and Currency 1963-1975

When you or I write a check, there must be sufficient funds in our account to cover the check, but when the Federal Reserve writes a check there is no bank deposit on which that check is drawn. When the Federal Reserve writes a check, it is creating money.

~ Federal Reserve Bank of Boston
'Putting It Simply', 1984

THE FEDERAL RESERVE

- The Fed is the 'independent' central bank of the US. It was created in 1913 with the passing of the Federal Reserve Act.

- It has a unique structure, part private and part government.

- It is supposed to be a politically independent, non-partisan entity within the government.

- While the Fed Board of Governors is appointed by the President and confirmed by Congress, **the decisions of the Fed do not need to be ratified by anyone.**

It consists of:

- The Federal Reserve Board of Governors
- 12 Federal Reserve Banks
- The Federal Open Markets Committee (FOMC), which is the monetary policy-making body.

The Fed is responsible for:

- Overseeing US monetary policy, promoting employment and stable prices.

- Regulating and supervising banking and financial institutions.

- Providing payments services to financial institutions.

- Promoting consumer protection and community development.

A NOTE ON THE FED CHAIR

The Chair of the Federal Reserve is also:

- Chairs the Federal Open Market Committee (FOMC), which decides on the direction of US monetary policy (for eg: QE, interest rate hikes)
- A member of the International Monetary Fund, the IMF
- A member of the Bank for International Settlements, the BIS (the bank of central banks).
- The US finance minister of the G-7
- The US finance minister of the G-20

A **whole** lot of power for one person.

FRACTIONAL RESERVE BANKING, INTEREST & LOANS

- **Fractional Reserve banking:** Until March 2020, banks were required to hold a reserve of 10%, and could loan out 90%.

- **Since March 2020, there is no reserve required, allowing banks to issue unlimited loans.**

- A loan is debt-based money, and you are required to pay interest on the loan.

- **Fun Fact 1:** The money to pay the interest on the loan is NOT created by the banks.
- **Fun Fact 2:** It is NEVER created.
- **Fun Fact 3:** There is NOT ENOUGH money in the world to pay back all the loans + the interest due on those loans.
- **Fun Fact 4:** There never will be!

A NOTE ON THE PETRO DOLLAR

- One could say **that until 1971 the dollar was backed by gold, and since 1974 it has been backed by oil, and thus by default, the US Military**.
- **In 1974 the US and Saudi Arabia entered into bilateral agreements to price the sale of oil in US dollars.**
- Since then, most global oil sales have been settled in US dollars.
- This has contributed greatly to the dollar becoming the strongest currency in the world.
- **It has thus been artificially propped up**, even during times when it would normally have struggled.
- Since late in 2022, a number of countries have begun to trade in currencies other than the US dollar.
- It is very possible that this could be the beginning of the end of the petro dollar. What happens next remains to be seen…

ON QE (QUANTITATIVE EASING)

- Quantitative Easing is considered an 'unconventional monetary policy' used by Central Banks to 'stimulate the economy', whereby the Fed buys government bonds and other government securities.

- It was first used by Japan between 2001-2006. Following that, the US, UK, and the Eurozone used QE during the 2008 financial crisis

- Since then, the only time the US has not had a QE program was between 2014-2019.

- As seen below, critics contend that **QE overwhelmingly benefits the already-wealthy.**

"QE was socialism for the 1%." - Kiril Sokoloff

"...when you look at the wealth disparity today, which by the way, in my opinion, the biggest accelerant of has been QE, it's not even debatable..." - Stan Druckenmiller

QE "1, 2 and 3 really did not lift the economy. The academic studies show that. The Fed won't accept that, but to me, the nasty aspect of the quantitative easing is that as it came in, it exacerbated the income and wealth divides." - Lacy Hunt

"QE has been a massive deceit and a huge factor in driving inequality." - Nomi Prins

"I like to nickname quantitative easing "monetary policy for rich people." You could quote me on that." - Steve Eisman

"21st-century central bankers are many things. What they are not is original. QE, financial repression & other post-2007 radical monetary innovations got a fair trial in France exactly 300 years ago. In the resulting spectacular boom & bust is a cautionary story for our time." - Edward Chancellor

"...results indicate that expansionary monetary policy strongly increases the share of national income held by the top 1%. Our findings also suggest that this effect is arguably driven by higher asset prices..." - Mehdi El Herradi & Aurélien Leroy

"QE has perverted investor expectations about what the permanent cost of capital is." - Peter Cecchini

"For all that veneer of credubility...QE has simply been an exercise in monetary debasement." - Julian Brigden on RealVision

"QE's aim is -- this they will never say, but it is targeting explicitly, implicitly, debasement -- so lower currencies." - Etienne de Marsac, Former Head of Proprietary Investments at the European Investment Bank

"When the Fed engages in QE...they give a signal to the corporate managers that financial asset prices & financial liquidity is protected...this causes a greater & greater share of corporate resources to be channeled into the financial markets rather than into the real economy.." - Lacy Hunt

"A lot of what the Fed now has to do, remember, is going to go to these nameless hedge funds. Nobody wants to name them, because nobody wants to know that quantitative easing is there to bail out some hedge funds." - Raoul Pal, March 16, 2020

"It's always been about bailing out the stock market. The first Covid bailout was really buying high-yield bonds. The first thing the government did was give money to Blackrock to go buy ETF's. A lot of that ETF's went into high-yield..Why are we still doing $120B a month in QE?" - Guy Adami

Credit: @RudyHavenstein on Twitter

CYCLES

- **In all of nature, there are cycles, natural ebbs and flows, expansions and contractions.**

- This **contributes to an overall, over-time, balance and sustainability** of the whole interconnected system, of all life on earth.

- **The debt-based, fiat currency system ignores the wisdom of natural cycles,** and instead is based on, and 100% reliant for its survival upon, unparalleled and unmitigated growth, in order to continue servicing its debts.

- In nature, this is cancer.

- In 'the economy', this unnatural trajectory is further supported by the government bailing out failing banks and large companies, rather than allowing them to fold, and be recycled into something new, something healthier.

- **The short-sightedness of bailing out failing companies is putting the whole economy at risk.** In essence, it is just kicking the can down the road, and the inevitable turmoil that lies ahead is likely to be far, far more intense than if natural cycles were allowed to play out.

- **We are indebted to Satoshi Nakamoto, and to the cypherpunks before and after him**, for having the vision, foresight, determination and skill to provide a lifeboat to carry us to new shores.

- Once we realize the gift that this is, it is up to us to jump on board, with full hearts and clear minds, to take the trip and build a new world with the Money of Peace.

- **Bitcoin fixes the money, it is up to us to fix the rest. And, to be clear, by having the money fixed, a LOT of other things will be fixed, by default**

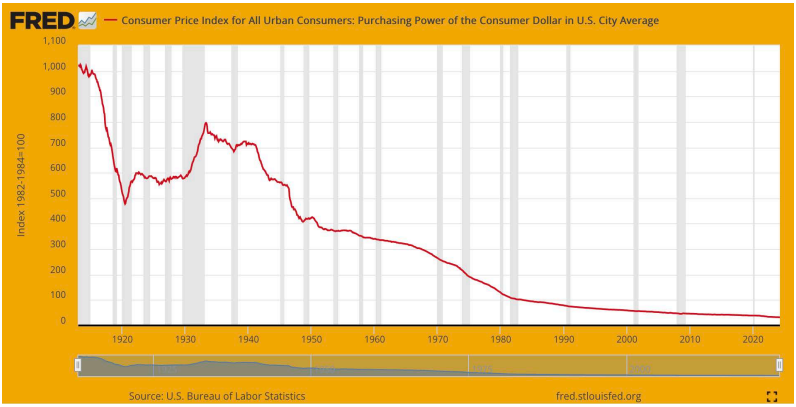
- The main one being that large-scale, government-initiated, kinetic war will no longer be profitable, or possible, without the support of the people.

- Additionally, there will naturally be less consumption, along with a switch over to real-value goods and services, free markets, real savings, & demonetization of housing and real estate, that was never meant to be monetized in the first place.

- **SEE:** Bitcoin Fixes This, page 32

WE NEED bitcoin

BECAUSE INFLATION IS THEFT



2024 FRED chart showing the declining purchasing power of the dollar since the formation of the Federal Reserve in 1913. The cumulative rate of inflation since 1913 is around 3.067%. All central bank fiat currencies around the world are following a similar rate of decline.

- **The more money that is created out of thin air, the more all money loses value/purchasing power.**
- This is called **inflation.**
- Inflation is **time-theft**, literally. The value of your time is stolen when you save it in a currency that is inflated, debased and manipulated.
- Inflation is also a **hidden tax**.

- This time-theft and tax has affected all other countries' fiat currencies as well, since they have all been pegged to the US dollar, as it has been the world reserve currency since the Bretton Woods agreement in 1944.

- **In the USA, a 2% annual inflation rate is written into the Federal Reserve mandate.**

- This means that **you are GUARANTEED to be able to buy 2% LESS** with the same $20 bill each year.

- **In March 2024, the annual inflation rate was 3.5%,** (a lot more than 2%, which means you lost 3.5% of your purchasing power between March 2023 and March 2024.

- Put another way, this means that on average, things went up in price by 3.5%.

- **If inflation was measured accurately, like it was done until the early 1980's, it would actually be closer to 10% in 2024.**

- When looked at by category, one sees that inflation is a whole lot worse than 3.5% in many categories over the past year.

- When one looks at one's rent, grocery bills, gas prices, almost anything one buys, it is quite clear that inflation is rampant in every sector.

Average Inflation over the past 50 years in the US:

Average Cost	1971	2024	% Increase
Salary	$9,400	$59,400	532%
House	$23,400	$513,000	2,092%
Gallon of Gas	$0.36	$4.17	1,058%
New Car	$3,400	$47,000	1,282%
College Degree	$1,400	$26,000	1,757%
Basket Groceries	$20	$210	950%
Electricity/kWh	$0.02	$0.15	650%

True Story:

~ A house was bought in 1976 for $58,000.

~ When accounting for 'official' inflation, this would be $279,000 in 2022 dollars.

~ In 2022 the same house was valued at $2.09 million.

~ Ponder on that…

Fiat currency is disinformation.
What information does a $10 bill convey?
The 10 is a numerator of a fraction with the denominator missing.
10 out of what?
The 10 says nothing without a known and stable denominator.

~ @bitlany

- **As inflation increases, your savings (if you are lucky enough to have savings), lose value.**

- Over time, they lose **A LOT** of value.

- If you started saving $100/month today, with the best available interest rate of 0.05%:
  - In 30 years you would have saved **$84,019**.
- When adjusted for the FED's mandated 2% inflation
  - In 30 years your savings would have an **effective purchasing power** of just **$46,384.**
- Adjusting for today's inflation of 3.5%:
  - Your $84,019 worth of savings would have the purchasing power of just **$11,037** in 30 years!

- **In effect this means that approximately six out of seven hours of your work have been stolen = *Time Theft*.**

Another way to look at it is the following:

- In **1971**, the cost of a house = **2.5** times an average annual salary.
- In **2024**, the cost of a house = **8.6** times an average annual salary.
- In **1971**, a new car cost about **1/3** of an average salary.
- In **2024**, a new car cost over **3/4** of an average salary.

I trust that it is now clear that
inflation
does *not*
work in your favor.

Note: All of these numbers are averages, and variable based on many factors. The point remains, inflation is a hidden tax and is time-theft on our real labor and production.

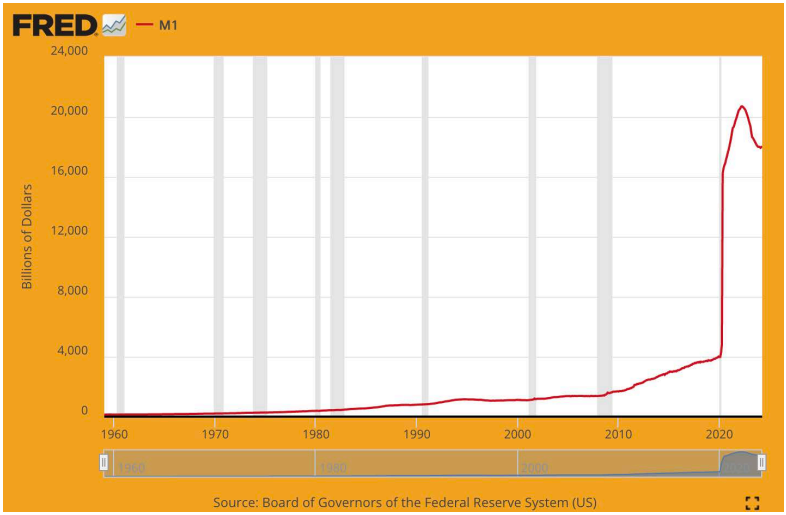
- **Hard money fixes this.**
- **Bitcoin is hard money.**

WE NEED bitcoin

TO REPLACE THE CENTRALLY CONTROLLED, MANIPULATED, DEBT-BASED ECONOMY

I don't believe we shall ever have a good money again, before we take the thing out of the hands of government, that is, we can't take them violently out of the hands of government, all we can do is by some sly roundabout way introduce something they can't stop.

~ Friedrich Hayek, 1984
Austrian Economist, Philosopher and Author, 1899-1992



Graph showing exponential M1 Money Supply increase from $4 trillion in March 2020 to over $18 trillion in June 2024.

Blow your mind here: https://usdebtclock.org/

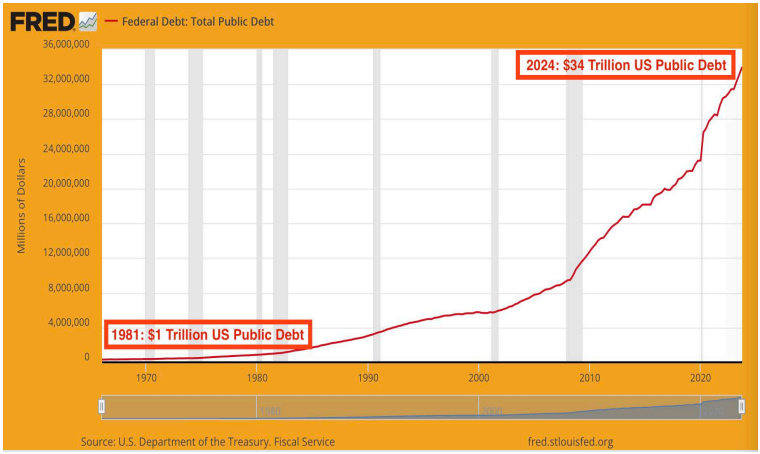
- **45% of all the US dollars in existence were printed between April 2020-Jan 2022!**

- Printed out of thin air that is, remember?

- Fiat money is centrally controlled by the state, and the supply is easily manipulated.

- **It took 205 years for the US National Debt to reach $1 trillion.** (1776 > 1981)

- It took just **33 more years for the** US National Debt **to reach $34 trillion!** (1981 > 2024)



FRED Graph showing Total Public Debt 1970-2024 in the US.

> *Global debt, measured by the Institute of International Finance, now totals $303 TRILLION. This is our planet on debt-based fiat. By the way, global GDP is only $84 trillion.*
>
> *~ Nik Bhatia, Author of 'Layered Money', 2021*

- For reference:

If you have:	You can spend $1/second	
$1 Million	for 11 days	= 11 days
$1 Billion	for 11,680 days	= 32 years
$1 Trillion	for 11,680,000 days	= 32,000 years!

- We are all at the mercy of those who have the power to decide when to print more, and what interest rates to charge.

- If the Fed raises the interest rates, then getting a loan for a house or a car becomes suddenly more expensive, which slows down spending, leading to stagflation

- If they keep the rates artificially low, we enter a period of depression

- Allowing the central bank to create the financia 'weather', takes away our freedom to let the market decide what is of value, and what is not.

- In addition, **when they bail out banks and corporations, they artificially prop up the economy.** It is only a matter of time before the house of cards falls.

- The original argument for having a central bank was that there needed to be a Lender of Last Resort when the economy wobbled.

- This has turned into the central bank being a Ruler of First Resort, with unparalleled, unelected, ultimately authoritarian power.

All money is political, except for Bitcoin. Fiat currencies, banking instruments, fintech credits, other cryptocurrencies, and even gold are all controlled by governments, corporations, or small groups. Having an exception will prove very useful as we head into the future.

~ Alex Gladstein @gladstein
Chief Strategy Officer for the Human Rights Foundation

Bitcoin links together 8 billion people, links together a hundred million companies, it synchronizes the world across political jurisdictions, and it returns rationality to the entire financial system, and it returns freedom and property rights to the entire human race.

~Michael Saylor
CEO Microstrategy

WE NEED bitcoin

TO BANK THE UNBANKED

For 953 million people in 20 countries with weakening currencies, Bitcoin represents something greater than a treasury asset. For them, it's more like an ark of encrypted energy to escape the flood.

~ Michael Saylor
CEO of Microstrategy

- As of 2024, approximately 25% of the adults in the world are unbanked, about 1.4 billion people!

- This means they have no access to banking services and cannot use ATM's, debit cards, credit cards or checks.
- In addition, they are not able to get loans to start a business, to buy a car or a house etc.

- Sending and receiving money, or cashing checks, is expensive.

- They have to use money-transfer and check cashing services like Western Union, that charge high rates and take time to process.

- It is **especially expensive for people sending money home to their families** in other countries (remittances), which can cost up to 10%, or 12% via a bank.

- It is **expensive and time-consuming for those receiving remittances**, as they need to pay for transport and go to the money-transfer office, often far from where they live, to get the money their family member sent.

- Oftentimes it is not safe for them to travel to these offices.

- Bitcoin, over the Lightning Network, provides an instant solution to these problems now!

#bitcoin fixes this

> *When has a technology that empowers people ever been stopped?*
>
> *~ Jeff Booth*
> *Author: The Price of Tomorrow*

WE NEED bitcoin

TO HELP PEOPLE ESCAPE TYRANNY AND CURRENCY COLLAPSE

- As we have seen, over the past couple of years, governments can and do freeze the bank accounts of those they disagree with.

- **This shows that, in essence, your money in the bank is nothing more than an IOU that can be stolen from you at any time.**

- In addition, when inflation runs rampant, as we are currently seeing in 2024 in Venezuela (283%), Sudan (63%), Lebanon (212%), Syria (79%), Argentina (161%), Zimbabwe (47%), Turkey (64%) and more, people's life-savings are vaporized, sometimes overnight, and there is nothing they can do about it.

- For people experiencing any of the above, **bitcoin becomes a real, immediate solution to an otherwise untenable problem.**

- **Considering that both tyranny and inflation is on the rise in many places, one would be wise to hedge against them by acquiring bitcoin now.**

WE NEED bitcoin

TO AVOID CBDCS

- You may have heard that **central banks are starting to create CBDC's, Central Bank Digital Currencies.** In May 2020, 35 countries were exploring this option.

- In March 2022, 87 countries were actively looking at, or had already launched, a pilot CBDC.

- As of this writing in June 2024, 134 countries representing 98% of global GDP are in the research, development, pilot or launch stage. www.atlanticcouncil.org/cbdctracker/

- **CBDCs are very similar to the electronic money you see in your online bank account, except that by being *natively digital*, they are *programmable* and *100% controllable.***

*A key difference with CBDCs is central banks would have **absolute control**..*

~Agustin Carstens
General Mgr, BIS - Bank for International Settlements (The bank of all banks)

- **This means the government can program an expiration date on your money,** forcing you to spend it before it expires.

- **They can also program other things into it**, like only allowing it to be spent at certain shops, websites or jurisdictions, and not at others.

- **They could link it to**: your credit score, your health pass, digital ID and other social scores.

- **They can program any restrictions they see fit,** based on your specific score in one area, or on your 'overall score', or on what they deem the 'economy' needs.

- In addition, they will be able to surveil every single thing you do with your money.

> *We don't know who's using a $100 bill today and we don't know who's using a 1,000 peso bill today. The key difference with the CBDC is* ***the central bank will have absolute control on the rules and regulations that will determine the use*** *of* ***that expression of central bank liability****, and also* ***we will have the technology to enforce that****.*
>
> ~Agustin Carstens
> GM, BIS - Bank for International Settlements

- **Note:** Saying **"that expression of central bank liability"** implies that your value, your life force, stored as money, is actually 'owned' by the central bank.

WE NEED bitcoin

TO SAVE THE GARDEN

- **Bitcoin plucks out, at the root, THE biggest issue we face, the Fiat Lie.**

- This is the lie of corrupted fiat currency, usury and all that comes with it to steal your time, while greatly enriching those closest to the money printer.

- The **Fiat Lie** is like a giant **monster weed** in your garden, **sucking** all the nutrients from the soil, **killing** all the mycelium, and **blocking** the sunlight so that the other plants cannot thrive, and are struggling to survive.

- Suddenly when this noxious, monster Fiat Lie weed is gone, Truth enters!

- All the plants (**the people**) can begin to recover.
- The soil (**being peoples' creativity, real goods and services**) can regenerate.
- The mycelium (**being authentic connection between people**) will regrow.
- And the sunlight (**unmediated life force**) will shine down once again upon us all!

WE NEED bitcoin

TO FIX THE WORLD

- This is not a joke. **#bitcoinfixesthis** is a running meme for good reason.

- While this might sound somewhat 'grandiose', let me explain. When one considers the 'way things are', **one can see that 'something is very wrong'**.

- Rampant destruction, environmental degradation, splintered families and communities, loss of cultures, languages, traditions, poverty increasing, massive wealth concentrating in the hands of the (very) few, over-consumption, infinite money backing politicians, lack of food and clean water for millions, ever-increasing obesity and auto-immune disorders, seemingly endless wars …

- One would think that with the exponential growth in NGOs, non-profit organizations, charitable foundations and so-called government-backed institutions, these issues would be getting less severe.

- Instead, **they are largely becoming more severe.**

bitcoin FIXES THIS

FINANCIAL INCLUSIVITY

- With bitcoin, everyone has access to the *same* financial system, with the *same* rules for everyone.
- No loopholes or back doors or special deals for anyone.
- Everyone has the potential to be compensated for the value they provide with the same real money, created and maintained with the same rules.
- Bitcoin is accessible to anyone, anywhere with an internet connection.

ADDING VALUE TO THE WORLD

- Bitcoin incentivizes people to add real value to the community and the marketplace, as this is the only way to make more money.
- If one is satisfied with less, one still benefits by working for a fair wage, and when one saves, those savings maintain their value over time.

bitcoin FIXES THIS

ENVIRONMENT

- Sound money with a hard-capped supply creates a very different dynamic to the one created by the debt-based, unlimited money-printing which we see taking place today.

- Instead of an unstoppable drive to consume ever more, in a race to the bottom to pay compounding interest rates on loans and debt that will ultimately never get paid off, **bitcoin provides an off-ramp to a world where a low-time preference is sought after.**

- Rampant environmental destruction is **replaced with less consumption, less waste, and a considered approach to production,** where the market decides what holds true value, and things are therefore built to last.

- This is a net benefit to people, plants and animals!

bitcoin FIXES THIS

WAR

- The unlimited printing of the fiat monetary system is what makes 'forever-wars' possible and profitable.

- Since the people are mostly in the dark about how war spending works, or where the money for war comes from, there is little to no accountability on the part of government. Wars can drag on for years in remote places, with no real oversight.

- Starting with Vietnam, wars have become 'credit card wars' (h/t @AlexGladstein), since the government borrows money to fund the wars, and then borrows more money to pay the interest on the initial loans... rinse and repeat.

- **On a bitcoin standard, it would require the people of a country to be willing to help pay for a war. They would likely only do so if it was absolutely and clearly necessary, to defend their families and country, with an end-goal in site.**

- Since there would be no undue profits to be made, government officials and corporations would not be incentivized to promote or engage in war as a viable option.

- **Efforts would greatly increase to find ways to come to peaceful, low-cost resolutions instead.**

bitcoin FIXES THIS

TIME PREFERENCE

High Time Preference: Instant gratification, Impatience, Short-term planning

Low Time Preference: Delayed gratification, Patience, Long-term planning

- High-time preference leads to personal, societal and environmental destruction. When our money is losing value each day, we are 'forced' to be impatient and to spend it as quickly as possible, before it loses more value.

- When our time is devalued by an ever-inflating fiat currency, we lose connection to the value of our time.

- This leads to disconnection, and an undercurrent of stress.

- Attempts to alleviate the stress, and find meaning, are distorted and become distractions such as over-consumption of drugs, alcohol, shopping, porn, fast food, short attention spans, addiction to screens/social media, impulsive decisions etc.

- Sound money on the other hand, which holds its value over time and properly measures our contributions through our work, leads to a low-time preference, thoughtful quality of life, with meaningful relationships, less consumption, deeper connection, more profound conversation, long-term goals and increased creativity.

WHAT IS bitcoin ?

"Writing a description for this thing for general audiences is bloody hard. There's nothing to relate it to."

~ Satoshi Nakamoto 2010-07-05

Total circulation will be 21,000,000 coins. It'll be distributed to network nodes (miners) when they make blocks, with the amount cut in half every 4 years.
first 4 years: 10,500,000 coins
next 4 years: 5,250,000 coins
next 4 years: 2,625,000 coins
next 4 years: 1,312,500 coins etc...
When that runs out, the system can support transaction fees if needed. It's based on open market competition, and there will probably always be nodes willing to process transactions for free.

~ Satoshi Nakamoto 2009-01-09

- **Bitcoin is freedom money**... in the sense that it has the potential to free us all from the overarching manipulation by, and control of, the central banking system.

- **In bitcoin, the monetary rules are the same for EVERYONE, EVERYWHERE.**

- Bitcoin is **inclusive**, in the sense that anyone with an internet connection can participate in the network, and **has to play by the same rules.**

bitcoin IS:

- DECENTRALIZED
- TRULY SCARCE
- CENSORSHIP RESISTANT
- A DISTRIBUTED LEDGER
- INCORRUPTIBLE

This group of five properties distinguish bitcoin from every other cryptocurrency!

- PERMISSIONLESS
- AUDITABLE
- TRANSPARENT
- IMMUTABLE
- BORDERLESS
- HARD TO COUNTERFEIT
- PSUEDONYMOUS
- FRICTIONLESS
- TRUSTLESS
- PEER-TO-PEER

- **Bitcoin is decentralized.**
- **It is run on thousands of nodes worldwide, by thousands of people who don't know each other.**
- No one person, government or company can ever control it.
- You can run a node too, it's easy ;)
- By running your own node, you increase your privacy and help to secure the network when you verify your own transactions.

Don't trust. Verify.

- **Bitcoin (upper case 'B')** is a monetary network.

- **bitcoin (lower case 'b')** is the currency, or monetary asset, that is issued on, and runs on the Bitcoin network.

- Bitcoin is the great incentivizer.

- The genius of Satoshi was such that in bitcoin, for the first time, both good and bad actors are incentivized to play by the rules.

"The incentive may help encourage nodes to stay honest. If a greedy attacker is able to assemble more CPU proof-of-worker than all the honest nodes, he would have to choose between using it to defraud people by stealing back his payments, or using it to generate new coins. He ought to find it more profitable to play by the rules, such rules that favour him with more new coins than everyone else combined, than to undermine the system and the validity of his own wealth."

~ Satoshi Nakamoto 2008-10-31

- Bitcoin is the first *digitally native money,* unlike your online checking account, which is just a digital form of central bank fiat.
- Bitcoin is **decentralized** digital currency.
- Bitcoin has **no central authority**.
- Bitcoin is **stateless.**
- Consider the implications ...

Bitcoin is a decentralized digital currency that enables instant payments to anyone, anywhere in the world. Bitcoin uses peer-to-peer technology to operate with no central authority: transaction management and money issuance are carried out collectively by the network.

~ Bitcoin Wiki
en.bitcoin.it

- Bitcoin is magic internet money.
- No seriously, **Bitcoin is the way we are going to fix the world.**
- Seriously? Yes.

- Bitcoin is a way to transfer value
  - of any amount
  - securely
  - instantly (on the Lightning Network)
  - between any two parties
  - anytime
  - 24/7
  - anywhere
  - yes, anywhere
  - Think about that.

> *With e-currency based on cryptographic proof, without the need to trust a third party middleman, money can be secure and transactions effortless.*
>
> ~ Satoshi Nakamoto 2009-02-11

Bitcoin is (almost) costless to move with certainty. I know with 100% certainty what I am receiving.

~ Michael Saylor CEO of Microstrategy

- You can send $1.13, or 46c or 359 sats or 500,000,000 sats or $1 million to anyone, anywhere, anytime via the Bitcoin Network, or the Lightning Network built on Bitcoin.

- **And no one can stop you.**

- Can you do that with gold, silver, USD/GBP/EUR/YEN/CYK/ZAR or any other central bank fiat currency?

- **Bitcoin is historical.** This is the first time in history that a truly decentralized, censorship-resistant, immutable, borderless, permissionless, and incorruptible monetary system with an absolute hard cap (21 million coins) has ever been created.

- Bitcoin is **as significant to decentralizing power and increasing financial inclusion**, as the invention of the printing press, and later the World Wide Web, **was to decentralizing control of, and increasing access to, information.**

A lot of people automatically dismiss e-currency as a lost cause because of all the companies that failed since the 1990's. I hope it's obvious it was only the centrally controlled nature of those systems that doomed them. I think this is the first time we're trying a decentralized, non-trust-based system.

~ Satoshi Nakamoto 2009-02-15

- **Bitcoin is a distributed, decentralized, transparent and immutable LEDGER OF ACCOUNT.**

- Anyone in the world can see who owns what, at any given moment, and it cannot be changed.

- Except the 'who' isn't a name, **it is an address made up of numbers and letters.**

- An example of a bitcoin address:

  bc1qar0srrr7xfkvy5l643lydnw9re59gtzzwf5mdq

- Bitcoin is therefore **pseudonymous.**

- Bitcoin is
  - an impartial issuer of assets
  - a store of value
  - a medium of exchange
  - and soon to be a unit of account
  - *as well as*
  - *the means* of exchange.

- It is the issuer, the gold, the cash, the debit card AND paypal, the bank, venmo, cashapp, western union

ALL ROLLED INTO ONE!

- **Bitcoin is a record keeper that uses mathematics and computer science, instead of bankers, bookkeepers and accountants.**

- It eliminates the middlemen, banks, govts, overdraft fees, checking account fees, limited hours of service, potential for censorship, frozen accounts, manipulation of the money supply, interest rates, the IMF, the WEF, the BIS, brick-and-mortar buildings, ATMs, checks, chargebacks, the petro dollar, the euro dollar, bank seigniorage, the cantillon effect, fractional reserve banking, visa, mastercard, amex, western union, days of waiting for your wire transfer to go through ...

- **Instead of having someone between you and the person whose hand you want to shake, you can just shake their hand directly.**
- **No need to ask permission to send your own money!**

Put Simply...

- Bitcoin is digital property that no one can take from you.

- Owning bitcoin means owning the right to send value from a specific address that you control with your private key to ANY other address you choose.

Bitcoin is a property right that is independent of the monopoly on violence.

~ Robert Breedlove @breedlove22

- Bitcoin is a once-in-a-species event.
- Bitcoin is choice.
- Bitcoin engenders sovereignty.

- The discovery of Bitcoin 15 years ago, is to human financial freedom and sovereignty, as the discovery of fire was to human flourishing over 500,000 years ago, and the printing press was to decentralizing access to human knowledge nearly 900 years ago.

- **Bitcoin is a true store of value.**

- It stores your most precious resource, your time, in such a way that you can access it again later.

Bitcoin is like a high bandwidth conduit of energy to your future self ... you can work today and Bitcoin will deep freeze your energy for later use.

~ Robert Breedlove

The root of money is time
And the root of time is value

~ Guy Swann

- Bitcoin is a timechain, literally.
- Satoshi referred to the timechain many times in his emails with the early devs.
- You can measure time in blocks, since one block is mined every ~10 minutes.

- Our time is our most scarce and precious resource.
- It is our literal life force.
- True Money allows us to store our time.

- It is the way we can acknowledge the time we 'spent'.
- We trade our time for money, which is simply a record of our time and effort.
- Bitcoin makes it possible to preserve our time such that we have 'access' to it later in life, when we are no longer able to work as we once did.

- Bitcoin is a **store of value.**
- Bitcoin is a **medium of exchange**.
- Bitcoin **will one day be a unit of account.**
- Bitcoin **will one day be *THE unit of account*.**

- **Bitcoin is scarce.**
- It has a hard cap of 21,000,000.
- There will never be more.
- Code is law here.*

* While it is 'technically' possible to change the code, Satoshi's genius prevents that, since increasing (inflating) the supply would only serve to decrease the value of all bitcoin in circulation. This therefore incentivizes everyone to implicitly agree to maintain the 21,000,000 hard cap supply.

- Check out **timechaincalendar.com** by @TC to check the current block height, the available supply, and numerous other metrics with regard to the bitcoin timechain.

- Bitcoin is infinitely divisible, without debasing the supply.
- One pizza is one pizza, regardless of how small the slices are.
- It is currently divisible to the eighth decimal: ฿1.00000000
- There are 100,000,000 satoshis in 1 bitcoin.
- 1 satoshi = ฿ 0.00000001
- You can buy sats (satoshis) in any amount.

- **Bitcoin is the hardest, soundest money we have ever known.**

- It is even sounder than gold, since gold is not easily divisible or portable, has low velocity (moves slowly) and is not easily verifiable

- **Bitcoin has the most superior monetary properties of any asset ever known.**

SOUND MONEY PROPERTIES COMPARISON CHART

PROPERTIES OF SOUND MONEY	BITCOIN	CRYPTO	GOLD Bullion	GOLD Coin	FIAT Digital	FIAT Cash
Truly Scarce/Hard Cap Supply						
Portable						
Durable						
Divisible						
Fungible - Units interchangeable						
Secure - Can't be counterfeited						
Neutral - Issued by code, not govt						
High Velocity Globally						
Easily Verifiable						
Easily Verifiable Supply						
Easy to transact						
Decentralized						
Trustless						
Permissionless						
Censorship Resistant						
Immutable/Incorruptible						
Disinflationary>Deflationary						
Provides Settlement Finality						
Peer-to-Peer - P2P						

@SimplestBTCBook

NOTE: This is a general overview, there are nuances not addressable in a chart.

- Bitcoin is the antidote.
- Attempting to 'stabilize' the economy with bailouts, money printing, QE and interest rate manipulation is like having it on artificial life support
- This 'machine' can only go on so long, before becoming more and more expensive to maintain, and less and less sustainable, leading to a serious breakdown.
- Bitcoin fixes this
- Bitcoin is better money.

- **Bitcoin is anti-fragile.**

- And it gets more so with every attempted attack, with every government ban, with every piece of mainstream media FUD (fear, uncertainty, doubt).

- Bitcoin has never been hacked.*

- Though many have tried.

  * Although you may have heard of hacks, it is the exchanges that have been hacked, not the bitcoin protocol.

- **Remember:**

  - Not your keys, not your coins.
  - **Always** withdraw your sats to your **own wallet**.
  - **Best** to buy peer-to-peer.

Bitcoin is a combination of:

- computer science
- network protocols
- electrical systems
- game theory
- conviction
- mimetics
- thermodynamics
- network effects
- cryptography
- energy
- true scarcity
- economic incentives
- software engineering
- time value of money
- tech adoption curves
- emergent phenomena
- power of decentralization
- low time preference
- alignment of incentives
- monetary neutrality
- financial activism
- immutability

... all working together to create trust in a trustless, decentralized environment, to support a

- neutral
- secure
- censorship-resistant
- permissionless
- global

digital money and monetary network.

- **Bitcoin is a deep rabbit hole**, causing you to question most everything you thought you knew ;)
- Bitcoin is self-contained.
- **Bitcoin simply is.**

Bitcoin is. And that is enough.
~ @Beautyon

- Bitcoin is a symbiotic relationship between:

  Humans

  and

  A perfect solution to transfer and store time/value.

- Humans need bitcoin, bitcoin needs humans.

- **Bitcoin is the solution to the Byzantine General's problem.**
- This was once thought to be an unsolvable problem in computer science.
- This problem arises in decentralized systems, where it was thought impossible to prove that message sent = message received, since the 'man-in-the-middle' could be a bad actor and falsify the message.
- In other words, it seemed impossible to form consensus amongst a network of distributed and independent computers.
- By using a timestamp along with a cryptographically secured distributed ledger, Satoshi solved this problem.
- His solution is known as **Nakamoto's consensus.**

- **Bitcoin is the solution to the double-spend problem.**

- This means that when you send bitcoin, the receiver can be sure that you actually owned the bitcoin you sent, and, that once you sent it to them you cannot spend those coins again by sending them to someone else (double-spending).

- Just like me giving you an orange. Once it leaves my hands and is in your hands, I no longer have the orange to give to someone else.

> *..double-spends are never accepted into the transaction pool, so every node bears witness to which transaction it saw first by working to put it into a block.*
>
> ~ Satoshi Nakamoto 2010-12-09

- **Bitcoin is a bearer asset**, like cash or gold, held by the bearer (owner) directly.

- This means that, once sent (given), it goes directly to the new bearer (owner), with no middleman (bank) needed to process the transaction.

- Bitcoin is P2P (peer-to-peer).
- Bitcoin is censorship-resistant.
- This means that no one has the power to hold up or to prevent a transaction from going through to the new bearer.
- Bitcoin flows freely.
- There can be no gatekeepers.

Bitcoin is trustless.

> *The root problem with conventional currency is all the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust.*
>
> ~ Satoshi Nakamoto on the importance of Bitcoin's trustless nature.

- Bitcoin is code.
- Code is speech.
- Check out github.com/bitcoin
- This is currently the main bitcoin repository.
- Click around to view the code, the pull requests, the reviews, the commits, the bips (bitcoin improvement proposals) and the developers who are working on, maintaining and improving the creation that is bitcoin.

- **Bitcoin is the internet of money.**

- When one stops to consider that everything else is going/has gone digital, including:

  - music
  - books
  - banking
  - movies
  - education
  - photos
  - phone calls
  - radio
  - maps
  - games
  - meetings
  - and the list goes on (for better or for worse)

  … then one sees how **it is really a logical step for money to follow.**

BUT, we need **BITCOIN, NOT CBDCs**!

SATOSHI's GENIUS

- Bitcoin is **ALL** of the following:
  - A **decentralized, distributed ledger**
  - A **payment system**
  - **And the value *itself* being transferred.**

- Outside of bitcoin, **money creation** (issuance), and **accounting** (keeping track of money received/spent), **is centralized**, and includes the following separate layers:
  - Various **Central Banks' issuance** of money
  - **The ledgers of account**, whether written or digital
  - **The trusted parties** who enter the numbers into the ledgers
  - **The trusted parties** who keep the physical ledgers safe, or who maintain the computer databases
  - **The trusted security teams** who work to prevent hacking of the databases

- With bitcoin, **all these layers are folded into one!**

- While this might sound more centralized, Satoshi's genius made it such that the opposite is true.

- It is **100% Decentralized**!

Bitcoin has NO central point of failure.

- The only way it could all be rolled into one, and be decentralized, is that **the distributed ledger is main-tained by a voluntary, world-wide, ad hoc group of people voluntarily mining and/or running full nodes.**

- And, the incentives of the network **encourage everyone to play by the rules.**

- You can join us!

Bitcoin is
a peaceful revolution

Bitcoin is Hope

HOW DOES ₿ *bitcoin* WORK?

Rules not Rulers

tik-tok/
/next block

₿ Bitcoin uses **proof-of-work**, **public-key cryptography** and **peer-to-peer networking**, to process and verify payments in a global, distributed, online ledger.

Cryptography (noun) /krɪpˈtɑːgrəfi

: the enciphering and deciphering of messages in secret code or cipher
: the computerized encoding and decoding of information

~ Merriam Webster Dictionary

Hashing (verb) /ˈhæʃɪŋ/

: a method of encryption
: the process of using a mathematical algorithm against data to produce a numeric value (a hash digest) that is representative of that data.

~ crsc.nist.gov

Remember:

The bitcoin ecosystem includes >>

bitcoin: the digital **monetary asset**

Bitcoin: the **payment network** of miners and nodes

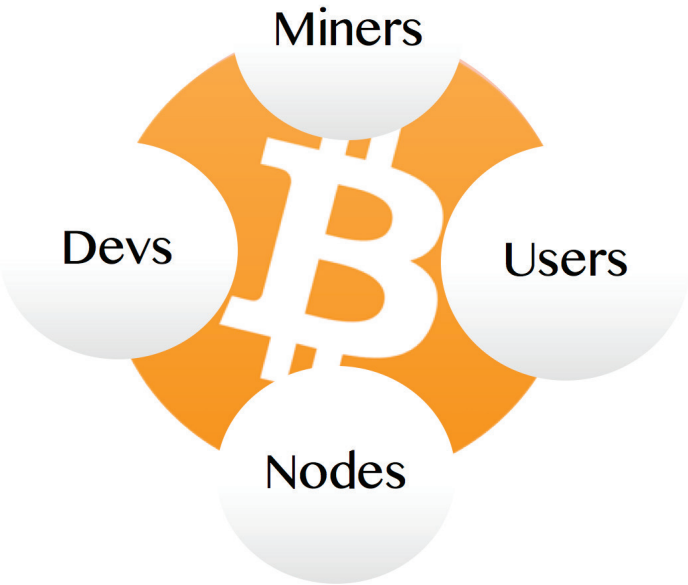
1 bitcoin = 100,000,000 satoshis (sats)
(You can buy sats, a fraction of a bitcoin)

We define an electronic coin as a chain of digital signatures. Each owner transfers the coin to the next by digitally signing a hash of the previous transaction and the public key of the next owner and adding these to the end of the coin. A payee can verify the signatures to verify the chain of ownership.

~ Satoshi Nakamoto
Bitcoin White Paper, Pt.2, 2008
Describing how a bitcoin transaction works in the distributed ledger

THE BITCOIN ECOSYSTEM..

consists of Miners, Nodes, Users, Developers
all working independently,
and simultaneously *inter*dependently,
to enliven that which is
BITCOIN!



MINERS

- **Specialized nodes** (computers called ASICS) **that 'mine' the blocks** that become part of the bitcoin blockchain.

- In so doing, they **verify the validated transactions made by users, mint new bitcoins** and **secure the entire network.**

USERS

- **You and me. All of us.** The people.

- Acknowledging and appreciating the value of goods and services provided, we **transact**: give and receive bitcoin, or we **store** it for use later, as needed.

NODES

- **Nodes are computers that run the bitcoin software.**

- **There are thousands of nodes** making up the decentralized, global, voluntary **network that validates transactions** (thereby preventing double-spending, and helping to secure the system).

DEVELOPERS (DEVS)

- **Coders, programmers & digital authors** who work to **maintain and scale the network, improve security, privacy and user interface, and translate code** into language and visuals that the rest of us can comprehend and utilize.

A BITCOIN TRANSACTION:

Ali wants to send Benji some bitcoin:

1. Ali **opens the bitcoin wallet** app on her phone and **clicks 'Send'**.
2. Benji **opens his wallet app** and **clicks 'Receive'**.
3. **If they are together:** Ali scans the QR code on the wallet app on Benji's phone.
4. **If they are not together:** Ali copies and pastes the address Benji texts her, into the address field in her wallet.
5. Ali **enters the amount to send**, and hits '**Send**'.
6. **A few seconds later**, Benji will see the amount pending in his wallet.
7. **If it was sent through Lightning** it will be confirmed almost instantly, and is almost free.
8. **If it was sent 'onchain'** (on the Bitcoin mainchain), it includes a small fee, and usually takes around 10 minutes to be confirmed. It can take longer, depending on network traffic.

A BITCOIN TRANSACTION UNDER THE HOOD:

(Definitions of the terms that are **in bold** follow)

1. When Ali sends those sats to Benji, the payment **transaction** is **broadcast** to the network.

2. The transaction gets validated by **nodes** that make sure Ali really has the bitcoin to send, and that it has not previously been spent (to prevent double-spending) .

3. Once validated by a node, it waits in the **mempool** with other peoples' transactions.

4. The transactions in the mempool get added in a block to the **blockchain** when a **miner** finds a **nonce** that satisfies the **difficulty algorithm**.

5. Each **block** has a **timestamp**.

6. This creates **immutability,** and helps protect the difficulty algorithm adjustment from being manipulated.

7. Each block represents one confirmation for the transactions included in it.

8. As blocks are added, on average every ten mins, the immutability of the blockchain increases.

GLOSSARY OF TERMS

TRANSACTION ~ Sending/receiving bitcoin

- A transfer of value in the form of satoshis, from one bitcoin holder to another.

NODE ~ A 'branch' of the decentralized bitcoin 'bank'. Anyone can run a node.

- Nodes are computers that run the bitcoin software.
- Nodes, along with miners, users and developers, form the peer-to-peer Bitcoin network.
- Imagine **each full node as a ledger containing the balances of every private key.**
- They interact, and reach consensus (agree) with one another by accepting and validating transactions from other nodes, along with blocks from miners, and then relaying these onward to other nodes.
- Nodes are run by an ad-hoc group of thousands of volunteers around the world.
- A full node is one that has independently validated the entire Bitcoin blockchain, since the Genesis Block mined by Satoshi in 2009.
- The more active nodes there are, the more distributed, and therefore resilient, the whole network becomes.
- There are **currently over 19,000 reachable full nodes worldwide, & far more unreachable ones.**
- All participating nodes are equal.

BROADCAST ~ Letting the network know you are sending bitcoin to someone.

- When you click 'Send', your wallet signs the transaction with your private key and broadcasts it, letting all the other nodes know of your intention to transfer value so that they can validate the transaction.

MEMPOOL ~ A transaction waiting room

- This is the 'waiting room' where validated transactions are sent to be picked up by a miner and added to a block.

BLOCK ~ A 'page' in the bitcoin ledger

- The Bitcoin distributed ledger is made up of digital 'blocks'.
- Each block contains verified bitcoin transactions that keep the global ledger accurate and current. They also contain the nonce, a time-stamp and a hash of the previous block, all of which contribute to the immutability of the bitcoin blockchain.

BLOCKCHAIN ~ The whole bitcoin ledger

- The bitcoin blockchain, also known as the timechain, is the distributed ledger that contains every block, and every bitcoin transaction ever made since the Genesis block was mined by Satoshi in 2009.

MINER ~ A specialized node that both confirms transactions and issues new bitcoins.

- Bitcoin miners are specialized computers. They direct lots of computing power (hashrate) in a digital lottery to guess a number that will satisfy the current difficulty algorithm, thereby 'mining' a 'block' (a piece of the ledger).
- A mined block is timestamped and added to the blockchain (aka timechain).

DIFFICULTY ALGORITHM ~ A special, adaptive design that helps keep new bitcoin issuance predictable.

- This was one of Satoshi's genius solutions to help protect the bitcoin issuance from outrunning itself, as more advanced computers are developed.
- When more miners come online, the target number (nonce) in the 'lottery' gets smaller, and therefore more difficult to find.
- When less miners are online, it gets easier.
- The algorithm **adjusts automatically every 2016 blocks** (about every two weeks), to ensure a predictable rate of supply, where one block is mined on average every ten minutes.

NONCE ~ A 32-bit random number

- A 32-bit random number that miners add to the end of the hashed list of transactions, to attempt to satisfy the difficulty target to mine a block.
- When a miner finds a nonce that leads to generating a hash below the current target number, they have mined a block and get to add it to the blockchain and claim the bitcoin block reward.

TIMESTAMP ~ Stamps the time

- Every block mined has a timestamp added to it.
- This is for added security, immutability and to help establish the difficulty adjustment

IMMUTABILITY ~ Cannot be changed.

- This means the blockchain is 'set in digital stone'.

PROOF-OF-WORK (PoW) ~ Cryptographic proof that difficult work was done to satisfy an algorithm.

- Miners use the PoW algorithm to prove they have used a lot of computational power via electricity (work), in order to achieve consensus in a decentralized manner, and to prevent corrupt actors from spamming the network.

PUBLIC KEY CRYPTOGRAPHY ~ A process that creates the digital keys to access your bitcoins.

- This is a system whereby two keys are created through a cryptographic algorithm.
- **One key is public** - Like your bank account number, that you can give people to send bitcoin to you for goods, gifts or services.
- **The other key is private** - Only you have a copy, and you use it to unlock access to your bitcoin, just as a password unlocks your online bank account.
- **You must secure your private key very well**, since anyone who has access to it has access to your bitcoin.

PEER-TO-PEER (P2P) NETWORK ~ A decentralized network with no middlemen

- Full nodes (peers) collaboratively maintain a peer-to-peer network for transaction and block validation and verification.
- In this type of network, each node is able to both provide/request data to/from its peers.
- There are no gatekeepers in a P2P network.

LIGHTNING NETWORK ~ A network built on bitcoin that makes it possible to send or receive sats very fast and almost for free.

- Lightning is a Layer 2 scaling solution. This means it provides a way for bitcoin to scale, giving it the potential to process millions of transactions per second (TPS).

WALLET ~ A 'wallet' holds the cryptographic keys to access your bitcoin.

- It can be on a phone, computer or on a separate small hardware device (the safest).
- A bitcoin wallet would more accurately be called a signing device. Your bitcoin never actually leaves the blockchain, the digital ledger.
- When you wish to send or spend your bitcoin, the wallet will sign and broadcast the transaction to the network, so that it can be validated and added into a block on the blockchain.

DEVELOPERS ~ Computer programmers

- Cypherpunks/programmers that maintain the network, improve security, check for bugs, submit pull requests (for new updates or features), review pull requests, audit the code.

PUBLIC KEY ~ Like a bank account number for receiving bitcoin.

- You can give it to people to send you bitcoin, just like you would give your account number to someone so they can send you fiat.

PRIVATE KEY ~ For securing, accessing and sending bitcoin, like the key to a safety deposit box.

- A bitcoin private key is a secret string of numbers and letters that allows you to send/spend your bitcoin.
- Only you have a copy. **It is very important to keep it very safe and secure, as anyone who obtains a copy can spend your bitcoin.**

DISTRIBUTED LEDGER ~ A ledger maintained by everyone who wishes to help maintain it.

- Instead of a centrally-controlled ledger that is invisible to the public, like one that a bank maintains, Bitcoin is a transparent, open, decentralized ledger visible to anyone, anytime.
- The addresses are strings of letters and numbers, with no names attached.
- While pseudonymous, it is possible to track transactions, especially if the bitcoin was bought from a centralized KYC exchange.
- The Bitcoin network is trustless and anyone can audit it anytime, unlike a bank where one must trust that the ledgers are being kept honestly.

MORE ON MINING

- Bitcoin is 'mined' by specially designed, powerful computers all over the world, called ASIC miners - Application Specific Integrated Circuit miners.

Whatsminer M50S

Antminer S21 Pro

Bitaxe 401 Supra

- **Miners devote computing power AKA hashrate, via electricity to the network**, to add blocks to the Bitcoin blockchain.

- These computers run 24 hours a day, usually in sets of a few, to a few hundred or thousand.

- **They are basically running a lottery. When one of them guesses a number** (the nonce) that generates a hash that satisfies the current difficulty target, **they get to add the next block to the timechain**.

- **All the above is the proof-of-work (PoW) needed to birth new bitcoins.**

BITCOIN BLOCK REWARD = Subsidy + Fees

- For their work, miners get:
  - A subsidy, in the form of freshly minted bitcoins.
  - Plus, the fees from the verified transactions included in that block.

- **When you send bitcoin to someone, that transaction includes a fee** and needs to be verified by a miner, and then included in a block.
- The **bitcoin block subsidy** gets cut in half every four years.
- It is **currently 3.125 bitcoin** per block that is mined.
- **The next 'halving' will be in 2028**, at which point the block reward will drop to 1.5625 bitcoin per block mined.
- As mentioned before, **this keeps the issuance stable.**
- **In the year 2140, the last piece of bitcoin will be mined.**
- After that, miners will only get the fees from the transactions they verify in each block.

> *In a few decades when the reward gets too small, the transaction fee will become the main compensation for nodes (miners).*
>
> ~ Satoshi Nakamoto
> Bitcointalk.org, 2010-02-14

- **Miners will always be needed to verify transactions, thereby keeping the network updated and secure.**

- While one needs to be aware that there are costs involved, and profitability is negligible for home miners, it is a powerful way to help secure and keep the network decentralized.

- Miners last quite a few years. There are currently many Antminer S9's for example, that have been running for over 6 years.

- When miners are retired **they can easily be taken apart and recycled.**

- **Tons of fascinating innovation is happening,** with people using the excess heat from miners to heat their homes, saunas, greenhouses, hot tubs, dry jerky and vegetables, heat decks, dry wood and more!

A WORD ON THE LIGHTNING NETWORK

- **Bitcoin blocks are intentionally small*** (1MB each), resulting in the bitcoin mainchain being able to process about 7 transactions per second (TPS).

- Visa processes about 24,000 TPS.

- Also, **it generally takes about 10 minutes for the first confirmation to go through on a mainchain transaction** (since a block is mined on average every ~10 minutes).

- This is not practical if you are at a store and want to make a quick payment for your goods.

*** Important Detail:** The reason the blocks are small, is to keep **the timechain small enough for anyone to run their own node at home**, which **helps keep the network decentralized.** Satoshi realized the importance of this ↓

> *Bitcoin users might get increasingly tyrannical about limiting the size of the chain so it's easy for lots of users and small devices.*
>
> ~ Satoshi Nakamoto, 2010-12-10

Recommended Reading:

- The Blocksize War by Jonathan Bier

- Enter, the **Lightning Network (LN)**, a **Layer 2 bitcoin scaling solution.**
- **'Layer 2'** means **it is built on top of bitcoin**.
- **'Scaling Solution'** means it allows the network to:
  - **Vastly increase the speed of processing.**
  - **Vastly increase the number of transactions it can process per second.**
  - **Make micropayments possible.**

- The Lightning Network can be (sort of) thought of like a tab you might keep with some friends at the bar.

- You keep track between all of you who owes what (like a Lightning Network channel), and at the end of the night your group settles with the barman ('the mainchain').

- **Lightning channels, however, can stay open for days, weeks, months or years before being 'settled' on the mainchain.**

BENEFITS OF ⚡ :

- **VOLUME** - The volume of transactions per second is in essence limitless, as countless channels can be opened at the same time, each keeping their own 'tab'.

- **MICROPAYMENTS** - You can send as little as 1 satoshi (currently $0.0006).

- **SPEED** - It usually takes between a millisecond and a few seconds to receive a payment.

- **PRIVACY** - Transactions are not stored on the open, public bitcoin blockchain. In some ways it is even more private than cash, because with Lightning, even the other party does not necessarily know who you are, as your payment often 'hops' through different channels to reach the receiver.

  To be clear, I am not saying it is 100% impossible to uncover, just far more so than with payments on the bitcoin mainchain.
  It would take an immense amount of time and energy to establish with certainty who was making payments to whom, and it would not always be possible to do so at all.

Enjoy amazing visualizations of the current state of the Lightning Network at:

- lnrouter.app/graph
- mempool.space/graphs/lightning/nodes-channels-map

Bitcoin itself cannot scale to have every single financial transaction in the world be broadcast to everyone and included in the blockchain. There needs to be a secondary level of payment systems which is lighter weight and more efficient.

~ Hal Finney, 2010-12-30, Early cypherpunk & the second person to run Bitcoin

Think of it like this:

- Bitcoin: **Savings Account** ~ Slower transactions for larger amounts.
- Lightning: **Checking Account** ~ Faster transactions for smaller amounts.

Bitcoin enhanced by Lightning can be viewed as both a product (digital property) and a service (open monetary network). The ability to transfer monetary energy through time and space without government intervention or conventional banking is enormously valuable to humanity.

~ Michael Saylor, CEO
Microstrategy

Learn more about Lightning here:

lopp.net/lightning-information.html

HOW TO ฿ bitcoin

To Bitcoin: (verb) /tuːˈbɪtkɔɪn/

I hereby propose making 'to bitcoin' a verb, that encapsulates the fullness of participating in the bitcoin/Bitcoin eco-system.

฿ Ok, now that you have, hopefully ;) been orange-pilled, and are ready to become your own bank, participating in the world's first global freedom money, here comes the fun part!

BECOMING YOUR OWN BANK

- This is where the really epic shift in becoming financially self-sovereign lies, and, it can take time to really, truly grasp what this means.

- Some **intention and dedication is required to understand how to do it in the most secure way possible.**

- In the spirit of keeping this book 'the simplest bitcoin book ever written', I will provide an outline here, and then I offer resources at the end for you to dive in to that go much deeper than the scope of this primer.

HODL: (verb) /ho'dill/

: to hold on to your bitcoin
: to not sell

- From a 2013 bitcointalk.org post, where the poster professing to be drunk, misspelled 'HOLD'

- bitcointalk.org/index.php?topic=375643.0

- While the network is still growing, there is much value in the millions of global hodl'rs of last resort.

ACQUIRING BITCOIN

- **Bitcoin enters the market by miners selling some of the bitcoins they receive as rewards**, in order to pay for their operating costs.

- **You can acquire bitcoin by buying on a peer-to-peer trading platform, by accepting it as payment for goods or services you offer, as a gift, or by mining it.** (A very last resort, not recommended, is to buy it from a registered exchange).

- When you receive it, you are technically receiving the private keys with which to access your bitcoin.

> **Remember:** The bitcoin itself never leaves the timechain.

- You can acquire bitcoin either anonymously, or with ID verification (KYC - Know Your Customer)

- KYC is required by law to fulfill AML (anti-money laundering laws) when buying from exchanges.

> Buying non-KYC bitcoin **preserves your right to privacy in the future**.

Non-KYC >> Anonymously

How to Get non-KYC Bitcoin (No ID):

RECOMMENDED

1. Download a bitcoin-only wallet app (see pg 102).
2. Choose a method (see below).
3. Buy, receive or mine bitcoin.
4. Withdraw your bitcoin to your wallet.
5. HODL, or spend and replace.

- **Buy it from Robosats, Bisq, HodlHodl, Peach Bitcoin.**
- **Buy it from a bitcoin ATM** - Be sure to check, as some require ID. Others just ask for a name and number (you can use a temporary phone #).
- **Buy an Azteco voucher** - Visit azte.co for locations.
- **Earn it for work you do** - Ask to be paid in bitcoin. Offer to discount your price.
- **Buy it in person at a bitcoin meet-up.**
- **Mine it** - It is getting easier to mine at home, or you can join a mining pool, but then DYOR to stay KYC-free. Ocean Pool is a great option.

KYC >> ID Verification Required

How to Buy KYC Bitcoin (with ID):

NOT RECOMMENDED

1. Download a bitcoin-only wallet app (see pg 102).
2. Choose a bitcoin-only exchange.
3. Create an account & link a payment method.
4. Fulfill the KYC requirements.
5. Buy bitcoin.
6. **Withdraw your bitcoin to your own wallet.**
7. HODL or spend and replace.

- **Be aware that your bitcoin will be forever linked to your identity** if you buy it this way, thus forfeiting future pseudonymity with regard to these purchases.
- If you choose this method, I recommend finding a reputable ***bitcoin-only exchange***.
- ***Be sure the exchange allows you to withdraw your bitcoin to your own wallet!***
- **Exchanges are required by law to 'KYC' you.**
- They will take **your full name, address, social security number, email, phone number and often a photo of you holding your ID**.
- **Confirm that the exchange has both phone and email support** for customer service.

- Have them walk you through sending your bitcoin from your account with them to your own wallet, so that you are self-custodying your bitcoin
= **Holding your own keys.**

> - **Note:** This does NOT erase the fact you bought bitcoin from them.
> - **Transactions are traceable on-chain, and in many countries you are liable for taxation when spending your bitcoin.**

- If you want to buy through Venmo or Paypal, be sure to **first confirm that you can still withdraw your sats to your own self-hosted wallet**. In the past you could not do so.

- As they say:

> **"No keys, No cheese"** or
> **"Not your keys, Not your bitcoin"**

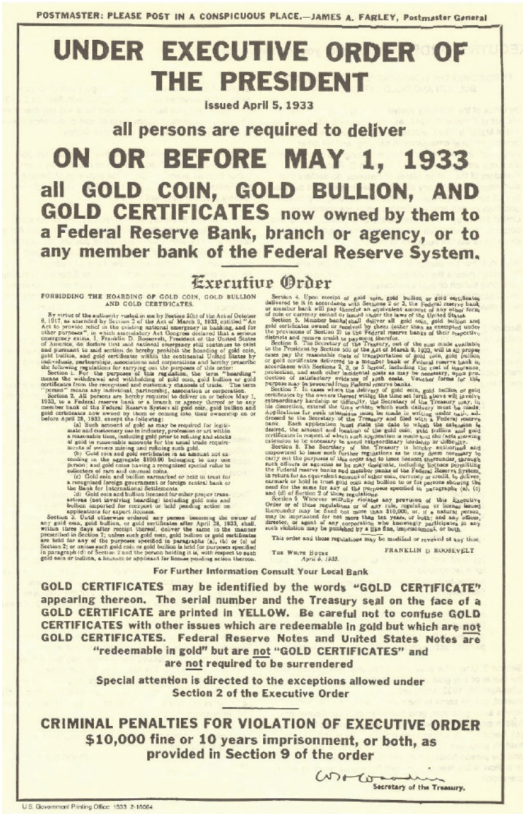
- What this means is, so long as a centralized service is holding the private keys to your bitcoin, there remains the possibility that their platform gets hacked, or that they undergo regulatory capture and you lose your bitcoin.

> - **Always withdraw your bitcoin to your own self-hosted wallet as soon as you have bought it.**

EO 6102

- In 1933 **President Roosevelt issued Executive Order 6102, which required every US citizen to turn in most of their gold in exchange for bank notes.**

- The gold was valued at $20.67/oz. The following year, the government increased the price of gold to $35/oz with the Gold Reserve Act of 1934, effectively devaluing the notes people had received by almost half, since the value of their notes never went up with the inflated gold price.



POSTMASTER: PLEASE POST IN A CONSPICUOUS PLACE.—JAMES A. FARLEY, Postmaster General

UNDER EXECUTIVE ORDER OF THE PRESIDENT

issued April 5, 1933

all persons are required to deliver

ON OR BEFORE MAY 1, 1933

all GOLD COIN, GOLD BULLION, AND GOLD CERTIFICATES now owned by them to a Federal Reserve Bank, branch or agency, or to any member bank of the Federal Reserve System.

Executive Order

FORBIDDING THE HOARDING OF GOLD COIN, GOLD BULLION AND GOLD CERTIFICATES

For further information consult your local bank

GOLD CERTIFICATES may be identified by the words "GOLD CERTIFICATE" appearing thereon. The serial number and the Treasury seal on the face of a GOLD CERTIFICATE are printed in YELLOW. Be careful not to confuse GOLD CERTIFICATES with other issues which are redeemable in gold but which are not GOLD CERTIFICATES. Federal Reserve Notes and United States Notes are "redeemable in gold" but are not "GOLD CERTIFICATES" and are not required to be surrendered

Special attention is directed to the exceptions allowed under Section 2 of the Executive Order

CRIMINAL PENALTIES FOR VIOLATION OF EXECUTIVE ORDER $10,000 fine or 10 years imprisonment, or both, as provided in Section 9 of the order

Secretary of the Treasury.

U.S. Government Printing Office: 1933 3-16064

- It took until 1975, **42 years later, for EO6102 to be repealed,** and for private citizens to once again be allowed to hold more than 5oz of gold.

- At this stage, we have little idea how the regulators are going to respond to bitcoin as it continues to gain popularity and more widespread adoption.

- So far, there has been a mixed reception. For the time being however, it seems that many understand, or perhaps just accept, that bitcoin cannot ultimately be stopped.

- There are a number of politicians starting to speak in support of bitcoin as part of their platform. There are also some against it.

- Being an election year in the US, 2024 is very interesting, with all three major Presidential candidates accepting bitcoin campaign donations!

- El Salvador made it a form of legal tender in 2021. It will be interesting to see which country is next.

- **Ultimately, it would be in the interest of every government to embrace it and add it to their balance sheet, as a hedge against their rapidly inflating fiat currencies.**

SECURELY STORING BITCOIN

- Once you have taken the life-changing step of buying your first ₿, you need to **decide how to securely store it.**

- **Being your own bank is a powerful form of self-sovereignty.**
- It needs to be taken **seriously**!

- *** Please DYOR - Do Your Own Research * beyond my basic recommendations here.**

- The **bitcoin ecosystem is evolving every minute.**

- Nostr, Twitter and bitcointalk.org are good places to stay on top of the latest developments.

CHECK OUT THESE SITES FOR TUTORIALS:

- BTCSessions.ca by @BTCSessions
- Bitcoiner.guide by @QnA
- Armantheparman.com by @ArmanTheParman
- @SouthernBitcoiner on YouTube
- @wickedsmartbitcoin on YouTube

BITCOIN-ONLY WALLETS

- Bitcoin is best stored in your own
  - **self-hosted**
  - **non-custodial**
  - **bitcoin-only** 'wallet'
- A 'wallet' is actually a piece of software which is a signing device. It contains your private keys which it uses to sign a transaction you send (broadcast).

HOT WALLET

- **This is an online bitcoin wallet app that you download to your phone or computer.**
- It is best used for smaller amounts, for day-to-day spending.

COLD STORAGE WALLET

- **This is an offline wallet**. Also known as a hardware wallet.
- It is a separate hardware device on which to store your keys.

> While both work well, it is generally recommended to make use of a cold wallet once you have over $500-1000 worth of bitcoin, as it is **more secure**.

➢ Please DYOR to compare the features and trade-offs between the wallets shown below.

HOT WALLET APPS - Non-Custodial

Blue Wallet, Muun Wallet, Sparrow Wallet, Green Wallet, Phoenix Wallet, Zeus Wallet, Bull Bitcoin Wallet

COLD STORAGE WALLETS - Non-Custodial

Foundation Devices, Trezor (Bitcoin-only version), Blockstream Jade, Seed Signer, Bitbox

ALWAYS purchase your cold storage wallet **direct from the manufacturer,** to be certain it has not been tampered with.

WALLET SETUP

- Follow @BTCSessions on YouTube for excellent tutorials on wallet set-up, and lots more.

- When setting up your wallet, be sure to ***write down the 12- or 24-word Seed Phrase on paper.***
- *Keep it offline. Never take a screenshot of it.*
- STORE THE SEED PHRASE VERY SAFELY.
- VERY, VERY SAFELY!

- Many companies make metal seed plates into which you can punch your seed phrase for added fire/water/damage protection. Highly recommend!

- If you were to lose access to your hot or cold wallet, you can restore it with the seed phrase and recover your funds.

- You can do so on any wallet that supports the same type of BIP39 seed phrase (12/24 words).

- Best practice would be to store the wallet descriptor of your wallet in addition to your seed.

- REMEMBER: Anyone who has your seed has access to your bitcoin!

ON PRIVACY

- Privacy when **buying (non-KYC), securing, storing and spending** bitcoin is becoming more and more important, especially in light of recent events with bank accounts being seized/frozen.

- In addition, **general digital privacy is critical if you wish to gain online sovereignty, and protect yourself from undue surveillance and fraud.**

- Below are some current privacy-focused services.

- It is beyond the scope of this book to go deeply into each of the following, so absolutely DYOR, and follow the accounts I mention below on Nostr or Twitter for updates.

Privacy is necessary for an open society in the electronic age. Privacy is not secrecy. A private matter is something one doesn't want the whole world to know, but a secret matter is something one doesn't want anybody to know. Privacy is the power to selectively reveal oneself to the world.

~Eric Hughes, From 'A Cypherpunk's Manifesto'

PRIVACY GUIDES

- Bitcoiner.guide @BitcoinQ_A
- Econoalchemist.com @econoalchemist
- Sethforprivacy.com @sethforprivacy
- diverter.hostyourown.tools @Diverter_NoKYC
- Citadeldispatch.com @ODELL on Nostr
- KYCnot.me
- Lopp.net @lopp > Click Resources > Privacy
- Privacytools.io
- Enegnei.github.io
- Restoreprivacy.com @ResPrivacy
- Keepitsimplebitcoin.com @KISBitcoin
- nbtv.media @naomibrockwell

VPN (Virtual Private Network to Obscure your ISP)

- Mullvad.net - Pay with bitcoin
- IVPN.net - Pay with bitcoin

TWO-FACTOR AUTHENTICATION APPS

- Yubi Key - Hardware
- 2FAS - Android-only App
- Bitwarden Authenticator - Android & iOS App

PRIVACY-FOCUSED BROWSERS

- TOR
- Firefox Focus
- Mullvad Browser
- Duck Duck Go

ENCRYPTED 'NOTES' APP

- StandardNotes.com

PRIVACY-FOCUSED SEARCH ENGINES

- Duck Duck Go
- Kagi - Paid and ad-free
- SearXNG
- Swisscows
- Mojeek

PRIVACY-FOCUSED MESSAGING APPS

- Signal
- SimpleX
- Session
- Telegram - 'Secret Chat' setting

RUNNING YOUR OWN NODE

- Bitcoin Knots
- Bitcoin Core
- Ronin Dojo
- Run Citadel
- Raspi Blitz
- Umbrel - If you just run your bitcoin node on it.

CELL PHONES/SINGLE USE PH #'S

- Run Graphene OS on an Android Pixel
- Silent.link - Accepts bitcoin & Lightning
- Text Verified - Accepts bitcoin

PRIVATE SPENDING

- The Bitcoin Company
- Bitrefill
- Bit.Store
- **Note:** Always read the small print

PRIVATE RECEIVING ADDRESS BOT

- PayNym

DECENTRALIZED SOCIAL MEDIA

- Nostr

> *The possibility to be anonymous or pseudonymous relies on you not revealing any identifying information about yourself in connection with the bitcoin addresses you use. If you post your bitcoin address on the web, then you're associating that address and any transactions with it with the name you posted under.*
> *If you posted under a handle that you haven't associated with your real identity, then you're still pseudonymous.*

~ Satoshi Nakamoto 2009-11-25

> *For greater privacy, it's best to use bitcoin addresses only once. You can change addresses as often as you want.*

~Satoshi Nakamoto 2009-11-25

DISPELLING bitcoin FUD
(Fear Uncertainty Doubt)

- Below are some common arguments against, or fears about, bitcoin.
- These are largely unfounded, resulting from ignorance, or perhaps incomplete understanding.
- I provide brief rebuttals to each here, and at the end you will find pointers to more in-depth resources rebutting all the FUD.

BITCOIN USES TOO MUCH ENERGY

> *The heat from your computer is not wasted if you need to heat your home… It's equal cost if you generate the heat with your computer.*
>
> ~ Satoshi Nakamoto 2010-08-09

> *At first, the production of a commodity simply because it is costly seems quite wasteful. However, the unforgeably costly commodity repeatedly adds value by enabling beneficial wealth transfers. More of the cost is recouped every time a transaction is made possible or made less expensive. The cost, initially a complete waste, is amortized over many transactions.*
>
> ~ Nick Szabo
> Cypherpunk

- 'Too much' energy is a value proposition that must consider how we value the *purpose* of the energy use.

- When one considers that the Christmas lights in the US use as much electricity as the entire Bitcoin network, then perhaps one can see that it is all relative!

- Using energy, even a whole lot of energy, to secure the hardest, most censorship-resistant money humanity has ever known, is more than worth it.

- In comparing bitcoin energy usage to that used by the legacy system, we also need to consider the 'full stack' on both sides:

Bitcoin Ecosystem	Legacy Fiat System
ASIC Miners	BIS
Nodes	Central Banks
Hardware Wallets	National/Regional Banks
Software Wallet Apps	Military Industrial Complex
	Backup Data Centers
	Physical Money Printing
	Physical Money Distribution
	Online Banking Apps
	Network of ATMs

- By using bitcoin, we will ultimately reduce energy usage in a multitude of other areas, most notably by no longer needing the Military Industrial Complex to protect the petro dollar.

- Also, the rampant consumerism that is required to keep the debt-based system afloat, will over time be curtailed, as **hard money naturally incentivizes prudent spending and saving** (since your savings will actually hold their value, a concept we have not experienced since being off the gold standard).

- **Lastly, and importantly, bitcoin mining is already reducing pollution by capturing flared natural gas and using it to power the miners**. Since miners seek low electricity costs, it is also likely to be the biggest driver toward renewable low cost energy, since the incentives match up.

- **Informed deep dives on Bitcoin and Energy** have been written by Daniel Batten on batcoinz.com, Troy Cross, Jyn Urso, the video 'This Machine Greens' by Swan Bitcoin on YouTube, 'Dirty Coin', A bitcoin mining documentary, and an excellent episode of the 'What is Money' show (WiM161) with B.Quittem, among many others.

BITCOIN IS A PONZI

- **Bitcoin is not a Ponzi:**
  - Old investors are not paid any money by new investors.
  - When buying bitcoin, no one is promising a return on your investment.
  - There is no leadership or promotions team.
  - There was no pre-mine.
  - **Read:** 'Why Bitcoin is Not a Ponzi' by Lyn Alden for more.

BITCOIN IS TOO SLOW

- While the Bitcoin base layer is slow, the 2nd layer **Lightning Network built on the base layer is … lightning fast!**

- Bitcoin's network can process about 7 transactions per second (TPS).

- The Visa network claims it can process up to 24,000 TPS, although 4,000 TPS is closer to actual usage.

- **The Lightning Network, a second layer solution built on Bitcoin, has the potential capacity to process millions of transactions per second!**

GOVERNMENTS COULD BAN BITCOIN

- Some governments have tried, like China, India and Nigeria for example. In each case, the use of bitcoin rises rapidly by the people of said country.

- **There is no way for governments to truly 'ban' bitcoin,** as it is by its nature permissionless and censorship-resistant. It is code and code is speech.

- That said, governments can make it harder to buy and sell with, and into fiat. They can also tax it as a commodity, like they do in the US.

- **Ultimately, it will not be in their favor to try and ban it, since bitcoin is inevitable and they are starting to see that**. They would be far smarter to add it to their country's balance sheet as a hedge against their inflating fiat currencies.

> *Governments are good at cutting off the heads of centrally controlled networks like Napster, but pure P2P networks like Gnutella and Tor seem to be holding their own.*
>
> ~ Satoshi Nakamoto

- **Read:**

  Can Government Stop Bitcoin? by Alex Gladstein, CSO of the Human Rights Foundation

  Can the Government Ban Bitcoin? Four Things You Need to Know by Nick Giambruno

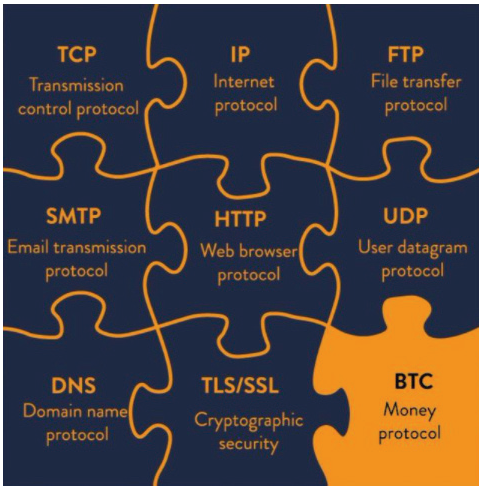
BITCOIN IS OLD TECH

- **More like 'ultimate tech'**, with regards to digital scarcity, decentralization and solving both the double-spending problem and the Byzantine General's problem. Once discovered, it cannot be re-discovered.

- **Once the wheel was invented, it could never be reinvented.**

- The TCP/IP protocol that the internet runs on has been the standard for all computer networking since 1983. It is likely to continue being the standard for a long time.

- Once a prefect-solution, base layer technology is discovered that works optimally, it can last for hundreds, or thousands of years.



Credit: @DecouvreBitcoin

BITCOIN IS USED BY CRIMINALS

- **So is the dollar, and every other fiat currency in the world.** It is simply incorrect to attribute this problem only to bitcoin.

- **Bitcoin is a tool, just like a knife, and it is up to each one of us how we use it.**

- Interestingly, if bitcoin couldn't be used by criminals, then it would not be the neutral, censorship-resistant money the world so badly needs.

- **Note:** Since the Bitcoin blockchain is auditable, it is actually a really bad choice for criminal activity!

QUANTUM COMPUTING COULD BREAK BITCOIN

- While this may be a possibility one day in the future, **developers are already working on solutions for post-quantum encryption.**

- Bitcoin is only one of a multitude of online applications that rely on SHA-256 hashing for security. Even the military uses it, so there is massive incentive beyond the bitcoin community to develop new encryption protocols.

- If SHA-256 is broken, we will have a lot else to worry about beyond bitcoin. The entire internet uses it for encryption. This includes all banking, supply chains, transportation systems, healthcare systems, education systems and more.

BITCOIN HAS NO REAL VALUE

"Bitcoin's value is driven by its enforceable scarcity"

~ Fidelity Digital Assets

- **Rarity is the value. All money over all time has been valued because it had some measure of scarcity.**

- In addition, it was backed by the belief that it would hold its value, such that it could be traded in the future for something else of value.

- As the Bitcoin network grows, backed by the superior monetary properties it embodies, the network effect grows exponentially.

- The larger the network effect, the more value it, as a scarce asset, offers. Value is a reflection of demand, and as demand increases, value increases.

SOME PEOPLE HAVE TOO MUCH

- It is true that some people have far more than others. **In releasing the protocol openly, Satoshi allowed it to roam freely, and those that understood the potential it held either mined, or bought in early. It was the fairest and most organic way possible to present it to the world.**

- Over time, when the world is hyperbitcoinized, meaning we are living on a bitcoin standard, those that have more will naturally spend it into the economy.

- Even though at a certain point one will no longer be able to buy it with fiat, people will get paid for their work in bitcoin. Being paid in truly sound money will allow us to have real savings that will not be debased over time by inflation

- While there will always be those with more wealth and those with less, due to a vast number of factors, **a bitcoin standard will make the membrane between wealth classes permeable,** as Aleks Svetsi says. This will allow both upward and downward mobility to be far, far more fluid than it is today.

- **Having been born into, and swimming our whole lives in a fiat world, it is almost impossible to imagine, and fully grok the implications of having a money that cannot be debased or manipulated!**

BITCOIN IS TOO VOLATILE

- **This is normal during the price discovery phase of a new monetary asset.** There is no other way for growth to happen when it is organic and emergent (as opposed to top down and centrally controlled.

- In addition, at this stage of human existence, with exponential shifts happening in all spheres, it makes sense that something as rEVOLutionary as bitcoin will have wild swings.

- While those of us deep down the rabbit hole see it as the future, currently only a small percent of the global population holds bitcoin at this time. This makes it vulnerable to immense volatility.

- As it matures, and adoption increases, the volatility will decrease, and eventually it will stabilize and become a unit of account.

> *I'm sure that in 20 years there will either be very large transaction volume or no volume.*
>
> ~ Satoshi Nakamoto 2010-02-14

YOU CAN'T TOUCH A BITCOIN

- **This is a feature, not a bug.** The very fact that bitcoin is not physical is one of the biggest factors contributing to it's unconfiscatability!

BITCOIN COULD GET HACKED

- In the 15 years since it was launched, it has never been hacked.
- There have been hacks at exchanges however, so I highly recommend moving your bitcoin to your own self-custody wallet as soon as possible.
- It has been estimated that to break the SHA-256 encryption (that bitcoin uses) within 24 hours, a quantum computer would need 13,000,000 physical qubits. At this time, the current qubit record held by Atom Computing in California is 1,180 qubits.
- It is widely assumed that a quantum-safe encryption method will be developed well before it is needed.

> *Being open source means anyone can independently review the code. If it was closed source, nobody could verify the security. I think it's essential for a program of this nature to be open source.*

~Satoshi Nakamoto 2009-12-10

MORE ON DEBUNKING FUD HERE:

- Endthefud.org
- Bitcoinmythbusters.org
- Casebitcoin.com - Common Critiques
- Safehodl.github.io/failure/
- Lopp.net - Bitcoin Info: Misconceptions

Bitcoin is fundamentally different from any other digital asset. No other digital asset is likely to improve upon bitcoin as a monetary good because bitcoin is the most (relative to other digital assets) secure, decentralized, sound digital money and any "improvement" will necessarily face tradeoffs.

~ Fidelity Digital Assets Report, 'Bitcoin First', Jan 2022
Chris Kuiper, CFA, Director of Research
Jack Neureuter, Research Analyst

ON THE PRICE OF BITCOIN

- **I see hodling (holding) bitcoin like having a long-term savings account.**

- The daily price doesn't matter, as it is expected to be volatile (go up and down) for some years yet.

- As I mentioned previously, this is normal for a new asset undergoing price discovery.

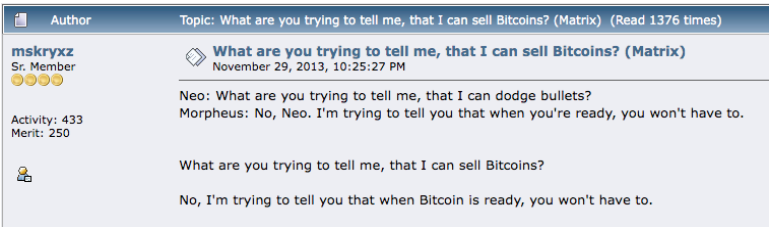
- If one zooms out on the BTC/USD price chart, you will see that it has increased by +31,296% since 2009, averaged out to ~200% per year.

- The price swings reflect various news articles, regulatory updates, market demand, fear and excitement. It's a roller-coaster!

- **The longer you hodl, the more you learn and understand the fundamentals, and the more you realize the profound implications of having sound money, the less the price matters.**

- **In the end, 'price' won't matter at all, as bitcoin will be the unit of account.**

- **Disclaimer:**
  - Only put in what you 'can afford to lose', since there are, of course, no guarantees.
  - Consider the bitcoin you buy as a long-term savings account, and plan to leave it in cold storage for a minimum of five years before spending.



Original bitcointalkforum.org source for one of the most classic bitcoin memes of all time.

IN THE MEANTIME, ON TAXES

➢ **Disclaimer**: This is **not** financial or tax advice

- In the US tax code, bitcoin is currently seen as a commodity, so there are potential tax implications if you sell it back into fiat, or even if you buy something with your bitcoin.
- If the price went down before you sold/spent it, you can claim a loss.
- If the price went up, you are supposed to claim a capital gain, and pay between 10-30% CGT (Capital Gains Tax).
- The amount depends upon several factors, such as how long you held it before selling or spending, and in which tax bracket you land.
- If you plan to sell or spend bitcoin, especially larger amounts, you may want to consider consulting with a tax professional.
- If you simply buy and hold, you currently do not have any taxable events regarding bitcoin.
- And if you buy non-KYC…

WHY bitcoin ONLY?

Of the over 2.5 million* (!) cryptocurrencies ever created, and 13,000 currently trading, bitcoin is the *only one* that is:

- **TRULY decentralized**
- With a **TRULY distributed ledger**
- A **TRULY hard capped supply**
- A **TRULY immutable ledger**
- A **network effect** built over 15 years
- And a **monetary policy that cannot be manipulated!**
- Every other cryptocurrency has a **small, centralized group who controls the supply, and/or has the power to change the base layer protocol (monetary policy).**
- **This is just like the central fiat banking system we see today.**
- Centralized power like this begs for manipulation and corruption.
- See the altcoin pump/dump scam described on the following page.
- **Listen to:**

  Stephan Livera Pod (SLP306) with Guy Swann

- A partial list of altcoin/defi rug-pulls since 2020:

  rekt.news/leaderboard/

* coingecko.com/research/publications/how-many-cryptocurrencies-are-there

ALTCOIN PUMP AND DUMPS

- Sadly, these are real, and happen daily with 'cryptos/tokens' other than bitcoin.
- There are various iterations, but one of the most common types is the following:

- **Token Created:** A new crypto token gets made. Far easier than it sounds, anyone can do it in minutes.

- **Website:** Often, a shiny, fancy website is created to make the token look legit.

- **Paid Influencers:** Paid to promote it on social media, Telegram etc.

- **Paid Insider Groups:** The info is sent to leaders of some of the hundreds of 'Trading' or 'Investment' Groups, where people pay monthly or annual fees to get 'insider intel'.

- **Pre-Launch:** The paid influencers and paid group leaders buy first, at the bottom price.

- **Launch:** The token is 'launched' by these influencers and group leaders, who tell their followers: "Quick, buy now!"

- **Pump:** The price pumps fast as their followers scramble to get in early.

- The rapidly rising price entices regular people to buy in, in the hopes of making their fortune.

- This in turn has the effect of pumping the price even further.

- **Dump:** This sad part usually happens fast. At a certain point, the paid group leaders sell their tokens, 'at the top'. Then they tell their followers to sell.

- **Price Drop:** Because so many people sell at the same time, and liquidity is generally low since it is a new coin, the price drops fast.

- **Panic:** The price drop causes panic amidst the general public, who have no idea of these back-door shenanigans, and they start to panic-sell.

- **Bag Holders:** The end of this sad story is that those left 'holding the bag', will likely be holding their bags forever.

- Without any real value or fundamentals, most of these tokens and meme coins never recover a market price.

SECURITY & AVOIDING SCAMS

- **Stick with bitcoin only.**

- **Be super vigilant** about your cyber security!

- **Do your own research** and **secure your bitcoin** with utmost care.

- **NEVER give your seed words to anyone you wouldn't give the key to for your stash of gold!**

- **NEVER click on any links** in your email that ask you to confirm account details of any kind. **Instead, go to the official website directly** and check if you have any notices requiring any actions.

- **BE AWARE** that there are endless imitations of accounts with large followings on social media. If an influencer randomly DMs you, it is probably a scam.

- **AVOID all the scams popping up on social media** accounts, promising to double your bitcoin if you send some to them! You will lose your bitcoin!

- **AVOID those same 'double your crypto' scams** on You Tube.

- **BE CERTAIN** about the address you are sending your bitcoin to, as transactions are irreversible. Ideally check the whole address, especially if it is a large amount.

SATOSHI'S NUMBERS
369 CLOCK

Bitcoin is designed to mine 6 blocks per hour >> one block on average every ~10 minutes.

- 24 hours in a day

  2+4=**6**

- That works out to 144 blocks per day

  1+4+4=**9**

- 52560 blocks per year

  5+2+5+6+0=18
  1+8=**9**

- 52704 blocks per leap year

  5+2+7+0+4=18
  1+8=**9**

- 21 Million coins:

  2 + 1 + 0 + 0 + 0 + 0 + 0 + 0 = **3**

- 33 Halvings:

  3 + 3 = **6**

- Difficulty adjusts every 2016 blocks:

  2 + 0 + 1 + 6 = **9**

  ~ Based on a tweet by @level39

- The block reward halving happens every 210,000th block (approximately every four years)

  2 + 1 + 0 + 0 + 0 + 0 = **3**

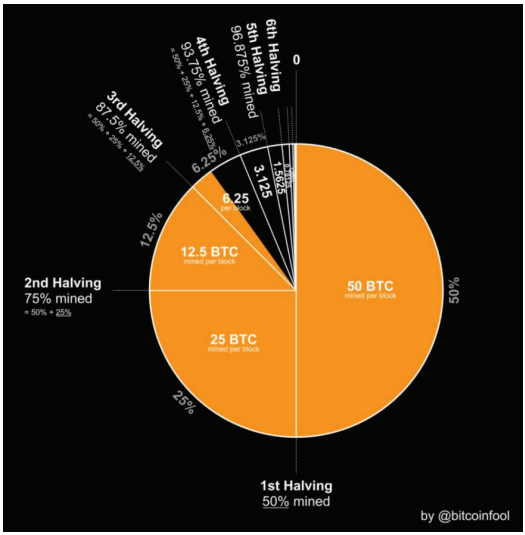
"If you only knew the magnificence of the 3, 6 and 9, then you would have the key to the universe."
~ Nikola Tesla

BLOCK REWARD = % OF SUPPLY

- The block subsidy (number of bitcoins rewarded for each newly mined block) represents **the percentage of the total supply** that will be mined during that epoch.

- For example, the current block reward between 2024-2028 is **3.125** bitcoin.

- In these same four years, **3.125**% of the 21 million bitcoins will be mined.



Credit: @bitcoinfool

REWARD EPOCHS

Every four years, the bitcoin subsidy gets halved for each block mined. **A Reward Epoch is that four year period.**

- **Reward epoch 1**: 2009-2012 **Block subsidy:** 50 bitcoin
  = (50 bitcoins * 210,000 blocks) = 10,500,000 bitcoin
  1+0+5+0+0+0+0+0 = **6**
- **Reward epoch 2**: 2012-2016 **Block subsidy:** 25 bitcoin
  = (25 * 210,000) = 5,250,000 bitcoin
  5+2+5+0+0+0+0 = 12
  1+2 = **3**
- **Reward epoch 3**: 2016-2020 **Block subsidy:** 12.5 bitcoin
  = (12.5 * 210,000) = 2,625,000 bitcoin
  2+6+2+5+0+0+0 = 15
  1+5 = **6**
- **Reward epoch 4:** 2020-2024 **Block subsidy:** 6.25 bitcoin
  = (6.25 * 210,000) = 1,312,500 bitcoin
  1+3+1+2+5+0+0 = 12
  1+2 = **3**
- **Reward epoch 5:** 2024-2028 **Block subsidy:** 3.125 bitcoin
  = (3.125 * 210,000) = 656,250 bitcoin
  6+5+6+2+5+0 = 24
  2+4 = **6**
- **Reward epoch 6:** 2028-2032 **Block subsidy:** 1.5625 btc
  = (1.5625 * 210,000) = 328,125 bitcoin
  3+2+8+1+2+5 = 21
  2+1 = **3**
- **Reward epoch 7: 2032-2036 Block subsidy:** 0.78125 btc
  = (0.78125*210,000) = 164,062.5 bitcoin
  1+6+4+0+6+2+5 = 24
  2+4 = **6**

  ... and so on until 2140

SATOSHI'S BIRTHDAY

- *April 5, 1975* is the date Satoshi claimed as his birthday.

- While we cannot know if this was indeed his true birth date, it is very interesting.

- *April 5th* (1933) was the day that Executive Order 6102 was signed by US President Franklin D. Roosevelt "forbidding the hoarding of gold coin, gold bullion, and gold certificates within the continental United States."

- *1975* was the year the repeal of EO 6102 went into effect, and US citizens were once again allowed to hold more than 5oz of gold.

A NUMERIC PALINDROME 6102-2016

- *6102* was the number of the above-mentioned Executive Order.

- *2016* is the number of blocks mined during each difficulty adjustment (approximately 2 weeks).

> ➢ In both of the above examples, one could postulate that Satoshi was using numbers to indicate a reversal, **an unwinding of the damage inflicted by government overreach**.

BITCOIN PIZZA DAY

- May 22 is known as Bitcoin Pizza Day. This was the day that a guy, named Laszlo Hanyecz, announced on bitcointalkforum.org that he had successfully traded 10,000 bitcoin for pizza! Back then that was about $40.

- In today's prices, that would be ~$610,000,000.

- It was a milestone for bitcoin, in that it was the first known incident of someone trading bitcoin for a good or service. What a long way we have come!

laszlo
Full Member

Activity: 199
Merit: 1014

Re: Pizza for bitcoins?
May 21, 2010, 09:33:45 PM

I just think it would be interesting if I could say that I paid for a pizza in bitcoins

BC: 157fRrqAKrDyGHr1Bx3yDxeMv8Rh45aUet

laszlo
Full Member

Activity: 199
Merit: 1014

Re: Pizza for bitcoins?
May 22, 2010, 07:17:26 PM
Merited by vizique (10), paxmao (10), vapourminer (1), Searing (1), BitcoinFX (1), 600watt (1), Toxic2040 (1), xtraelv (1), Spray. (1), TotSamiy (1), Aricoin (1), dektox (1)

I just want to report that I successfully traded 10,000 bitcoins for pizza.

Pictures: http://heliacal.net/~solar/bitcoin/pizza/

Thanks jercos!

BC: 157fRrqAKrDyGHr1Bx3yDxeMv8Rh45aUet

sirius
Bitcoiner
Sr. Member

Activity: 429

Re: Pizza for bitcoins?
May 22, 2010, 10:10:25 PM
Merited by Aricoin (1)

Congratulations laszlo, a great milestone reached

5184x3456 (1/60) f/5.6 f(35)=78mm (flash)
2010-05-22 15:01:22 -0400

Download: IMG_0985.jpg

5184x3456 (1/60) f/5.6 f(35)=78mm (flash)
2010-05-22 15:01:29 -0400

Download: IMG_0986.jpg

BITCOIN CALENDAR OF NOTABLE DAYS

2008-08-18 ~ The domain name **bitcoin.org was registered**.

2008-10-31 ~ **Bitcoin White Paper Day:** The White Paper, titled "Bitcoin: A Peer-to-Peer Electronic Cash System" was published by an anonymous cryptographer named Satoshi Nakamoto on metzdowd.com, the cryptography mailing list.

2009-01-03 ~ **Bitcoin's Birthday:** The Bitcoin network was launched, when Satoshi mined the Genesis block.

2009-01-12 ~ **The first bitcoin transaction** took place, when Hal Finney received ten bitcoins from Satoshi as a test send.

2009-10-05 ~ **Birth of the first bitcoin exchange**, The New Liberty Standard (NLS), with a listed market price of $0.00764 per coin.

2009-10-12 ~ "Found the **first known bitcoin to USD transaction** from my email backups. I sold 5,050 BTC for $5.02 on 2009-10-12." - Martti Malmi, bitcointalk.org founder, sold bitcoin to NewLibertyStandard who started the first exchange.

2010-05-22 ~ **Bitcoin Pizza Day:** The first known occurrence of bitcoin being used to buy a good or service, when Lazslo Hanyecz paid 10,000 bitcoin for two Papa John's pizzas!

2010-12-12 ~ **The last time** that Satoshi posted on the bitcointalk.org forum.

2011-02-11 ~ **Bitcoin reaches parity** with the US Dollar for the first time.

2011-06-14 ~ **Wikileaks** begins accepting donations in bitcoin.

2017-03-03 ~ **Bitcoin reaches parity** with an ounce of gold.

2021-08-21 ~ **First Annual Bitcoin Infinity Day** suggested by Knut Svanholm's meme:

Everything divided by 21 million.

$$\frac{\infty}{21{,}000{,}000}$$

2021-09-07 ~ El Salvador becomes the first country to make bitcoin legal tender.

that was just the start…

here are more

RESOURCES FOR THE bitcoin RABBIT HOLE

"Curiouser and curiouser!" said Alice

MOVIES

- ₿ You can find these movies on YouTube or Rumble.

BITCOIN MOVIES:

- @MaxDeMarco and @GetBasedTV on YouTube
- Bitcointv.com
- Dirty Coin: A Bitcoin Mining Documentary (2024)
- Immutable Democracy: film.simpleproof.com (2023)
- The Great Reset and the Rise of Bitcoin (2022)
- A Sly Roundabout Way: aslyroundaboutway.com (2022)
- Where Did Bitcoin Come From (2021)
- This Machine Greens (2021) About Bitcoin & Energy
- Bit X Bit: In Bitcoin We Trust (2018)
- Bitcoin Big Bang (2018) About the 2014 Mt Gox hack
- Magic Money: The Bitcoin Revolution (2017)
- Banking on Bitcoin (2016)
- Deep Web (2015) About Silk Road & Ross Ulbricht
- Bitcoin: The End of Money as We Know It (2015)
- The Rise and Rise of Bitcoin (2014)
- Bitcoin in Uganda (2014)

FIAT MONEY SYSTEM MOVIES:

- How is Money Created (2020)
- Hidden Secrets of Money - Mike Maloney (2013-18)
- Who Controls All of our Money? (2017)
- How the Economic Machine Works - Ray Dalio (2013)
- Inside Job (2010) - Events leading up to 2008 crash
- The Money Masters (1996)

BOOKS

On Bitcoin:

- **Layered Money** by Nik Batia
- **21 Lessons** by DerGigi
- **The Bullish Case for Bitcoin** by Vijay Boyapati
- **The Bitcoin Standard** by Saifedean Ammous
- **Inventing Bitcoin** by Yan Pritzker
- **Check Your Financial Privilege** by Alex Gladstein
- **Why Buy Bitcoin** by Andy Edstrom
- **Bitcoin Audible:** Guy Swann reads Bitcoin books
- **The Bitcoin Dictionary** by Ansel Lindner
- **The Genesis Book** by Aaron van Wirdum
- **Gradually, then Suddenly** by Parker Lewis
- **Cryptosovereignty** by Eric Cason

On Fiat, Monetary History and more:

- **The Price of Tomorrow** by Jeff Booth
- **Broken Money** by Lyn Alden
- **The Fiat Standard** by Saifedean Ammous
- **The Hidden Cost of Money** by Seb Bunney
- **Shells to Satoshi** by D Heikkinen and J Marquez
- **The Sovereign Individual** by Davidson & Rees-Mogg

PODCASTS

Listen on Fountain app to stream sats to hosts!
If not yet on Fountain, find these on Spotify and iTunes.

- **Citadel Dispatch** with Matt Odell
- **Bitcoin Rapid Fire** with John Vallis
- **Stephan Livera Podcast** with Stephan Livera
- **Coin Stories** with Natalie Brunell
- **Access Tribe's Bitcoin Podcast** with Krista Edmunds
- **The Bitcoin Standard Podcast** with Dr S. Ammous
- **Once Bitten** with Daniel Prince
- **Rabbit Hole Recap** with Matt Odell and Marty Bent
- **Bitcoin for Peace** with DJ Valerie B Love

- **The Bitcoin Matrix** with Cedric Youngelman
- **Bitcoin Fixes This** with Jimmy Song
- **Orange Pill Podcast** with Max Keiser and Stacy Herbert
- **What Bitcoin Did** with Peter McCormack
- **Bitcoin Audible** Guy Swann reads books/articles

FREE COURSES

- **My First Bitcoin** - Bitcoin Curriculum
- **Saylor Academy** - Bitcoin for Everybody
- **Looking Glass Education** - Money & Bitcoin Courses

WEBSITES

- Nakamotoinstitute.org
- Bitcoin-only.com
- Bitcoin Wiki - En.bitcoin.it
- WhyBitcoinOnly.com
- Wtfhappenedinfeb2023.com
- Lopp.net
- Casebitcoin.com
- Bitcoiner.guide
- Bitcoin.tv
- Learnmeabitcoin.com - Great simple btc tech explainer!
- Hope.com
- Bitcoin-resources.com
- Myfirstbitcoin.io (Available in Spanish too)
- Whatisbitcoin.com
- SatoshisJournal.com
- github.com/bitcoin

FOR KIDS

- **PlayShamory.com** - Toys, games & books incl.
- **Satoshi Nakamoto & His Bitcoin Invention**
- **Bitcoin Money** By Michael Caras
- **Bitcoin Trading Cards** - btc-tc.com
- **Bitcoin Kids Comic Book** by Nzonda Fotsing Sr
- **Hodl Up** - Bitcoin Mining Board Game
- **21 Bitcoin Lessons** - freemarketkids.com
- **What is Bitcoin?** - @TuttleTwins on YouTube

BT ~ BITCOIN TWITTER

Some cypherpunks, geniuses, goats & wild ones to follow!
Through these accounts, you will find 1000's of plebs
and other deep thinkers,
all on the journey.
BT, along with bitcointalk.org and Reddit, has largely been
where this experiment has grown,
and now joined by Nostr,
the decentralized communication protocol,
all unfurling in real time, across time and space,
in the ethers of cyberspace, connected to the physical,
through all of us,
humans,
sharing a vision of a decentralized world.
Then there are the quieter ones, developers working
behind the scenes
without whom
none of this would be possible.
All of us
together,
unleashed,
as bitcoin was unleashed upon us,
a blessing beyond measure.

TOPICS INCLUDE: Bitcoin, Proof-of-Work, Privacy, Philosophy, Monetary History, Code, Bitcoin Mining, Sociology, Game Theory, Austrian Economics, Bitcoin Education, Lightning Network, Regulatory Environment, Bitcoin's Energy Use, Core Devs, Bitcoin Communities, Bitcoin's Future and more.

Be warned: It helps to have a somewhat thick skin on twitter, and know this, there is a lot of passion in defense of bitcoin. Keeping a clear line between it and all the altcoins takes work. Maintaining the clarity, security and purity of the only truly sound money the world has ever known is critical, if we are to have a chance in these times a'coming.

Resources for the bitcoin Rabbit Hole

Adam Back - @adam3us
Allen Farrington - @allenf32
Anil - @anilsaidso
Anita Posch - @AnitaPosch
Arman the Parman - @parman_the
Beautyon - @Beautyon_
Bitcoin Q+A - @BitcoinQ_A
BTC Sessions - @BTCsessions
BTC Times - @btc
Brandon Quittem - @Bquittem
D++ - @D_plus__plus
Daniel Batten - @DSBatten
Daniel S Pico - @BTCGandalf
Deterministic Optimism - @nvk
Efrat Fenigson - @efenigson
Erik Cason - @Erikcason
Giacomo - @giacomozucco
Gigi - @dergigi on Nostr
Guy Swann - @TheGuySwann
Jack - @jack on Nostr
Jameson Lopp - @lopp
Jeff Booth - @JeffBooth
Jimmy Song - @jimmysong
Knut Svanholm - @knutsvanholm
Luke Dash Jr - @LukeDashjr
Lyn Alden - @LynAldenContact
Marty Bent - @MartyBent
Matt Odell - @ODELL on Nostr
Mechanic - @GrassFedBitcoin
Michael Saylor - @saylor
Natalie Brunell - @natbrunell
Natalie Smolenski - @NSmolenski
Nick Szabo - @NickSzabo4
Nik Bhatia - @timevalueofbtc
Parker Lewis - @parkeralewis
Pavlenex - @pavlenex
Pleb Lab - @PlebLab
Preston Pysh - @PrestonPysh
Seb Bunney - @sebbunney
Tomer Strolight - @TomerStrolight
Troy Cross - @thetrocro
Vijay Boyapati - @real_vijay

Thank you all for teaching me every day!

bitcoin COMMUNITY PROJECTS

Below are some of the grassroots projects around the world that are working to educate and create a local economy with bitcoin.

Follow them on Nostr or Twitter to learn more or to donate:

- **Bitcoin Beach El Zonte** - El Salvador - @Bitcoinbeach
- **Bitcoin Ekasi** - South Africa - @BitcoinEkasi
- **Bitcoin Beach Brazil** - Brazil - @BitcoinBeachBR
- **Bitcoin Jungle** - Costa Rica - @BitcoinJungleCR
- **Bitcoin Venezuela** - Venezuela - @btcven
- **Bitcoin Bay** - Florida, USA - @bitcoinbaytpa
- **Bitcoin Lake** - Lake Atitlan - @LakeBitcoin
- **Bitcoin House Bali** - Indonesia - @btchousebali
- **7 Mile Bitcoin** - Cayman Islands - 7milebitcoin.org
- **Bitcoin Kampala** - Uganda - @BitcoinKampala
- **Bitcoin Retreat** - Phillipines - @BtcRetreat
- **Bridge2Bitcoin** - UK - @Bridge2Bitcoin
- **Bitcoin Berlin** - El Salvador - @BitcoinBerlinSV
- **Harlem Bitcoin** - New York, USA - @HarlemBitcoin
- **F.R.E.E Madeira** - Portugal - @FREEMadeiraOrg
- **Bitcoin Valley** - Rovereto, Italy

bitcoin INDUCED PONDERINGS

Shout out to
Satoshi
and all the
orange-pilled
dreamers
seers
cypher punk wizards
poets for freedom
keepers of wisdom
sovereign individuals
hodlers of last resort
fearlessly forging forward
alone together
for freedom
Vires In Numeris!

A RABBIT HOLE PONDERING

Bitcoin is really a rather fascinating 'thing'
Except it is not a 'thing'
In the sense that you cannot touch it
Yet it is touching millions of us
Around the world
Soon to be billions..
It is true that
It is digital bits and bytes
Algorithms and code
0's and 1's
And that if every single node
Archival node, pruned node and light node
Were somehow
Destroyed
It would no longer exist
In the way we know it
Are able to perceive it..
It would, however, still 'exist'
In the sense that quantum physics
Or gravity
Exists
Regardless of human perception..
In the sense that mathematics existed
Before humans codified it
Chose symbols to represent it..
Truth
Does not need us

WHY WILL ALL VALUE ACCRUE TO BITCOIN

There are some interesting game theories that appear to converge when it comes to bitcoin, making the likelihood of it's growth and increased value over time more and more certain.

SCHELLING POINT

- Introduced in the 1960s by the American economist, Thomas Schelling, the Schelling point basically asserts that **people who cannot necessarily communicate with one another, can still converge on a decision or course of action, especially when a compelling solution to a problem presents itself** (-> bitcoin)

- In addition, as more people are drawn to the Schelling point, it attracts ever more people (-> bitcoin)

LINDY EFFECT

- In essence, the Lindy Effect states **that the longer an idea, a technology or a business has been around, the longer it is likely to endure**.

METCALFE'S LAW

- Popularized by Robert Metcalfe, who invented Ethernet, among other things. Metcalfe's law states that **a network becomes proportionally more valuable the more users it has**. Utility increases exponentially as more and more users join, strengthening the network.

THE P2P NETWORK

It is a global distributed database, with additions to the database by consent of the majority...

~ Satoshi Nakamoto 2009-02-18

REACHABLE BITCOIN NODES
Updated: Sat Jun 29 23:32:27 2024 BST

18976 NODES CHARTS

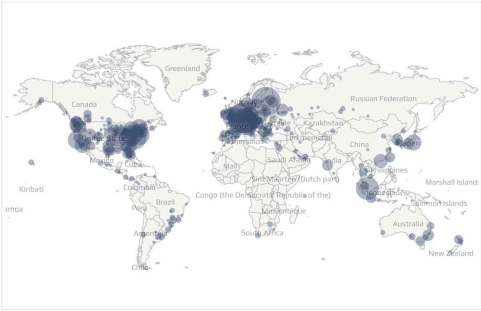
IPv4: -5.3% / IPv6: -12.5% / .onion: +6.3%

Top 10 countries with their respective number of reachable nodes are as follows.

RANK	COUNTRY	NODES
1	n/a	12250 (64.56%)
2	United States	1659 (8.74%)
3	Germany	1594 (8.40%)
4	France	414 (2.18%)
5	Netherlands	339 (1.79%)
6	Canada	289 (1.52%)
7	Finland	284 (1.50%)
8	United Kingdom	198 (1.04%)
9	Singapore	184 (0.97%)
10	Switzerland	174 (0.92%)

All (90) »

NOTE / The data above includes reachable nodes only. View global nodes here »



Map shows concentration of reachable Bitcoin nodes found in countries around the world. LIVE MAP

Global reachable Bitcoin Nodes distribution, June 2024

The result is a distributed system with no single point of failure. Users hold the crypto keys to their own money and transact directly with each other, with the help of the P2P network to check for double-spending.

~ Satoshi Nakamoto 2009-02-11

BITCOIN, NONVIOLENT COMMUNICATION & PERMACULTURE

I see **Bitcoin**, brought to us by Satoshi Nakamoto, as being the foundation layer for a healthy society with regards to:

- communicating value
- transacting and exchanging
- storing our time/life energy

in an emergent, organic, honest unfolding.

I see **Nonviolent Communication**, brought to us by Marshall Rosenberg PhD, as the foundation layer for a healthy society with regards to:

- communicating feelings and needs
- deep listening, empathy
- finding co-creative solutions

in an emergent, organic, honest unfolding.

I see **Natural Farming and Permaculture**, brought to us by our Ancestors, and more recently, Masunobu Fukuoka and Bill Mollison as being the foundation layer for a healthy society with regards to:

- communication with the earth
- growing food, healing the soil
- tending the wild

in an emergent, organic and honest unfolding.

Each of these technologies, one mathematical, taking us beyond mathematics, one linguistic, taking us beyond language, one biological, taking us beyond biology, are based in Truth.

It is up to us to make use of them, to live into them, and to allow them to guide us deeper and deeper into the profound potential we feel tingling at the tip of our perception.

May we find the courage, the strength,
the wisdom and the grace
to move forth fearlessly
on the journey.

A Cypherpunk's Manifesto

by Eric Hughes

Privacy is necessary for an open society in the electronic age. Privacy is not secrecy. A private matter is something one doesn't want the whole world to know, but a secret matter is something one doesn't want anybody to know. Privacy is the power to selectively reveal oneself to the world.

If two parties have some sort of dealings, then each has a memory of their interaction. Each party can speak about their own memory of this; how could anyone prevent it? One could pass laws against it, but the **freedom of speech, even more than privacy, is fundamental to an open society**; we seek not to restrict any speech at all. If many parties speak together in the same forum, each can speak to all the others and aggregate together knowledge about individuals and other parties. The power of electronic communications has enabled such group speech, and it will not go away merely because we might want it to.

Since we desire privacy, we must ensure that each party to a transaction have knowledge only of that which is directly necessary for that transaction. Since any information can be spoken of, we must ensure that we reveal as little as possible. In most cases personal identity is not salient. When I purchase a magazine at a store and hand cash to the clerk, there is no need to know who I am.

When I ask my electronic mail provider to send and receive messages, my provider need not know to whom I am speaking or what I am saying or what others are saying to me; my provider only need know how to get the message there and how much I owe them in fees. When my identity is revealed by the underlying mechanism of the transaction, I have no privacy. I cannot here selectively reveal myself; I must always reveal myself.

Therefore, **privacy in an open society requires anonymous transaction systems. Until now, cash has been the primary such system. An anonymous transaction system is not a secret transaction system. An anonymous system empowers individuals to reveal their identity when desired and only when desired; this is the essence of privacy.**

Privacy in an open society also requires cryptography. If I say something, I want it heard only by those for whom I intend it. If the content of my speech is available to the world, I have no privacy. To encrypt is to indicate the desire for privacy, and to encrypt with weak cryptography is to indicate not too much desire for privacy. Furthermore, **to reveal one's identity with assurance when the default is anonymity requires the cryptographic signature.** We cannot expect governments, corporations, or other large, faceless organizations to grant us privacy out of their beneficence

It is to their advantage to speak of us, and we should expect that they will speak. To try to prevent their speech is to fight against the realities of information. Information does not just want to be free, it longs to be free. Information expands to fill the available storage space. Information is Rumor's younger, stronger cousin; Information is fleeter of foot, has more eyes, knows more, and understands less than Rumor.

We must defend our own privacy if we expect to have any. We must come together and create systems which allow anonymous transactions to take place. People have been defending their own privacy for centuries with whispers, darkness, envelopes, closed doors, secret handshakes, and couriers. The technologies of the past did not allow for strong privacy, but electronic technologies do.

We the Cypherpunks are dedicated to building anonymous systems. We are defending our privacy with cryptography, with anonymous mail forwarding systems, with digital signatures, and with electronic money.

Cypherpunks write code. We know that someone has to write software to defend privacy, and since we can't get privacy unless we all do, we're going to write it. We publish
our code so that our fellow Cypherpunks may practice and play with it.

Our code is free for all to use, worldwide. We don't much care if you don't approve of the software we write. We know that software can't be destroyed and that a widely dispersed system can't be shut down.

Cypherpunks deplore regulations on cryptography, for encryption is fundamentally a private act. The act of encryp-tion, in fact, removes information from the public realm. Even laws against cryptography reach only so far as a nation's bor-der and the arm of its violence.

Cryptography will ineluctably spread over the whole globe, and with it the anonymous transactions systems that it makes possible.

For privacy to be widespread it must be part of a social con-tract. People must come and together deploy these systems for the common good. Privacy only extends so far as the cooperation of one's fellows in society. We the Cypherpunks seek your questions and your concerns and hope we may engage you so that we do not deceive ourselves. We will not, however, be moved out of our course because some may disagree with our goals.

The Cypherpunks are actively engaged in making the net-works safer for privacy. Let us proceed together apace.

Onward.
Eric Hughes <hughes@soda.berkeley.edu>
9 March 1993

(Emphasis in **bold** is mine)

SOME OF THE EARLY CYPHERPUNKS

we can thank for contributing to the development of digital peer-to-peer cash

- **Satoshi Nakamoto** - Anonymous cypherpunk who introduced bitcoin to the world in 2009.
- **Nick Szabo** - Bit Gold 2005
- **Hal Finney** - 2004 Reusable Proof of Work (RPoW), Author of PGP 2.0. Second person to run the bitcoin client. Received the first bitcoin transaction of 10 bitcoins from Satoshi Nakamoto
- **Wei Dai** - B-money 1998
- **Dr Adam Back** - HashCash 1997 - CEO Blockstream
- **Douglas Jackson and Barry Downey** - E Gold 1996
- **John Gilmore**
- **Timothy C.May**
- **Eric Hughes**

  Founders of the Cypherpunk movement and mailing list in 1992.
- **Philip Zimmermann**: 1991 PGP 1.0, the most widely used email encryption in use.
- **David Chaum** - Ecash 1983 and DigiCash 1989

The bitcoin White Paper

Presented to the world on metzdowd.com
2008-10-31

by Satoshi Nakamoto

A pseudonymous cypherpunk, who last communicated with the cypherpunk community on the bitcointalk.org forum on 2010-12-10.

By leaving, he allowed Bitcoin to be a true experiment in the wild. Everyone who works on it is a volunteer in some sense <-> inspired by the potential of freeing humanity from the shackles of a manipulated, debt-based money system, and instead, participating in a global, trustless, permissionless, censorship-resistant, truly scarce, peer-to-peer, decentralized money and monetary payment network, that is inspiring an emergent order to rise out of the fiat ashes

We are all Satoshi

The Times 03/Jan/2009 Chancellor on brink of second bailout for banks

~ Text of a headline from The Times of London, etched into the Bitcoin Genesis block by Satoshi Nakamoto on 2009-01-03

Bitcoin: A Peer-to-Peer Electronic Cash System

Satoshi Nakamoto
satoshin@gmx.com
www.bitcoin.org

Abstract. A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

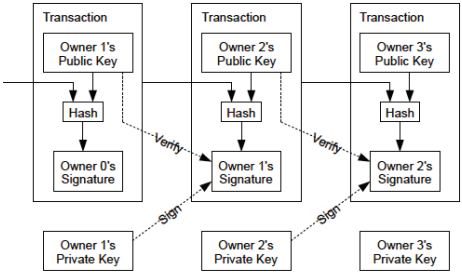
1. Introduction

Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments. While the system works well enough for most transactions, it still suffers from the inherent weaknesses of the trust based model. Completely non-reversible transactions are not really possible, since financial institutions cannot avoid mediating disputes. The cost of mediation increases transaction costs, limiting the minimum practical transaction size and cutting off the possibility for small casual transactions, and there is a broader cost in the loss of ability to make non-reversible payments for non-reversible services. With the possibility of reversal, the need for trust spreads. Merchants must be wary of their customers, hassling them for more information than they would otherwise need. A certain percentage of fraud is accepted as unavoidable. These costs and payment uncertainties can be avoided in person by using physical currency, but no mechanism exists to make payments over a communications channel without a trusted party.

What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party. Transactions that are computationally impractical to reverse would protect sellers from fraud, and routine escrow mechanisms could easily be implemented to protect buyers. In this paper, we propose a solution to the double-spending problem using a peer-to-peer distributed timestamp server to generate computational proof of the chronological order of transactions. The system is secure as long as honest nodes collectively control more CPU power than any cooperating group of attacker nodes.

2. Transactions

We define an electronic coin as a chain of digital signatures. Each owner transfers the coin to the next by digitally signing a hash of the previous transaction and the public key of the next owner and adding these to the end of the coin. A payee can verify the signatures to verify the chain of ownership.

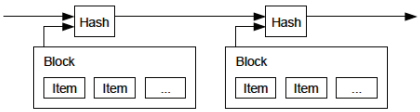


The problem of course is the payee can't verify that one of the owners did not double-spend the coin. A common solution is to introduce a trusted central authority, or mint, that checks every transaction for double spending. After each transaction, the coin must be returned to the mint to issue a new coin, and only coins issued directly from the mint are trusted not to be double-spent. The problem with this solution is that the fate of the entire money system depends on the company running the mint, with every transaction having to go through them, just like a bank.

We need a way for the payee to know that the previous owners did not sign any earlier transactions. For our purposes, the earliest transaction is the one that counts, so we don't care about later attempts to double-spend. The only way to confirm the absence of a transaction is to be aware of all transactions. In the mint based model, the mint was aware of all transactions and decided which arrived first. To accomplish this without a trusted party, transactions must be publicly announced [1], and we need a system for participants to agree on a single history of the order in which they were received. The payee needs proof that at the time of each transaction, the majority of nodes agreed it was the first received.

3. Timestamp Server

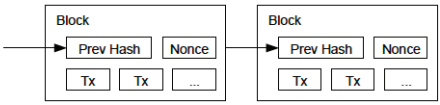
The solution we propose begins with a timestamp server. A timestamp server works by taking a hash of a block of items to be timestamped and widely publishing the hash, such as in a newspaper or Usenet post [2-5]. The timestamp proves that the data must have existed at the time, obviously, in order to get into the hash. Each timestamp includes the previous timestamp in its hash, forming a chain, with each additional timestamp reinforcing the ones before it.



4. Proof-of-Work

To implement a distributed timestamp server on a peer-to-peer basis, we will need to use a proof-of-work system similar to Adam Back's Hashcash [6], rather than newspaper or Usenet posts. The proof-of-work involves scanning for a value that when hashed, such as with SHA-256, the hash begins with a number of zero bits. The average work required is exponential in the number of zero bits required and can be verified by executing a single hash.

For our timestamp network, we implement the proof-of-work by incrementing a nonce in the block until a value is found that gives the block's hash the required zero bits. Once the CPU effort has been expended to make it satisfy the proof-of-work, the block cannot be changed without redoing the work. As later blocks are chained after it, the work to change the block would include redoing all the blocks after it.



The proof-of-work also solves the problem of determining representation in majority decision making. If the majority were based on one-IP-address-one-vote, it could be subverted by anyone able to allocate many IPs. Proof-of-work is essentially one-CPU-one-vote. The majority decision is represented by the longest chain, which has the greatest proof-of-work effort invested in it. If a majority of CPU power is controlled by honest nodes, the honest chain will grow the fastest and outpace any competing chains. To modify a past block, an attacker would have to redo the proof-of-work of the block and all blocks after it and then catch up with and surpass the work of the honest nodes. We will show later that the probability of a slower attacker catching up diminishes exponentially as subsequent blocks are added.

To compensate for increasing hardware speed and varying interest in running nodes over time, the proof-of-work difficulty is determined by a moving average targeting an average number of blocks per hour. If they're generated too fast, the difficulty increases.

5. Network

The steps to run the network are as follows:

1) New transactions are broadcast to all nodes.
2) Each node collects new transactions into a block.
3) Each node works on finding a difficult proof-of-work for its block.
4) When a node finds a proof-of-work, it broadcasts the block to all nodes.
5) Nodes accept the block only if all transactions in it are valid and not already spent.
6) Nodes express their acceptance of the block by working on creating the next block in the chain, using the hash of the accepted block as the previous hash.

Nodes always consider the longest chain to be the correct one and will keep working on extending it. If two nodes broadcast different versions of the next block simultaneously, some nodes may receive one or the other first. In that case, they work on the first one they received, but save the other branch in case it becomes longer. The tie will be broken when the next proof-of-work is found and one branch becomes longer; the nodes that were working on the other branch will then switch to the longer one.

New transaction broadcasts do not necessarily need to reach all nodes. As long as they reach many nodes, they will get into a block before long. Block broadcasts are also tolerant of dropped messages. If a node does not receive a block, it will request it when it receives the next block and realizes it missed one.

6. Incentive

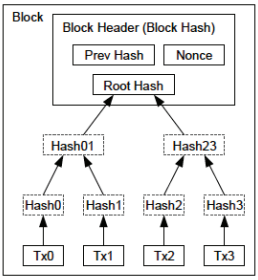
By convention, the first transaction in a block is a special transaction that starts a new coin owned by the creator of the block. This adds an incentive for nodes to support the network, and provides a way to initially distribute coins into circulation, since there is no central authority to issue them. The steady addition of a constant of amount of new coins is analogous to gold miners expending resources to add gold to circulation. In our case, it is CPU time and electricity that is expended.

The incentive can also be funded with transaction fees. If the output value of a transaction is less than its input value, the difference is a transaction fee that is added to the incentive value of the block containing the transaction. Once a predetermined number of coins have entered circulation, the incentive can transition entirely to transaction fees and be completely inflation free.

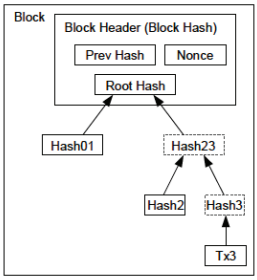
The incentive may help encourage nodes to stay honest. If a greedy attacker is able to assemble more CPU power than all the honest nodes, he would have to choose between using it to defraud people by stealing back his payments, or using it to generate new coins. He ought to find it more profitable to play by the rules, such rules that favour him with more new coins than everyone else combined, than to undermine the system and the validity of his own wealth.

7. Reclaiming Disk Space

Once the latest transaction in a coin is buried under enough blocks, the spent transactions before it can be discarded to save disk space. To facilitate this without breaking the block's hash, transactions are hashed in a Merkle Tree [7][2][5], with only the root included in the block's hash. Old blocks can then be compacted by stubbing off branches of the tree. The interior hashes do not need to be stored.



Transactions Hashed in a Merkle Tree

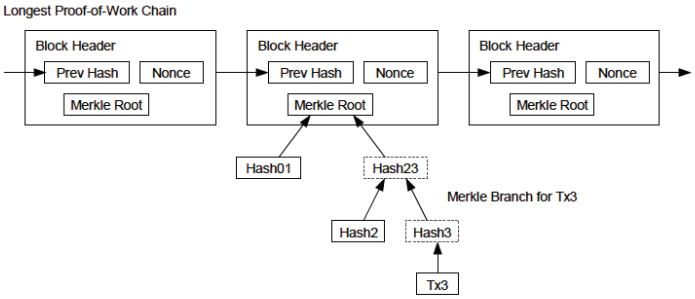


After Pruning Tx0-2 from the Block

A block header with no transactions would be about 80 bytes. If we suppose blocks are generated every 10 minutes, 80 bytes * 6 * 24 * 365 = 4.2MB per year. With computer systems typically selling with 2GB of RAM as of 2008, and Moore's Law predicting current growth of 1.2GB per year, storage should not be a problem even if the block headers must be kept in memory.

8. Simplified Payment Verification

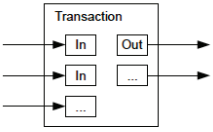
It is possible to verify payments without running a full network node. A user only needs to keep a copy of the block headers of the longest proof-of-work chain, which he can get by querying network nodes until he's convinced he has the longest chain, and obtain the Merkle branch linking the transaction to the block it's timestamped in. He can't check the transaction for himself, but by linking it to a place in the chain, he can see that a network node has accepted it, and blocks added after it further confirm the network has accepted it.



As such, the verification is reliable as long as honest nodes control the network, but is more vulnerable if the network is overpowered by an attacker. While network nodes can verify transactions for themselves, the simplified method can be fooled by an attacker's fabricated transactions for as long as the attacker can continue to overpower the network. One strategy to protect against this would be to accept alerts from network nodes when they detect an invalid block, prompting the user's software to download the full block and alerted transactions to confirm the inconsistency. Businesses that receive frequent payments will probably still want to run their own nodes for more independent security and quicker verification.

9. Combining and Splitting Value

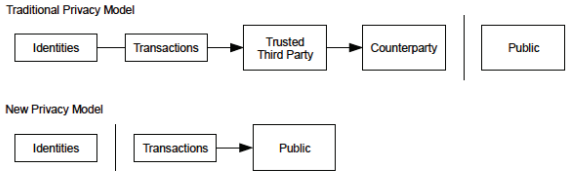
Although it would be possible to handle coins individually, it would be unwieldy to make a separate transaction for every cent in a transfer. To allow value to be split and combined, transactions contain multiple inputs and outputs. Normally there will be either a single input from a larger previous transaction or multiple inputs combining smaller amounts, and at most two outputs: one for the payment, and one returning the change, if any, back to the sender.



It should be noted that fan-out, where a transaction depends on several transactions, and those transactions depend on many more, is not a problem here. There is never the need to extract a complete standalone copy of a transaction's history.

10. Privacy

The traditional banking model achieves a level of privacy by limiting access to information to the parties involved and the trusted third party. The necessity to announce all transactions publicly precludes this method, but privacy can still be maintained by breaking the flow of information in another place: by keeping public keys anonymous. The public can see that someone is sending an amount to someone else, but without information linking the transaction to anyone. This is similar to the level of information released by stock exchanges, where the time and size of individual trades, the "tape", is made public, but without telling who the parties were.



As an additional firewall, a new key pair should be used for each transaction to keep them from being linked to a common owner. Some linking is still unavoidable with multi-input transactions, which necessarily reveal that their inputs were owned by the same owner. The risk is that if the owner of a key is revealed, linking could reveal other transactions that belonged to the same owner.

11. Calculations

We consider the scenario of an attacker trying to generate an alternate chain faster than the honest chain. Even if this is accomplished, it does not throw the system open to arbitrary changes, such as creating value out of thin air or taking money that never belonged to the attacker. Nodes are not going to accept an invalid transaction as payment, and honest nodes will never accept a block containing them. An attacker can only try to change one of his own transactions to take back money he recently spent.

The race between the honest chain and an attacker chain can be characterized as a Binomial Random Walk. The success event is the honest chain being extended by one block, increasing its lead by +1, and the failure event is the attacker's chain being extended by one block, reducing the gap by -1.

The probability of an attacker catching up from a given deficit is analogous to a Gambler's Ruin problem. Suppose a gambler with unlimited credit starts at a deficit and plays potentially an infinite number of trials to try to reach breakeven. We can calculate the probability he ever reaches breakeven, or that an attacker ever catches up with the honest chain, as follows [8]:

p = probability an honest node finds the next block
q = probability the attacker finds the next block
q_z = probability the attacker will ever catch up from z blocks behind

$$q_z = \begin{cases} 1 & \text{if } p \le q \\ (q/p)^z & \text{if } p > q \end{cases}$$

Given our assumption that $p > q$, the probability drops exponentially as the number of blocks the attacker has to catch up with increases. With the odds against him, if he doesn't make a lucky lunge forward early on, his chances become vanishingly small as he falls further behind.

We now consider how long the recipient of a new transaction needs to wait before being sufficiently certain the sender can't change the transaction. We assume the sender is an attacker who wants to make the recipient believe he paid him for a while, then switch it to pay back to himself after some time has passed. The receiver will be alerted when that happens, but the sender hopes it will be too late.

The receiver generates a new key pair and gives the public key to the sender shortly before signing. This prevents the sender from preparing a chain of blocks ahead of time by working on it continuously until he is lucky enough to get far enough ahead, then executing the transaction at that moment. Once the transaction is sent, the dishonest sender starts working in secret on a parallel chain containing an alternate version of his transaction.

The recipient waits until the transaction has been added to a block and z blocks have been linked after it. He doesn't know the exact amount of progress the attacker has made, but assuming the honest blocks took the average expected time per block, the attacker's potential progress will be a Poisson distribution with expected value:

$$\lambda = z\frac{q}{p}$$

To get the probability the attacker could still catch up now, we multiply the Poisson density for each amount of progress he could have made by the probability he could catch up from that point:

$$\sum_{k=0}^{\infty} \frac{\lambda^k e^{-\lambda}}{k!} \cdot \begin{cases} (q/p)^{(z-k)} & if\ k \le z \\ 1 & if\ k > z \end{cases}$$

Rearranging to avoid summing the infinite tail of the distribution...

$$1 - \sum_{k=0}^{z} \frac{\lambda^k e^{-\lambda}}{k!} \left(1 - (q/p)^{(z-k)}\right)$$

Converting to C code...

```
#include <math.h>
double AttackerSuccessProbability(double q, int z)
{
    double p = 1.0 - q;
    double lambda = z * (q / p);
    double sum = 1.0;
    int i, k;
    for (k = 0; k <= z; k++)
    {
        double poisson = exp(-lambda);
        for (i = 1; i <= k; i++)
            poisson *= lambda / i;
        sum -= poisson * (1 - pow(q / p, z - k));
    }
    return sum;
}
```

Running some results, we can see the probability drop off exponentially with z.

```
q=0.1
z=0     P=1.0000000
z=1     P=0.2045873
z=2     P=0.0509779
z=3     P=0.0131722
z=4     P=0.0034552
z=5     P=0.0009137
z=6     P=0.0002428
z=7     P=0.0000647
z=8     P=0.0000173
z=9     P=0.0000046
z=10    P=0.0000012

q=0.3
z=0     P=1.0000000
z=5     P=0.1773523
z=10    P=0.0416605
z=15    P=0.0101008
z=20    P=0.0024804
z=25    P=0.0006132
z=30    P=0.0001522
z=35    P=0.0000379
z=40    P=0.0000095
z=45    P=0.0000024
z=50    P=0.0000006
```

Solving for P less than 0.1%...

```
P < 0.001
q=0.10    z=5
q=0.15    z=8
q=0.20    z=11
q=0.25    z=15
q=0.30    z=24
q=0.35    z=41
q=0.40    z=89
q=0.45    z=340
```

12. Conclusion

We have proposed a system for electronic transactions without relying on trust. We started with the usual framework of coins made from digital signatures, which provides strong control of ownership, but is incomplete without a way to prevent double-spending. To solve this, we proposed a peer-to-peer network using proof-of-work to record a public history of transactions that quickly becomes computationally impractical for an attacker to change if honest nodes control a majority of CPU power. The network is robust in its unstructured simplicity. Nodes work all at once with little coordination. They do not need to be identified, since messages are not routed to any particular place and only need to be delivered on a best effort basis. Nodes can leave and rejoin the network at will, accepting the proof-of-work chain as proof of what happened while they were gone. They vote with their CPU power, expressing their acceptance of valid blocks by working on extending them and rejecting invalid blocks by refusing to work on them. Any needed rules and incentives can be enforced with this consensus mechanism.

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Bitcoin Genesis Block ~ Raw Hex Version 2009-01-03

```
00000000   01 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ................
00000010   00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ................
00000020   00 00 00 00 3B A3 ED FD  7A 7B 12 B2 7A C7 2C 3E   ....;£íýz{.²zÇ,>
00000030   67 76 8F 61 7F C8 1B C3  88 8A 51 32 3A 9F B8 AA   gv.a.È.Ã^ŠQ2:Ÿ¸ª
00000040   4B 1E 5E 4A 29 AB 5F 49  FF FF 00 1D 1D AC 2B 7C   K.^J)«_Iÿÿ...¬+|
00000050   01 01 00 00 00 01 00 00  00 00 00 00 00 00 00 00   ................
00000060   00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ................
00000070   00 00 00 00 00 00 FF FF  FF FF 4D 04 FF FF 00 1D   ......ÿÿÿÿM.ÿÿ..
00000080   01 04 45 54 68 65 20 54  69 6D 65 73 20 30 33 2F   ..EThe Times 03/
00000090   4A 61 6E 2F 32 30 30 39  20 43 68 61 6E 63 65 6C   Jan/2009 Chancel
000000A0   6C 6F 72 20 6F 6E 20 62  72 69 6E 6B 20 6F 66 20   lor on brink of 
000000B0   73 65 63 6F 6E 64 20 62  61 69 6C 6F 75 74 20 66   second bailout f
000000C0   6F 72 20 62 61 6E 6B 73  FF FF FF FF 01 00 F2 05   or banksÿÿÿÿ..ò.
000000D0   2A 01 00 00 00 43 41 04  67 8A FD B0 FE 55 48 27   *....CA.gŠý°þUH'
000000E0   19 67 F1 A6 71 30 B7 10  5C D6 A8 28 E0 39 09 A6   .gñ¦q0·.\Ö¨(à9.¦
000000F0   79 62 E0 EA 1F 61 DE B6  49 F6 BC 3F 4C EF 38 C4   ybàê.aÞ¶Iö¼?Lï8Ä
00000100   F3 55 04 E5 1E C1 12 DE  5C 38 4D F7 BA 0B 8D 57   óU.å.Á.Þ\8M÷º..W
00000110   8A 4C 70 2B 6B F1 1D 5F  AC 00 00 00 00            ŠLp+kñ._¬....
```

and so,
a new era,
was unleashed

NOSTR

NOTES & OTHER STUFF TRANSMITTED BY RELAYS

> *One could pass laws against it, but the freedom of speech, even more than privacy, is fundamental to an open society; we seek not to restrict any speech at all.*
>
> ~ Eric Hughes, The Cypherpunk's manifesto, 1993

WHAT IS NOSTR

> *TL;DR: nostr is a protocol that has the power to replace twitter, Telegram, and other things.*
>
> ~ @dergigi

> *nostr is to freedom of communication as bitcoin is to freedom of transaction.*
>
> ~ Keysa @SimplestBitcoinBook

- Nostr is a **simple, decentralized protocol for censorship-resistant, global, interoperable networks.**
- Nostr does not rely on a trusted central server.
- It is a free and open source (FOSS) software protocol, like Bitcoin, HTTP or TCP-IP, which allows anyone to build on nostr.
- **It is how we retain our freedom to communicate** with anyone, anywhere with an internet connection.

> *(it is) a communications protocol with a self-sovereign identity layer... and nostr is also more than that.*
>
> ~ @dergigi

WHY WE NEED NOSTR

We need nostr because the current communication systems and social media platforms are centralized.

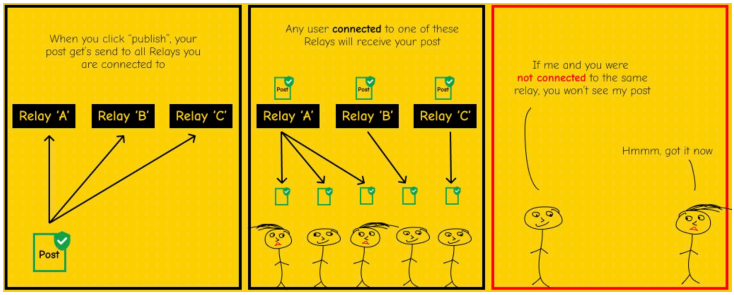
This is problematic because these systems:

- Have the power to censor your speech.
- Are vulnerable to regulatory attacks by the state.
- Can choose, or be told, to suspend or delete your account.
- Can be hacked, and thus compromise your data.
- Use algorithms to feed you the information they want you to see.
- Manipulate every aspect of your experience on them.
- Track all your activity.
- Harvest and sell your data.
- Use your data to litter your feed with advertisements.

Freedom tech is hope.
~ @ODELL

HOW DOES NOSTR WORK?

- **Nostr has two parts:** Clients and Relays.
- A **CLIENT** is an INTERFACE (app or website) that is run on the nostr protocol.
- **It is where you see the notes** that you and the people you follow post (in the same way that twitter is an interface where you post and read notes by others, except twitter is centralized & it censors posts.)
- A **RELAY** is a SERVER and a DATABASE. Anyone can run a relay, which is what makes nostr decentralized.
- **It is where your notes are sent, stored and retrieved from** by clients.
- There are many relays and you can choose which ones to connect to. Some are free and some are paid.
- When you post a message, it is broadcast to the relays you are connected to.
- The clients query the relays they are connected to, and then they populate the messages being hosted by those relays.



~ @BTCillustrated

> *Anyone can run a relay. A relay is very simple and dumb. It does nothing besides accepting posts from some people and forwarding to others. Relays don't have to be trusted. Signatures are verified on the client side.*
>
> ~ @fiatjaf, 2019-11-02 fiatjaf.com/nostr.html

- When you open your nostr client, you will see all the notes posted by you and those you follow in chronological order.
- There are **no algorithms** deciding what to show you, what to withhold from you, or censoring your posts.
- Like Bitcoin, **nostr uses public/private key pairs**.
  - **PUBLIC KEY** = npub, like a username
  - **PRIVATE KEY** = nsec, like a password

- **NOTE:** Your private key cannot be reset if lost, so you **must secure it well**!
- If you leak your private key, whoever has access to it has access to your nostr account, and **there is no way to regain sole access.**

- You can create a human-readable username using NIP-05. **For example:**

- **My Public Key, or npub is:**
  npub1dpna3xwwddnhhzg9ycpvlcz2ze0jdwm2rf3eqd2lf9leaewtq7tqhw0ef2

- **My NIP-05 Nostr address is:**
  SimplestBitcoinBook@nostrplebs.com

- **You can search for people on nostr** by entering their:
  - npub
  - NIP-05 (aka nostr address) if they have one
  - Username from NIP-05 -> @SimplestBitcoinBook

- **Get a NIP-05 Identifier here:**
  - nostrplebs.com
  - verified-nostr.com
  - getalby.com
  - Or set one up with your own domain

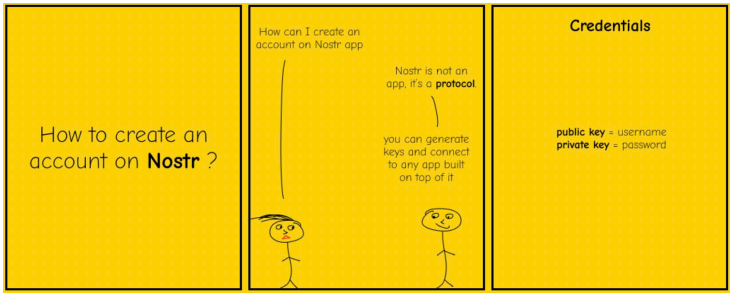
- Once you have your nostr key pair, you can log into any nostr client with those same keys, and you will see that you **retain your identity and followers/following lists** on all the clients.

- This differs from legacy social media, where you need a separate account, username and password for each platform, and you have different content, follows and followers on each one.

> *At it's most basic level, Nostr is a communication protocol that acts as the social glue that binds all of your apps together.*
>
> ~ derekross@nostrplebs.com

HOW TO NOSTR

1. **Choose a client** app to download. (It doesn't matter which one you select, as you can try them all out once you have your key pair generated.)
2. **Popular Client Examples**:
   - Damus on iOS
   - Amethyst on Android
   - Primal on iOS/Android/Desktop
3. **Create a User Name.** No other info is needed.
4. **The app will generate the account.**
5. **You can add a profile picture and banner** if you like.
6. **Your account will automatically connect to a few relays** once you select at least one interest (eg: bitcoin, art, human rights, sports, music etc)
7. Depending on the client, it will automatically follow a few accounts with a similar interest, or let you select a few.
8. **You can then add or remove relays and accounts.**



~ @BTCillustrated

KEY MANAGEMENT

- Once your keys have been generated, it is time to install a **signing extension.**
- When you want to log in to a website running on the nostr protocol, it will ask for your nsec, or private key.
- **DO NOT** enter it directly, as websites can leak data.
- **Instead, always use a signing extension.**
- This is a tool which stores your private key, and you authorize it to sign events, such as notes, on your behalf. Don't worry, this is simpler than it sounds!
- **Popular signing extensions:**
  - Nostore (iOS Safari)
  - Amber (Android)
  - Nsec App (Mobile/Desktop)
  - Alby (Desktop)
  - Nos2X (Desktop)
  - Nostr Connect (Desktop)

ZAPS

- Zapping is how we bitcoin on nostr! Creating a V4V (Value4Value) economy, note by note, zap by zap.
- You can send and receive sats (aka zaps) for notes or content you appreciate by connecting a Bitcoin Lightning wallet to your nostr account.
- There are various ways to do this. If the client you choose doesn't walk you through it, just ask on nostr with the #asknostr tag, and someone will guide you. Nostriches are friendly!

NOSTR RESOURCES

Below is a list of websites that have excellent, easily digestible guides on nostr and it's wonders!

- nostr-resources.com by @derGigi
- nostr.com by @fiatjaf
- nostr.net by @aljaz
- nostr.how by @JeffG
- usenostr.org by @pluja
- benwehrman.com/nostr-guide by @benwehrman
- nostrapps.com by @Karnage

WHY THE OSTRICH?

The Nostrich Origin Story
by Walker@primal.net

December 16, 2022:
I discovered ChatGPT3 and, naturally, asked it
"Can you write a joke about #nostr?"
ChatGPT3 responded:
Q: What do you call a nosy ostrich?
A: A nosTrich!
The joke wasn't great, but you can't blame a bot. Regardless, I loved the idea of a visual identity for nostr, and ostriches are cool birds. So I took to Midjourney and created The #Nostrich

December 20, 2022:
@jb55 proposed the "Nostrich" as the official Nostr mascot and logo.
Three minutes later, @jack tweets the Nostrich image.
The rest, as they say, is history.

~ @Walker

NOSTR CLIENTS/APPS

Visit **nostrapps.com** to find these, and so many more amazing apps built on the free, open-source nostr protocol. Use your signing extension to sign into them all!

- **Nostr Nests** - An audio space for chatting, jamming, micro-conferences, live podcasts.
- **Plebian Market** - The self-sovereign marketplace of the Internet, powered by Bitcoin & Lightning.
- **Npub.pro** - Make yourself a nostr-based website.
- **Corny Chat** - Live audio spaces.
- **Wavlake** - A music streaming platform that utilizes Bitcoin's Lightning Network to offer value for value.
- **Zap.stream** - Host your live stream and get sat zaps.
- **Flare** - A client for viewing, uploading, and interacting with video content.
- **Blowater** - Built to replace Telegram/Slack/Discord.
- **Stemstr** - A social experience for music artists to connect, collaborate and share amazing music.
- **Nostr.build** - Image, video & media uploader & host.
- **Hivetalk** - Real-time, totally private video calls and meetings, replaces Zoom.
- **Zap.cooking** - Share recipes over Nostr.
- **Flockstr** - Events and meetup scheduling.
- **Memestr** - View and make memes over Nostr
- **Quotestr** - Make a Nostr note an image quote.

JOIN US

- Nostr is still very young. Just like bitcoin, but much younger, it is a grassroots, messy, global, ground-up experiment.

- If you see the value in a decentralized, censorship-resistant, open-source communications protocol, please join us in using it, developing it, offering feedback to the devs, and participating in whatever way you feel called, to help grow this free speech tool.

- It is an amazing experience to engage in a growing technology that is built to preserve freedom of speech and open communication globally.

- Dive in and learn along with the rest of us sovereign souls, embracing the inherent chaos to create beauty, and to forge a bright future for our grandchildren!

More important than all is that we must keep in mind that nostr is just a very loose set of servers with basically no connection between them, ... and the process of keeping connected to others and finding content must be addressed through many different hackish attempts. To write Nostr applications and to use Nostr one must embrace the inherent chaos.

~ @fiatjaf from:

'A vision for content discovery and relay usage for basic social-networking in Nostr'

Profound gratitude to Satoshi, Fiatjaf, the cypherpunks past, present and future, Nostr fam, the BT vortex, the toxic maxis, the non-toxic maxis, the meme-lords and -ladies, the believers, the cynics, the seers...
and always,
my beloved family, friends,
and the One who breathes through us all,
for always seeing me through,
more precious than anything, even bitcoin

Free PDF of this book and the translations
available at: thesimplestbitcoinbook.net

Follow me on nostr:

Comments, questions, updates, feedback:
thesimplestbitcoinbook@proton.me

Can't promise I will get to it in a timely fashion ...
might be barefoot on a mountain somewhere

Stack sats
Stay strong
Stay true

in the end, Love

851522