Polkadot.

Polkadot for Beginners

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Polkadot.

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Background:

- Head of Marketing, Wanchain
- Global and U.S. Pharmaceutical Brand Strategy, Eli Lilly & Company

Polkadot.

This presentation is for beginners

You may have heard of blockchain or Polkadot, but aren't exactly sure what it is or what it's used for.

We will purposely avoid technical words as much as possible - there are hours of technical content on Polkadot's Youtube if that interests you.

Ask questions - there are no bad questions.

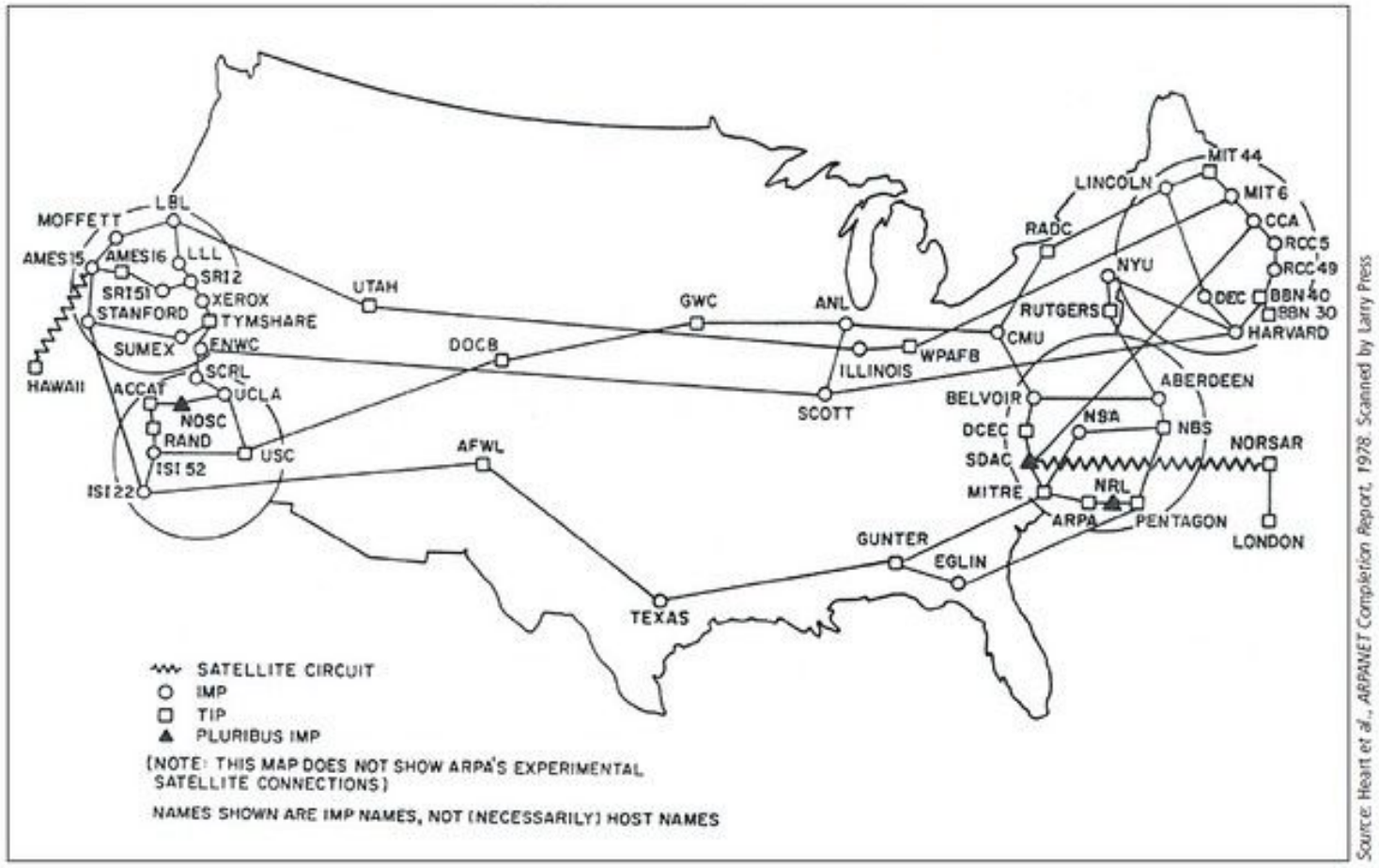
Polkadot.

What we'll cover today

1. Brief history of the internet
2. History of blockchain and crypto
3. What is blockchain?
4. What are the issues with legacy blockchains?
5. What is Polkadot?
6. What problems is Polkadot solving?
7. A world built on Polkadot in 5-10 years

1967 to 1975

ARPANET connects Stanford and UCLA, then expands across the United States



Source: Heart et al., *ARPANET Completion Report*, 1978. Scanned by Larry Press

Polkadot.

1972

Ray Tomlinson wrote the basic **email message** send and read software. Email took off as the largest network application for over a decade. Queen Elizabeth II sent her first email in 1976.

1978

In 1978, Robert Kahn and Vinton Cerf create **TCP/IP** (transmission control protocol / internet protocol), a standard protocol that allows network connections to be made between computers and networks through packets of information.

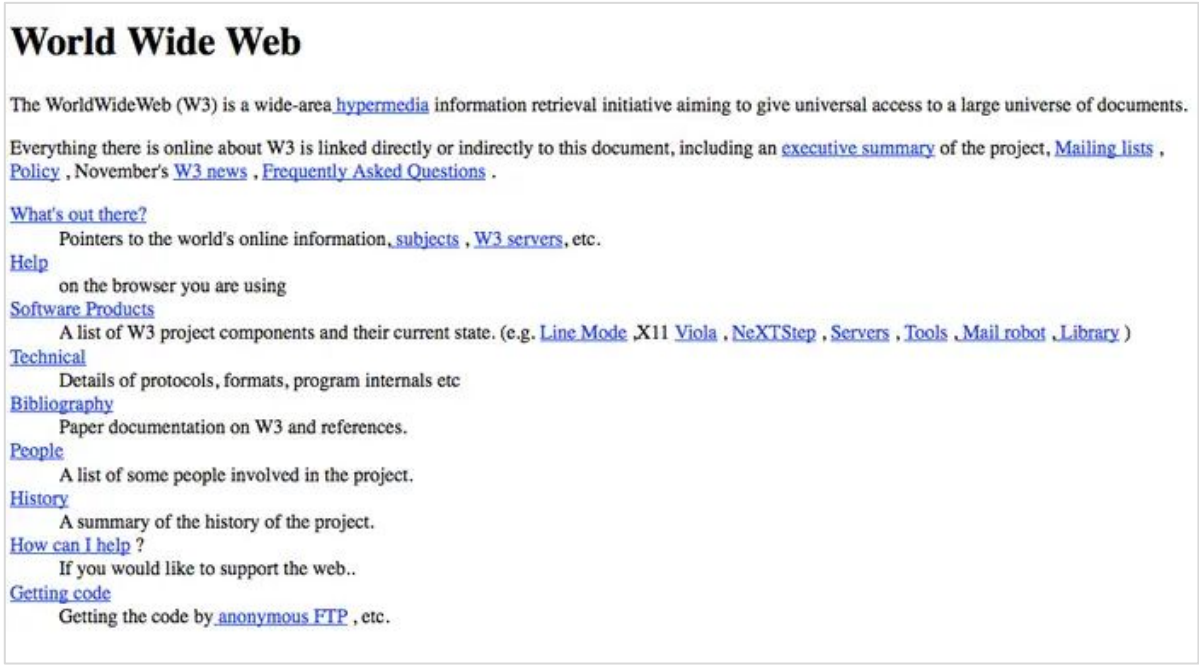
1983 to 1990

In 1983, **ARPANET adopts TCP/IP**. With a common protocol, other networks joined ARPANET, which was becoming a true “network of networks.” In 1990, ARPANET was officially decommissioned, giving birth to the Internet.

Polkadot.

1989 to 1991

HTTP defined in 1989;
first webpage at CERN, 1991



World Wide Web

The WorldWideWeb (W3) is a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an executive summary of the project, Mailing lists , Policy , November's W3 news , Frequently Asked Questions .

What's out there?
Pointers to the world's online information, subjects , W3 servers, etc.
Help
on the browser you are using
Software Products
A list of W3 project components and their current state. (e.g. Line Mode ,X11 Viola , NeXTStep , Servers , Tools , Mail robot , Library)
Technical
Details of protocols, formats, program internals etc
Bibliography
Paper documentation on W3 and references.
People
A list of some people involved in the project.
History
A summary of the history of the project.
How can I help ?
If you would like to support the web..
Getting code
Getting the code by anonymous FTP , etc.

1994

Netscape launches

Polkadot.

1995

1997 to 2010

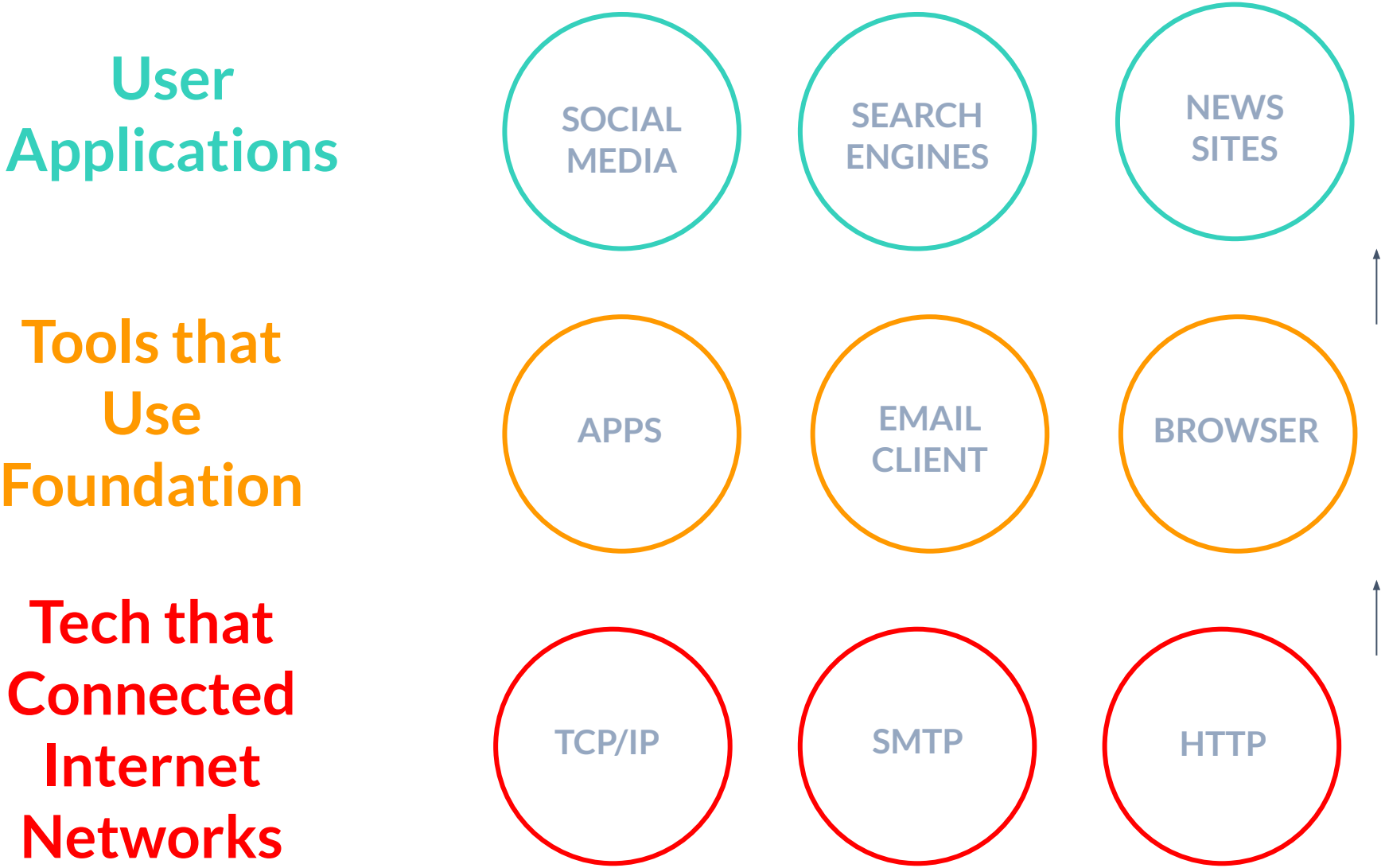
Google!

facebook

2020

What laid the foundation of today's internet?

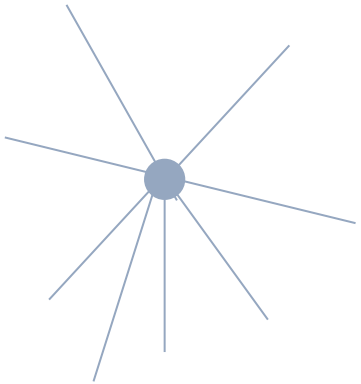
Polkadot.



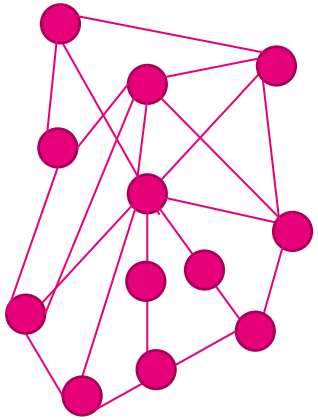
What is Blockchain?

Polkadot.

A digital chain made of blocks of information hosted on a decentralized and distributed network of computers that cannot be altered



Centralized



Decentralized

Blocks	are chunks	of data	collected	over a	specific	period	of time

Blockchain Analogy

Polkadot.

1. Everyone records the results of each hand in their own notebook

2. After the full game is complete, all players agree on the chip counts and finalize that game (a block)

3. After 3 games, Kelly tries to cash out $100 more than she is truly owed

4. Everyone checks the records from the three previous games that were finalized by the group. Kelly's request is declined, and she's paid what she is truly owed

What is Blockchain?

Polkadot.

Block start – April 12th

Accounts

Dan: $5M

Kevin: $0

Bill: $0

Transactions

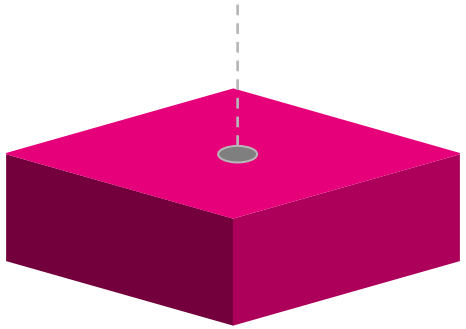
1. Dan paid Kevin $5M
2. Kevin paid Bill $2M
3. Bill paid Dan $1M

End Accounts

Dan: $1M

Kevin: $3M

Bill: $1M



Block Start – April 13th

Accounts

Dan: $1M

Kevin: $3M

Bill: $1M

Transactions

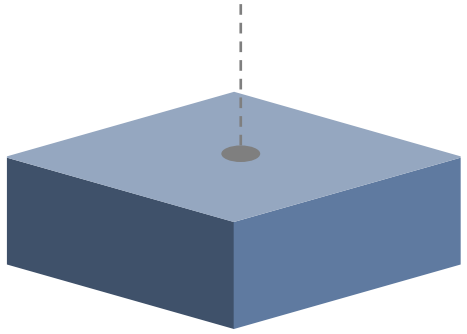
1. Kevin paid Bill $2M

End Accounts

Dan: $1M

Kevin: $1M

Bill: $3M



Block Start – April 14th

Accounts

Dan: $1M

Kevin: $1M

Bill: $3M

Transactions

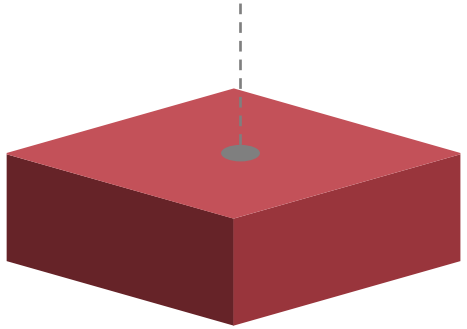
1. Kevin paid Bill $1M

End Accounts

Dan: $1M

Kevin: $0

Bill: $4M



Block Start – April 15th

Accounts

Dan: $1M

Kevin: $0M

Bill: $4M

Transactions

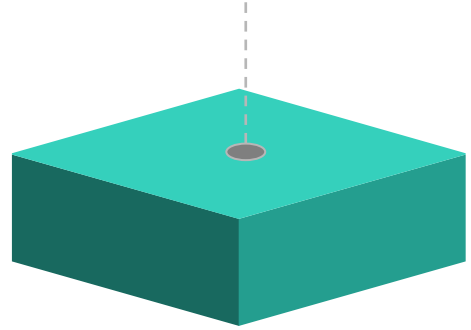
1. Dan paid Bill $500K

End Accounts

Dan: $500K

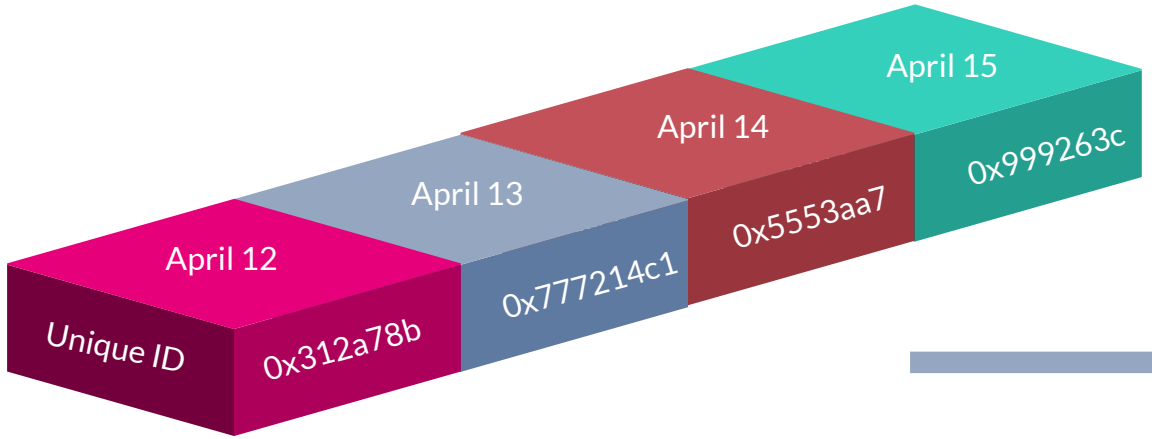
Kevin: $0

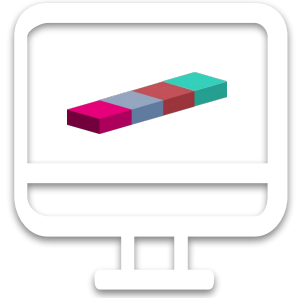
Bill: $4.5M



What is Blockchain?

Polkadot.





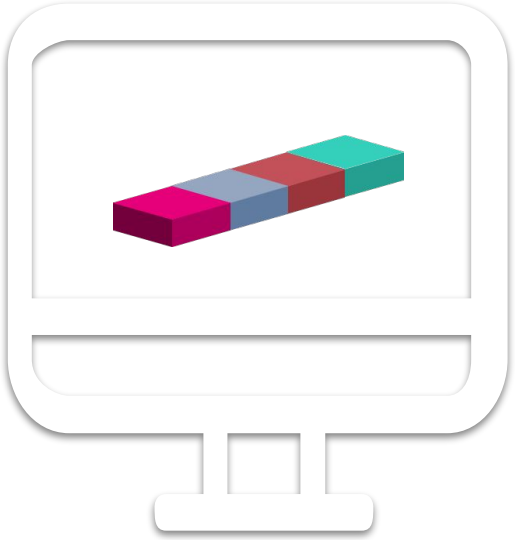
Centralized Server (Facebook)

Decentralized and distributed network

What is Blockchain?

Polkadot.

Bill can edit the last transaction in the single database to show $1M instead of $500k



Block Start – April 15th
Accounts
Dan: $1M
Kevin: $1M
Bill: $3M

Transactions
~~1. Dan paid Bill $500k~~

End Accounts
Dan: $500k
Kevin: $1M
Bill: $4.5M

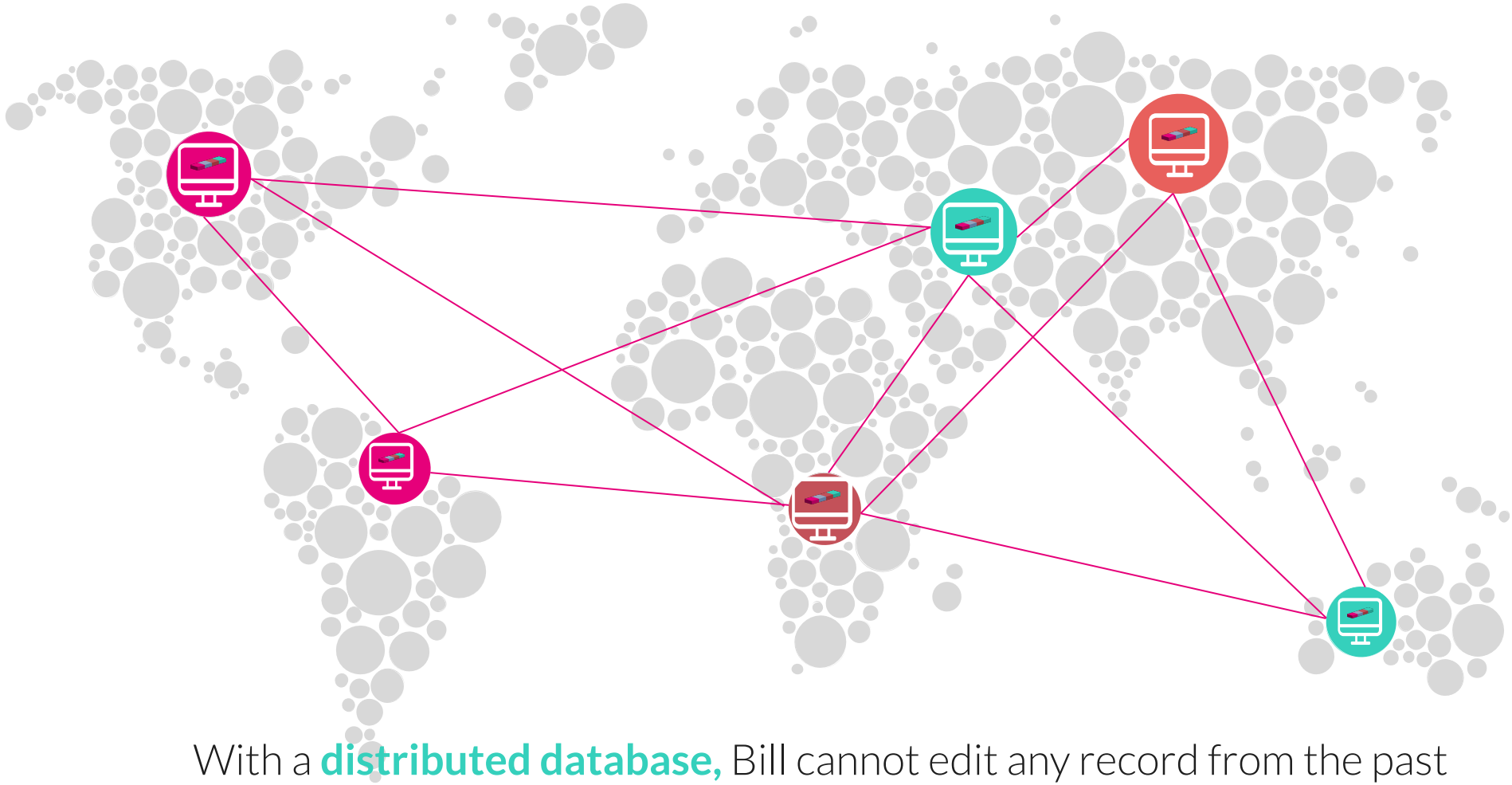
Block Start – April 15th
Accounts
Dan: $1M
Kevin: $1M
Bill: $3M

Transactions
1. Dan paid Bill $1M

End Accounts
Dan: $0
Kevin: $0
Bill: $5M

What is Blockchain?

Polkadot.



With a **distributed database,** Bill cannot edit any record from the past

Why Blockchain?

- Users agree on data in the blocks without trusting or even knowing one another
- Nobody can change this data once it has been added to the blockchain
- Virtually impossible for anyone to permanently delete a blockchain or stop it from running
- Users can own their own data - can avoid major hacks

Blockchain Use Cases

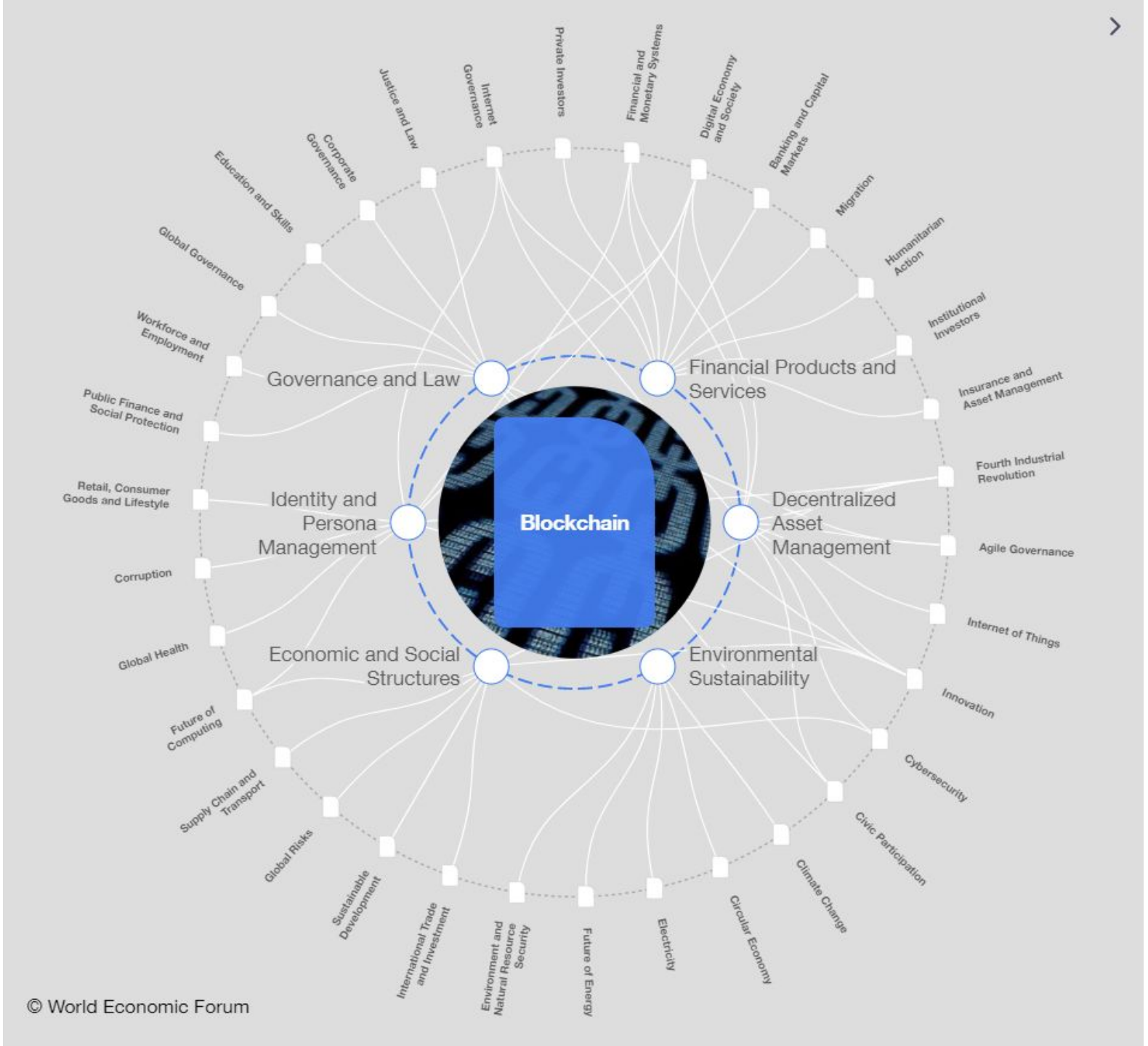
Polkadot.

Anonymous logins

Digital identity

Pharmaceutical drug
anti-counterfeiting

Personal healthcare data
digital ownership


Blockchain
Governance and Law
Financial Products and Services
Identity and Persona Management
Decentralized Asset Management
Economic and Social Structures
Environmental Sustainability
Private Investors
Financial and Monetary Systems
Digital Economy and Society
Banking and Capital Markets
Migration
Humanitarian Action
Institutional Investors
Insurance and Asset Management
Fourth Industrial Revolution
Agile Governance
Internet of Things
Innovation
Cybersecurity
Civic Participation
Climate Change
Circular Economy
Electricity
Future of Energy
Environment and Natural Resource Security
International Trade and Investment
Sustainable Development
Global Risks
Supply Chain and Transport
Future of Computing
Global Health
Corruption
Retail, Consumer Goods and Lifestyle
Public Finance and Social Protection
Workforce and Employment
Global Governance
Education and Skills
Corporate Governance
Justice and Law
Internet Governance
© World Economic Forum

Polkadot.

1995

amazon.com
Earth's biggest bookstore

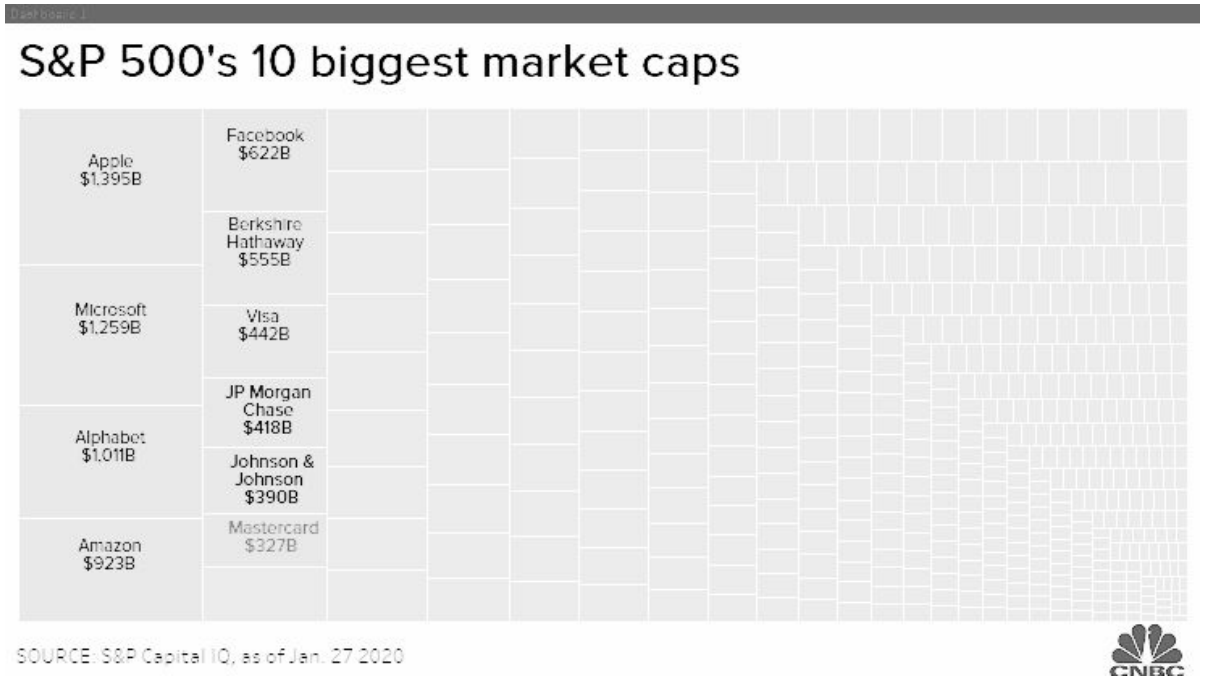
1997 to 2010

Google!

facebook

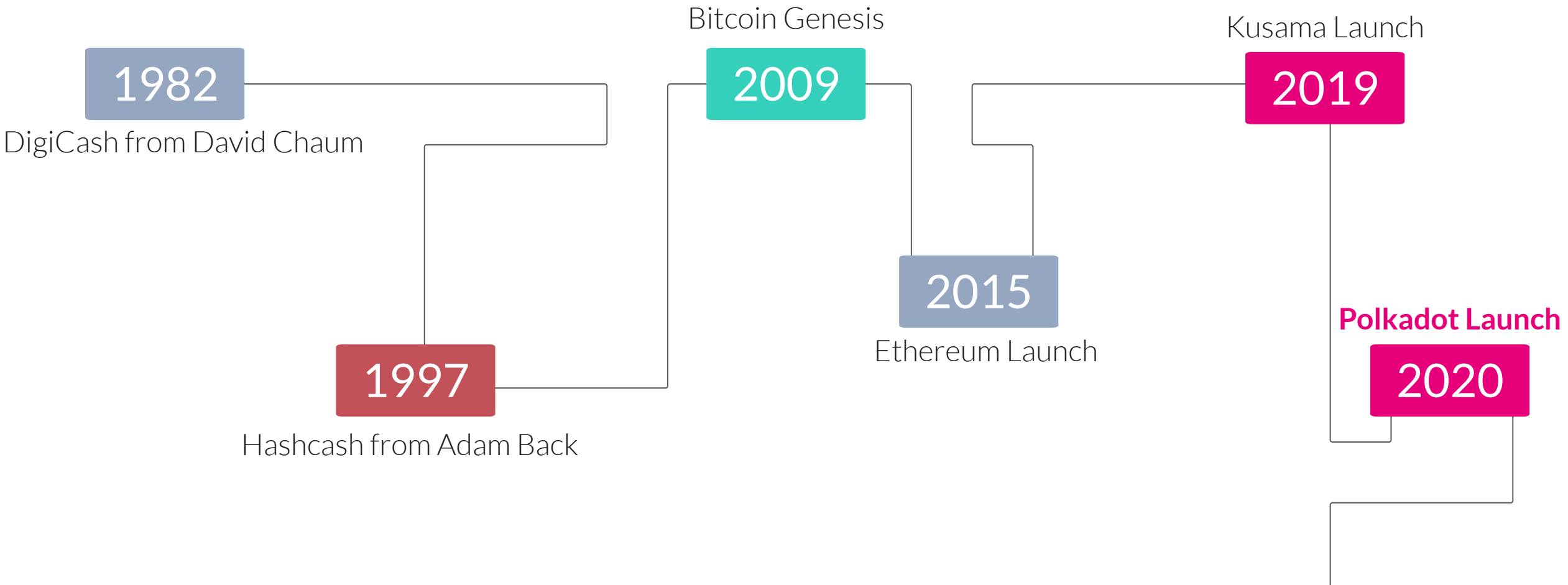
2009 First Bitcoin block

2020



Blockchain and Crypto History

Polkadot.



Legacy networks like Bitcoin and Ethereum have many problems

Polkadot.

Can't Communicate

Legacy blockchains can't easily communicate with each other

Can't Scale

These networks can't handle a lot of traffic

Poor Security

Many networks have been attacked by hackers

No Customization

One-size-fits-all application platforms do not work

Poor Governance

Decisions on many legacy networks are made by one powerful individual or group, or are not made

Upgrades are Difficult

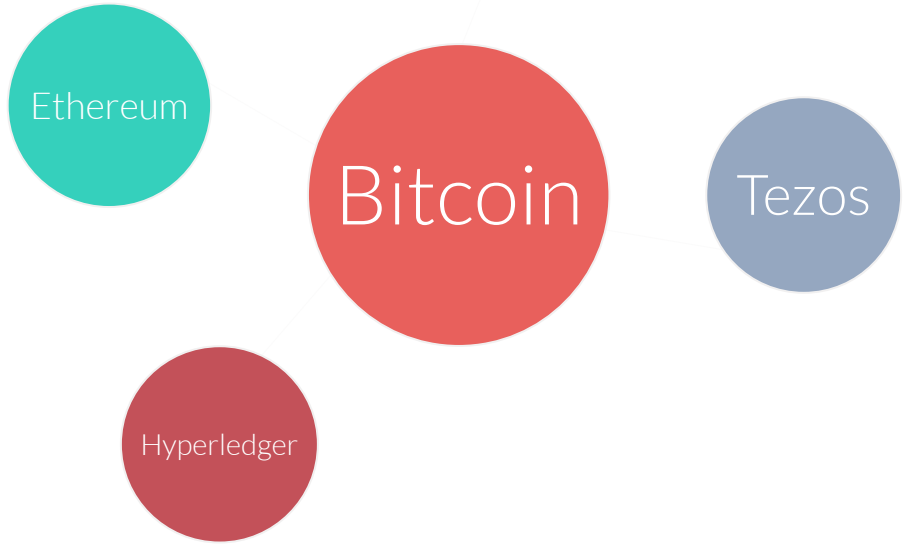
Users of the network must independently upgrade their software; otherwise the chain can split into two!

Can't Communicate

Polkadot.

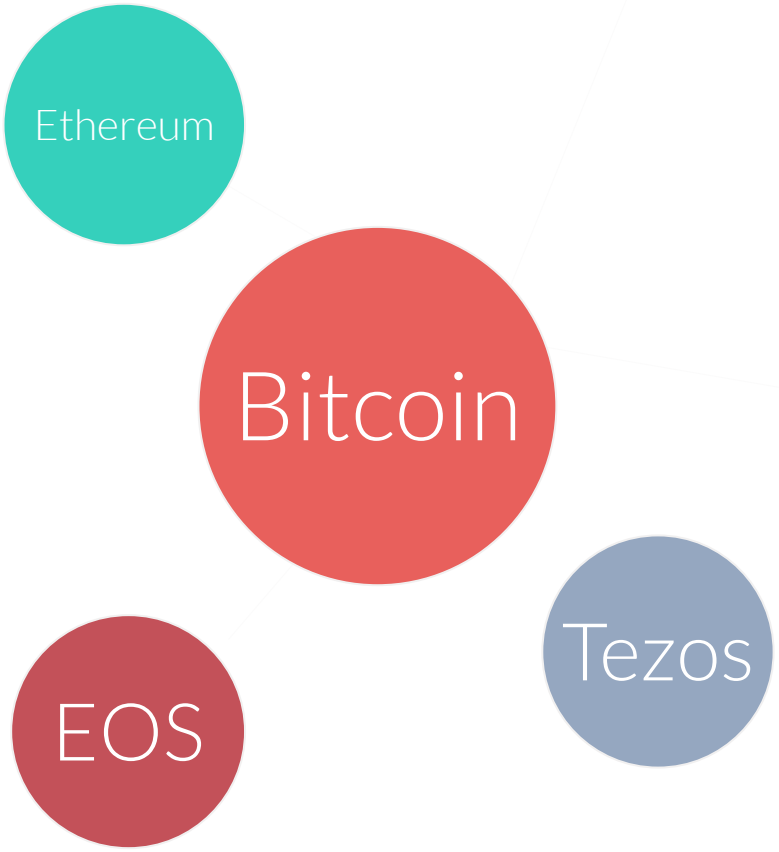
Communications Issues

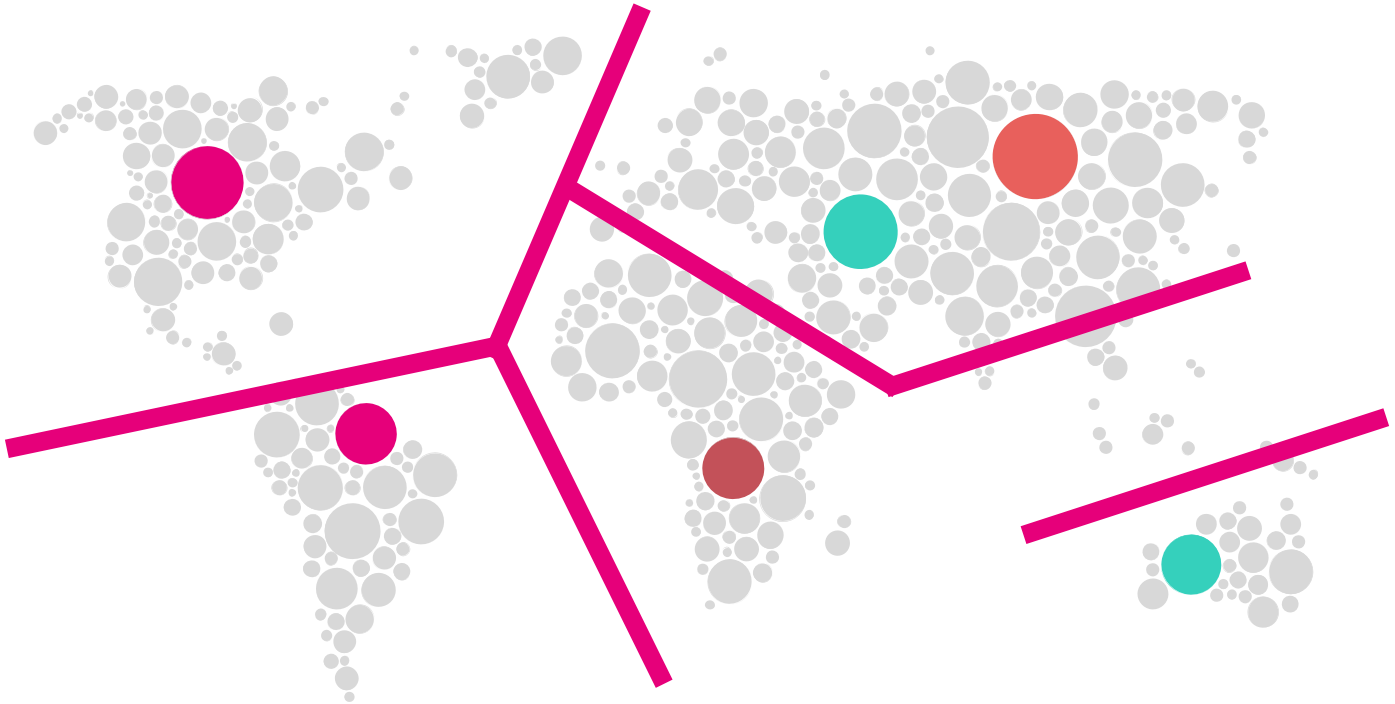
- Blockchains are very good at interacting with data stored on them...
- ... but are inherently bad at communicating with other chains without trusting an intermediary



Blockchains not communicating is like having several separate ‘internets’ all over the world

Polkadot.





Can't Scale

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Scaling Issues

- Traditional blockchains are resilient but very slow
- Bitcoin can theoretically max ~7 tps, Ethereum around ~25 tps.
  - Visa does 1,736 transactions per second.
- Issues seen in
  - Bitcoin transaction fees maxing out at ~ $37 in 2018
  - Fees up 800% over last month
  - Ethereum slowdowns for CryptoKitties, Fomo3D
  - MakerDAO flash crash (people could not submit bids in time)

Poor Security

Security Issues

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- Bitcoin and Ethereum are very secure
- But creating a new blockchain is difficult to do securely
- Numerous 51% attacks carried out
  - Ethereum Classic
  - Bitcoin Gold
  - Vertcoin
  - Krypton
  - Shift

No Customization

Lack of Customization Issues

Polkadot.

- Choice comes down to using an existing blockchain, which may not have all of the features you want (or may have some you don’t!)...
- ... or creating your own from nothing (very difficult)

- Blockchain should not be one-size-fits-all

Poor Governance

Governance Issues

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Either too centralized (benevolent dictator model)...

... or no on-chain governance whatsoever

Decision making is not well thought out and documented for the community to see and agree upon

Upgrades are Difficult

Upgrade Issues

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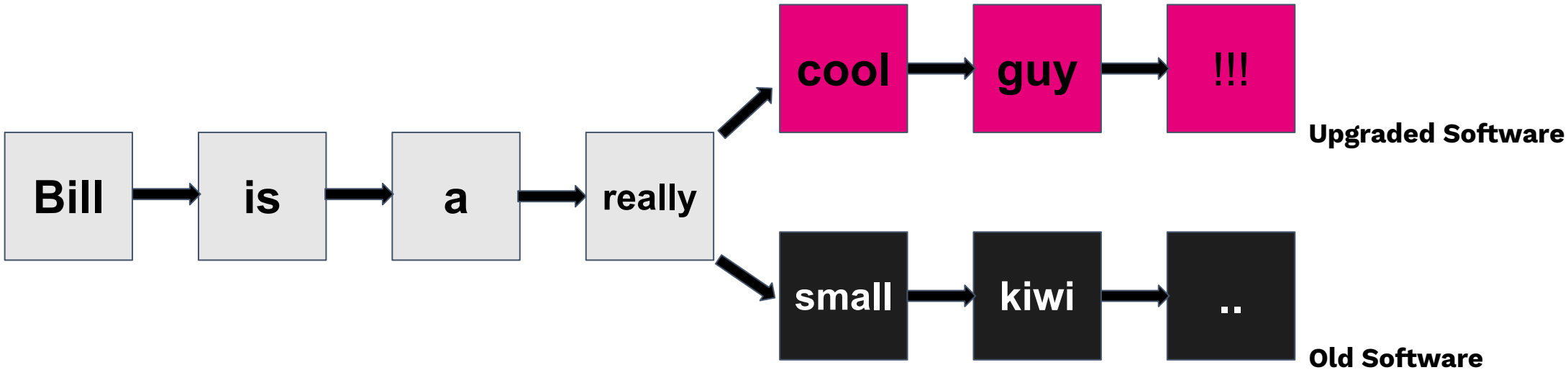
- Everyone must upgrade software before any major change
- Otherwise, a “fork” occurs, where upgraders think one version of the chain is valid, non-upgraders think another



How do we solve these challenges?

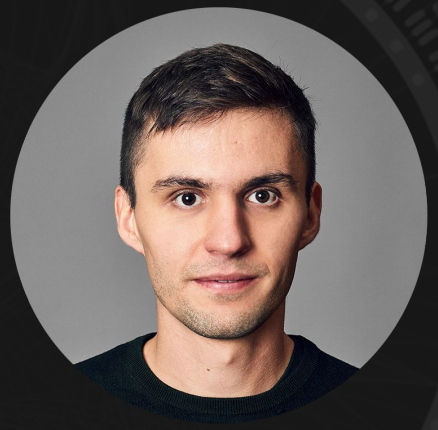
Polkadot is a foundational building block of the new web that enables humans, enterprises, and governments to use private and secure applications that don't rely on trusting a third party.

Polkadot.

Polkadot was founded by some of the blockchain industry's leading builders

Dr. Gavin Wood
Polkadot co-founder
Web3 Foundation president; co-founder and former chief technology of Ethereum

Robert Habermeier
Polkadot co-founder
Thiel Fellow



Peter Czaban
Polkadot co-founder
Web3 Foundation technology director

Polkadot.

The two organizations behind Polkadot.

Web3 Foundation
~50 employees
Renowned research team
Zug, Switzerland

Parity Technologies
~120 employees
6 years of blockchain development
Berlin, Germany

Polkadot.

Connects networks together

Handles heavy traffic at scale

Industry-leading security

Enables custom-made platforms built for specific apps

Revolutionizes online governance thru open, community-driven decision-making

Self-upgrades allowing it to be future-proof

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Polkadot.

Single blockchains can be built to do one thing really well

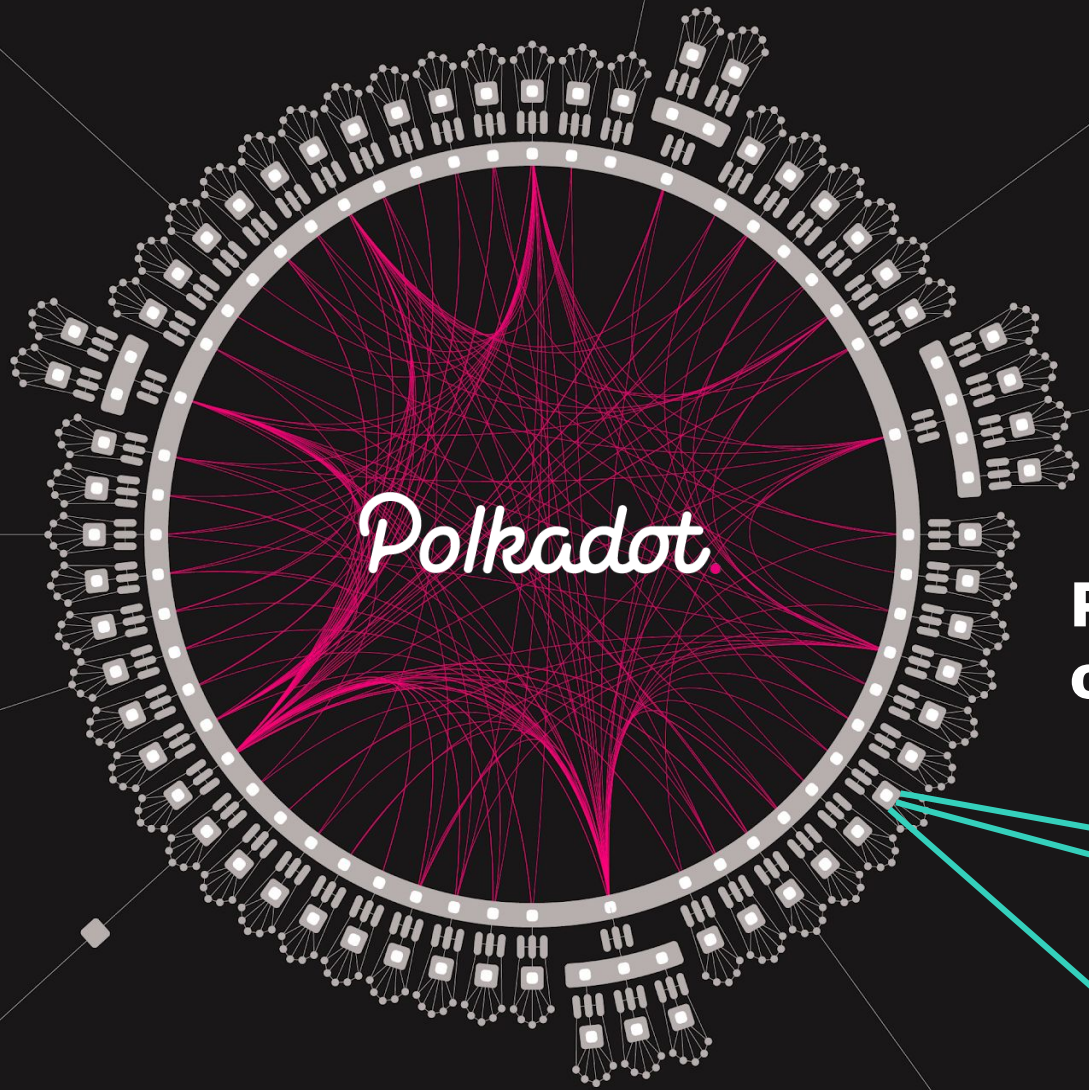
Bitcoin

Custom blockchain built on top of Polkadot

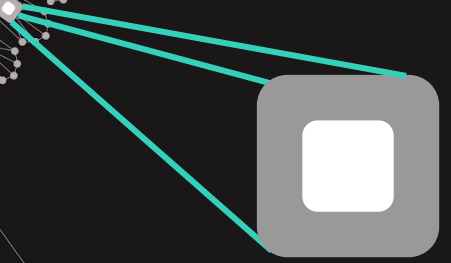
Single blockchains can also be built to attempt to do a lot things just ok

Ethereum

Polkadot.



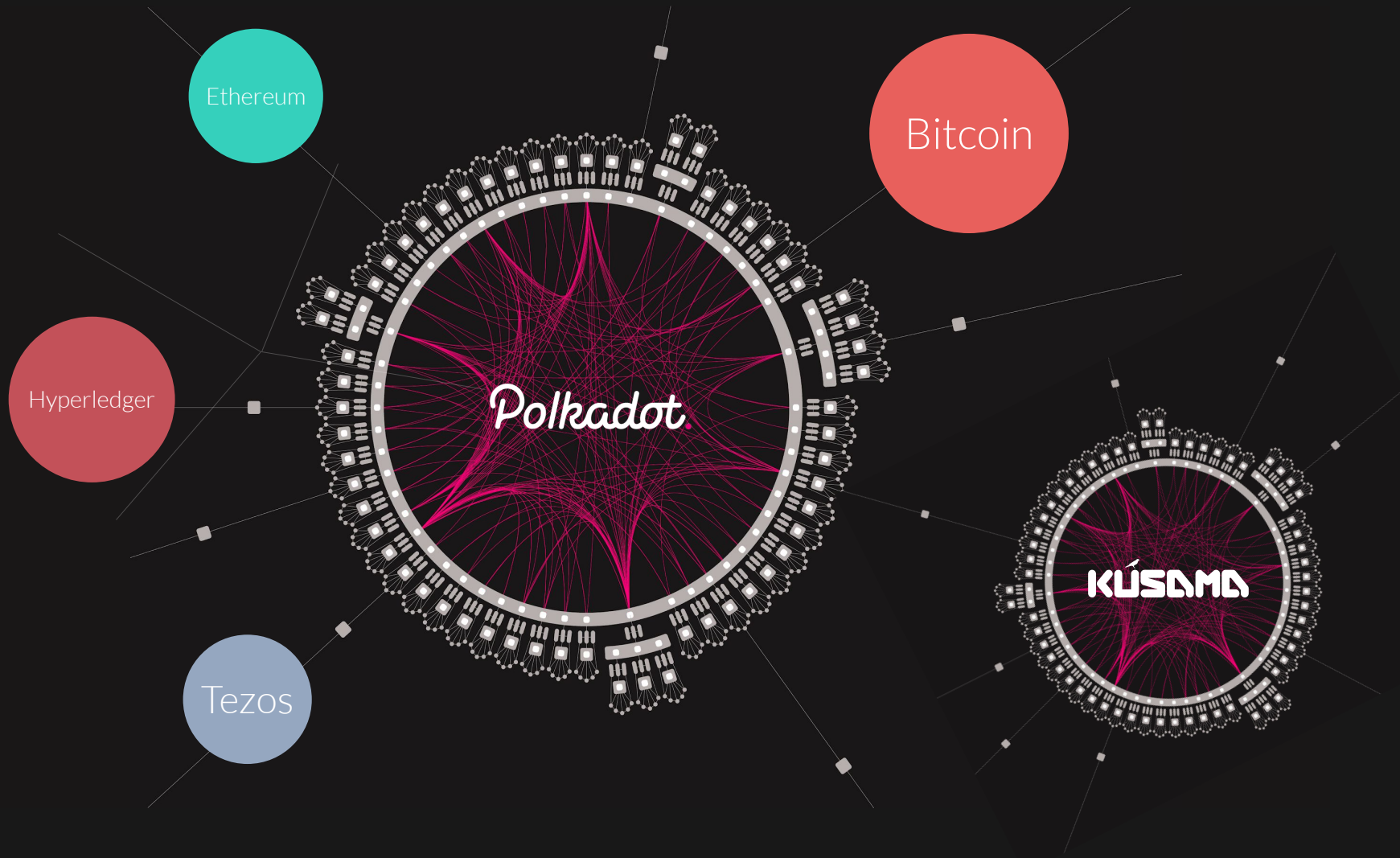
Polkadot connects a network of custom-built blockchains into one



Blockchains are custom-built on Polkadot for specific uses

Example custom blockchains: IOT, finance, insurance, gaming, music, identity, government, data storage

Polkadot also uses bridges to connect to legacy networks and Polkadot's cousin network, Kusama



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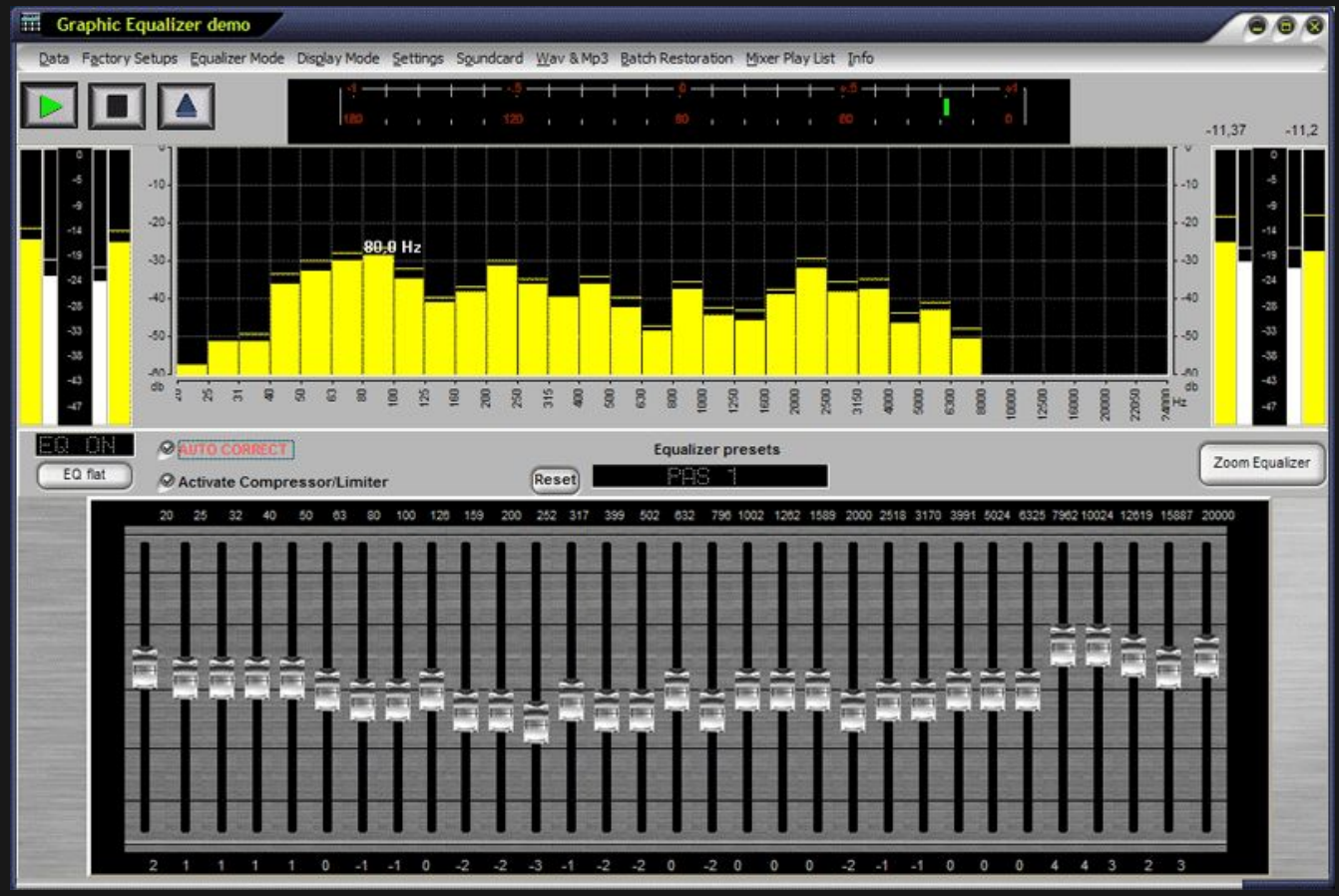
Customization

Blockchains on Polkadot are custom-built and optimized for specific uses, like a producer would use a music equalizer

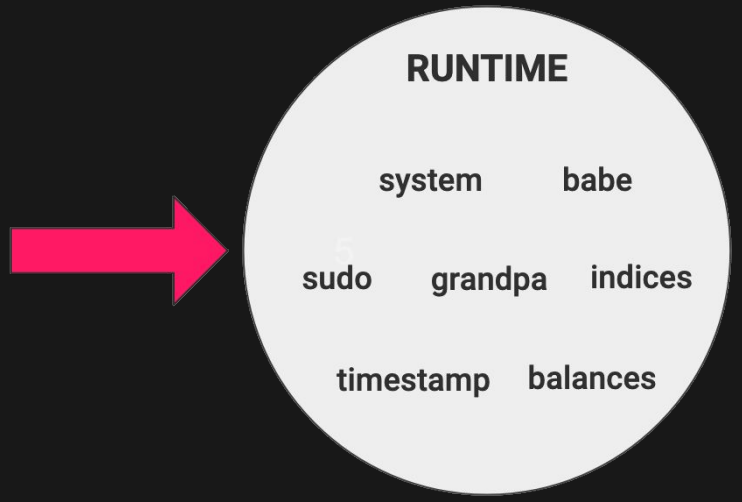


Customization

Blockchains on Polkadot are custom-built and optimized for specific uses with a tool called Substrate

Polkadot.

Substrate FRAME Pallets			
assets	babe	balances	collective
contract	democracy	elections	grandpa
indices	grandpa	indices	membership
offences	session	staking	sudo
system	timestamp	treasury	and more...



*Check out the new substrate.io website for info and tutorials on Substrate

Polkadot.

Connects networks together

Handles heavy traffic at scale

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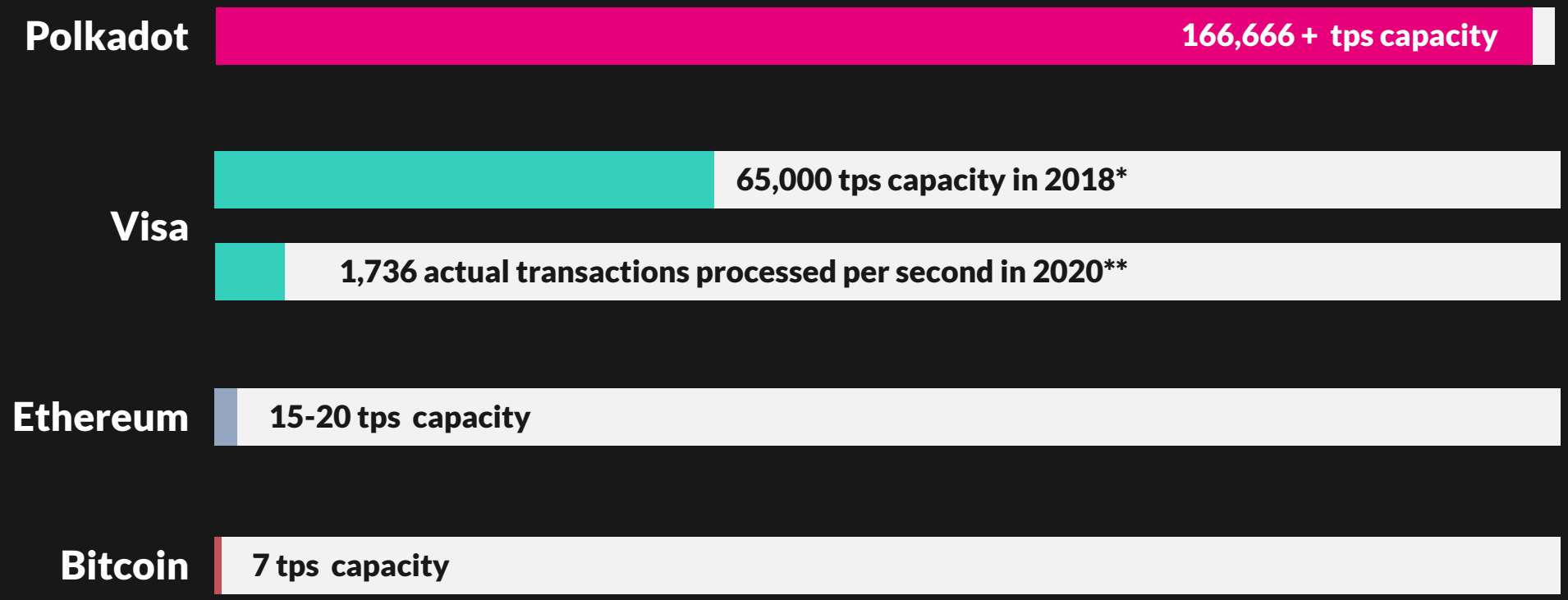
Polkadot handles transactions at the scale of global commerce

Polkadot.



*https://usa.visa.com/dam/VCOM/download/corporate/media/visanet-technology/aboutvisafactsheet.pdf
**https://usa.visa.com/run-your-business/small-business-tools/retail.html

Polkadot.

Connects networks together

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Self-upgrades allowing it to be future-proof

Blockchain governance

Polkadot.

1. No governance
2. One person or small group decides on the network's future
3. The community proposes and votes on decisions that impact the network's future

Polkadot's novel governance system puts decisions on the network's future in the hands of users instead of an individual

Polkadot.

DOT holders can contribute to the future of Polkadot in several ways

Propose a public referendum	Prioritize public referenda	Vote on all active referenda	Vote for council members	Become a council member

Polkadot.

Connects networks together

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Industry-leading security

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Self-upgrades allowing it to be future-proof

Polkadot makes security easy for new blockchain teams by allowing them to **plug right into** an existing security system...

Polkadot.

...and focus on what they do best, **coding.**

Polkadot.

Connects networks together

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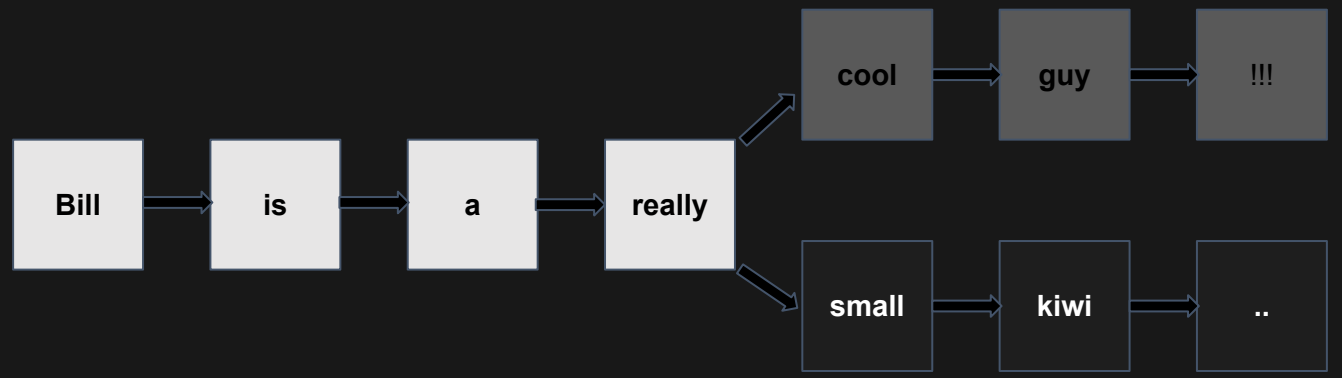
Polkadot.

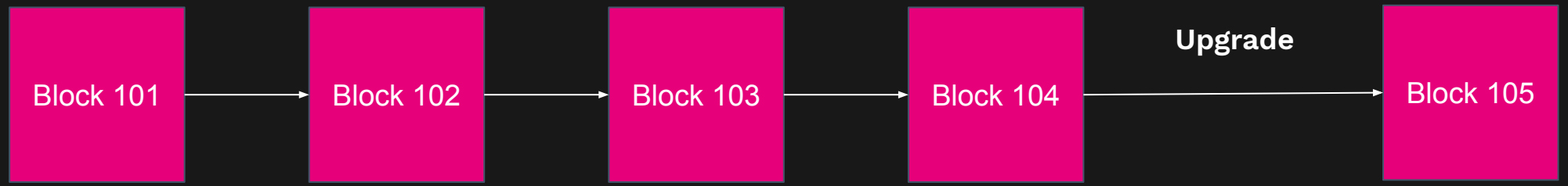
Future-proof

Polkadot can easily upgrade its entire network without splitting the community and splitting the chain

Polkadot

Legacy blockchain upgrades





Polkadot.

A world built on Polkadot

Polkadot.

Tech that Connected Internet Networks

Application Layer

Facebook, Email, Chrome Browser, YouTube

TCP/IP **SMTP** **HTTP** **BROWSER**

Tech Connecting Distributed Networks in Web 3.0

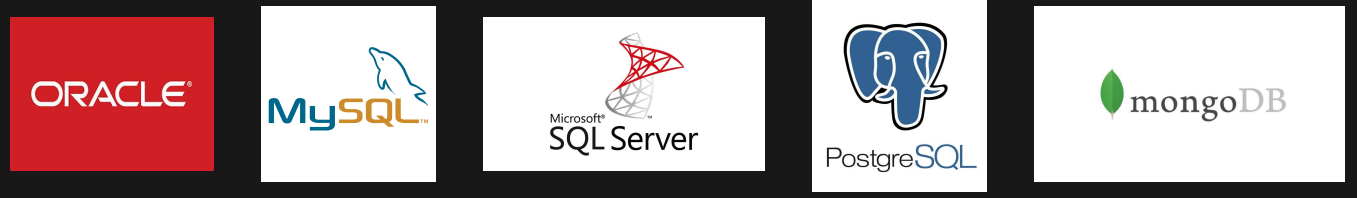
Application Layer

SubSocial (decentralized social networking), Acala (decentralized finance & trading), Brave Browser

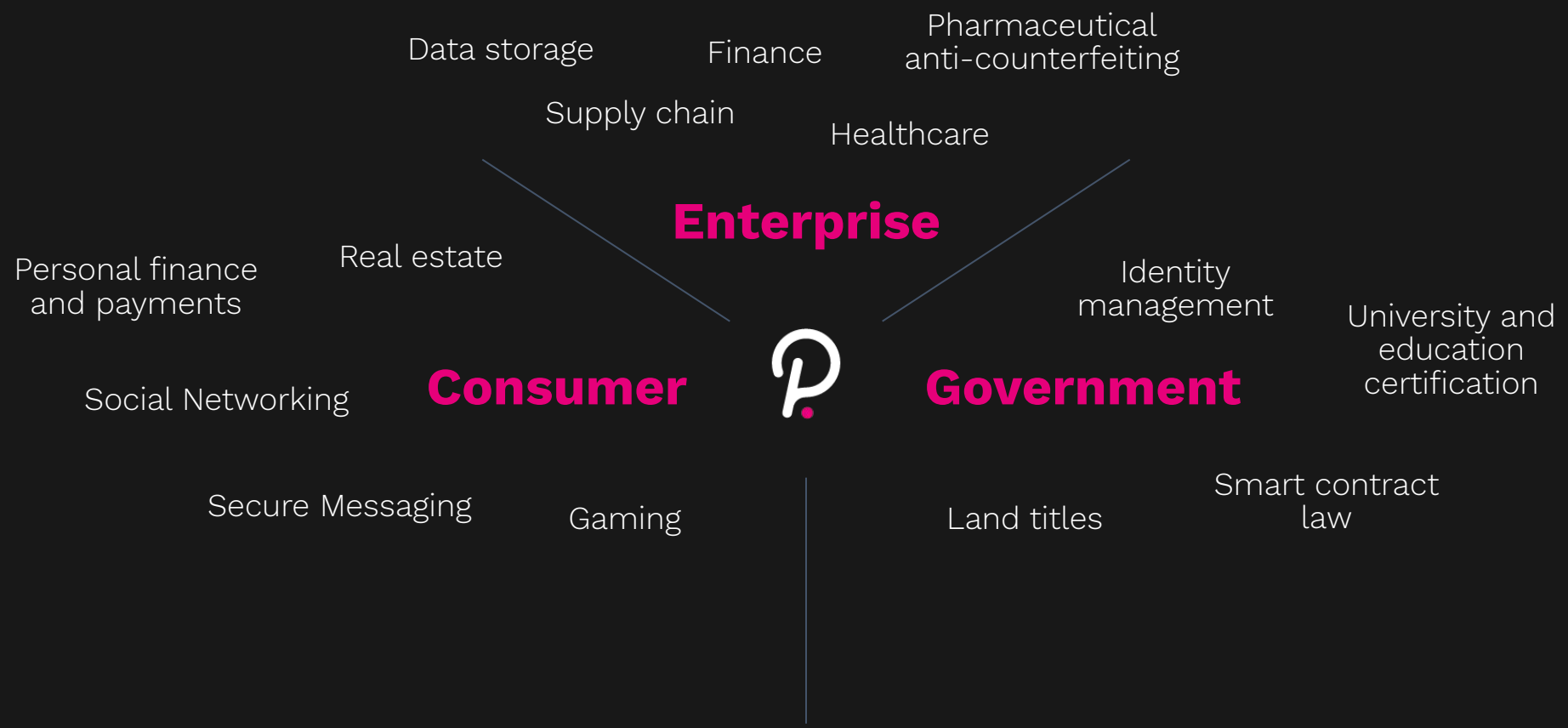
SUBSTRATE **POLKADOT CONSENSUS** **CROSS CHAIN MESSAGE PASSING** **BRIDGES**

Just like with databases, end users shouldn't notice their app uses a blockchain

Polkadot.



A world built on Polkadot



web3 foundation

Polkadot.

Web3 Foundation Grant Recipients

100 projects 83 Teams 24 New Chains

- Bridging
- Communication
- Finance
- Gaming
- Identity
- Interface
- IoT
- Privacy
- Robotics
- Scaling
- Social Networking
- Storage
- Supply Chain
- Tooling and Technical improvements
- Wallets

Thank you

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