REDISCOVER THE MEANING OF

TECHNOLOGY

plain concepts

Dev Day: Más que Código

28.03.2019

Agenda

9:30	Cómo petarlo con Blockchain en 45'
10:15	Derribando la torre de marfil
11:00	CAFÉ Y NETWORKING
11:30	Kubernetes 101
12:15	Desplegar en la nube y no morir en el intento
13:00	Depende ¿de qué depende?

plain concepts

plain concepts

Dev Day:
Más que Código

28.03.2019

Cómo petarlo con Blockchain en 45’

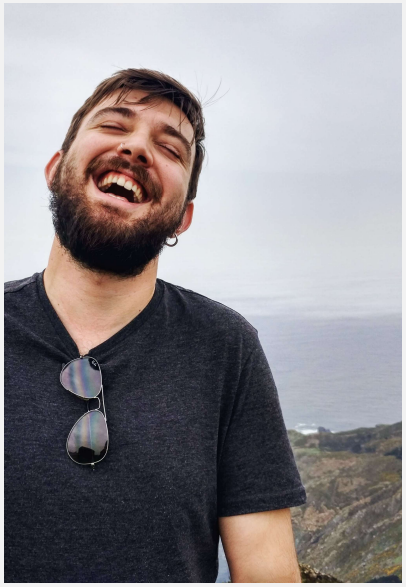
David Gómez y Anxo Fole

Software Development Engineers

David Gómez

Software development engineer

@davidgooomez



Anxo Fole

Software development engineer

¿Qué es Blockchain?

Libro mayor de cuentas o Ledger

Blockchain

Ethereum

Vitalik Buterin

Año 2015

Satoshi Nakamoto

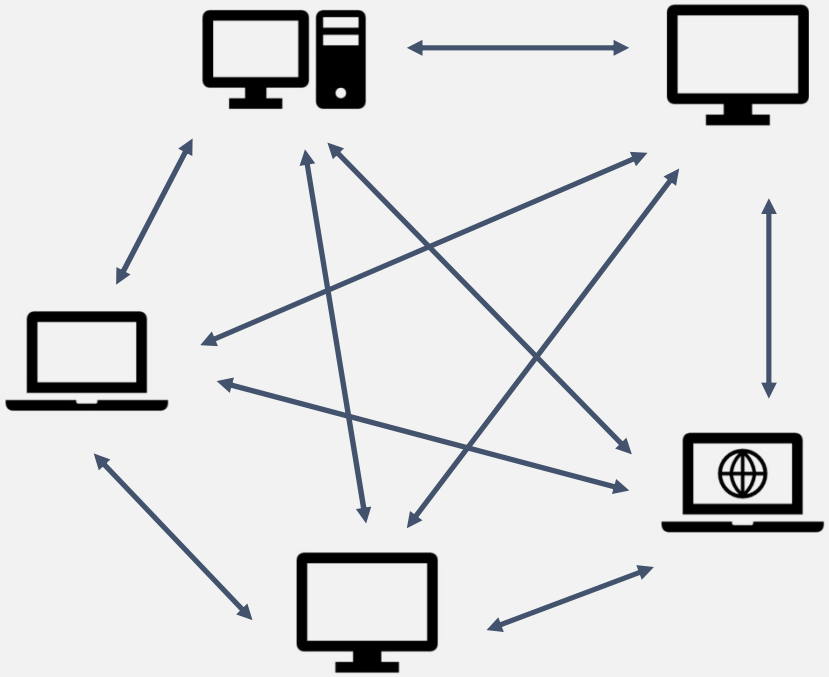
2009

¿Características?

Peer to Peer

Blockchain

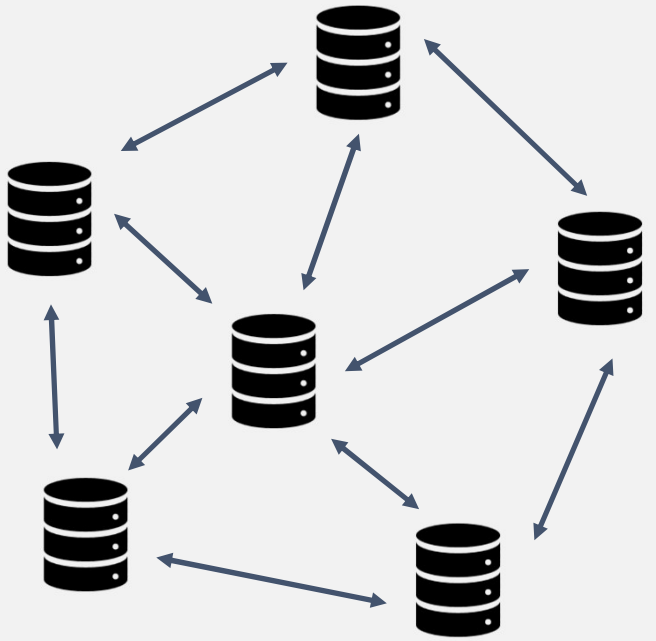
- Todos los nodos son iguales.
- Se puede cambiar de rol.
- La información es compartida.
- Un ejemplo de esto es Bittorrent.



Distribuido

Blockchain

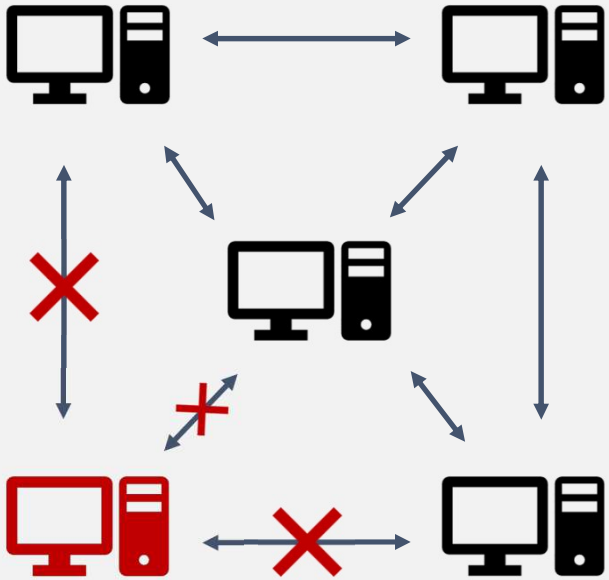
- Todos los usuarios tienen una copia exacta.
- Es infalsificable, los demás nodos repudiarán al nodo corrupto.
- Alta disponibilidad, ya que todos los nodos contienen una copia.
- Si alguno de los nodos falla, se puede acceder a los datos sin problemas.



Descentralizado

Blockchain

- No hay nodo central.
- El poder queda repartido entre todos los nodos. (**Algoritmo de consenso**)
- Todo cambio debe ser reconocido por la mayoría de los usuarios.



Inmutable

Blockchain

- **No** se puede **editar, ni eliminar** contenido.
- Es un sistema **infalsificable.**
- Beneficioso para **auditorías.**

La cadena de bloques y como se consigue la consistencia de datos

Antes un poco de critografía

Blockchain

Las funciones de Hashing convierten cualquier dato de entrada a un **Hash**

Hash("Hola mundo") =>

CA8F60B2CC7F05837D98B208B57FB6481553FC5F1219D59618FD025002A66F5C

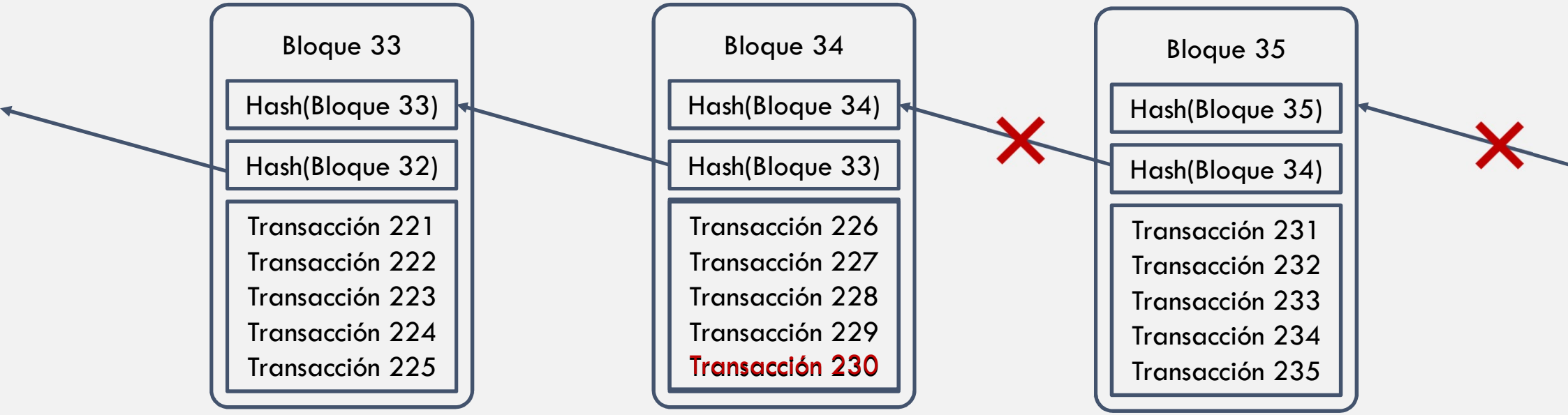
Hash("Hola mundo!") =>

1E479F4D871E59E9054AAD62105A259726801D5F494ACBFCD40591C82F9B3136

Un Hash **no es revertible**

La cadena de bloques

Blockchain



Usuarios

Blockchain

Desarrolladores

Usuarios

Mineros

¿Cómo se ponen de acuerdo?

Algoritmo de **consenso** = **Proof of Work**

- Los mineros usan todo el **poder computacional de trabajo** para ganar la competición.
- Ethereum se encuentra en migración a **Proof of Stake**.

¿Cómo se resuelve el algoritmo de consenso?

Hash (contenido del bloque + **N.º Nonce**) < dificultad objetivo

Modificar el **N.º Nonce** continuamente

Recompensa de minado

Cantidad Fija

Bitcoin : 12.5 Bitcoins

Ethereum : 3 Ethers

Gas = **Comisiones** cobradas a los usuarios.

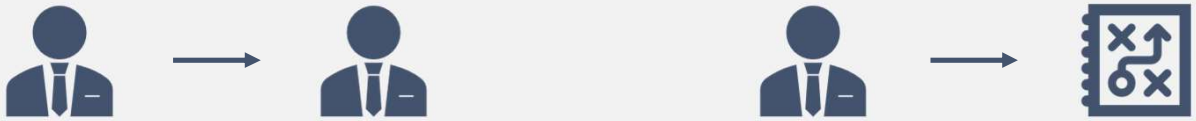
Tiempo de minado de los bloques

- Existe un tiempo **por defecto** para generar nuevos bloques.
  - **Bitcoin:** 10'
  - **Ethereum:** 15"

Transacciones en Ethereum

Blockchain

- Cada usuario tiene un identificador que representa su cuenta.
- El dueño de una cuenta tiene una clave privada con el que firma.
- Formato de una transacción:



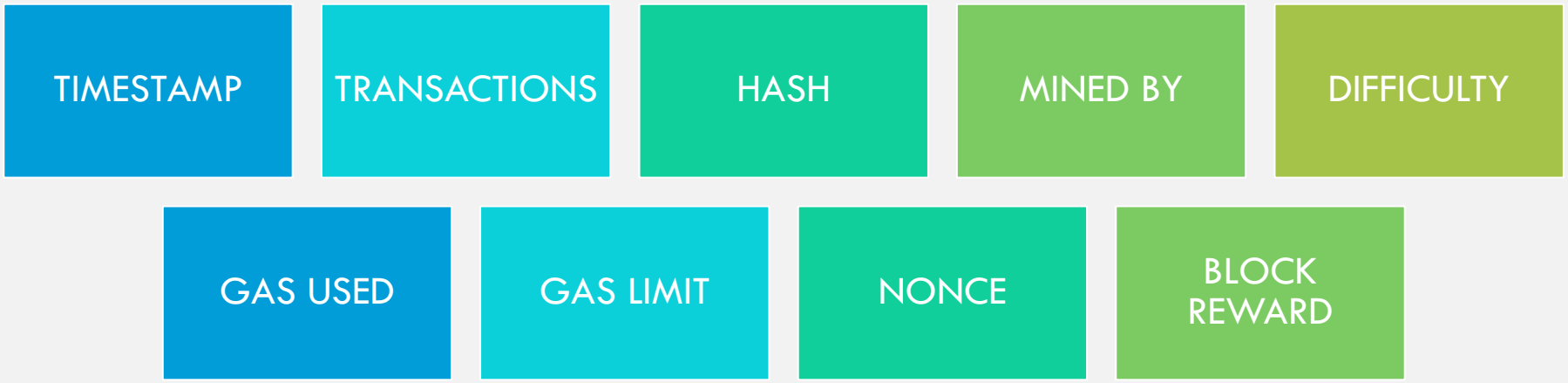
Transacción en Ethereum

Blockchain

FROM	TO	VALUE	TxHASH	TIMESTAMP
BLOCK	GAS LIMIT	GAS USED	GAS PRICE	INPUT DATA

Bloque Ethereum

Blockchain



Smart Contracts

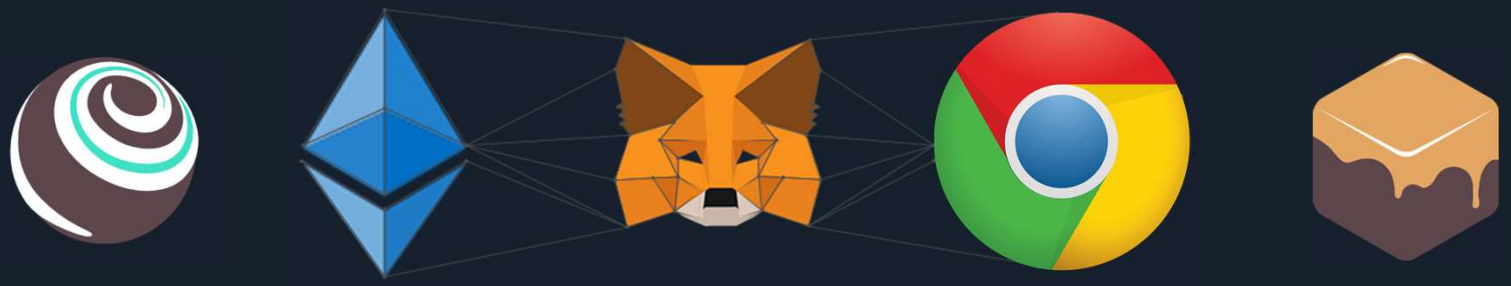
Blockchain

- **Acuerdo** entre 2 o más partes.
- **Programa** almacenado en la cadena de bloques.
- Ahorrar en **(Intermediarios + tiempo + dinero).**
- Capaz de ejecutarse y hacerse cumplir de manera autónoma.
- No se puede modificar
- No se puede mal interpretrar ya que es código.

Desarrollo de Smart Contracts

- **Solidity**
- **Capacidades adicionales**
- Compila a **ByteCode**. Al enviarlo a la cadena de bloques creamos una **instancia**.
- La red Ethereum contiene la **EVM** (Ethereum Virtual Machine).

¿Qué vamos a usar?



Truffle Solidity Metamask Google Ganache

Real Estate Agency

Real Estate Agency

Blockchain

Inmobiliaria

Finalizar alquiler

Ver ganancias

Transferir ganancias

Arrendatario

Alquilar piso

Pagar la renta

Vamos al código

50+ BLOCKCHAIN
REAL WORLD USES CASES

GOVERNMENT
Essentia develops world's first blockchain solution to manage international logistics hub together with Traffic Labs and the Finnish Government

essentia.one

IDENTIFICATION
Voter registration is being facilitated via a blockchain project in Switzerland spearheaded by **Uport**.

uport

MOBILE PAYMENTS
The blockchain ledger that **Ripple** uses has been latched onto by a group of Japanese banks, who will be using it for quick mobile payments.

ripple

INSURANCE
A smart contract-based blockchain is being used by Insurer **American International Group Inc** as a means of saving costs and increasing transparency.

AIG

ENDANGERED SPECIES PROTECTION
The protection of endangered species is being facilitated via a blockchain project that records the activities of these rare animals.

CARBON OFFSETS
IBM is using the Hyperledger Fabric blockchain in China to monitor carbon offset trading.

IBM HYPERLEDGER

ENTERPRISE
Ethereum's blockchain can be accessed as a cloud-based service courtesy of **Microsoft Azure.**

Microsoft Azure

BORDER CONTROL
Essentia has devised a border control system that would use blockchain to store passenger data in the Netherlands.

essentia.one

SUPPLY CHAINS
IBM and **Walmart** have partnered in China to create a blockchain project that will monitor food safety.

IBM Walmart

HEALTHCARE
A number of healthcare systems that store data on the blockchain have been pioneered including **MedRec.**

MEDREC

SHIPPING
Shipping is a natural fit for blockchain, and **Maersk** have been trialling a blockchainbased project within the maritime logistics industry.

MÆRSK

REAL ESTATE
Blockchain is now being used to complete real estate deals, the first of which was conducted in Kiev by **Propy**.

PROPY

ENERGY
Essentia is developing a test project that will help energy suppliers track the distribution of their resources in real time, whilst maintaining data confidentiality.

essentia.one

LAND REGISTRY
Land registry titles are now being stored on the blockchain in Georgia in a project developed by the **National Agency of Public Registry**.

NATIONAL AGENCY of PUBLIC REGISTRY

COMPUTATION
Digital Currency Group are helping Amazon Web Services examine ways in which the distributed ledger technology can help improve database security.

DIGITAL CURRENCY GROUP

ADVERTISING
New York Interactive Advertising Exchange has been experimen- ting with blockchain as a means of providing an ads marketplace for publishers.

NYIAX

BORDER CONTROL
Essentia is developing a blockchain project for border control that will allow customs agents to record passenger data from an array of inputs and safely store it.

essentia.one

JOURNALISM
Decentralized journalism, as enabled by blockchain technology, has the potential to prevent censorship and increase transparency, as **Civil** has shown.

CIVIL

WASTE MANAGEMENT
Waltonchain is using **RFID** technology to store waste management data on the blockchain in China.

ENERGY
Food importation is another industry where blockchain is proving its worth, with **Louis Dreyfus Co** trialling a soybean importation operation using this technology.

LDC. Louis Dreyfus Company

DIAMONDS
The **De Beers Group** is using blockchain to track the importation and sale of diamonds.

De Beers Group of Companies

FINE ART
By storing **certificates** of authenticity on the blockchain, it's possible to dramatically reduce art forgeries, as one blockchain project is proving.

NATIONAL SECURITY
For the past two years, the **US Department of Homeland Security** has been using blockchain to record and safely store data captured from its security cameras.

TOURISM
In a bid to boost its tourism economy, **Hawaii** is examining ways in which blockchain-based cryptocurrencies can be adopted throughout the US state.

TAXATION
In China, a tax-based initiative is using blockchain to store tax records and electronic invoices led by **Miaocai Network**.

ENERGY
Chile's National Energy Commission has started using blockchain technology as a way of certifying data pertaining to the country's energy usage as it seeks to update its electrical infrastructure.

CNE COMISIÓN NACIONAL DE ENERGÍA

RAILWAYS
Russian rail operator **Novotrans** is storing inventory data on a blockchain pertaining to repair requests and rolling stock

дружовая компания НОВОТРАНС

ENTERPRISE
Google is building its own blockchain which will be integrated into its cloud-based services, enabling businesses to store data on it, and to request their own white label version developed by **Alphabet Inc**

Google Alphabet

MUSIC
Arbit is a blockchain-based project led by former Guns N Roses drummer Matt Sorum seeking a fairer way to reward musicians for their creative efforts.

arbit

FISHING
Blockchain technology has been used to provide a transparent record of where fish was caught, as a means of ensuring it was legally landed.

¡MUCHAS GRACIAS!

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