





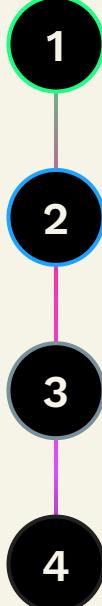
# Commons



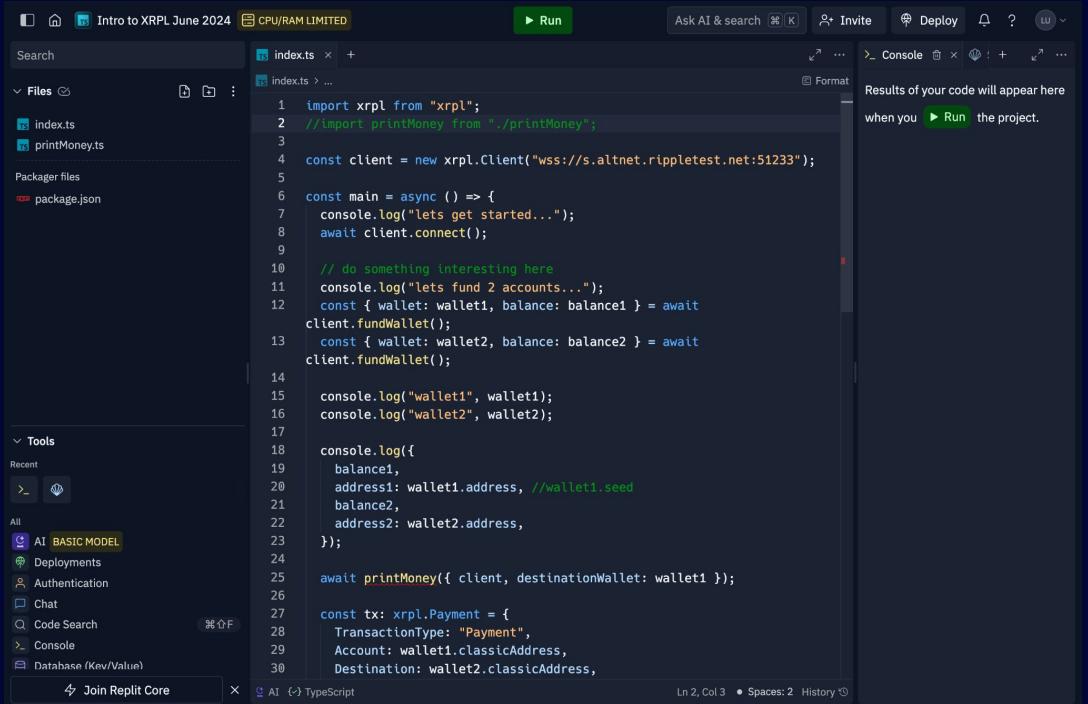
# Introduction to Blockchain and XRPL IE Tech Venture Bootcamp

October 4th 2024

# Agenda

- 
- 1 XRPL Commons
  - 2 Key Blockchain Concepts
  - 3 XRP Ledger
  - 4 Resources

# replit.com



The screenshot shows the Replit IDE interface. The main area is a code editor with the following TypeScript code:

```
import xrpl from "xrpl";
//import printMoney from "./printMoney";

const client = new xrpl.Client("wss://s.altnet.rippletest.net:51233");

const main = async () => {
    console.log("lets get started...");
    await client.connect();

    // do something interesting here
    console.log("lets fund 2 accounts...");
    const { wallet: wallet1, balance: balance1 } = await client.fundWallet();
    const { wallet: wallet2, balance: balance2 } = await client.fundWallet();

    console.log("wallet1", wallet1);
    console.log("wallet2", wallet2);

    console.log({
        balance1,
        address1: wallet1.address, //wallet1.seed
        balance2,
        address2: wallet2.address,
    });

    await printMoney({ client, destinationWallet: wallet1 });

    const tx: xrpl.Payment = {
        TransactionType: "Payment",
        Account: wallet1.classicAddress,
        Destination: wallet2.classicAddress,
    }
}
```

The interface includes a sidebar with a file browser showing `index.ts` and `printMoney.ts`, and a tools section with options like AI, Deployments, Authentication, Chat, Code Search, Console, and Database (Key/Value). The bottom status bar indicates "Ln 2, Col 3 • Spaces: 2 History".



# XRPL Commons



**Our mission is to create the  
conditions of success for  
entrepreneurs and developers to  
thrive in the XRPL ecosystem.**

# We provide support to the XRPL community.



Learn



Build



Adopt



Engage



# Learn

The learning curve to Blockchain is steep. It's better to be supported whether you have tech or business roles.

**Academic  
partnerships**

**Learning resources**

**Trainings for  
students &  
instructors**

**Research**



# Build

Our in-house residency and hackathons offer builders a playground for invention.

## The Aquarium



## Hackathons



# Adopt

Blockchain integration for corporations and large institutions with tailored support and resources.

## Workshops & Summits

## Corporate Developers Trainings

## Corporate & Institutional Partnerships



# Engage

Meetups, podcasts, our Community Magazine, and news on our socials unite the XRPL ecosystem.

**XRPL Meetups**  
**Podcasts**  
**Community Magazine**  
**News**

# Find out more



🔗 <https://xrpl-commons.org>



Learn Build Engage

XRP Ledger Apex is back in Amsterdam

Register Now

We're creating the conditions  
for success for entrepreneurs  
and developers to thrive in the  
XRPL ecosystem.

PARTICIPATE IN OUR NEXT TRAINING SESSIONS & HACKATHONS!

Get in touch



**Hey Luc,  
Nice to meet you!**

# What is a blockchain?

**Raise your hand if  
you have a wallet**

# A Definition

# A blockchain is...

A **shared** Database

It coordinates Heterogeneous Actors

Key concepts:

- **Immutable**
- **Distributed**
- **Decentralized**

# An immutable data store

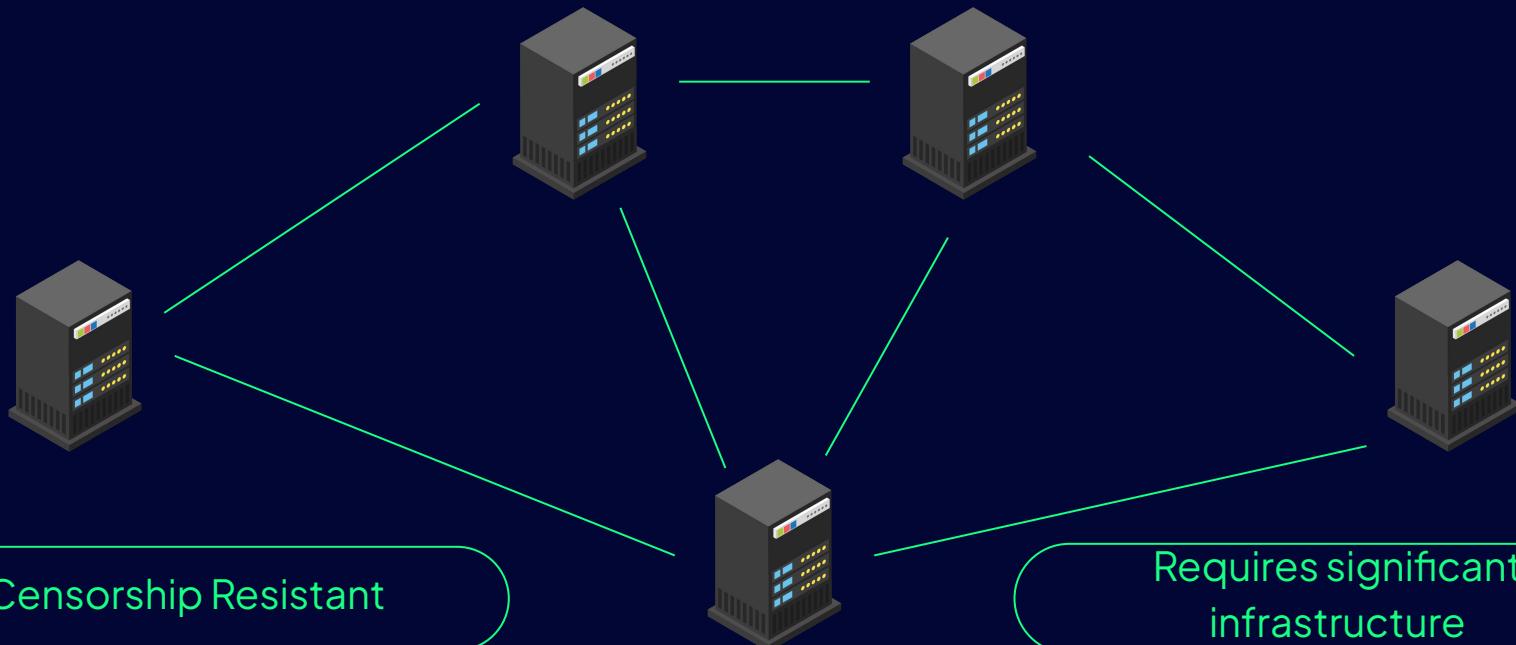
The ledger is immutable

**Write Once**

**Read Forever**

Data is tamper-proof

# Distributed



## 2. Key Concepts



# Decentralized

Users agree **beforehand** on the rules used to establish the truth via **the consensus mechanism**.



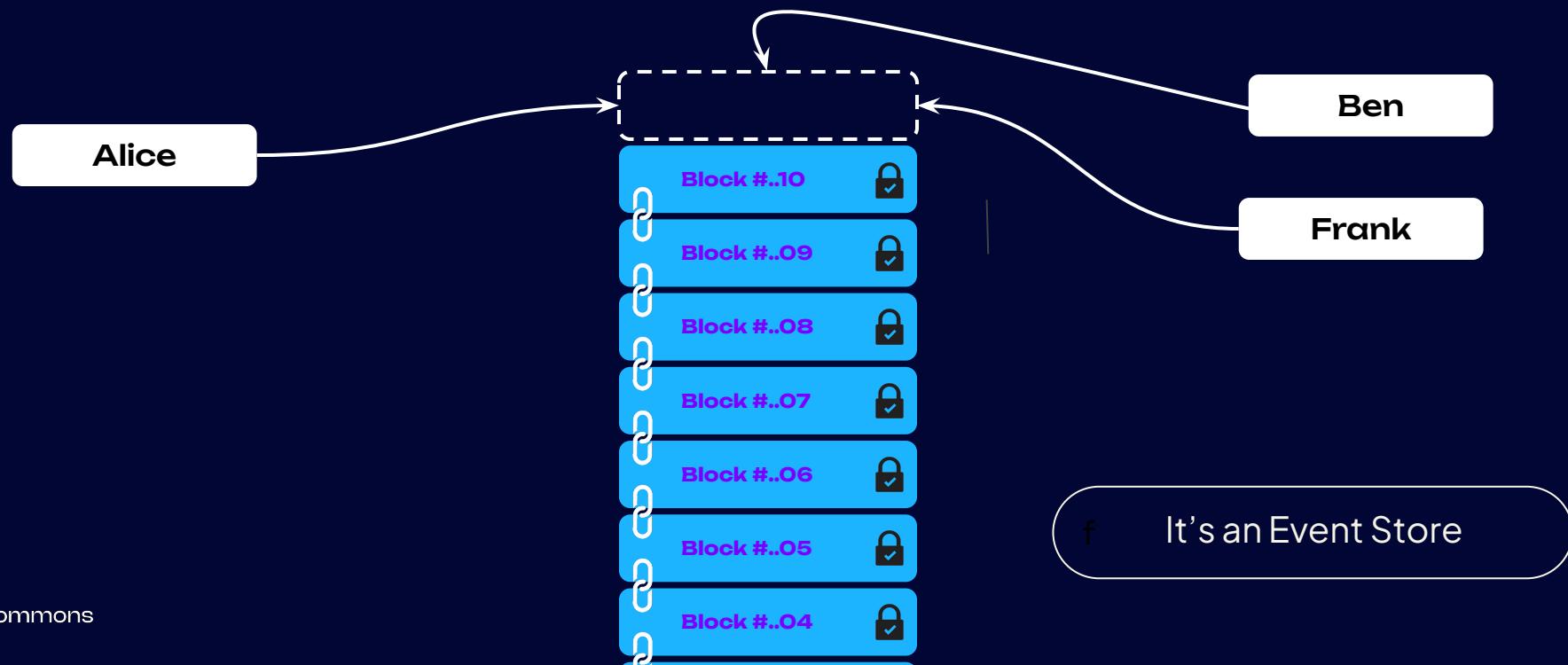
## Types of consensus mechanisms

- Proof of Work (PoW)
- Proof of Stake (PoS)
- Delegated Proof of Stake (DPoS)
- Proof of Importance (PoI)
- Proof of Capacity (PoC)
- The Proof of Elapsed Time (PoET)
- Hybrid Proof of Activity (PoA)
- Proof of Authority (PoA)
- **Proof of Association (PoA)**

## 2. Key Concepts

# A database

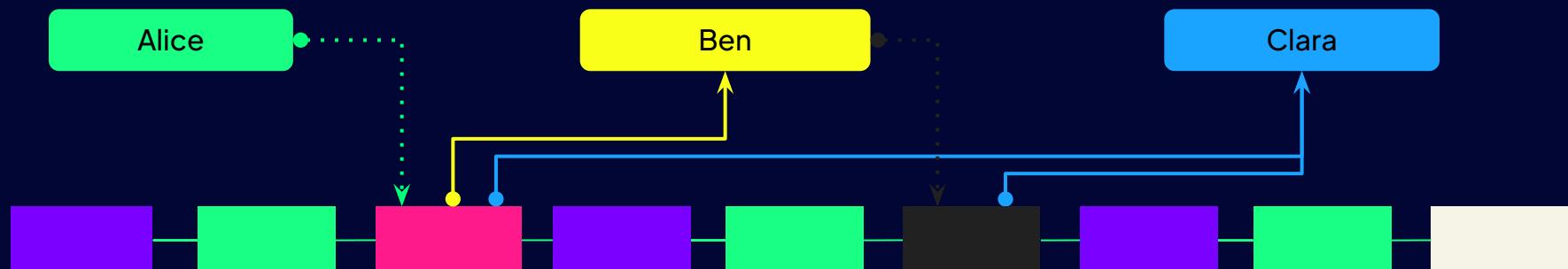
Data is written sequentially



# Coordinating Heterogeneous Actors

Different profiles, outside your circle of trust or outside your control

- Clients
  - Competitors
  - Suppliers
  - Etc...
- Everyone is one hop away to read or write to the blockchain making it easy for all to sync
  - Coordination happens in the open



An  
**Immutable, Distributed  
Decentralized  
Database  
Coordinating  
Heterogeneous Actors**

# Not Everything should be built on Blockchain!

## Limits include:

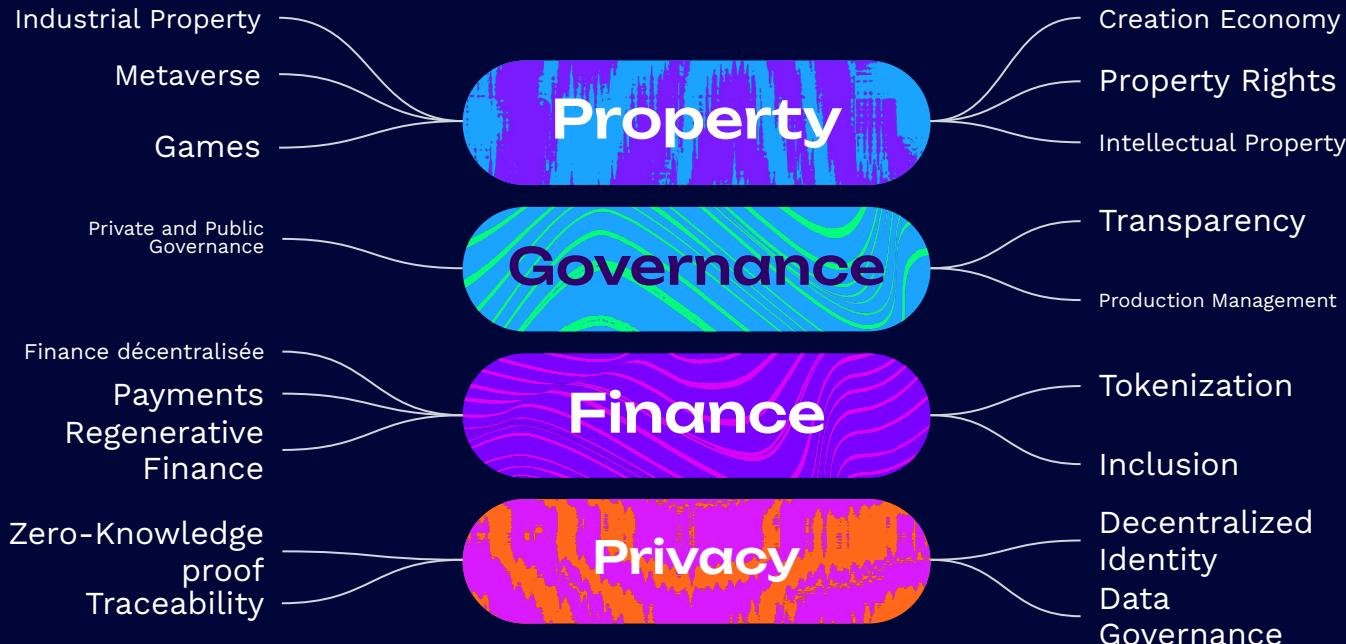
- Speed
- Cost
- Limited Storage

## Ideal for:

- Community based services
- Decentralized marketplaces

## 2. Key Concepts

### Many use cases



# Any questions?

# Concepts clés de la Blockchain: Pour aller plus loin

# Private

Invitation only

Companies and consortiums

# Public

Anyone can join

Public services, governance,  
audits, proof of authenticity

# A hash is a function that gives a unique fixed size output for any input

Plain text

“Learning center”

Hashed text

8aa82d8799d716e7fb890589124aeef6  
8d2172f3a24f6ed3e8209d4b06e2c15

“University training”

2ca74c87d6c7cf47e6f0205f43f302d59  
5f3a106231d6fb6aadbd7f672296419

SHA-256

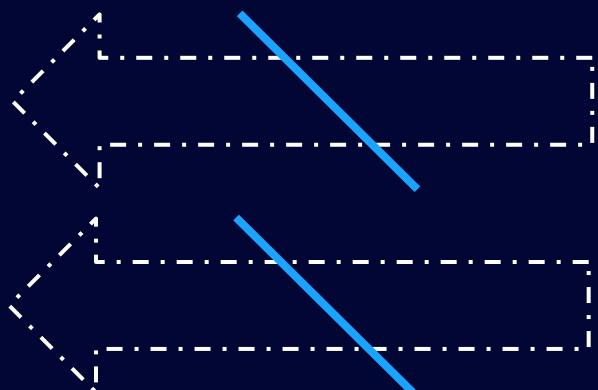
SHA-256

# Hashing is deterministic and only one-way

## Plain text

“Learning center”

“University training”



## Hashed text

8aa82d8799d716e7fdb890589124aeef6  
8d2172f3a24f6ed3e8209d4b06e2c15

2ca74c87d6c7cf47e6f0205f43f302d59  
5f3a106231d6fb6aadbd7f672296419

## 2. Key Concepts



# Blocks are ledgers that contain information from the previous block

Block 1

## Block 0 Hash

Alice sends X to Bob  
Charlie sends Y to David  
Bob sends Z to Alice

Block 1 Hash

Block 2 contains the hash of Block 1

## Block 1 Hash

David sends X to Charlie  
Bob sends Y to David  
Charlie sends Z to Alice

Block 2 Hash

## Block 2 Hash

David sends X to Charlie  
Bob sends Y to David  
Charlie sends Z to Alice

Block 3 Hash

# The chain of blocks is called a blockchain



## 2. Key Concepts

# Un registre blockchain en action

Plus de 80 M de registres XRPL

80728702

AB4782

TOTAL: 105  
UNL: 32/35

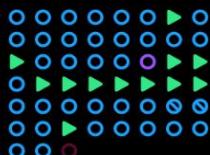


 Commons

80728701

11:29:22 AM

TXN COUNT: 51  
FEES: × 0.003822



924701



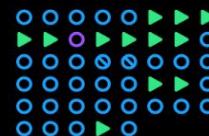
TOTAL: 108  
UNL: 34/35



80728700

11:29:21 AM

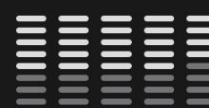
TXN COUNT: 45  
FEES: × 0.003622



BBA286



TOTAL: 108  
UNL: 34/35



80728699

11:29:20 AM

TXN COUNT: 34  
FEES: × 0.100522



0DBEAD



TOTAL: 108  
UNL: 34/35



80728698

11:29:11 AM

TXN COUNT: 38  
FEES: × 0.002932



9ACA8C



TOTAL: 108  
UNL: 34/35



807

11:29

TXN COUNT:  
FEES:



93

TOTAL:  
UNL:



# How to write on the blockchain

Public Key Cryptography (PKC) leverages **public keys** & **private keys** which are the cornerstones of the **digital identity** and the **proof system**



Public key (the address)

Used to encrypt information destined to the holder & to verify signatures



Private key (the password)

Used to decrypt messages encoded with the public key and to signs transactions

Digital signatures are unique to each transaction and are proofs of who created them

# Les jetons ou tokens

D'une part un jeton utilitaire, pour payer son droit de passage (les gas fees)

XRP

D'autre part les jetons représentant des biens digitaux :

**1. Fongibles**

(devises)

**2. Non Fongibles**

(NFT)

# La chaîne de preuve

## La signature permet de créer des preuves

Différents types de preuves :

- du monde physique (en utilisant des devices de mesures ou des oracles)
- dans le monde digital (NFTs)
- de process (algorithmiques, modèles IA)
- dérivées sur la blockchain

On parle de “**verified web**”

Sur la blockchain on peut donc raisonner à partir de **données vérifiées**.

# Les smart contracts

L'algorithme fait la loi



- On construit des contrats digitaux sur la blockchain
- Ils reposent sur un algorithme **reproductible** à un moment donné.
- On peut partir des données existantes sur la blockchain.
- Le résultat est écrit sur la blockchain.
- Il existe plusieurs implémentations.

# Blockchain et IA

## Deux technologies convergentes

### L'Intelligence artificielle :

- Détections statistiques
- Modèles prédictifs
- IA générative

### Apporte :

- Nouvelles interfaces
- Multimodalités

### La blockchain :

- Permet l'identification et l'audit des modèles
- Enregistre les preuves fournies par les modèles IA
- Permet l'interopérabilité des données

**Demain la blockchain permettra de coordonner un monde entre agents autonomes et humains.**

# Any questions?

# Le XRP Ledger

### 3. The XRP Ledger



# A brief history of blockchain



**1991- 2000**

Publication of work on  
cryptography & Merkle trees



**2004**

Hal Finney introduces a digital  
currency system to solve the  
double spending problem



**2008-2009**

Satoshi Nakamoto publishes a  
whitepaper on Distributed  
Blockchain. The first bitcoin block is  
mined by Satoshi



**2012**

Creation of the XRP Ledger



**2014-2016**

Vitalik Buterin creates the  
Ethereum network



**2017 - 2021**

Acceleration of DeFi, NFTs  
and Metaverse

**2024-onwards**

Bull market, Bitcoin and other  
cryptos reach all time high

### 3. The XRP Ledger

# Bitcoin

2008-2009

La concrétisation  
d'une idéologie



The Satoshi sculpture in Budapest

# Les limites du Bitcoin

Top c: Bitcoin without mining (Read 13555 times)

 Bitcoin without mining  
May 27, 2011, 03:44:53 PM #1

So I've been thinking...  
mining seems like such an unfortunate side effect of the system since it is so wasteful. It will be a bit obscene how much will be spent mining if the network ever gets large. It would be cool to come up with a bitcoin that doesn't need miners.

There are several issues but I'll ignore how coins are distributed and focus on the central problem of creating some way to trust the central ledger\*. Currently this is what mining solves. The network trusts the ledger with the most mining done on it. So now to trust bitcoin you have to trust that >50% of the current mining power is "good". And actually the way the network has evolved with pools we are actually trusting that every large pool operator is "good" since even if the pool isn't over 50% the operator could have non-pool mining going on bringing the total over 50% or two pools could collude to defraud the network etc. Also if say some government decides to wreck the network it wouldn't be that expensive for them to do so. (This is all discussed in other threads so no need to go into this here) My point is that although the current network uses mining as a way to solve the trust issue it really doesn't since you still must trust the large pool operators.

My idea is to make this issue of trust explicit.

Let's say a **node** has a public key that the client generates for them. There is no connection between this key and a wallet key. It just allows you to be sure you are talking to the node you think you are.

So when you run a node you choose which other nodes you trust. So you could say "I trust my 3 friends' nodes, Gavin's node, and these 5 businesses' nodes." This trust just means that you believe these people will never participate in a double spend attack or otherwise manipulate the ledger. The ledger would basically be like the current bitcoin block chain but it would also have a list of what nodes believe the current ledger to be valid. <hash of current ledger signed by node's public key> (This list doesn't have to be complete. Nodes can just collect this list as needed. They could even just ask the nodes they trust if they think the current ledger is valid since those are the only ones they care about)

Transactions are still sent to all nodes connected to the network. There would be a network wide timestamp. Transactions would only be accepted if they were within a certain time period of the network timestamp. So you would need to wait maybe 10min before you could fully trust a given transaction. After this waiting period you could be sure those coins weren't double spent.

If a node ever encounters two conflicting ledgers it would just go with the one that was validated by more nodes that it trusts.

So there should always be a consensus among the trusted members of the network.

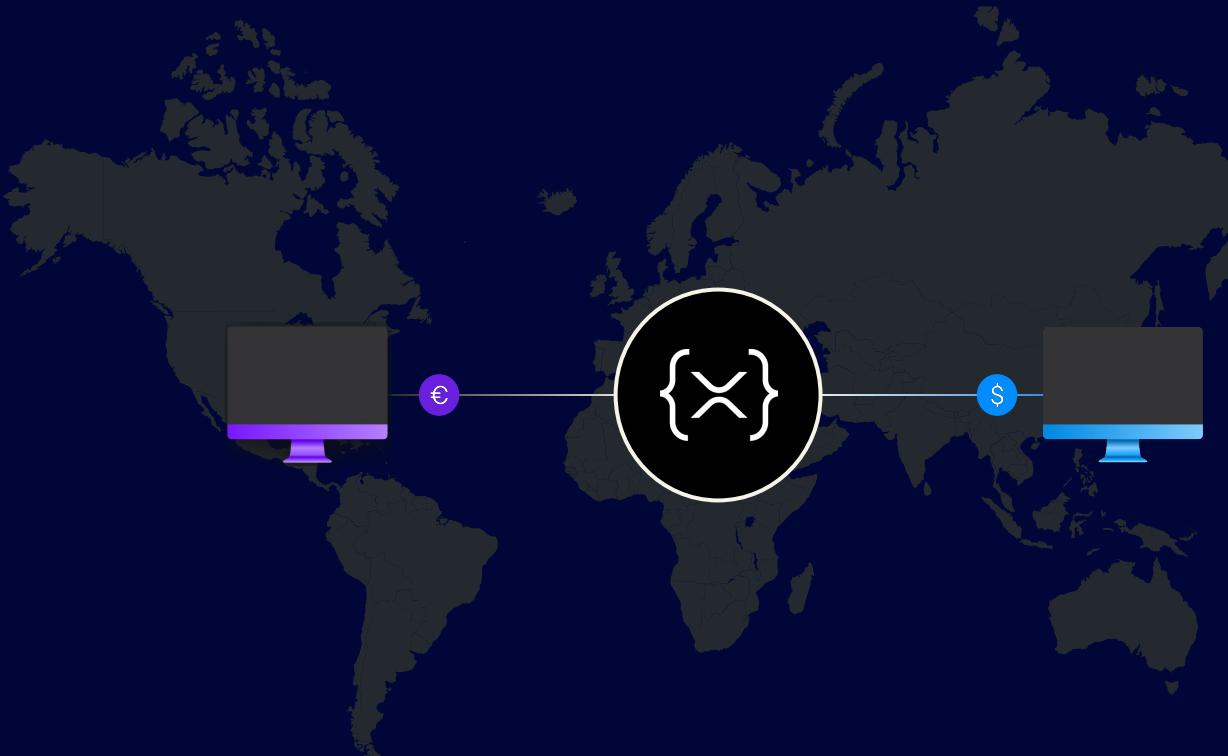
There would be a way to look up particular nodes in the network and ask them questions. (I'm imagining this whole thing running on Kademlia, a DHT)

## 3. The XRP Ledger

# XRP Ledger

2012

Spécialisée dans les cas d'usages financiers, spécialement pour les paiements



3. The XRP Ledger

# Ethereum

2014–2016

Smart contracts et dApps  
“Code is law”

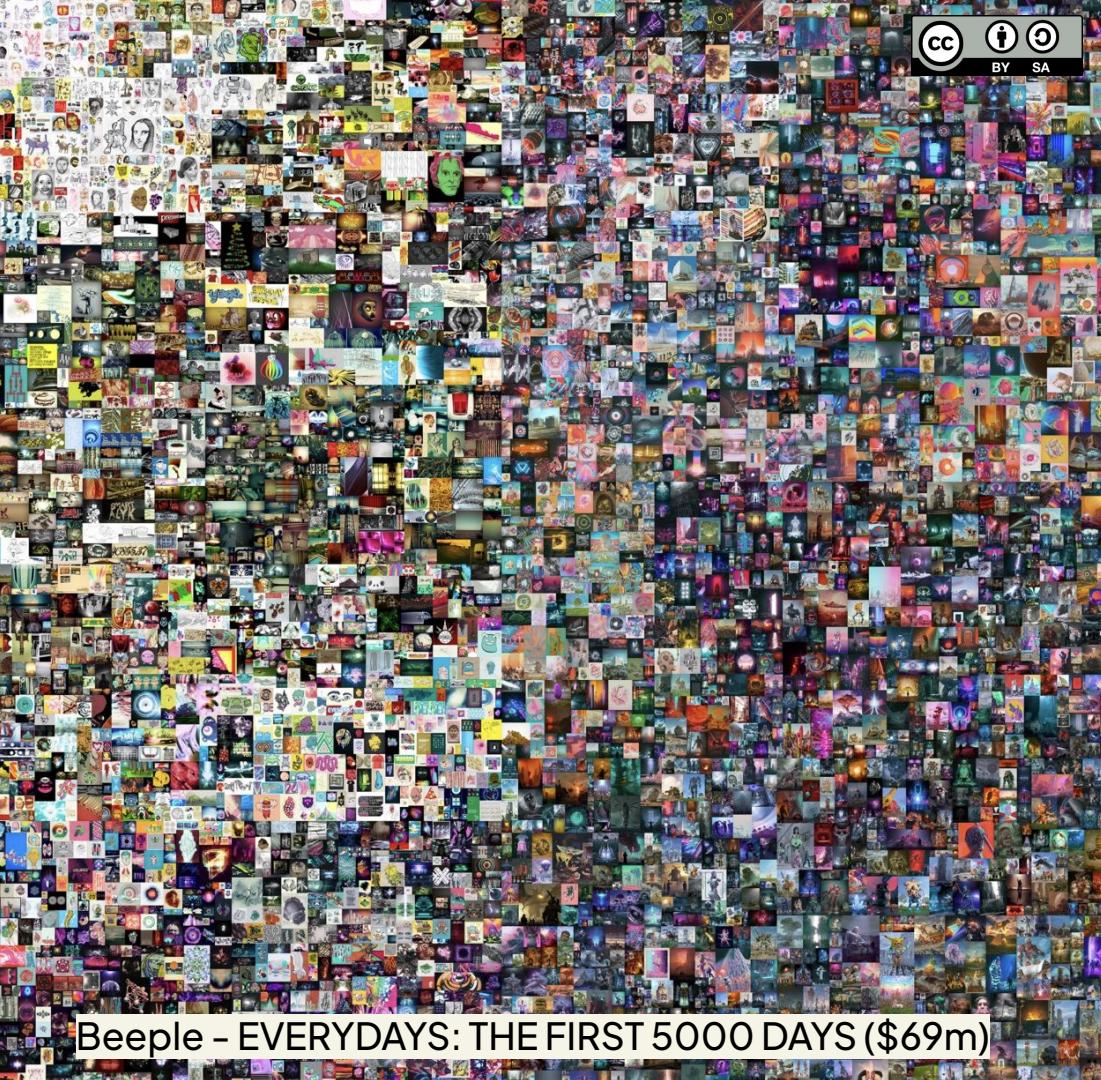


### 3. The XRP Ledger

# DeFi et NFTs

2017–2021

Accélération de l'adoption  
de la blockchain



Beeple - EVERYDAYS: THE FIRST 5000 DAYS (\$69m)

# Multi chains

2022-2024

Création de nombreuses layer 2 et apparitions de chaînes spécialisées

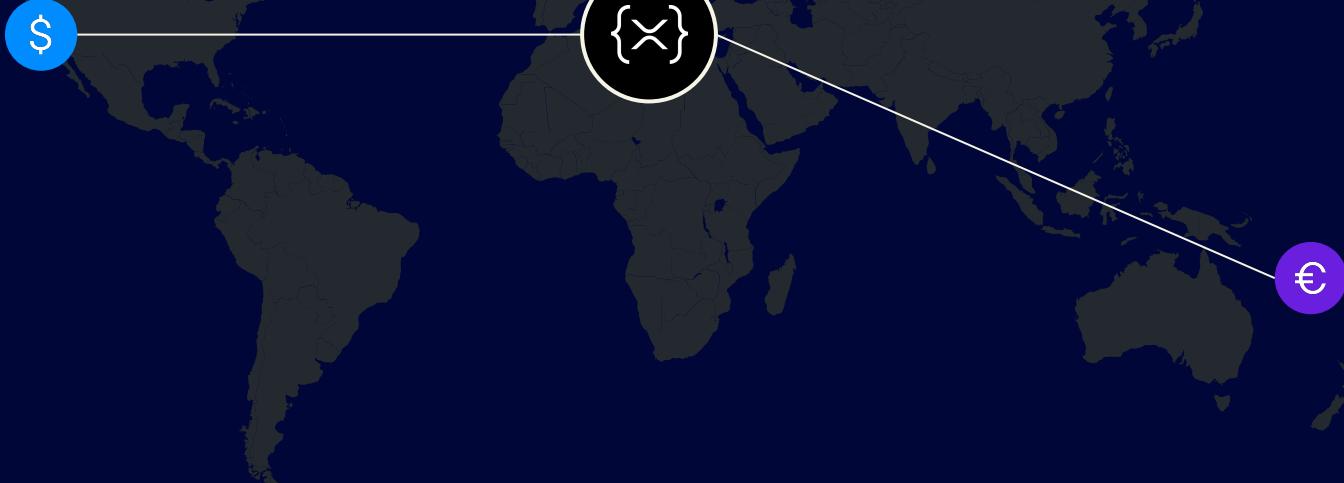


Multichain world by DALL-E

### 3. The XRP Ledger



**XRP Ledger (XRPL) est créé en 2012 pour répondre aux limites des devises et des crypto monnaies pour les usages financiers, notamment les payments**



# XRPL a émergé comme une des blockchains layer 1 les plus matures et les plus robustes

**100%**

decentralized blockchain with 600+ nodes processing transactions and maintaining the ledger

**1,750+**

unique apps and exchanges on mainnet built by a diverse set of global developers

**5M+**

active XRP wallet holders around the world

**125+**

Proof-of-Association validators operated by universities, exchanges, businesses, & individuals

**2.8B+**

transactions processed representing over \$1T in value moved between counterparties

**~\$28B+**

market capitalization of XRP, making it the ~5th largest cryptocurrency

Registre Public

Open Source & Décentralisé

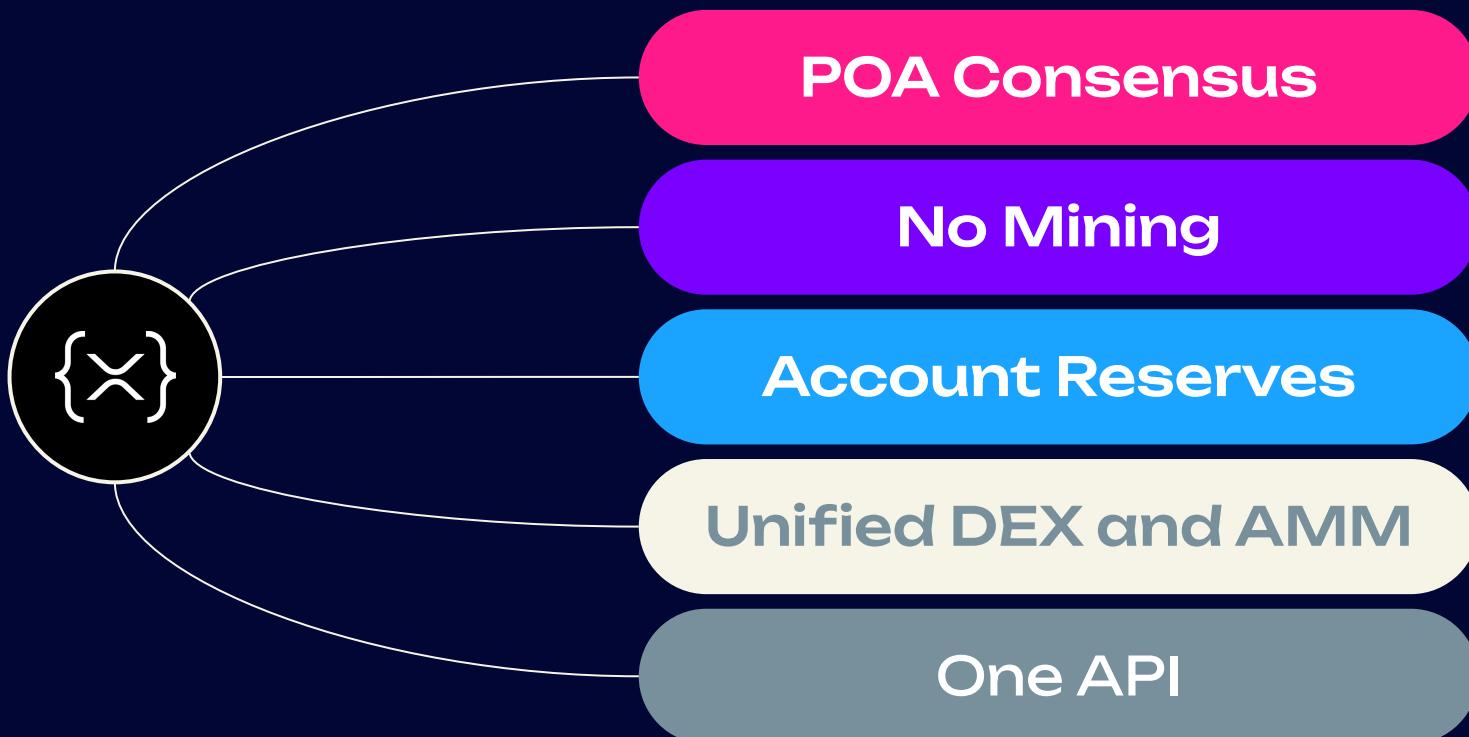
Mature (12 ans sans interruption)

Rapide (4s)

Très faible empreinte carbone

Nombreuses librairies pour coder

# Specificities of the XRPL



### 3. The XRP Ledger

# One Endpoint to do all the things



## Single API

No need to stitch together disparate systems or spend months integrating complex technology - simply connect into XRPL through a single API

## Minimal Code Required

Astonishingly simple, you can get up and running on the XRP Ledger in as little as few lines of code using familiar programming languages (JS, Python, Java, and many more)

# XRPL Consensus

The XRPL consensus is a type of **Proof of Association**

## Explicit trust

Hundreds of validator nodes participate in the consensus. **35 special nodes** are on the UNL which lists the nodes who have final say. 80% of the UNL must agree to validate a block.

## Decentralized

No single entity can control more than 5% of the UNL. Every member of the UNL is a known entity with full transparency.

## Independently governed

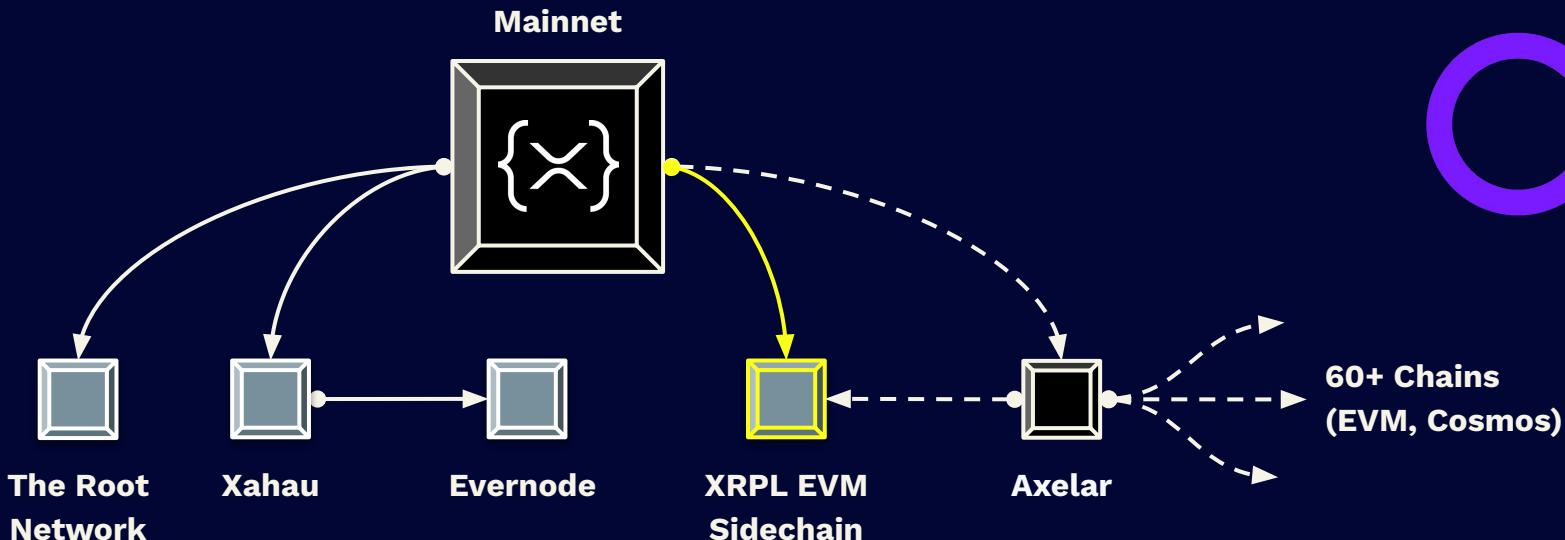
The XRPL foundation ensures UNL members adhere to strict guidelines of maintenance upgrades and uptime. UNL members are regularly audited and can change over time.

### 3. The XRP Ledger



# The XRPL Extended Ecosystem

XRPL Mainnet interoperates with sidechains, to bridge XRP and tokens



# Questions?

Do you want to learn more about XRPL?  
**XRPL COMMONS Developers Trainings**

November 4-5th, 2024

Do you want to build your next project  
with a community of peers?  
**Aquarium residency**

**Gaming & Gamification**  
January  
**AI & Blockchain**  
April

Do you want to work with us?  
**XRPL Commons**

**Jobs & Internships**

# Resources

# Resource Links



Scan Me !

## Contact

Luc Bocahut

[luc@xrpl-commons.org](mailto:luc@xrpl-commons.org)

Education

[vera@xrpl-commons.org](mailto:vera@xrpl-commons.org)

<https://github.com/XRPL-Commons/IE-Tech-Venture-Bootcamp-2024>

# Thanks !

<https://www.xrpl-commons.org/>

Contact

Luc Bocahut [luc@xrpl-commons.org](mailto:luc@xrpl-commons.org)  
Education [vera@xrpl-commons.org](mailto:vera@xrpl-commons.org)