



# Commons

# You are holding open source content.

Here's how to handle it:

- You can use this content in your work, adapt it and share it.
- You must mention [XRPL Commons](#) as a source as well as the Creative Commons licence.



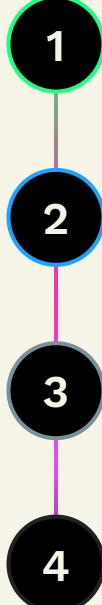
**Creative Commons Attribution-ShareAlike CC BY-SA** – This licence allows you to protect, reuse and adapt this content even for commercial purposes, if you mention XRPL Commons as a source and allow your re-adapted content to be under the same Open Source Licence.



# Introduction to the XRPL ecosystem

January 27th, 2024

# Agenda

- 
- 1 Welcome to XRPL Commons
  - 2 Key Blockchain Concepts
  - 3 The XRP Ledger
  - 4 Tools & Resources



# 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

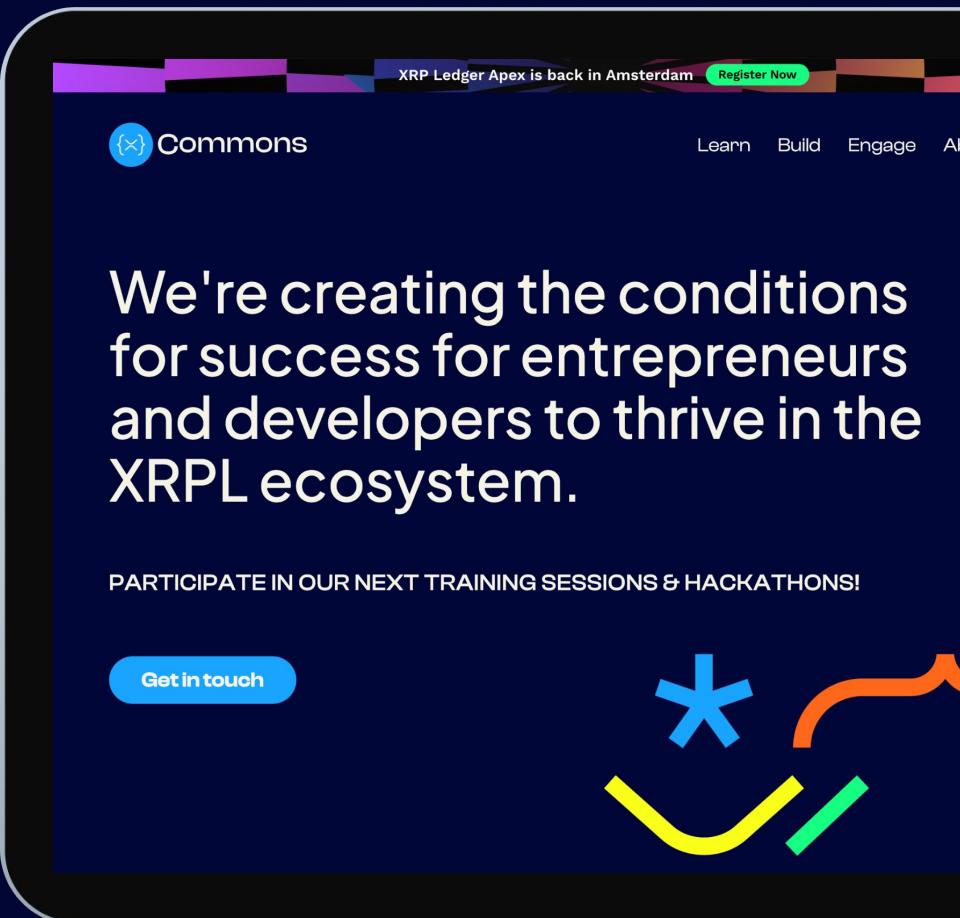
Meetups, podcasts, our Community Magazine, and news on our socials unite the XRPL ecosystem.

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

# Find out more



🔗 <https://xrpl-commons.org>



The image shows a dark blue mobile phone screen displaying the XRPL Commons website. At the top, there's a purple header bar with the text "XRP Ledger Apex is back in Amsterdam" and a green "Register Now" button. Below the header is the XRPL Commons logo (a blue circle with a white 'x' and brackets) followed by the word "Commons". To the right are three buttons labeled "Learn", "Build", and "Engage". The main content area features a large white text block: "We're creating the conditions for success for entrepreneurs and developers to thrive in the XRPL ecosystem." Below this, in smaller white text, is "PARTICIPATE IN OUR NEXT TRAINING SESSIONS & HACKATHONS!". At the bottom left is a blue button with the white text "Get in touch". The bottom right corner of the screen features a stylized graphic of four curved lines in blue, orange, yellow, and green.

XRP Ledger Apex is back in Amsterdam [Register Now](#)

Commons

Learn Build Engage

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

# XRPL Commons team

## Pillars

### Education



Mathilde Morineaux  
Education Director



Vera Radeva  
Program Manager

### Startups



Aurelien Burget  
Residency Director



Cyrille Bourdeaux  
Program Manager

### Strat. & Finance



David Bchiri  
CEO



Melanie Damour  
Strat. Initiatives Director

### Coms & Media



Cassie Hirsh  
Content Director



Alex Mavigok  
Graphic Designer

### Adoption



Odelia Torteman  
Adoption Director

### Tech



Luc Bocahut  
Product Director



Darius Tumas  
Infra. Engineer



Thomas Husenet  
Technical Partner



Valentin Gonnot  
Intern



Florian Alonso  
Intern

### Events



Elisa Bailly  
Sr Events Manager



Fanny Brakchi  
Experience Manager

### Community



Zsofi Borsi  
Head of Com.  
Engagement

# Who are you?

# Blockchain Key Concepts

# What is a blockchain?

## 1. Definition



# A shared database...



## 1. Definition



An

**Immutable, Distributed, and Decentralized**

**Database**

that **coordinates Diverse Users.**

# An immutable data store

The ledger is immutable

**Write Once**

**Read Forever**

Data is tamper-proof

# Distributed



## 1. Definition



# Decentralized

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



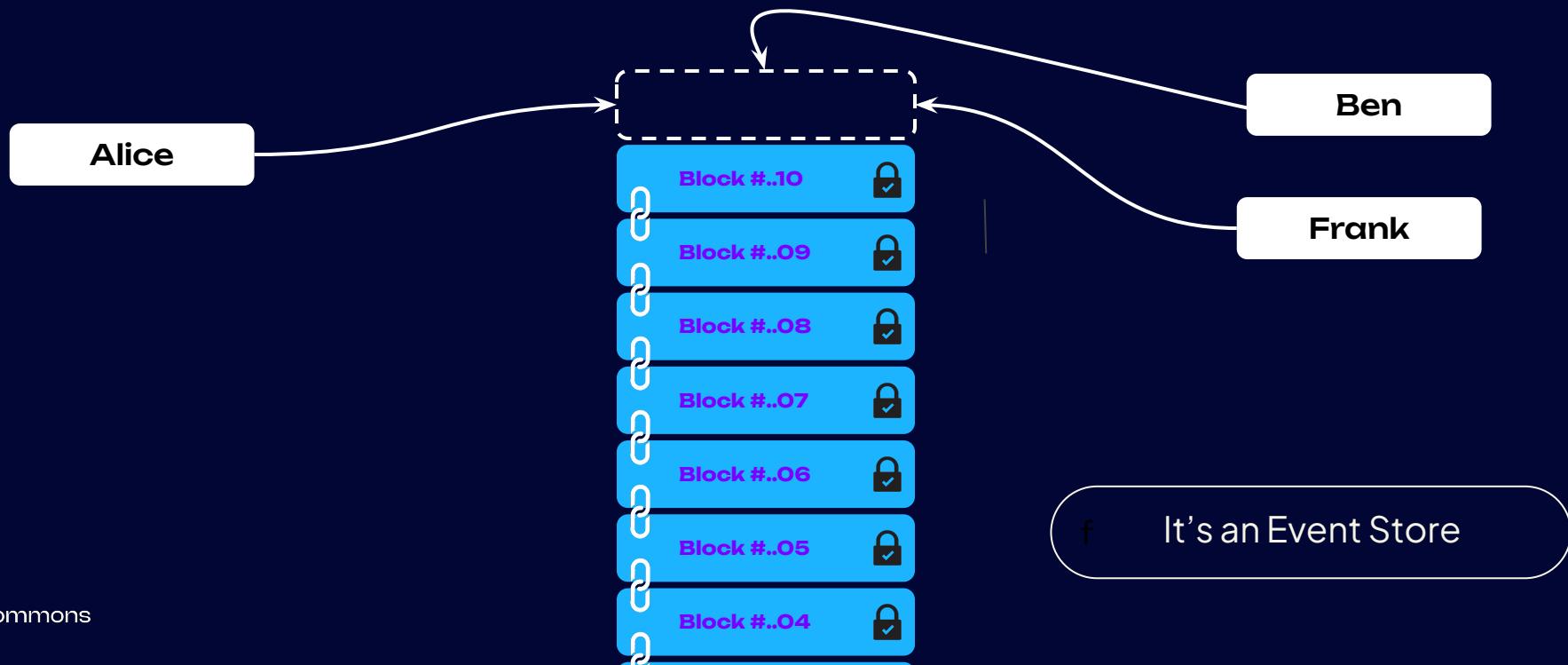
## Types of consensus mechanisms

- 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)**

1. **Definition**

# A database

Data is written sequentially

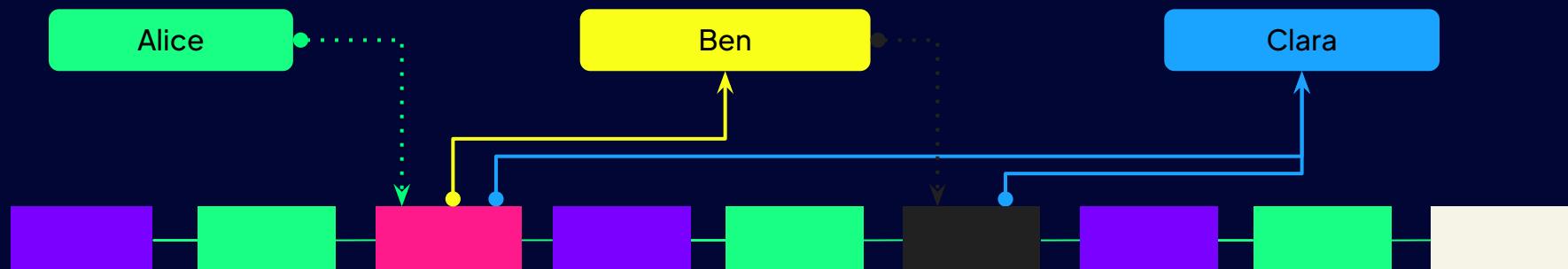


## 1. Definition

# 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**

1.

## Definition



# Private

Invitation only

Companies and consortiums

# Public

Anyone can join

Public services, governance,  
audits, proof of authenticity

## 2. A ledger in action



**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

# Hashing is deterministic and only one-way

## Plain text

“Learning center”

“University training”



## Hashed text

8aa82d8799d716e7fdb890589124aeef6  
8d2172f3a24f6ed3e8209d4b06e2c15

2ca74c87d6c7cf47e6f0205f43f302d59  
5f3a106231d6fb6aadbd7f672296419

## 2. A ledger in action

**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**

2. A ledger in action



# The chain of blocks is called a blockchain



# 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)

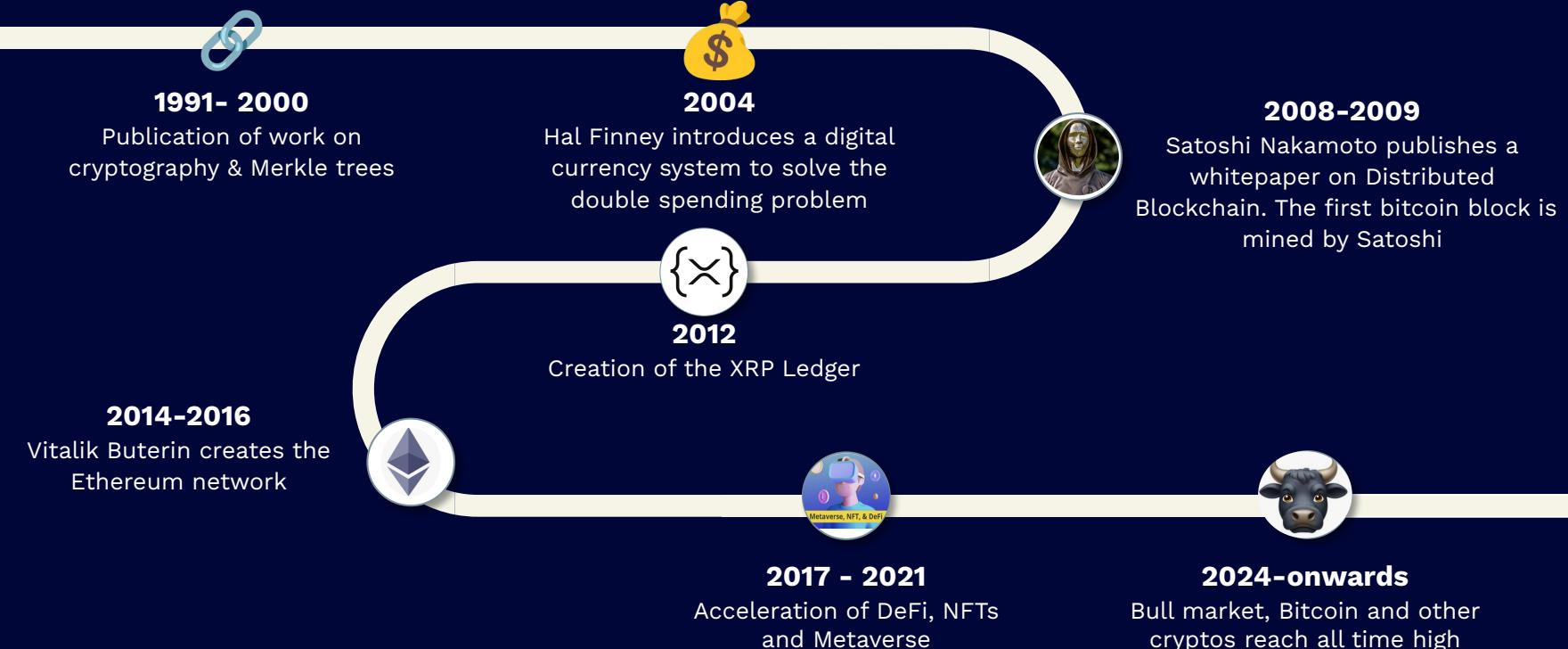
Used to decrypt messages encoded with the public key and to signs transactions

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

# The XRP Ledger

### 3. The XRP Ledger

# A brief history of blockchain



# Bitcoin

2008-2009

The beginning of  
an ideology



The Satoshi sculpture in Budapest

# Bitcoin's limitations

Topic: 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.

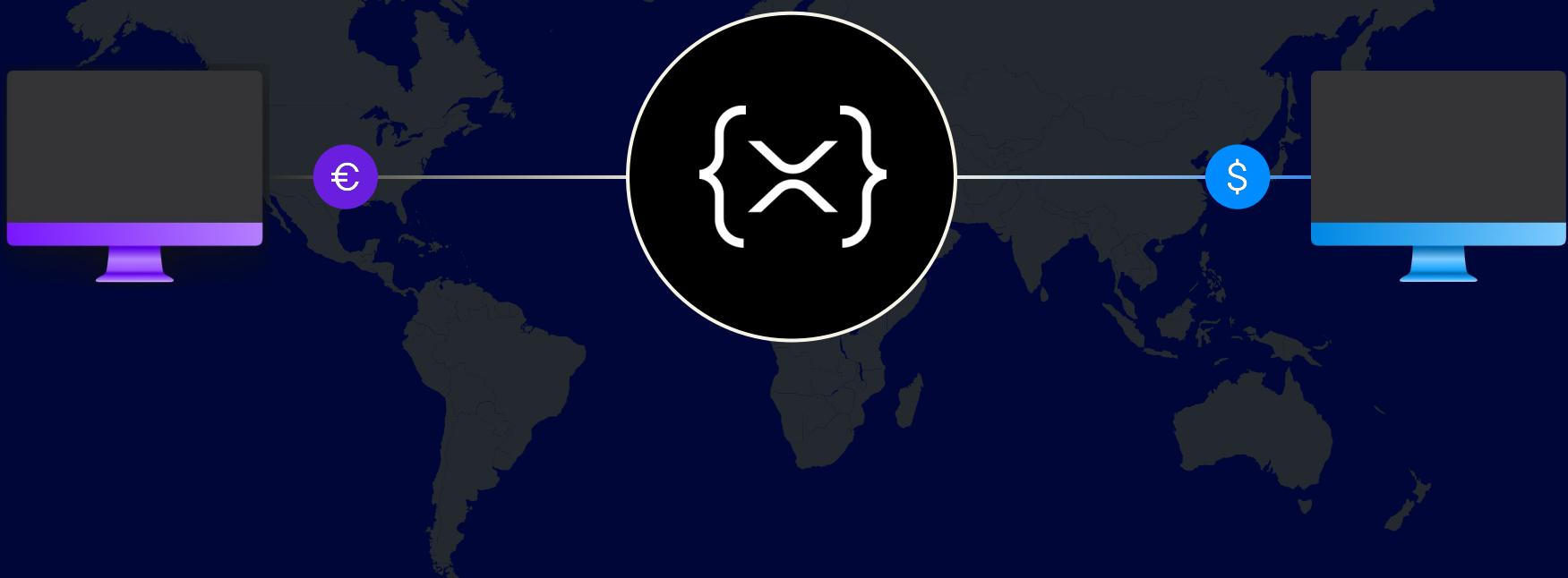
There would be a way to look up particular nodes in the network and ask them questions. (I'm imagining this whole thing running on Kademlia, a DHT)

Source: <https://bitcointalk.org/index.php?topic=10193.0>

### 3. The XRP Ledger



**XRP Ledger (XRPL) launched in 2012 to address limitations of crypto and fiat currencies for financial use cases, specifically payments**



# The XRP Ledger



**Open Source**



**Many  
libraries for  
coding**



**Low carbon  
footprint**



**Decentralized**



**Safe** (12y w/o interruption)



**Fast** (4s finality)

# Carefully designed to enable scalable blockchain development



## Proven

Supports large scale use cases and long term projects with **2.6B+** **successful transactions, more than Ethereum**, without failure or security breach since 2012



## Batteries included

Access complete blockchain functionality, from tokenizing assets to advanced payments, **without needing to learn, build, and maintain complex smart contracts**



## Fast, Cheap, Green

Low carbon blockchain settling transactions every **3–5 seconds** at fractions of a cent per transaction for mass market adoption

Source: <https://blockchair.com/ethereum/charts/total-transaction-count>

### 3. The XRP Ledger



## XRPL has matured into one of the most robust layer-1 blockchains

**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

**~\$180B+**

market capitalization of XRP, making it the ~8th largest cryptocurrency

# The differences between the XRP Ledger, XRP, and Ripple



## Layer-1 blockchain

The XRP Ledger is a decentralized public blockchain that is open-source and powered by a global developer community.

Companies, institutions, developers and individuals around the world use the XRP Ledger for use cases across, tokenization, payments, stablecoins, CBDCs, and more.



## Native Digital Asset

XRP is the native digital asset (token) of XRPL, similar to ETH for Ethereum or SOL for Solana.

The primary utility of XRP is to facilitate transactions on the network.

XRP also serves to protect the ledger from spam, and to bridge currencies in the XRP Ledger's DEX.

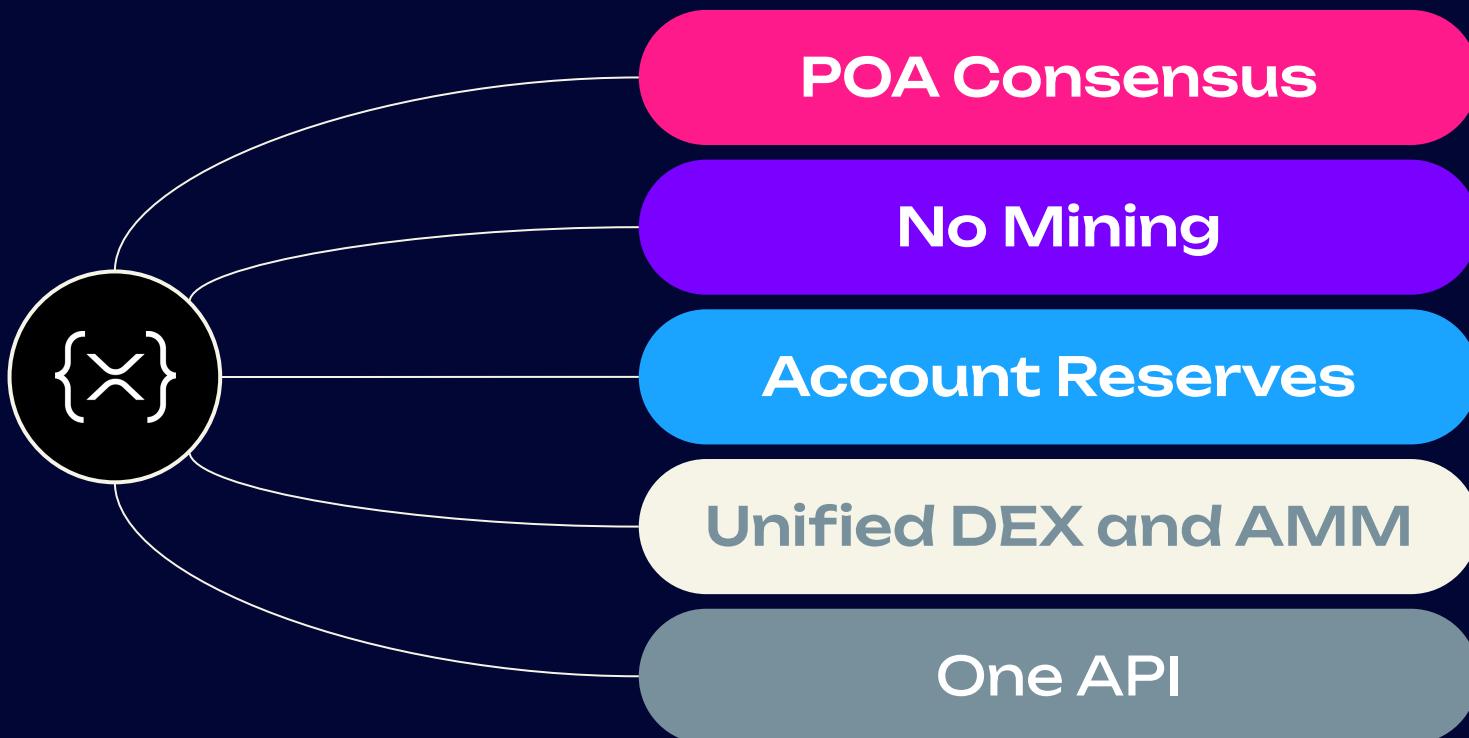


## Crypto Solutions Company

Ripple is a technology company that builds crypto solutions for businesses. Ripple uses XRP as a bridge currency in its solutions because it's fast, efficient, and reliable, making it ideal for financial use cases like payments. Ripple is also a holder of XRP.

Ripple is one of many companies building on and contributing to the XRP Ledger.

# Specificities of the XRPL



# 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 protocol native DEX

## a key feature that powers trading and settlement of tokenized assets without intermediaries

### Protocol Features

---

**On-Chain:** CLOB based trading system with unlimited pairs, minimal fees, and fast speeds fully on-chain, unique to XRPL vs EVM chains

**Liquidity Aggregation:** Liquidity is consolidated in a single DEX, leading to the best prices, deeper liquidity, and ease of use

**No Miner Extractable Value (MEV):** There are no miners to prioritize only certain transactions (namely higher gas fee orders) to the ledger

**No Front-Running:** Transaction ordering is determined by distributed validators, making it near impossible to front-run transactions

### Technological Differentiators

---

**Auto-bridging:** XRP is used as an intermediary asset to complete trades at the lowest cost for two tokens with limited liquidity

**Pathfinding:** Transactions hop from one currency to another, piecing together the best path and liquidity between the original trading pairs

**AMM:** Expanding liquidity through a native AMM to determine whether swapping within a liquidity pool or order book provides the best price to execute

### 3. The XRP Ledger



# Powerful protocol features provide the building blocks to innovate

## Native DEX

First on-chain DEX in the world, trading and moving tokens anywhere in seconds with competitive liquidity

## Issued Assets

Ability to represent digital currencies, legal obligations, fungible tokens, and other asset classes on the ledger

## Non-Fungible Tokens

Implements non-fungible tokens with built-in royalties where all trades handled by the DEX

## Token Asset Controls

Controls for token issuers and holders to enhance security and regulatory compliance

## Advanced Payments

Use advanced payment capabilities like “Escrow” and “Checks” to build smart applications without smart contracts

## Automated Market Maker

Liquidity pools bring yielding assets to the ledger as well as the ability to provide liquidity on your tokens

### 3. The XRP Ledger



# In 2022, the community adopted a native NFT standard



## Mint

Create non-fungible tokens on the XRP Ledger through a simple transaction



## Trade

Create offers to buy or sell NFTs on marketplaces, storefronts, or even directly on the XRP Ledger



## Monetize

Built-in royalties for NFT issuers upon every secondary sale



## Display

Extensive metadata, including titles, descriptions, and images with hosting options such as HTTP, IPFS, and more



## Programmability

XRP Ledger & its native NFTs offer deep optionality, including tradability, burnability, payment types, and more



## Build

Robust APIs, libraries, and tooling to enable powerful NFT use cases without complex and costly smart contracts

### 3. The XRP Ledger



# Protocol contributors are building a full suite of institutional-grade capabilities to expand use cases on XRPL

## ● Amendment up for voting

### Decentralized Identity

Interoperable global standard to enable identity management for compliance, authentication, & access management

## ● Amendment up for voting

### XRPL Sidechain

Customize a version of the XRPL to the needs of a specific use case / business while remaining interoperable

## ● Amendment up for voting

### EVM Sidechain

Bringing full programmability to the XRPL in familiar EVM environments

## ● In Development

### Atomic Transactions

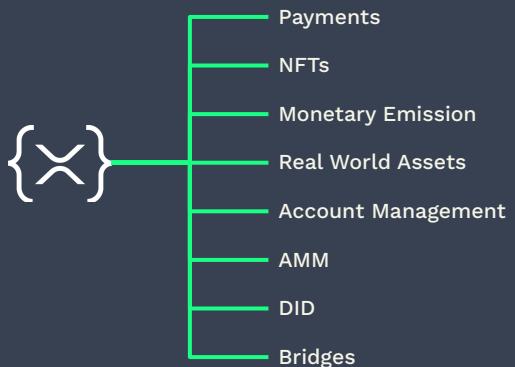
Bundle transactions so they are executed all or none

## ● In Development

### Lend / Borrow

Protocol native lending and borrowing functionality without needing smart contracts

# 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

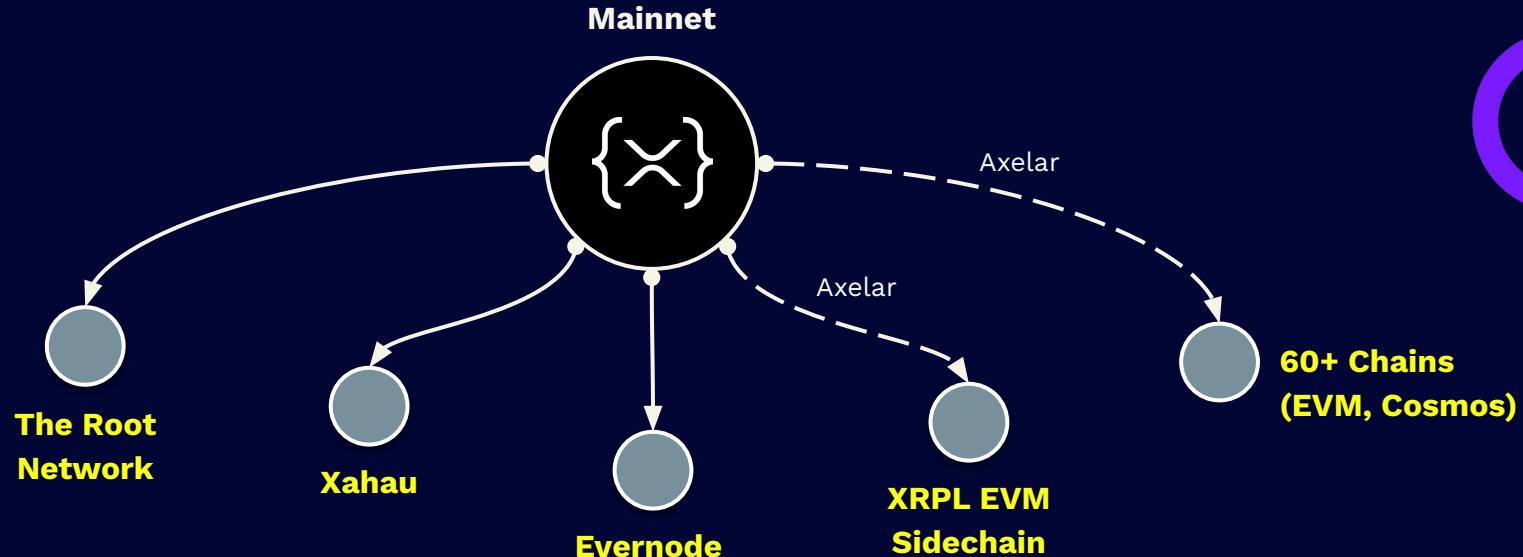
Astonishingly simple, you can get up and running on the XRP Ledger in as little as few lines of code using familiar programming languages (JS, Python, Java, and many more)

### 3. The XRP Ledger



# The XRPL Extended Ecosystem

XRPL Mainnet interoperates with sidechains, to bridge XRP and tokens

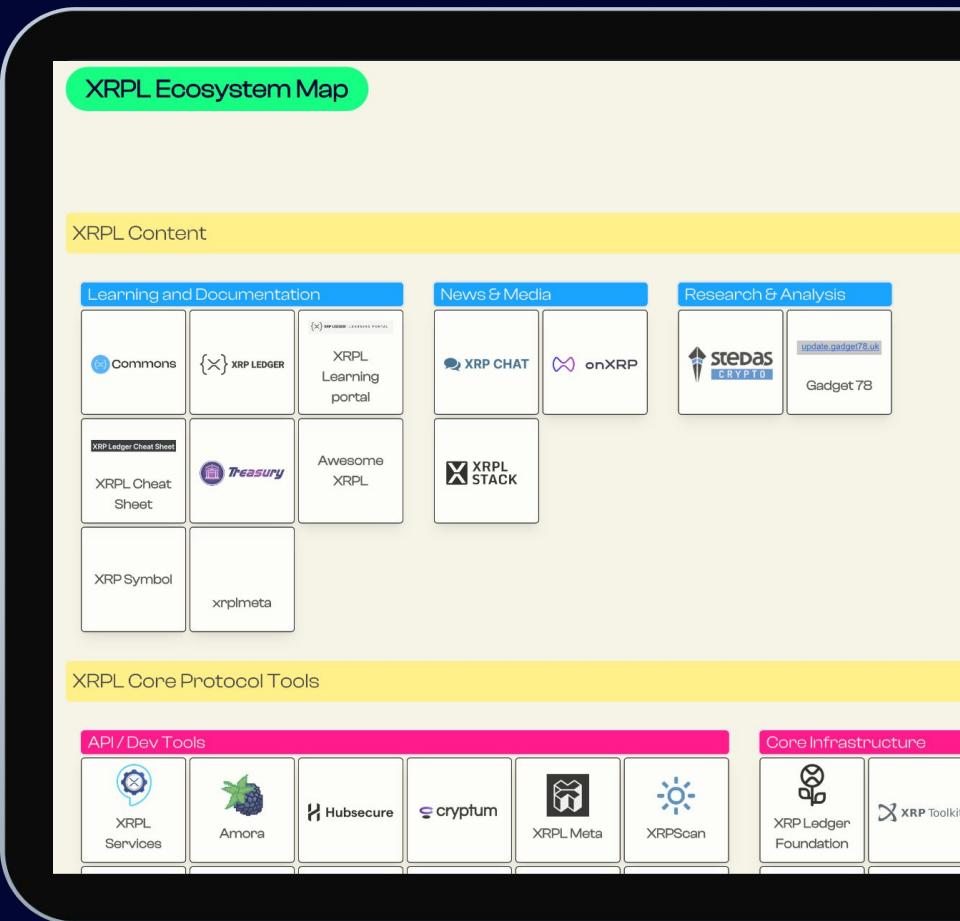


# Resources

# Ecosystem Map



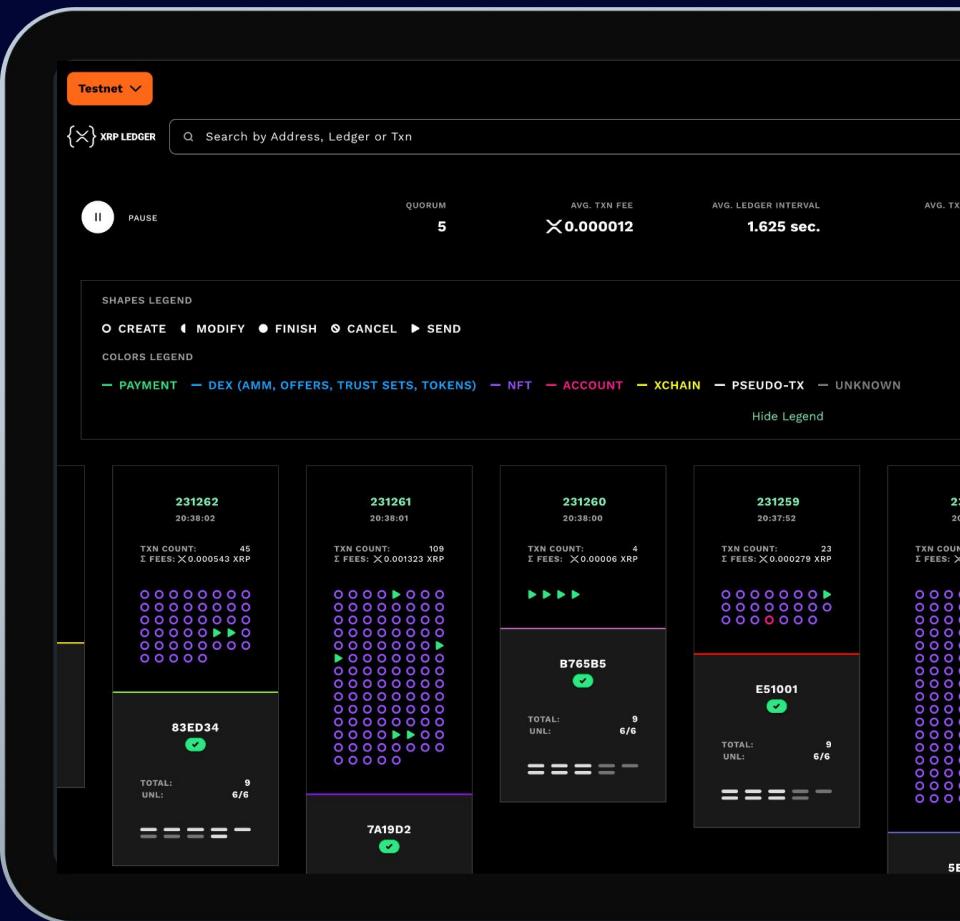
 <https://map.xrpl-commons.org>



# Block Explorer



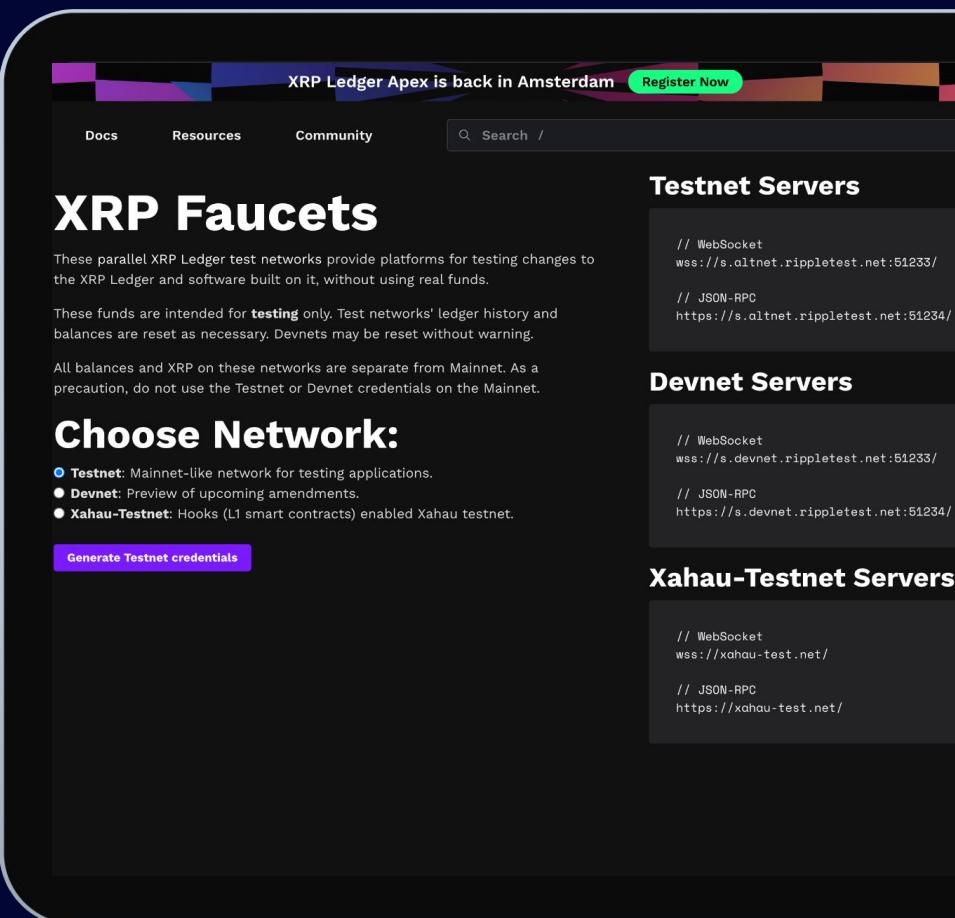
🔗 <https://testnet.xrpl.org>



# Faucets



 <https://xrpl.org/resources/dev-tools/xrp-faucets/>



The screenshot shows the XRP Faucets page with a header banner for "XRP Ledger Apex is back in Amsterdam" and a "Register Now" button. The main navigation includes "Docs", "Resources", and "Community". A search bar is also present.

## XRP Faucets

These parallel XRP Ledger test networks provide platforms for testing changes to the XRP Ledger and software built on it, without using real funds.

These funds are intended for **testing** only. Test networks' ledger history and balances are reset as necessary. Devnets may be reset without warning.

All balances and XRP on these networks are separate from Mainnet. As a precaution, do not use the Testnet or Devnet credentials on the Mainnet.

### Choose Network:

- Testnet**: Mainnet-like network for testing applications.
- Devnet**: Preview of upcoming amendments.
- Xahau-Testnet**: Hooks (L1 smart contracts) enabled Xahau testnet.

[Generate Testnet credentials](#)

### Testnet Servers

```
// WebSocket  
wss://s.altnet.rippletest.net:51233
```

```
// JSON-RPC  
https://s.altnet.rippletest.net:51234
```

### Devnet Servers

```
// WebSocket  
wss://s.devnet.rippletest.net:51233
```

```
// JSON-RPC  
https://s.devnet.rippletest.net:51234
```

### Xahau-Testnet Servers

```
// WebSocket  
wss://xahau-test.net/
```

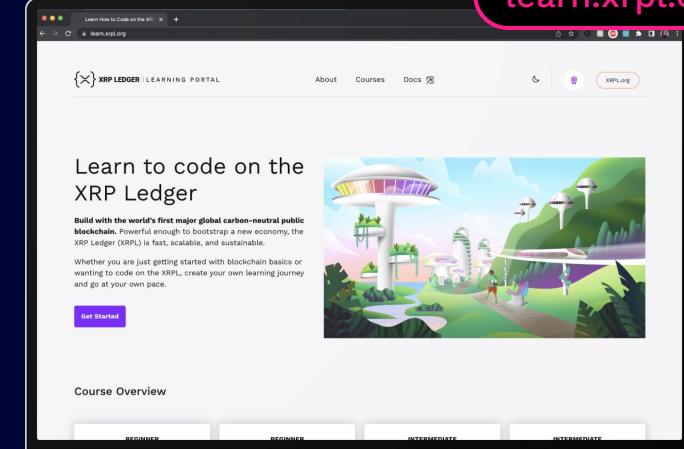
```
// JSON-RPC  
https://xahau-test.net/
```

# Documentation and learning



The screenshot shows the XRPL Documentation homepage. It features a dark background with a purple abstract graphic on the left. The main heading is "What Would You Like to Learn?". Below it are two sections: "Browse By Popular Topics" and "Browse By Label". The "Popular Topics" section lists items like Send XRP, Reserves, XRP Faucets, Run rippled as a Validator, Build and Run rippled in Reporting Mode, Introduction to Consensus, and Public API Methods. The "Label" section lists categories such as Accounts, Blockchain, Checks, Core Server, Cross-Currency, Data Retention, Decentralized Exchange, Development, Escrow, Fees, Non-fungible Tokens, NFTs, Payment Channels, Payments, Smart Contracts, Security, Tokens, Transaction Sending, and XRP.

Source of all XRPL documentation



The screenshot shows the XRPL Learning Portal homepage. The title is "Learn How to Code on the XRPL". It features a large image of a futuristic, green-themed blockchain city with flying cars and stylized buildings. Below the image, there's a "Get Started" button and a "Course Overview" section with four categories: BEGINNER, INTERMEDIATE, and two labeled "INTERMEDIATE".

Learn the basics of coding on XRPL

<https://github.com/XRPL-Commons/xrpl-commons-january-2024>

