Commons

Our mission is to create

The conditions of success

for Startups and Developers

to thrive in the XRPL ecosystem

Claim your NFT

Introduction to the XRPL EVM Sidechain

September 28th 2024

XRPL Sidechains

What is it?

Developer managed independent ledger that remains seamlessly interoperable via a secure bridge with XRPL Mainnet

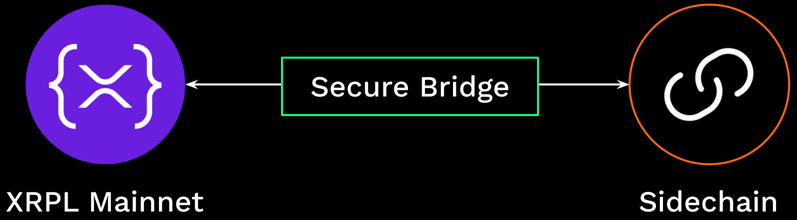
Key Characteristics of XRPL Sidechains

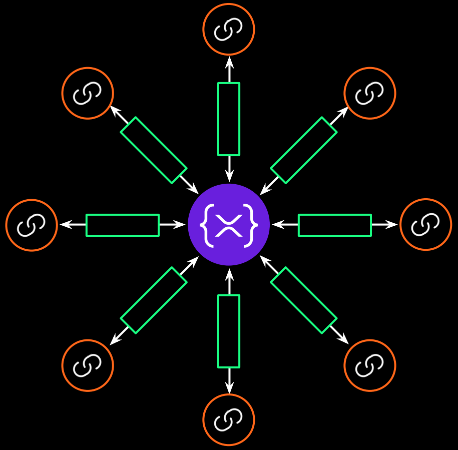
A sidechain is an independent ledger parallel to the main chain with its own consensus & nodes

Secure “bridges” enable XRP and other tokens to move between a sidechain and XRPL Mainnet

“Witness servers” attest that assets have moved into specially designated accounts

Transactions within the sidechain are not visible to the servers on the mainnet





Why is that interesting?

Create a fully customizable, interoperable sidechain for your business on the XRP Ledger

01

Customization

Pick and choose XRPL features best suited to a use case, and implement new features not available on mainnet

02

Control

Ability to create a permissioned, parallel network to mainnet while keeping the benefits of low costs and fast finality

03

XRP Liquidity

XRP is readily available via the bridge to use as the gas token. Additionally, access liquidity of issued assets such as stablecoins

EVM Sidechain

Why EVM Sidechain?

01

Smart Contracts

General purpose smart contracts open up our ecosystem to the frontier of innovation and create more interoperability with the larger blockchain ecosystem.

02

Open to Solidity Devs

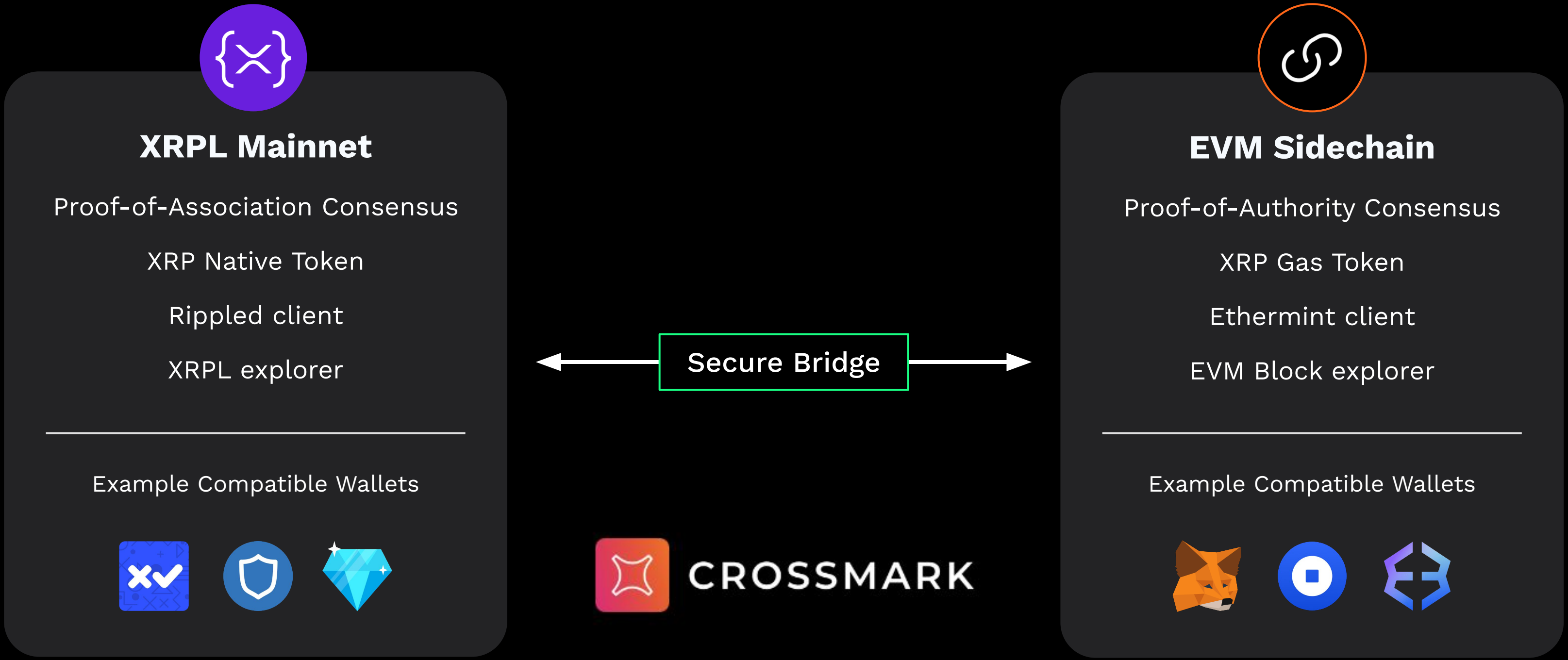
The EVM developer community is thriving, the EVM sidechain is a way to address this large community and onboard them into the XRPL ecosystem.

EVM Compatibility on different blockchains

Blockchain Ecosystem	EVM Compatibility Solution/Project
Ethereum	Native
Solana	Neon
Polkadot	Moonbeam
Cosmos	Evmos
Polygon	zkEVM
BNB Chain	BNB Smart chain
Avalanche	Avalanche C-chain
XRPL	**EVM Sidechain**

What is it?

The EVM Sidechain enables the ability to interact or deploy smart contracts written in Solidity with a secure bridge to XRPL Mainnet



XRPL Mainnet

Proof-of-Association Consensus

XRP Native Token

Rippled client

XRPL explorer

Example Compatible Wallets

Secure Bridge

CROSSMARK

EVM Sidechain

Proof-of-Authority Consensus

XRP Gas Token

Ethermint client

EVM Block explorer

Example Compatible Wallets

Network Details

- Consensus Mechanism:
  - Uses **CometBFT** (Tendermint Fork) for fast, secure consensus.
  - Implements **Byzantine Fault Tolerance (BFT)** to handle faulty/malicious nodes.
  - Achieves **1-block finalization**, ensuring immediate transaction finality.
- Execution Framework:
  - Built on the **Cosmos SDK,** a modular framework for scalable blockchain development.
  - Integrates **Ethermint** to run Ethereum smart contracts on the XRPL EVM sidechain.
- Validators and Security:
  - Operates on a **Proof of Authority (POA)** system with pre-selected trusted validators.
  - **Cosmos SDK** manages validator set and **secures the network.**

Why is that interesting?

EVM apps can now access and benefit from the XRPL ecosystem

01

Bridge to the XRPL ecosystem

Any Solidity app written for Ethereum / EVM can access liquidity and user base of XRPL Mainnet

02

Optimized for DeFi

Secure bridges, enhanced scalability and fast transaction finality makes the EVM optimized for financial use cases, like DeFi and payments

03

Easy to Build

Build using familiar Ethereum-based tools, wallets, explorers, and apps like MetaMask, Foundry, and Truffle

Project components

- **Network**: The blockchain that will bring the EVM compatibility
- **Explorer**: The component that will be used for monitoring the network
- **Wallet**: The application in charge of allowing the users to hold the balances and interacting with the network (Metamask)
- **Bridge**: The unit that will bring interoperability with the XRPLedger. This will be divided in two:
  - Client: The frontend website that will be used by the final users to create and interact with the bridge node
  - Node: The server that will be listening events and pushing data from both chains

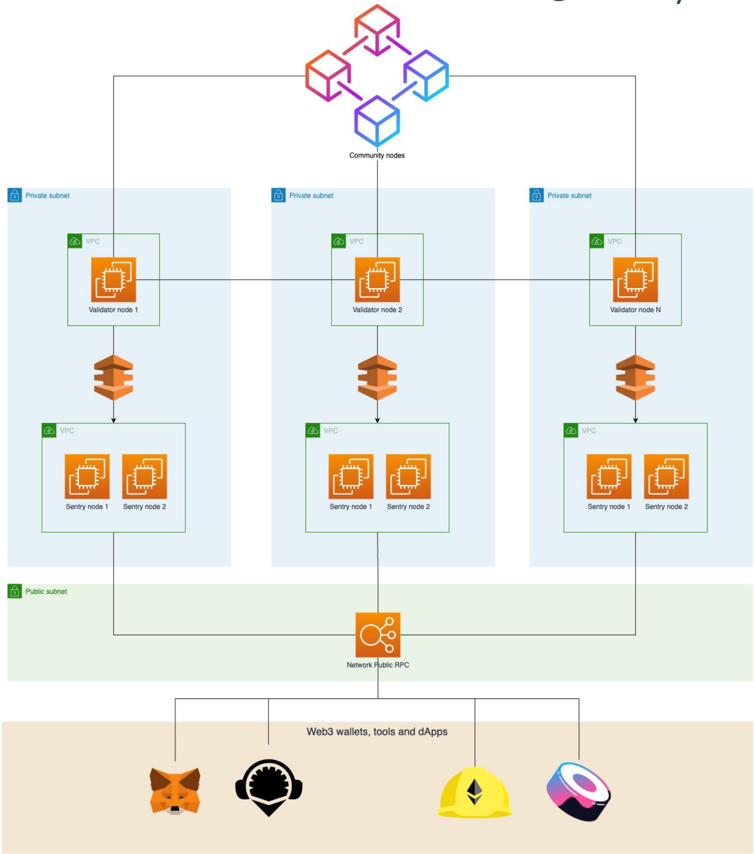
Final network overview

- Project driven validators configured with a sentry node production setup

- Network public RPC for easy connection and integration of community driven projects

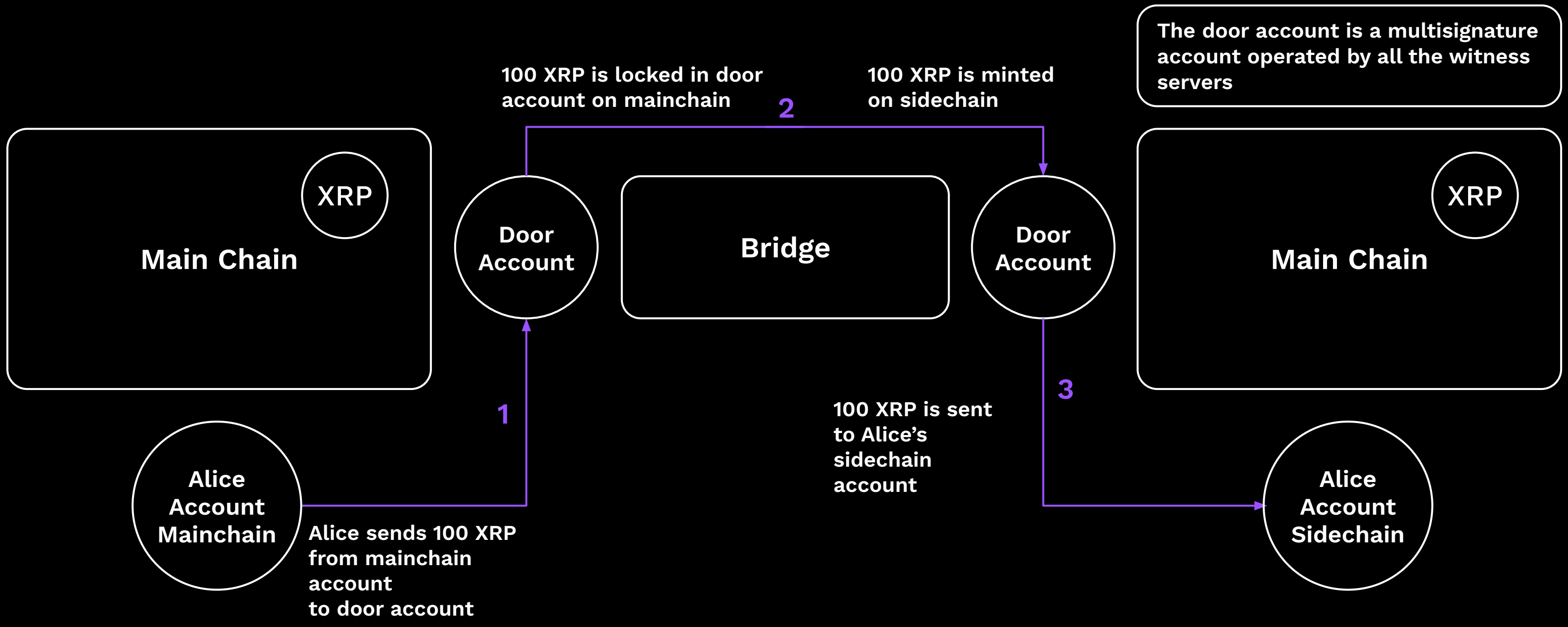
- Community validators can bring better decentralization

- Web3 wallets, developer tools and other dApps can be connected

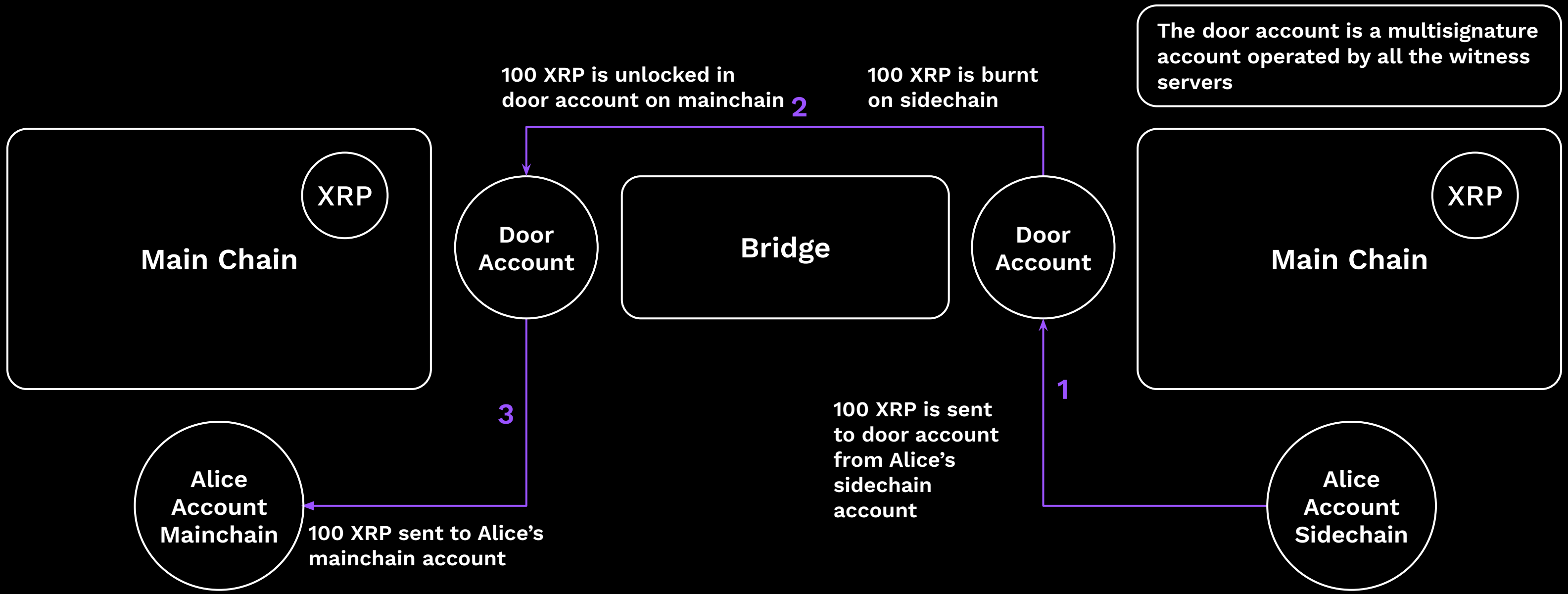


Join the XRPL EVM Discord!

Sidechains - Flow of Funds Mainchain -> Sidechain


The door account is a multisignature account operated by all the witness servers
100 XRP is locked in door account on mainchain
2
100 XRP is minted on sidechain
XRP
Main Chain
Door Account
Bridge
Door Account
XRP
Main Chain
1
3
100 XRP is sent to Alice's sidechain account
Alice Account Mainchain
Alice sends 100 XRP from mainchain account to door account
Alice Account Sidechain

Sidechains - Flow of Funds Sidechain -> Mainchain



The door account is a multisignature account operated by all the witness servers

1 100 XRP is sent to door account from Alice's sidechain account

100 XRP is burnt on sidechain

2 100 XRP is unlocked in door account on mainchain

3 100 XRP sent to Alice's mainchain account

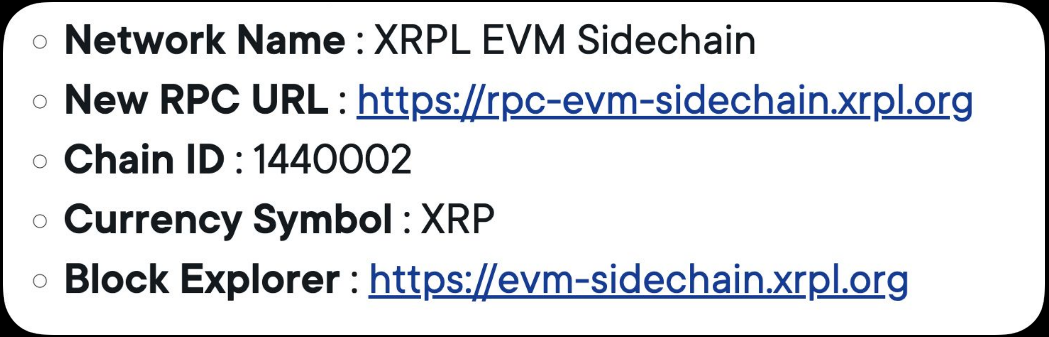
Workshop

Links for workshop

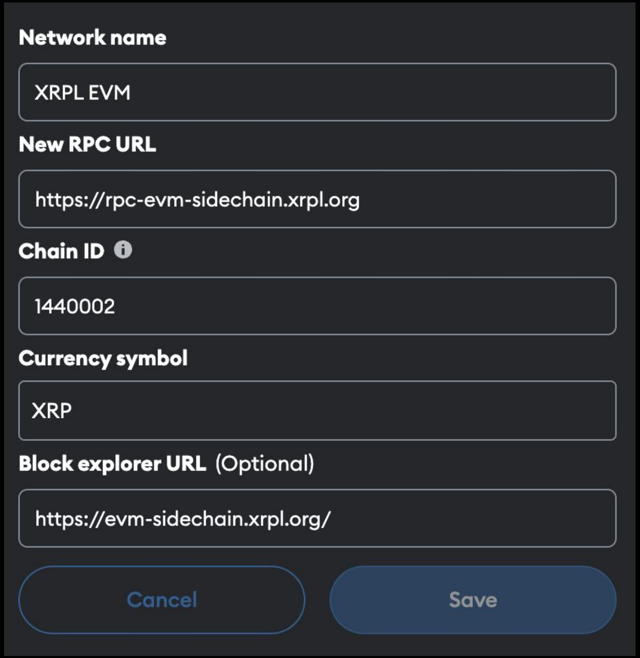
https://github.com/XRPL-Commons/Jan2024_EVM_Links

Setting up Metamask

Add a custom network using the details below:



- **Network Name** : XRPL EVM Sidechain
- **New RPC URL** : https://rpc-evm-sidechain.xrpl.org
- **Chain ID** : 1440002
- **Currency Symbol** : XRP
- **Block Explorer** : https://evm-sidechain.xrpl.org



Network name

XRPL EVM

New RPC URL

https://rpc-evm-sidechain.xrpl.org

Chain ID

1440002

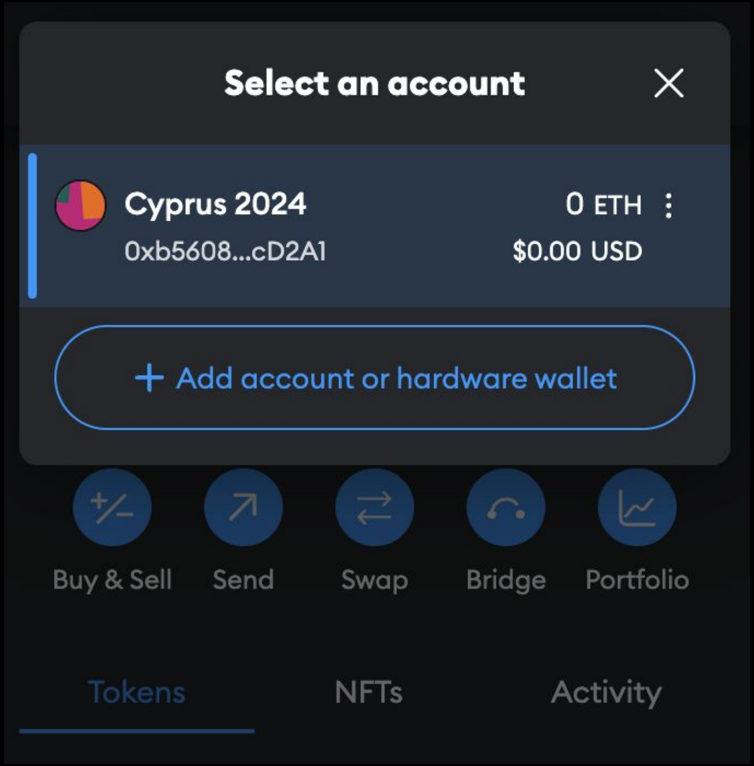
Currency symbol

XRP

Block explorer URL (Optional)

https://evm-sidechain.xrpl.org/

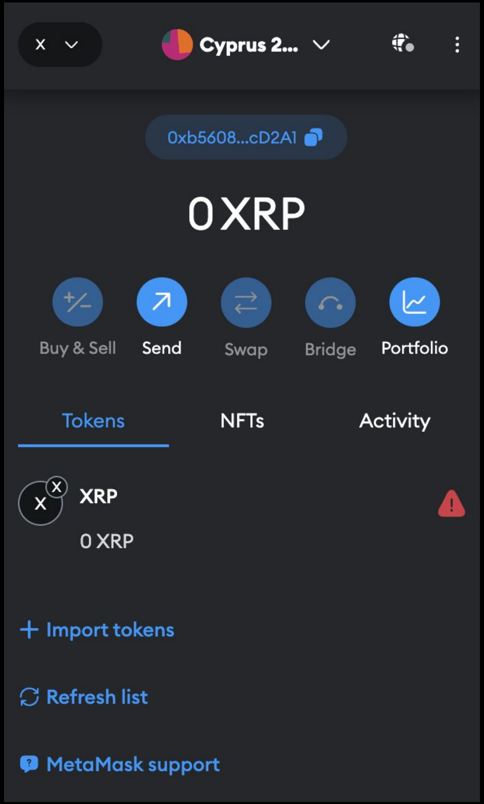
Add a new account



Select an account

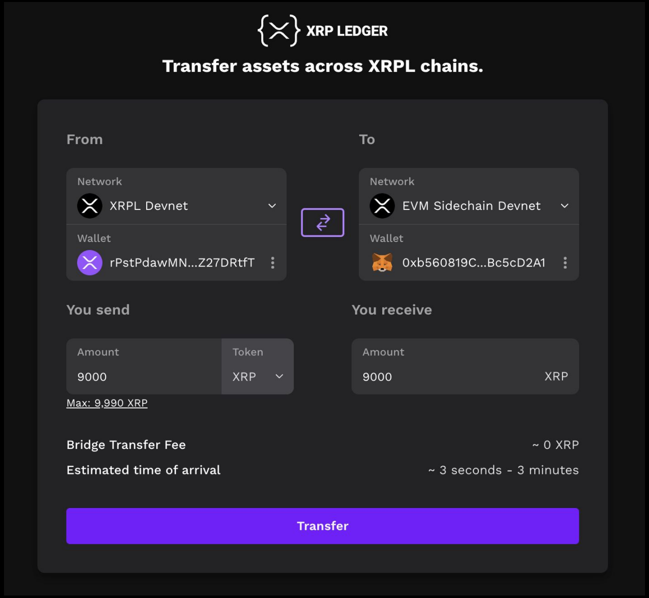
Cypress 2024 0xb5608...cD2A1 0 ETH $0.00 USD

+ Add account or hardware wallet



Bridge over some XRP

https://bridge.devnet.xrpl.org



XRP LEDGER

Transfer assets across XRPL chains.

From

Network: XRPL Devnet

Wallet: rPstPdawMN...Z27DRtfT

To

Network: EVM Sidechain Devnet

Wallet: 0xb560819C...Bc5cD2A1

You send

Amount: 9000

Token: XRP

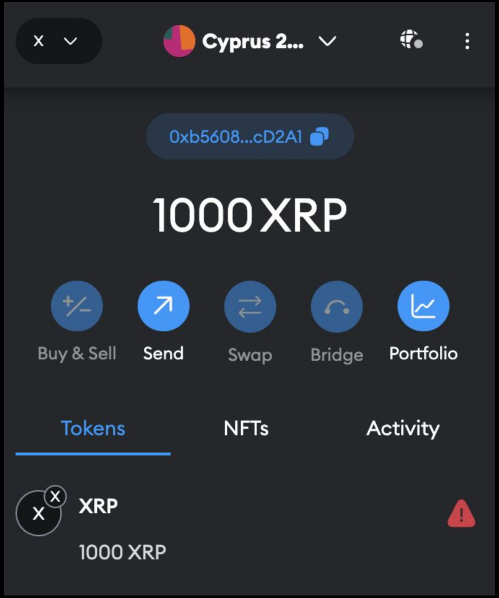
Max: 9,990 XRP

You receive

Amount: 9000 XRP

Bridge Transfer Fee ~ 0 XRP

Estimated time of arrival ~ 3 seconds - 3 minutes

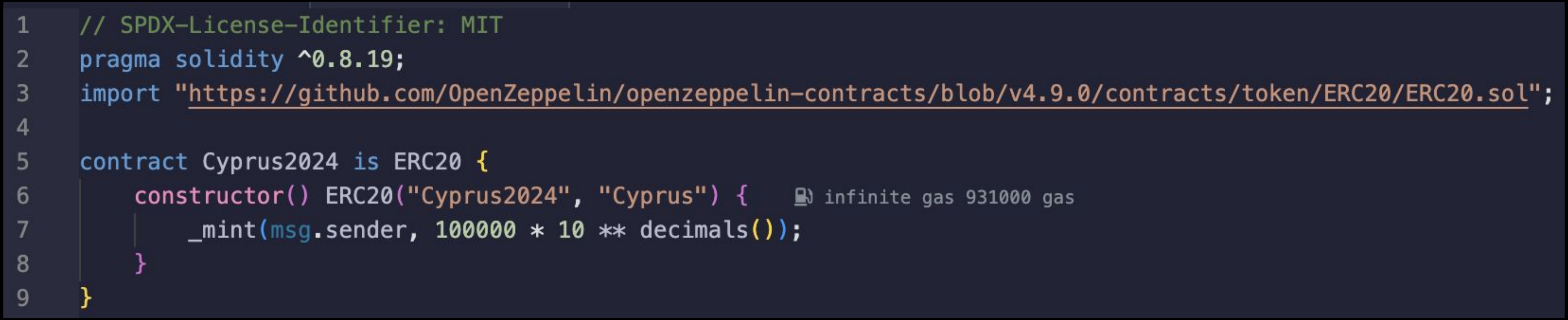


1000 XRP

XRP 1000 XRP

Create your own ERC20 token

https://wizard.openzeppelin.com/#erc20

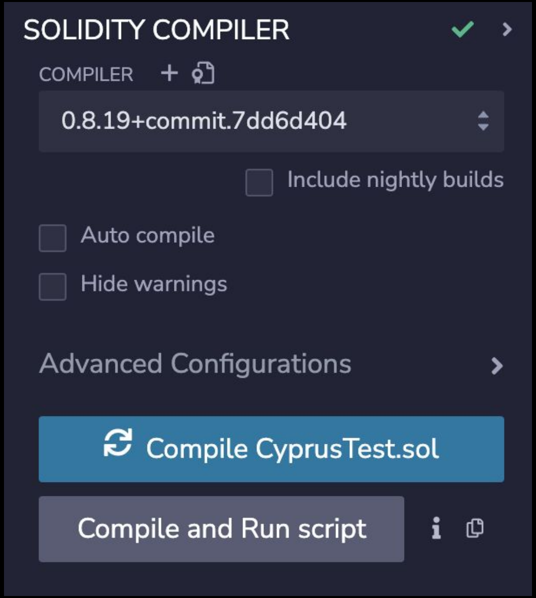


```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.19;
import "https://github.com/OpenZeppelin/openzeppelin-contracts/blob/v4.9.0/contracts/token/ERC20/ERC20.sol";

contract Cyprus2024 is ERC20 {
    constructor() ERC20("Cyprus2024", "Cyprus") {    infinite gas 931000 gas
        _mint(msg.sender, 100000 * 10 ** decimals());
    }
}
```

Compile and deploy in Remix

Use “Injected Provider” to compile and deploy



SOLIDITY COMPILER

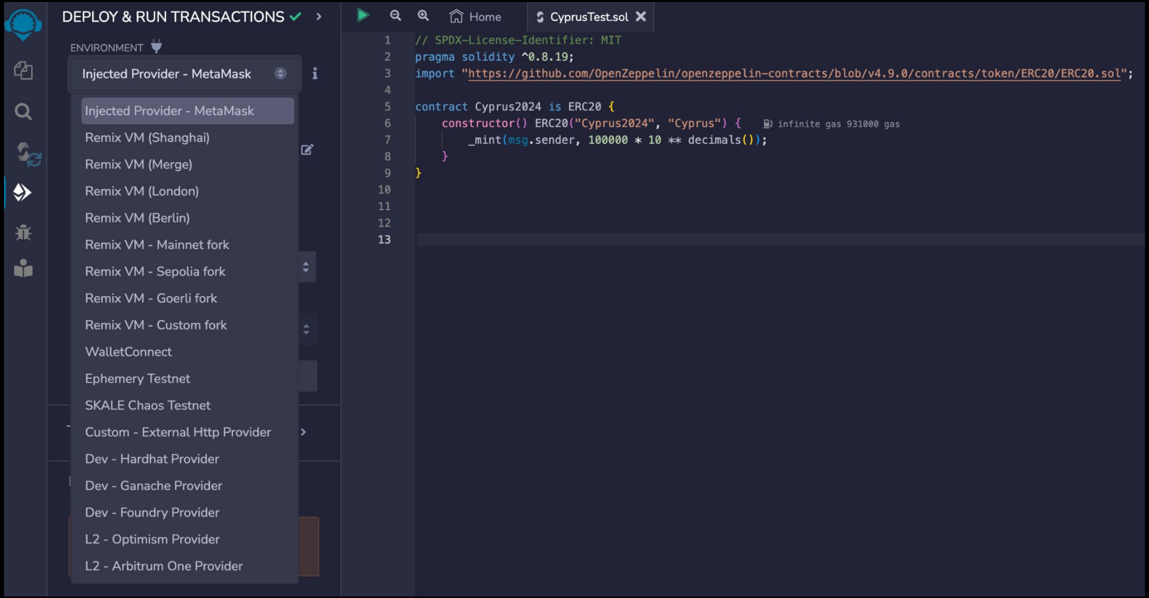
COMPILER

0.8.19+commit.7dd6d404

□ Include nightly builds

□ Auto compile

□ Hide warnings



DEPLOY & RUN TRANSACTIONS

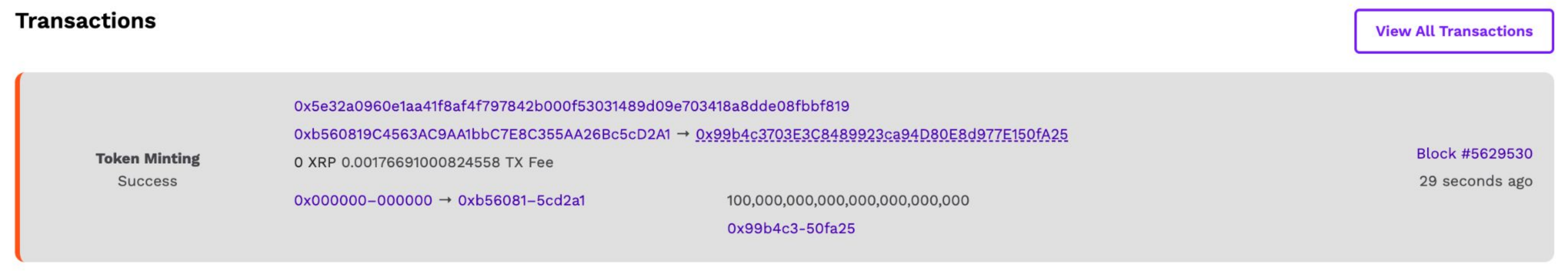
ENVIRONMENT

Injected Provider - MetaMask

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.19;
import "https://github.com/OpenZeppelin/openzeppelin-contracts/blob/v4.9.0/contracts/token/ERC20/ERC20.sol";

contract Cyprus2024 is ERC20 {
    constructor() ERC20("Cyprus2024", "Cyprus") {
        _mint(msg.sender, 100000 * 10 ** decimals());
    }
}
```

View your token on the EVM explorer



Transactions

Token Minting
Success

0x5e32a0960e1aa41f8af4f797842b000f53031489d09e703418a8dde08fbbf819

0xb560819C4563AC9AA1bbC7E8C355AA26Bc5cD2A1 → 0x99b4c3703E3C8489923ca94D80E8d977E150fA25

0 XRP 0.00176691000824558 TX Fee

0x000000–000000 → 0xb56081–5cd2a1 100,000,000,000,000,000,000,000

0x99b4c3-50fa25

Block #5629530
29 seconds ago

Web 3 example

https://github.com/XRPL-Commons/Jan2024_web3

EVM Banking Fullstack

https://github.com/XRPL-Commons/evm-banking-kryptoshpere-2024

Get the Code!

https://tinyurl.com/xrpl-evm-workshop

Oracle price feed demo

https://github.com/hazardcookie/Cyprus2024

XRP LEDGER