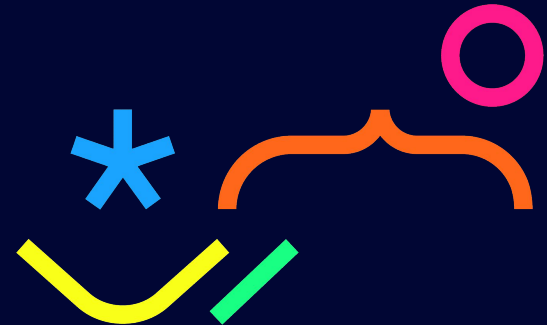


Providing Liquidity on the XRPL

Token Emissions and AMM



Liquidity On XRPL

- Tokens emissions
 - Fungible tokens / Stablecoins
 - NFTs
- Central Limit Order Book
- Automated Market Maker

Fungible tokens

- All tokens from a collection are interchangeable
- They are issued on chain by an issuer with a certain currency code
- Represent various types of assets like currencies, commodities, cryptocurrencies...
- Stablecoins are designed to track an underlying asset price



Trustlines on XRPL

TrustSet

```
{
  "TransactionType": "TrustSet",
  "Account": "ra5nK24KXen9AHvsdFTKHSANinZseWnPcX",
  "Fee": "12",
  "Flags": 262144,
  "LastLedgerSequence": 8007750,
  "LimitAmount": {
    "currency": "USD",
    "issuer": "rsP3mgGb2tcYUrxilFiHJiQXhsziegtwBc",
    "value": "100"
  },
  "Sequence": 12
}
```

- Representant a contract between two accounts to send payment of a defined currency, issuer and amount
- Prevent receiving unwanted tokens
- Directly integrated to XRPL's functions

Central Limit Order Book (CLOB)

- Order Matching
 - Buyers and sellers submit orders
 - Orders are matched based on price and time priority
- Liquidity depth
 - Multiple price levels
 - Quantity available at each price
- Suffer from possible lack of liquidity
 - gaps in prices
 - require professional market makers

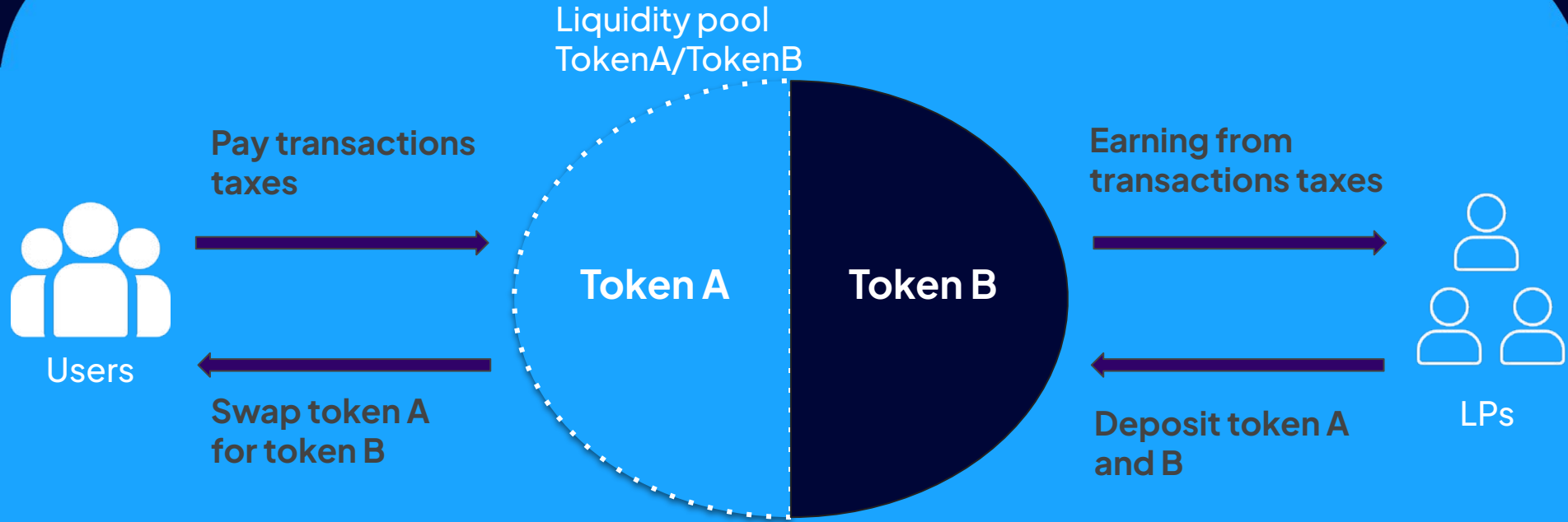
Central Limit Order Book (CLOB)



Why Use an AMM ?

- Liquidity
 - Simple mechanism for users to trade assets
 - Allow for constant liquidity and availability on the pools
 - Ideal for less liquid markets
 - All orders are market orders
 - Slippage (depends on pool size)
- Farming
 - Create add initial liquidity to the pool
 - LP represents the proportion ownership of the pool
 - Provide liquidity to AMM
 - Anyone can be market maker
 - Passively generate returns on liquidity

AMM Flow



Orchestra Pool



XRP/USDC

rGHt6...Lofs



1 XRP = 0.551982 USDC



1 USDC = 1.81165 XRP

\$502.24K

309.38M LP

● Total XRP XRP coin

461,215 XRP

● Total USDC GateHub

254,582 USDC

Volume 24h

~\$19,556

Fees 24h

~\$219.28

APR

15.72%

Contributors

795

Constant Product Market Maker

$$X * Y = K$$

$$\begin{array}{ccc} 1000 & \times & 2000 \\ \text{XRP} & & \text{USD} \\ x & & y \end{array} = \begin{array}{c} 2\,000\,000 \\ k \end{array}$$

Price per
XRP
2 USD

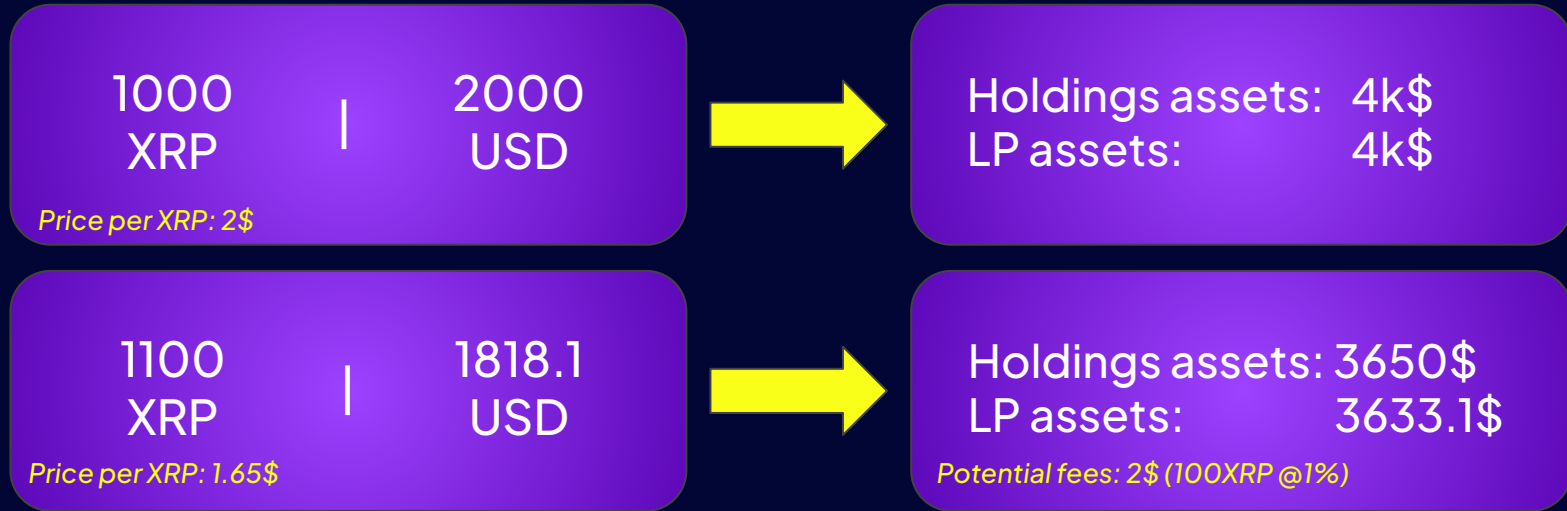
+100 XRP SWAP -181.9 USD

$$\begin{array}{ccc} 1100 & \times & 1818.1 \\ \text{XRP} & & \text{USD} \\ x & & y \end{array} = \begin{array}{c} 2\,000\,000 \\ k \end{array}$$

Price per
XRP
1,65 USD

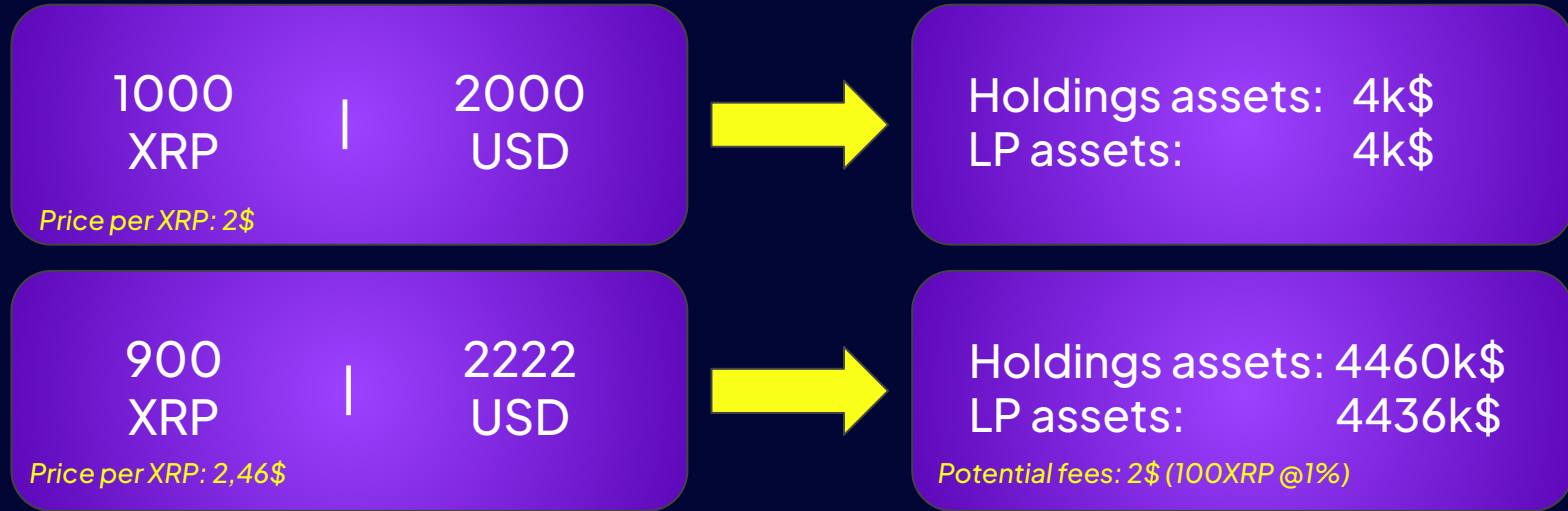
Impermanent loss (IL)

Impermanent loss occurs when the price of assets in liquidity pool changes after depositing them, leading to potential losses compared to holding the assets outside the pool. It must be mitigated with AMM pool fees.



Impermanent loss (IL)

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$|\Delta| = 24$ when XRP price rises vs $|\Delta| = 17$ when XRP price dump

Impermanent loss (IL)

Uniques features of XRPL AMMs

Protocol Native

Developers can utilize native AAM functionality without the need to manage their own smart contract design

Continuous Auction Mechanism

Reduces impermanent loss by incentivizing arbitrageurs to bid for price discrepancies at near zero fees

CLOB integration

Price optimization determines best price through liquidity pool or central limit order book

Single-sided liquidity

Anyone can easily participate as a liquidity provider as only a single asset is required to contribute to a pool

Prevent gas front running

XRPL's deterministic random transaction ordering makes front running difficult. No miners gas prioritization.

XRPL's AMM Basic functions

AMMCreate

```
{
  "Account" : "rJVUeRqDFNs2xqA7ncVE6ZoAhPUoaJJJSQm",
  "Amount" : {
    "currency" : "TST",
    "issuer" : "rP9jPyP5kyvFRb6ZiRghAGw5u8SGAmU4bd",
    "value" : "25"
  },
  "Amount2" : "2500000000",
  "Fee" : "20000000",
  "Flags" : 2147483648,
  "Sequence" : 6,
  "TradingFee" : 500,
  "TransactionType" : "AMMCreate"
}
```

→ Initiate liquidity pool on the ledger

→ Create initial balances of LP for sender

→ One or both can be tokens

XRPL's AMM Basic functions

AMMDeposit

```
{
  "Account" : "rJVUeRqDFNs2xqA7ncVE6ZoAhPUoaJJJSQm",
  "Amount" : {
    "currency" : "TST",
    "issuer" : "rP9jPyP5kyvFRb6ZiRghAGw5u8SGAmU4bd",
    "value" : "2.5"
  },
  "Amount2" : "30000000",
  "Asset" : {
    "currency" : "TST",
    "issuer" : "rP9jPyP5kyvFRb6ZiRghAGw5u8SGAmU4bd"
  },
  "Asset2" : {
    "currency" : "XRP"
  },
  "Fee" : "10",
  "Flags" : 1048576,
  "Sequence" : 7,
  "TransactionType" : "AMMDeposit"
}
```

→ Add liquidity to existing pool
in exchange of LP tokens

→ Can be single or double
assets deposits

→ Use the pool to trade for
single asset deposits

XRPL's AMM Basic functions

AMMWithdraw

```
{
  "Account" : "rJVUeRqDFNs2xqA7ncVE6ZoAhPUoaJJJSQm",
  "Amount" : {
    "currency" : "TST",
    "issuer" : "rP9jPyP5kyvFRb6ZiRghAGw5u8SGAmU4bd",
    "value" : "5"
  },
  "Amount2" : "500000000",
  "Asset" : {
    "currency" : "TST",
    "issuer" : "rP9jPyP5kyvFRb6ZiRghAGw5u8SGAmU4bd"
  },
  "Asset2" : {
    "currency" : "XRP"
  },
  "Fee" : "10",
  "Flags" : 1048576,
  "Sequence" : 10,
  "TransactionType" : "AMMWithdraw"
}
```

→ Withdraw assets by returning LP tokens to the pool

→ Delete the AMM if both pools are emptied

→ Can be simple or double assets withdrawals

XRPL Basic functions

AMMDelete

```
{
  "Account" : "rJVUeRqDFNs2xqA7ncVE6ZoAhPUoaJJJSQm",
  "Asset" : {
    "currency" : "XRP"
  },
  "Asset2" : {
    "currency" : "TST",
    "issuer" : "rP9jPyP5kyvFRb6ZiRghAGw5u8SGAmU4bd"
  },
  "Fee" : "10",
  "Flags" : 0,
  "Sequence" : 9,
  "TransactionType" : "AMMDelete"
}
```

→ Happens if there is too many trustlines to remove at once on the AMMWithdraw

→ Can delete up to 512 trustlines per call

XRPL's AMM Basic functions

AMMVote

```
{
  "Account" : "rJVUeRqDFNs2xqA7ncVE6ZoAhPUoaJJJSQm",
  "Asset" : {
    "currency" : "XRP"
  },
  "Asset2" : {
    "currency" : "TST",
    "issuer" : "rP9jPyP5kyvFRb6ZiRghAGw5u8SGAmU4bd"
  },
  "Fee" : "10",
  "Flags" : 2147483648,
  "Sequence" : 8,
  "TradingFee" : 600,
  "TransactionType" : "AMMVote"
}
```

→ Vote to change pool fees

→ Vary between 0.5 and 1%

→ Votes weighted based on LP tokens held

Any feedback ?



Swap (Payment & OfferCreate)

Workshop

- Create token
 - Enable rippling on Issuer (TrustSet)
 - Issue trustlines
 - Send payment
- Create AMM Pool
 - Must be XRP-Token
- Interact with your pool (swap)
- Interact with other trainees pools (swap)
- Become LP of others trainees pools
- Withdraw from pools

Trainings



Transaction Types



Solution



<https://replit.com/@luc26/XRPL-training-AMM-example-June-2024>