



zkBridge: The XRP Ledger

Aanchal Malhotra, Mayukha Vadari
Ripple

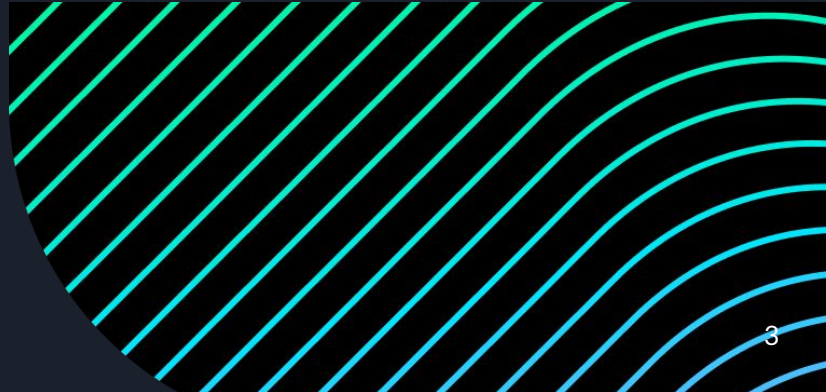


What is the XRP Ledger?

- One of the first decentralized blockchains (est. 2012)
- High performance (>1500 tps)
- Low latency (ledgers close every 4 seconds)
- Low fees (<\$0.001 per transaction)
- Carbon-neutral
- Native DEX (no smart contracts needed)
- Native NFTs (no smart contracts needed)

Python Demo

- Connect to the ledger
- Send requests
- Create & send transactions
- Check if transactions were successful





What is a transactor?

- General term for specific features on the XRPL
- Usually they involve a ledger object and a handful of transaction types
- Examples:
 - Escrows
 - Payment Channels



What is a transaction, really?

A transaction:

- Is the only way to modify the XRP Ledger state
- Creates, modifies, or deletes ledger objects
- Commits data to the ledger that users and servers have access to
- Is submitted by an account

```
{  
  "TransactionType": "...",  
  "Account": "r....",  
  "Fee": "12",  
  "Flags": "0",  
  "Sequence": 0,  
  ...  
  "SigningPubKey": "033....",  
  "TxnSignature": "3045....",  
}
```



Ledger Objects

- How the XRP Ledger stores on-ledger data
- Must be owned by an account (exception: Amendments)

```
{  
  "TransactionType": "...",  
  "Account": "r....",  
  "Fee": "12",  
  "Flags": "0",  
  "Sequence": 0,  
  ...  
  "SigningPubKey": "033....",  
  "TxnSignature": "3045....",  
}
```



The Parts of a Transaction

- **preflight**
 - what is literally everything that you can check about the validity of the transaction without needing to check the current ledger state?
- **preclaim**
 - what is everything that you can check about the validity of the transaction with read-only access to the ledger state?
- **doApply**
 - do a few sanity checks, and actually try to apply the transaction (if it fails, then you can throw another error)
- **calculateBaseFee**
 - calculate the fee that the transaction needs to pay (usually this is just inherited from the base transactor, but e.g. escrows need higher fees)
- **makeTxConsequences**
 - used when an account has multiple transactions queued to estimate whether it'll be able to pay the fees for all of them

Current Bridge Design



Resources

For more info visit : <https://xrpl.org/docs.html>

