

LABITCONF

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BUENOS AIRES, ARGENTINA



EARLY
TICKETS

WakeUp Labs



Software Engineer
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- Optimism & Arbitrum Infrastructure
- Tokenization solutions
- Aave fork



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Agenda

1. **Blockchain Architecture**
2. **Solidity: Basic concepts**
3. **Open zeppelin and ERC 20 tokens**
4. **Testing and deployment of Smart contracts**
5. **Example**

Blockchain Architecture

A blockchain is a decentralized, distributed and public digital ledger that is used to record transactions across many computers



Nodes

Machines on the network that validate transactions.



Read and Write (GAS)

write: needs to be signed and has a cost.

Read: no cost



Ethereum Virtual Machine (EVM)

decentralized virtual environment that executes code across all Ethereum nodes

Solidity

Solidity is an object-oriented, high-level language for implementing smart contracts.



object-oriented language



Inheritance and Modifiers



persistent data in state variables

```
// SPDX-License-Identifier: GPL-3.0
```

```
pragma solidity >=0.4.16 <0.9.0;
```

```
contract SimpleStorage {
```

```
    uint storedData;
```

```
    function set(uint x) public {
```

```
        storedData = x;
```

```
    }
```

```
    function get() public view returns (uint) {
```

```
        return storedData;
```

```
    }
```

```
}
```

What is an ERC20 token?



Open Zeppelin

A library for secure smart contract development.



ERC20 tokens

An ERC-20 token contract keeps track of fungible tokens



Deployment & testing

Hardhat consists of different components for editing, compiling, debugging and deploying your smart contracts



networks

Machines on the network that validate transactions.

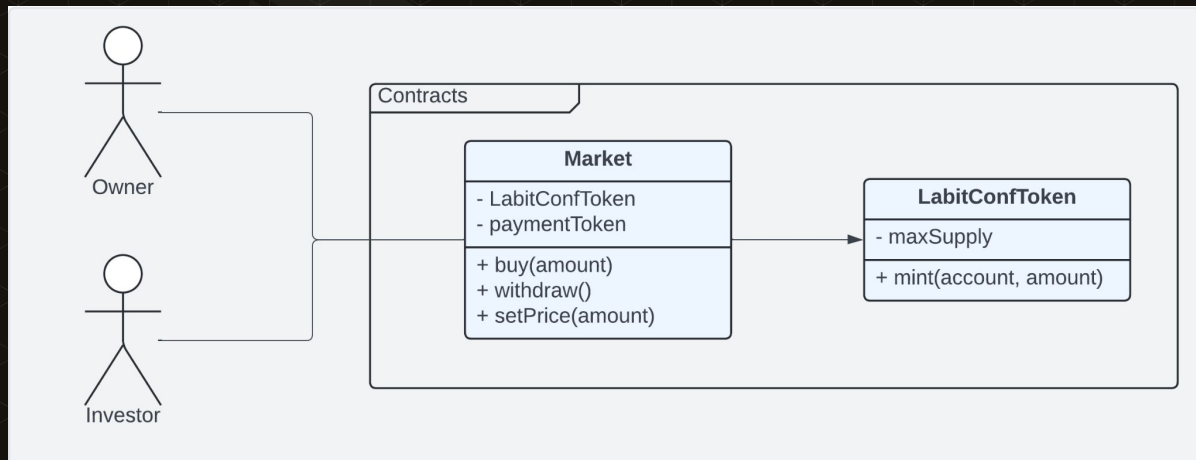


Ignition

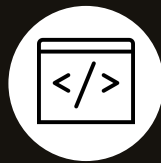
system for deploying smart contracts on Ethereum

Implements a token

Problem: Allows users to buy these tokens, possibly by exchanging another currency for the token. The token contract limits the total supply



Go to the code



DEMO

Marketplace | Address 0x9311 x +

sepolia-optimism.etherscan.io/address/0x931144fec76c30f665e10785de3d2f1497ca2dAc#readContract

OP Sepolia Testnet Search by Address / Txn Hash / Block / Token

Optimism Home Blockchain Tokens NFTs More

Contract 0x931144fec76c30f665e10785de3d2f1497ca2dAc

Source Code

Overview

ETH BALANCE

0 ETH

More Info

CONTRACT CREATOR

0x4a546591...647F34c4F at txn 0x237b32b28f3...

Multichain Info

N/A

Transactions Internal Transactions Token Transfers (ERC20) **Contract** Events

Code **Read Contract** Write Contract

Connect to Web3

Read Contract Information [Expand all] [Reset]

1. labitConfToken	[Copy] [Copy] [Copy]
2. owner	[Copy] [Copy] [Copy]
3. paymentToken	[Copy] [Copy] [Copy]
4. tokenPrice	[Copy] [Copy] [Copy]

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Summary

1. Solidity: Basic concepts

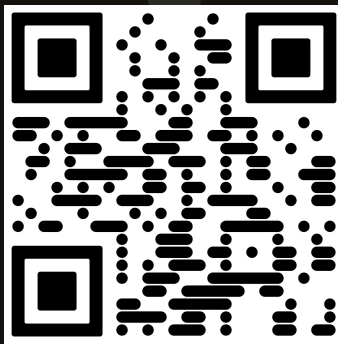
- Ownership
- msg.sender
- Approves and minting

MARKETPLACE: [Ox931144fec76c30F665E10785De3D2F1497Ca2dAc](#)

Useful links

- ✓ [solidity documentation](#)
- ✓ [Open Zeppelin documentation](#)
- ✓ [Hardhat](#)
- ✓ [github](#)

Thanks!



 **wakeup**