

Họ và tên: Phan Quốc Việt

MSV: 22025066

# Ultimate ERC-20 Token & Crowdsale Creation Guide

- What is ERC-20 ?

ERC-20 là một giao diện tiêu chuẩn cho các mã thông báo trên chuỗi khối Ethereum, có nghĩa là tất cả các mã thông báo ERC-20 đều tuân theo các quy tắc giống nhau và tương thích với nhau. Điều này giúp ví, sàn giao dịch và các dịch vụ khác hỗ trợ tất cả các mã thông báo ERC-20 dễ dàng hơn vì chúng có thể dựa vào một bộ quy tắc và chức năng được chia sẻ.

Step 1: Setup environment

NodeJs: <https://nodejs.org/en/download/>

Truffle : <https://github.com/nodejs/node-gyp#installation>

Ganache: <https://trufflesuite.com/ganache/>

Step2: Write your smart contract

Ganache

ACCOUNTS

BLOCKS

TRANSACTIONS

CONTRACTS

EVENTS

LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK  
0

GAS PRICE  
20000000000

GAS LIMIT  
6721975

HARDFORK  
MERGE

NETWORK ID  
5777

RPC SERVER  
HTTP://127.0.0.1:7545

MINING STATUS  
AUTOMINING

WORKSPACE  
QUICKSTART

SAVE

SWITCH

MNEMONIC

clerk else name session pelican scorpion toilet depth pink cotton tribe bean

HD PATH  
m44'60'0'0account\_index

ADDRESS  
0xC13788dba5a76dd38Ac2D4B0AA14651332025f6C

BALANCE  
100.00 ETH

TX COUNT  
0

INDEX  
0

ADDRESS  
0xA5e1cd276cB56C7aCf39C4f4a0C710d577492c11

BALANCE  
100.00 ETH

TX COUNT  
0

INDEX  
1

ADDRESS  
0x68c83a9b14A04f7AA1d333AcF3ea41eE10692180

BALANCE  
100.00 ETH

TX COUNT  
0

INDEX  
2

ADDRESS  
0xca570A758CFfa76C2A82fA1e21c0F5bFe19E4a0E

BALANCE  
100.00 ETH

TX COUNT  
0

INDEX  
3

ADDRESS  
0x3b2BFb9e7Db7f739e3B40275E6fb8A45f5001e11

BALANCE  
100.00 ETH

TX COUNT  
0

INDEX  
4

ADDRESS  
0xD0ec7d165Aba16a0c28bd0627d395e3162819fb6

BALANCE  
100.00 ETH

TX COUNT  
0

INDEX  
5

ADDRESS  
0x7FC964e11f8CcD02B13EC081D46E5CD75bfe6494

BALANCE  
100.00 ETH

TX COUNT  
0

INDEX  
6

*Giao diện của Ganache khi cài đặt thành công.*

Now we (globally) install and then initialise Truffle which will install a number of [default files and folders](#):

```
npm install -g truffle
truffle init
```

## Install OpenZeppelin ERC20

As we will be using OpenZeppelin's implementation of ERC20 we need to install with npm (initialising this first):

```
npm init -y
npm install @openzeppelin/contracts
```

*Cài đặt OpenZeppelin.*

```

29 module.exports = {
30   contracts_build_directory: path.join(__dirname, "client/src/contracts"),
31   /**
32    * Networks define how you connect to your ethereum client and let you set the
33    * defaults web3 uses to send transactions. If you don't specify one truffle
34    * will spin up a development blockchain for you on port 9545 when you
35    * run `develop` or `test`. You can ask a truffle command to use a specific
36    * network from the command line, e.g
37    *
38    * $ truffle test --network <network-name>
39    */
40
41   networks: {
42
43     // Useful for testing. The `development` name is special - truffle uses it by default
44     // if it's defined here and no other network is specified at the command line.
45     // You should run a client (like ganache-cli, geth or parity) in a separate terminal
46     // tab if you use this network and you must also set the `host`, `port` and `network_id`
47     // options below to some value.
48     //
49     development: {
50       host: "127.0.0.1",      // Localhost (default: none)
51       port: 7545,            // Standard Ethereum port (default: none)
52       network_id: "*",       // Any network (default: none)
53     },
54

```

*Sửa config trong file “truffle-config.js”.*

WORKSPACE
SERVER
ACCOUNTS & KEYS
CHAIN
ADVANCED
ABOUT

⚠ Restarting the Quickstart workspace resets the blockchain. All transactions will be lost.

### SERVER

HOSTNAME

127.0.0.1 - Loopback Pseudo-Interface 1
▼

The server will listen on this host.

PORT NUMBER

7545

Internal block explorer will use this port.

NETWORK ID

5777

Internal block explorer will use this network ID.

AUTOMINE

☒

Process transactions automatically.

ERROR ON TRANSACTION FAILURE

☒

When transaction "status" flag returns false, throw an error like this: "Transaction failed: status is false"

### CHAIN FORKING

☐

Fork an existing blockchain and initialize with a new genesis block.

*Chỉ sửa thông tin server ở Ganache.*

```

D:\master UET\blockchain\token>npx truffle test
> Something went wrong while attempting to connect to the network at http://127.0.0.1:7545. Check your network configuration.
CONNECTION ERROR: Couldn't connect to node http://127.0.0.1:7545.
Truffle v5.8.0 (core: 5.8.0)
Node v18.15.0

D:\master UET\blockchain\token>npx truffle test
Using network 'development'.

Compiling your contracts...
=====
> Compiling @openzeppelin\contracts\math\SafeMath.sol1
> Compiling @openzeppelin\contracts\token\ERC20\ERC20.sol
> Compiling @openzeppelin\contracts\token\ERC20\IERC20.sol
> Compiling @openzeppelin\contracts\utils\Context.sol
> Compiling .\contracts\Migrations.sol
> Compiling .\contracts\PreciousChickenToken.sol
> Artifacts written to C:\Users\Admin\AppData\Local\Temp\test--6576-5GmKzEKfyXwN
> Compiled successfully using:
   - solc: 0.6.12+commit.27d51765.Emscripten.clang
   Fetching solc version list from solc-bin. Attempt #1

 0 passing (0ms)

D:\master UET\blockchain\token>

```

*Chạy command deploy local network.*

| CURRENT BLOCK | GAS PRICE  | GAS LIMIT                    | HARDWARE | NETWORK ID | RPC URL               | MINING STATUS | WORKSPACE | QUICKSTART | SAVE | SWITCH | +               |
|---------------|------------|------------------------------|----------|------------|-----------------------|---------------|-----------|------------|------|--------|-----------------|
| 4             | 2000000000 | 6721975                      | MERGE    | 5777       | HTTP://127.0.0.1:7545 | AUTOMINING    |           |            |      |        |                 |
| BLOCK 4       |            | MINED ON 2023-03-11 19:01:46 |          |            |                       |               |           |            |      |        | 1 TRANSACTION   |
| BLOCK 3       |            | MINED ON 2023-03-11 19:01:46 |          |            |                       |               |           |            |      |        | 1 TRANSACTION   |
| BLOCK 2       |            | MINED ON 2023-03-11 19:01:46 |          |            |                       |               |           |            |      |        | 1 TRANSACTION   |
| BLOCK 1       |            | MINED ON 2023-03-11 19:01:46 |          |            |                       |               |           |            |      |        | 1 TRANSACTION   |
| BLOCK 0       |            | MINED ON 2023-03-11 19:01:33 |          |            |                       |               |           |            |      |        | NO TRANSACTIONS |

*Tạo transactions thành công.*

Refer:

<https://github.com/PreciousChicken/openzeppelin-erc20-using-ethers-truffle-and-react>

<https://www.preciouschicken.com/blog/posts/openzeppelin-erc20-using-ethers-truffle-and-react/>

<https://www.codementor.io/@thecodementor1/ultimate-erc-20-token-crowdsale-creation-guide-lxk65bxlr>