Geth

You can use geth to create a sandbox environment to run Etereum smart contracts. Download [geth](https://geth.ethereum.org/downloads/)

Use this script to run geth as a testchain:

RD /S /Q %~dp0\devChain\geth\chainData

RD /S /Q %~dp0\devChain\geth\dapp

RD /S /Q %~dp0\devChain\geth\nodes

del %~dp0\devchain\geth\nodekey

geth.exe --datadir=devChain init genesis\_dev.json

geth.exe --mine --rpc --networkid=39318 --cache=2048 --maxpeers=0 --datadir=devChain --rpccorsdomain "\*" --rpcapi "eth,web3,personal,net,miner,admin,debug" --verbosity 0 console

where genesis\_dev.json is:

{

"config": {},

"nonce": "0x0000000000000042",

"difficulty": "0x200",

"alloc": {

"12890d2cce102216644c59dae5baed380d84830c": {

"balance": "10000000000000000000000"

}

},

"mixhash": "0x0000000000000000000000000000000000000000000000000000000000000000",

"coinbase": "0x0000000000000000000000000000000000000000",

"timestamp": "0x00",

"parentHash": "0x0000000000000000000000000000000000000000000000000000000000000000",

"extraData": "0x",

"gasLimit": "0x4c4b40"

}

Solidity Smart Contracts

The smart contracts for **Ethereum** are written with **Solidity** and the framework **NEthereum** is used to interact with the Ethereum.

There are 3 contracts:

Zimrii.Solidity\Contracts\platform\ArtistContract.sol: this is used to store the details of the contract between artist/buyer.

Zimrii.Solidity\Contracts\platform\ArtistRoyalties.sol: this is used to store information about artist royalties.

Zimrii.Solidity\Contracts\platform\MusicCopyright.sol: this is used to store information about music copyrights.

Once the contract are built they generate a ***.bin*** file and ***.abi.*** They are stored under Zimrii.Solidity\Contracts\platform\Metadata

The bin file has the binary code of the contract, the abi is like a wsdl file.

**NB**: the abi needs to be stored in the database.

To understand how to use the smart contracts look at the tests, for example Zimrii.Solidity.Tests\MusicCopyrightTest.cs

As an example, the MusicCopyrigts has this interface:

var setCopyright = contract.GetFunction("setCopyright");

var getCopyrightId = contract.GetFunction("getCopyrightId");

var getCopyrightHash = contract.GetFunction("getCopyrightHash");

var setCopyrightEndpointResourceRoot = contract.GetFunction("setCopyrightEndpointResourceRoot");

var getCopyrightResourceEndpoint = contract.GetFunction("getCopyrightResourceEndpoint");

The get<Xyz> functions are quick to execute, the set<Xyz> needs to be “mined” and could take up to 1 hour to execute.

var transactionHash = await setCopyright.SendTransactionAsync(AccountAddress,

"51BF375C77BC4C089DCAD2AC4935E600", "3345D89C498A4EB79DB670F46F25EF00", "1B2M2Y8AsgTpgAmY7PhCfg==");