

Projecte

Creació d'un contracte intel·ligent de Crowdfunding o donacions usant BlockChain a MultiversX.

Les condicions del contracte serien les següents:

- Import mínim per donant (en 1 sola transacció): 0.1 \$EGLD per transacció.
- Import màxim per donant (acumulat en totes les transaccions del mateix donant): 0.4 \$EGLD en totes les transaccions del mateix donant.
- Import màxim per al projecte (sumant totes les transaccions de tots els donants):
 - Mínim de 50 \$EGLD de finançament.
 - Màxim de 100 \$EGLD.

Número de contracte

erd1qqqqqqqqqqqqqpqqacq4fpaah05j3ekpdst3e0xgdjz4lxpw54sg424yy

Visualització a Devnet

<https://devnet-explorer.multiversx.com/accounts/erd1qqqqqqqqqqqqqpqqacq4fpaah05j3ekpdst3e0xgdjz4lxpw54sg424yy>

Wallet

La wallet amb la què es realitza el contracte i les transaccions és la següent:

erd13p62plk4htgy3h0mqzhyzl2qp6sm0jdlpp9jzmw7f7g3vyqaw54sxcnz49

Codi del contracte (donacions.rs)

```
#![no_std]

use multiversx_sc::derive_imports::*;
#[allow(unused_imports)]
use multiversx_sc::imports::*;

#[type_abi]
#[derive(TopEncode, TopDecode, PartialEq, Clone, Copy)]
pub enum Status {
    FundingPeriod,
    Successful,
    Failed,
}

#[multiversx_sc::contract]
pub trait CrowdfundingSc {

    // --- MODIFICACIÓ 1: INIT ARA REP ELS NOUS PARÀMETRES ---
    #[init]
    fn init(
        &self,
```

```

        target: BigUint,
        deadline: u64,
        min_contribution: BigUint, // Mínim per transacció
        max_per_user: BigUint,      // Màxim acumulat per usuari
        max_cap: BigUint            // Màxim total del projecte (Hard
Cap)
    ) {
        require!(target > 0, "Target must be more than 0");
        require!(max_cap >= target, "Max cap must be >= Target");
        require!(max_per_user >= min_contribution, "Max per user must be
>= Min contribution");

        self.target().set(target);
        self.min_contribution().set(min_contribution);
        self.max_per_user().set(max_per_user);
        self.max_cap().set(max_cap);

        require!(
            deadline > self.get_current_time(),
            "Deadline can't be in the past"
        );
        self.deadline().set(deadline);
    }

#[upgrade]
fn upgrade(&self) {}

#[endpoint]
#[payable("EGLD")]
fn fund(&self) {
    let payment = self.call_value().egld().clone_value();

    // --- CONDICIÓN 1: Import mínim per transacció ---
    require!(
        payment >= self.min_contribution().get(),
        "L'import es inferior al mínim permès per transaccio"
    );

    let current_time = self.blockchain().get_block_timestamp();
    require!(
        current_time < self.deadline().get(),
        "cannot fund after deadline"
    );

```

```

        // --- CONDICIÓN 2: Màxim total del projecte (Hard Cap) ---
        // get_current_funds inclou el pagament actual perquè és un
mètode payable
        let current_funds = self.get_current_funds();
        require!(
            current_funds <= self.max_cap().get(),
            "S'ha superat el limit màxim de finançament del projecte
(Hard Cap) "
        );

        let caller = self.blockchain().get_caller();
        let deposited_amount = self.deposit(&caller).get();
        let new_user_total = &deposited_amount + &payment;

        // --- CONDICIÓN 3: Màxim acumulat per usuari ---
        require!(
            new_user_total <= self.max_per_user().get(),
            "Superes el limit màxim d'aportació per usuari"
        );

        // Si tot és correcte, actualitzem el dipòsit de l'usuari
        self.deposit(&caller).set(new_user_total);
    }

#[endpoint]
fn claim(&self) {
    match self.status() {
        Status::FundingPeriod => sc_panic!("cannot claim before
deadline"),
        Status::Successful => {
            let caller = self.blockchain().get_caller();
            require!(
                caller == self.blockchain().get_owner_address(),
                "only owner can claim successful funding"
            );

            let sc_balance = self.get_current_funds();
            self.send().direct_egld(&caller, &sc_balance);
        }
        Status::Failed => {
            let caller = self.blockchain().get_caller();
            let deposit = self.deposit(&caller).get();

```

```

        if deposit > 0u32 {
            self.deposit(&caller).clear();
            self.send().direct_egld(&caller, &deposit);
        }
    }
}

#[view]
fn status(&self) -> Status {
    if self.get_current_time() <= self.deadline().get() {
        Status::FundingPeriod
    } else if self.get_current_funds() >= self.target().get() {
        Status::Successful
    } else {
        Status::Failed
    }
}

#[view(getCurrentFunds)]
fn get_current_funds(&self) -> BigUint {
    self.blockchain()
        .get_sc_balance(&EgldOrEsdtTokenIdentifier::egld(), 0)
}

// private

fn get_current_time(&self) -> u64 {
    self.blockchain().get_block_timestamp()
}

// storage

#[view(getTarget)]
#[storage_mapper("target")]
fn target(&self) -> SingleValueMapper<BigUint>;

#[view(getDeadline)]
#[storage_mapper("deadline")]
fn deadline(&self) -> SingleValueMapper<u64>;

#[view(getDeposit)]

```

```

    #[storage_mapper("deposit")]
    fn deposit(&self, donor: &ManagedAddress) ->
SingleValueMapper<BigUInt>;

    // --- MODIFICACIÓ 2: NOUS STORAGE MAPPERS ---

    #[view(getMinContribution)]
    #[storage_mapper("minContribution")]
    fn min_contribution(&self) -> SingleValueMapper<BigUInt>;

    #[view(getMaxPerUser)]
    #[storage_mapper("maxPerUser")]
    fn max_per_user(&self) -> SingleValueMapper<BigUInt>;

    #[view(getMaxCap)]
    #[storage_mapper("maxCap")]
    fn max_cap(&self) -> SingleValueMapper<BigUInt>;
}

```

1. Realitzem la creació del nou contracte intel·ligent.

pwd_is_123@ubuntu24-vbox: ~/codigo/ejemplos/donacions

```
pwd_is_123@ubuntu24-vbox:~/codigo/ejemplos/donacions$ sc-meta all build
/home/pwd_is_123/codigo/ejemplos/donacions

Found 1 contract crates.

(1)
/home/pwd_is_123/codigo/ejemplos/donacions/meta
Building 'cargo run build'
Compiling multiversx-sc-meta-lib v0.58.0
Compiling donacions v0.0.0 (/home/pwd_is_123/codigo/ejemplos/donacions)
Compiling donacions-meta v0.0.0 (/home/pwd_is_123/codigo/ejemplos/donacions/meta)
Finished 'dev' profile [unoptimized + debuginfo] target(s) in 4.49s
Running '/home/pwd_is_123/codigo/ejemplos/donacions/target/debug/donacions-meta build'
Setting workspace target directory: /home/pwd_is_123/codigo/ejemplos/donacions/target ...
Building donacions.wasm in /home/pwd_is_123/codigo/ejemplos/donacions/wasm ...
RUSTFLAGS="-C link-arg=-s -C link-arg=-zstack-size=131072" cargo build --target=wasm32v1-none --release --target-dir /home/pwd_is_123/codigo/ejemplos/donacions/target
Updating crates.io index
Blocking waiting for file lock on package cache
Locking 25 packages to latest compatible versions
Adding multiversx-sc-wasm-adapter v0.58.0 (available: v0.63.1)
Blocking waiting for file lock on package cache
Blocking waiting for file lock on package cache
Compiling proc-macro2 v1.0.103
Compiling unicode-ident v1.0.22
Compiling quote v1.0.42
Compiling hex v0.4.3
Compiling rustversion v1.0.22
Compiling typenum v1.19.0
Compiling smallvec v1.15.1
Compiling autocfg v1.5.0
Compiling endian-type v0.1.2
Compiling nibble_vec v0.1.0
Compiling unwrap-infallible v0.1.5
Compiling bitflags v2.10.0
Compiling arrayvec v0.7.6
Compiling radix_trie v0.2.1
Compiling num-traits v0.2.19
Compiling hex-literal v1.1.0
Compiling syn v2.0.111
Compiling generic-array v1.3.5
Compiling multiversx-sc-codec-derive v0.22.1
Compiling multiversx-sc-derive v0.58.0
Compiling multiversx-sc-codec v0.22.1
Compiling multiversx-chain-core v0.15.0
Compiling multiversx-sc v0.58.0
Compiling multiversx-sc-wasm-adapter v0.58.0
Compiling donacions v0.0.0 (/home/pwd_is_123/codigo/ejemplos/donacions)
Compiling donacions-wasm v0.0.0 (/home/pwd_is_123/codigo/ejemplos/donacions/wasm)
```

2. Despliegamiento del contrato

```
mnp contract deploy --bytecode ./output/donacions.wasm --recall-nonce
--pem=walletdiego.pem --gas-limit=60000000 --proxy=https://devnet-gateway.multiversx.com
--chain="D" --arguments 5000000000000000000 1767225600 1000000000000000000
4000000000000000000 10000000000000000000 --send
```

```

696e436f6e747269627574696f6e7461726765746465706f7369746d6178436170646561646c696e654c27696d706f727420657320696e666572696f7220616
2616e73616363696f63616e6e6f742066756e6420616674657220646561646c696e6553276861207375706572617420656c206c696d6974206d6178696d2064
6a656374652028461726420436170295375706572657320656c206c696d6974206d6178696d20642761706f72746163696f7207065722075737561726954617
e20304d617820636170206d757374206265203e3d205461726765744d6178207065722075736572206d757374206265203e3d204d696e20636f6e7472696275
20696e20746865207061737463616e6e6f7420636c61696d206265666f726520646561646c696e656f6e6c79206f776e65722063616e20636c61696d2073756
0418885080b0438ffff0050000500002b5e3af16b188000006955b0000016345785d8a00000058d15e1762800000056bc75e2d63100000",
  "emittedTransactionHash": "d7bd6d7a391987214b3b82905dafa9c9cd62c93d6f3de1859dcc55297c24246b",
  "contractAddress": "erd1qqqqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy"
}
pwd_is_123@ubuntu24-vbox:~/codigo/ejemplos/donacions$

```

Número de contracte:

erd1qqqqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy

Contracte a Devnet:

<https://devnet-explorer.multiversx.com/accounts/erd1qqqqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy>

3. Consulta del contracte

mxpy contract query

erd1qqqqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy --proxy

<https://devnet-gateway.multiversx.com> --function getTarget

```

pwd_is_123@ubuntu24-vbox:~/codigo/ejemplos/donacions$ ^C
pwd_is_123@ubuntu24-vbox:~/codigo/ejemplos/donacions$ mxpy contract query erd1qqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy --proxy https://devnet-gateway.multiversx.com --function getTarget
{"02b5e3af16b1880000"}
pwd_is_123@ubuntu24-vbox:~/codigo/ejemplos/donacions$

```

4. Transaccions al contracte. (Donacions)

S'executen transaccions al contracte per tal de veure els límits posats.

Cas1:Transacció que supera el límit de la wallet amb la què es fa la donació.

mxpy contract call erd1qqqqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy

--function fund --value 6000000000000000000 --recall-nonce --pem=walletdiego.pem

--gas-limit=10000000 --proxy="<https://devnet-gateway.multiversx.com>" --chain="D" --send

```

pwd_is_123@ubuntu24-vbox:~/codigo/ejemplos/donacions$ mxpy contract call erd1qqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy --function fund --value 6000000000000000000 --recall-nonce --pem=walletdiego.pem --gas-limit=10000000 --proxy="https://devnet-gateway.multiversx.com" --chain="D" --send
WARNING: cli: The --recall-nonce flag is DEPRECATED. The nonce is fetched from the network by default.
INFO: utils: View this transaction in the MultiversX Devnet Explorer: https://devnet-explorer.multiversx.com/transactions/37278692b8780259b7eb4402a51f708fadd71d1e6ed420c13c7e9b56c59ff42
{"emittedTransaction": {
  "nonce": 9,
  "value": "6000000000000000000",
  "receiver": "erd1qqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy",
  "sender": "erd13p62p1k4htg3h0mzhyzl2q6sn@jdlpp9jzw7f7g3vyqaw54sxcnz49",
  "senderUsername": "",
  "receiverUsername": "",
  "gasPrice": 100000000,
  "gasLimit": 10000000,
  "data": "ZnVudA==",
  "chainID": "D",
  "version": 2,
  "options": 0,
  "guardian": "",
  "signature": "22e5c1e3c859546a1e508db12f8331ac441759c549ac8a7abb78e659568f45bcd98d18e2b73359c1e05087dd77c86af8a4e4c143e7cd9109dd5bb7c8a0189",
  "guardianSignature": "",
  "relayer": "",
  "relayerSignature": ""
},
  "emittedTransactionData": "fund",
  "emittedTransactionHash": "37278692b8780259b7eb4402a51f708fadd71d1e6ed420c13c7e9b56c59ff42",
  "contractAddress": "erd1qqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy"}
pwd_is_123@ubuntu24-vbox:~/codigo/ejemplos/donacions$

```

Mirem les transaccions realitzades.

Missatge: *Insuficient funds:15540000000000*. (Superat el límit de la wallet).

Cas2: Transacció amb l'aportació del mínim de 0,1\$EGLD per donant.

mxpy contract call erd1qqqqqqqqqqqqqqpggacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy
 --function fund --value 10000000000000000 --recall-nonce --pem=walletdiego.pem
 --gas-limit=10000000 --proxy="<https://devnet-gateway.multiversx.com>" --chain="D" --send

```

erd_is_123@lubuntu24-vbox:~/codigo/empleos/donacions$ mxpy contract call erd1qqqqqqqqqqqqpggacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy --function fund --value 10000000000000000 --recall-nonce --pem=walletdiego.pem --gas-limit=10000000 --proxy="https://devnet-gateway.multiversx.com" --chain="D" --send
WARNING: cli: The --recall-nonce flag is DEPRECATED. The nonce is fetched from the network by default.
INFO: utils: View this transaction in the MultiversX Devnet Explorer: https://devnet-explorer.multiversx.com/transactions/bf78af52674743e01f63771ca9dbb4821a4be26de9f912ac63688634f3bd4ecd0
{
  "emittedTransaction": {
    "nonce": 18,
    "value": "10000000000000000",
    "receiver": "erd1qqqqqqqqqqqqpggacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy",
    "sender": "erd13p62plk4htgy3h0mqzhyzl2qp6sm0jdlpp9jzmw7f7g3vyqaw54sxcnz49",
    "senderUsername": "",
    "receiverUsername": "",
    "gasPrice": 1000000000,
    "gasLimit": 10000000,
    "data": "ZnVudA==",
    "chainID": "D",
    "version": 2,
    "options": 0,
    "guardian": "",
    "signature": "3f37c26e783e0eb1fc67f16fa4c1dcad8f0a1b3ce973e1dce3b5896895b13fc177fb0f0ae858d021241567f3580242e893fbee9738eed4adda68e63f6fab01",
    "guardianSignature": "",
    "relayer": "",
    "relayerSignature": ""
  },
  "emittedTransactionData": "fund",
  "emittedTransactionHash": "bf78af52674743e01f63771ca9dbb4821a4be26de9f912ac63688634f3bd4ecd0",
  "contractAddress": "erd1qqqqqqqqqqqqpggacq4fpaah05j3ekpdst3e0xgdjzp4lxpw54sg424yy"
}
erd_is_123@lubuntu24-vbox:~/codigo/empleos/donacions$

```

Mirem les transaccions realitzades.

Devnet Explorer

Dashboard
Blocks
Transactions
Accounts
Apps
Tokens
NFTs
Validators
Devnet

Search for an address, @herotag, transaction/block hash, validator key or token id
Epoch 4,877
1,446 Rounds Left

erd1qqqqqqqqqqqqqq ... z4lpxw54sg424yy

Address: erd1qqqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjz4lpxw54sg424yy (Shard 1)
Owner: erd13p62plk4htgy3h0mqzhyz12qp6sm0jdlpp9jzrw7f7g3vyqaw54sxcnz49
Properties: Upgradeable, Readable, Payable, Payable by Smart Contract

Balance: 0.1 xEGLD
≈\$0.66

Rewards: 0.000036 xEGLD
≈\$0.00024

Total Transactions: 3

First Deployed: 13 mins ago

Latest Upgrade: N/A

Transactions
ESDT Tokens
NFTs
Staking
Analytics
Upgrades
Code

Fail: Superes el limit maxim d'aportacio per usuari

	Shard	From	To	Method	Value
ec92c10 ... bcc6548 52 secs Shard 1 → Shard 1 erd13p62 ... 4sxcnz49 IN erd1qqqq ... sg424yy Fund					0.4 xEGLD
bf78af526 ... 3bd4ecd0 2 mins Shard 1 → Shard 1 erd13p62 ... 4sxcnz49 IN erd1qqqq ... sg424yy Fund					0.1 xEGLD
3727869 ... 6c59ff42 5 mins Shard 1 → Shard 1 erd13p62 ... 4sxcnz49 IN erd1qqqq ... sg424yy Fund					6 xEGLD

Show 25 records

Missatge: *Superes el límit màxim d'aportació per usuari.*

Cas3: Transacció que supera l'aportació màxima de 0,4 \$EGLD per donant. (El donant ja havia donat 0,1 \$EGLD)

Transacció de 0,31 \$EGLD. (Transacció màxima fins al límit del donant 0,3 \$EGLD)

```

erd13p62plk4htgy3h0mqzhyz12qp6sm0jdlpp9jzrw7f7g3vyqaw54sxcnz49
cli.py:79
utils.py:161
{"emittedTransaction": {
  "nonce": 12,
  "value": "310000000000000000",
  "receiver": "erd1qqqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjz4lpxw54sg424yy",
  "sender": "erd13p62plk4htgy3h0mqzhyz12qp6sm0jdlpp9jzrw7f7g3vyqaw54sxcnz49",
  "senderUsername": "",
  "receiverUsername": "",
  "gasPrice": 100000000,
  "gasLimit": 10000000,
  "data": "ZnVhZA==",
  "chainID": "D",
  "version": 2,
  "options": 0,
  "guardian": "",
  "signature": "d0a67aa26ef80033b04a6de07ee6f7aed2c5cf96155ca0e7806d18f53c394f2dbbbeBece266ef50f798103718730a358642fc893b00beba6220cfff088e4e306",
  "guardianSignature": "",
  "relayer": "",
  "relayerSignature": ""
},
"emittedTransactionData": "fund",
"emittedTransactionHash": "f10899a9623da3ab15bc874beb619600c3bf9e7d1d6089293cddbaccd23a16f3",
"contractAddress": "erd1qqqqqqqqqqqqqqqgacq4fpaah05j3ekpdst3e0xgdjz4lpxw54sg424yy"
}

```

Mirem les transaccions realitzades.

6. Transaccions realitzades per la Wallet amb la que s'han realitzat les donacions.

[illegible]