

ETHEREUM



CryptoPack Delivery

Presented by:
Luigi di Nuzzo & Filippo Veronesi



Introduzione

CryptoPackDelivery è una dApp di Ethereum scritta in Solidity che simula la consegna di pacchi.

Ogni pacco è trattato come un NFT: infatti, al momento della creazione, viene minato e inserito nel container. Al termine della consegna la proprietà del NFT viene trasferita automaticamente all'indirizzo del destinatario inserito nel form della web page.



Core developers Tools

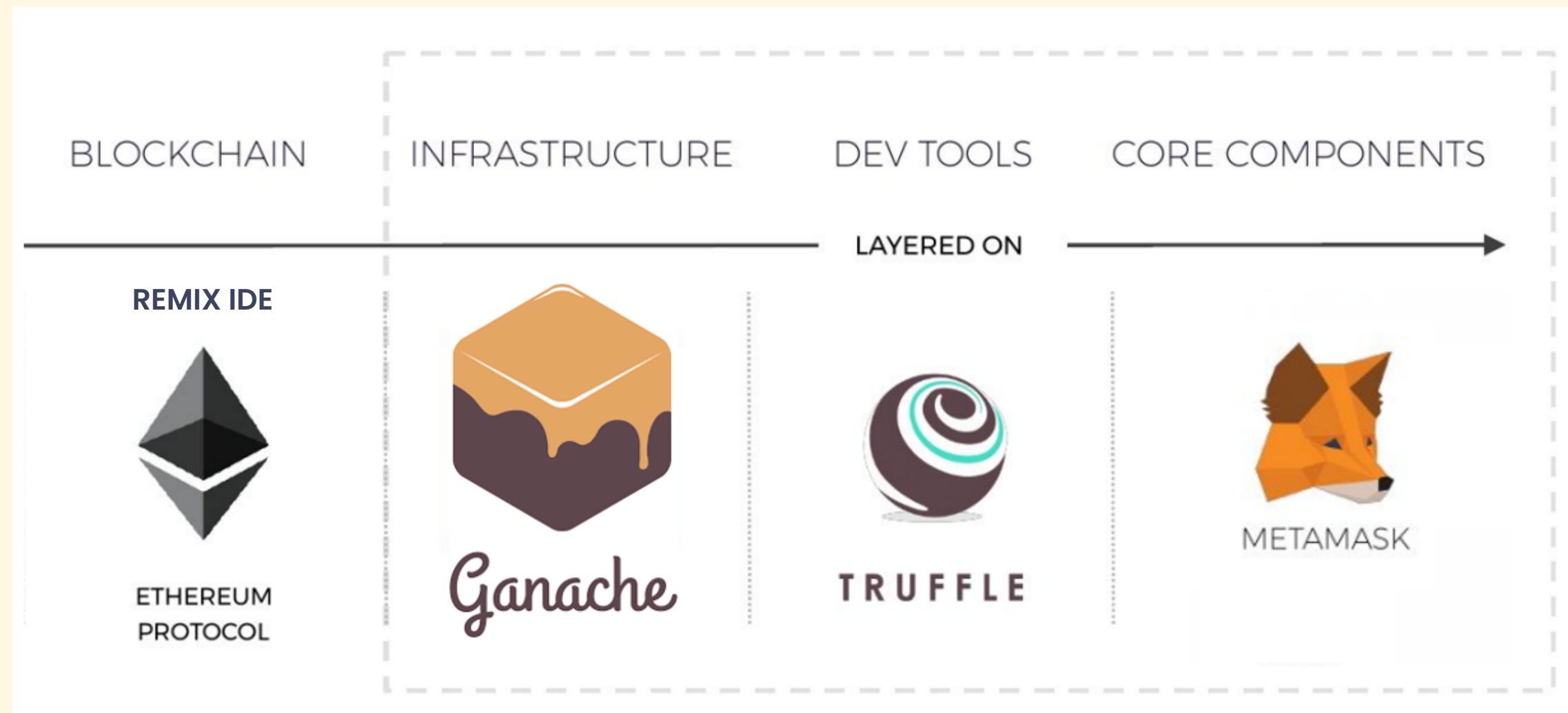
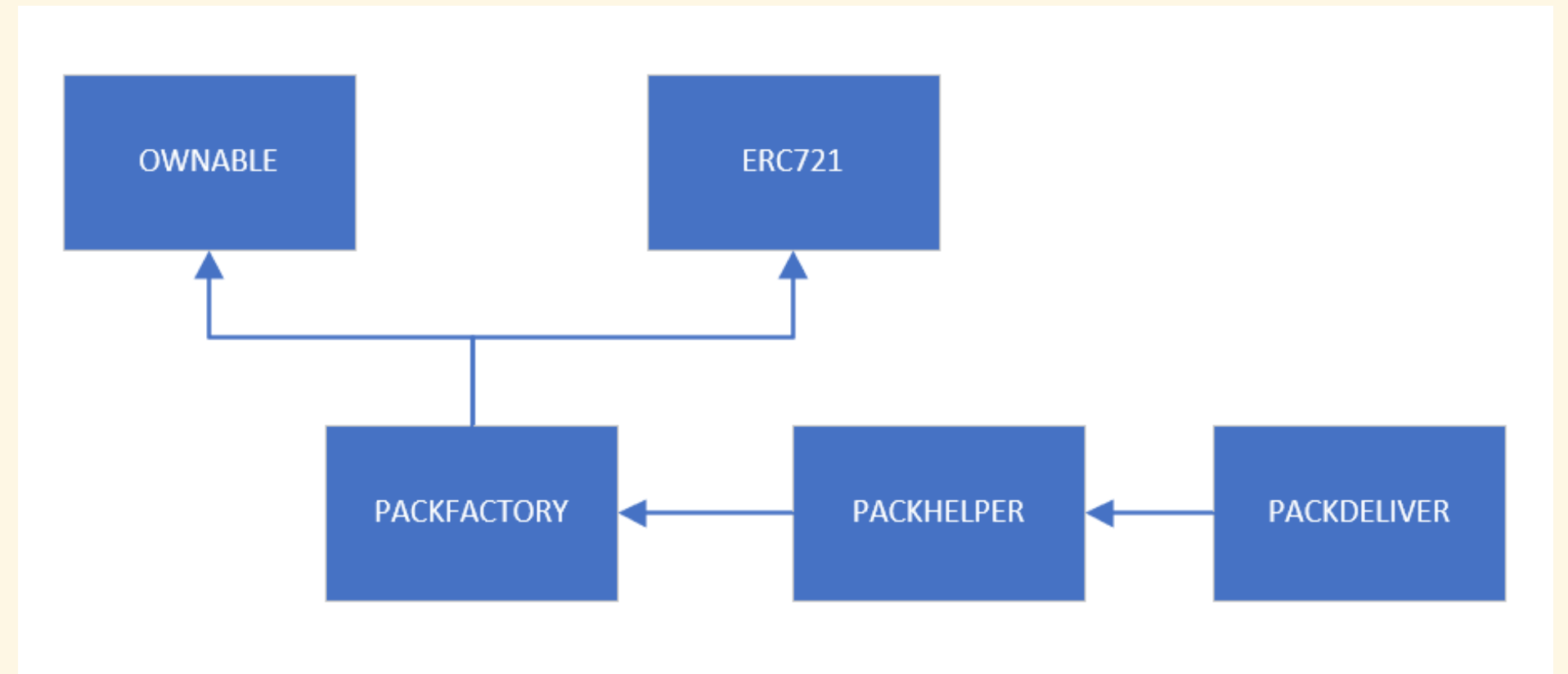


Diagramma di classe



PackFactory

```
function createPack(address _receiver, uint256 _numTokens, uint _lat, uint _long) external onlyOwner {
    Coordinate memory cord;
    cord.lat = _lat;
    cord.long = _long;
    coordinateFromReceiver[_receiver] = cord;
    for(uint256 i = 1; i <= _numTokens; ++i) {
        seed = seed.add(1);
        container.push(Pack(seed, msg.sender, _receiver, false));
        uint id = container.length - 1;
        packToSender[id] = msg.sender;
        packToReceiver[id] = _receiver;
        senderPackCount[msg.sender] = senderPackCount[msg.sender].add(1);
        receiverPackCount[_receiver] = receiverPackCount[_receiver].add(1);
        emit NewPack(id, _receiver);
        mint(1, _receiver);
    }
}
```

Framework OpenZeppelin:

- **Modifier OnlyOwner**
- **Inserimento N pacchi nel container**
- **Mint di N NFT -> Payable**

```
✓ [block:3 txIndex:0] from: 0xb68...51599 to: PackDeliver.createPack(address,uint256,uint256,uint256) 0xdca...c7D12
value: 0 wei data: 0x37d...0000f logs: 2 hash: 0x1ed...98320

status      true Transaction mined and execution succeed

transaction hash  0x8416691f910ade56d2b92b263cb9605eb9323ad1fe5b2ee21e646188d88bc4f9

from         0xb68f9C234B8953b409fc30ddF60DfC9D67F51599

to           PackDeliver.createPack(address,uint256,uint256,uint256) 0xdcae1F0f25cdd4d47DdeFF302757A9673A5c7D12

gas          394222 gas

transaction cost  394222 gas
```



Event Listener

```
logs [
  {
    "from": "0xdcae1F0f25cdd4d47DdeFF302757A9673A5c7D12",
    "topic": "0xdd99a654cef3d7d04265cbcd186b2898d64a57945f525288bdd7050c0aebd0cd",
    "event": "NewPack",
    "args": {
      "0": "0",
      "1": "0x6DC8Cd166FF3Dd832FccC397B9A36220643F83a0",
      "packId": "0",
      "receiver": "0x6DC8Cd166FF3Dd832FccC397B9A36220643F83a0"
    }
  },
  {
    "from": "0xdcae1F0f25cdd4d47DdeFF302757A9673A5c7D12",
    "topic": "0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",
    "event": "Transfer",
    "args": {
      "0": "0x0000000000000000000000000000000000000000000000000000000000000000",
      "1": "0xb68f9C234B8953b409fc30ddF60Dfc9D67F51599",
      "2": "1",
      "from": "0x0000000000000000000000000000000000000000000000000000000000000000",
      "to": "0xb68f9C234B8953b409fc30ddF60Dfc9D67F51599",
      "tokenId": "1"
    }
  }
]
```





Test CreatePack: gas used

- Gas usato per la creazione di 3 pacchi contemporaneamente.
- Gas usato per la creazione singola di ognuno dei 3 pacchi.
→ Totale spesa = 865362

BLOCK 5	MINED ON 2022-11-22 18:30:17	GAS USED 747180
------------	---------------------------------	--------------------

BLOCK 10	MINED ON 2022-11-22 18:39:03	GAS USED 235654
-------------	---------------------------------	--------------------

BLOCK 9	MINED ON 2022-11-22 18:38:58	GAS USED 235654
------------	---------------------------------	--------------------

BLOCK 8	MINED ON 2022-11-22 18:38:52	GAS USED 394054
------------	---------------------------------	--------------------

- Risparmio gas = 118182



PackDelivery

Al momento della consegna, viene effettuato il cambio di proprietà di address tra sender e receiver.

```
function deliver() public onlyOwner {
    address[] memory receivers = getAddressReceiver();
    uint dim = 0;
    for (uint i = 0; i < receivers.length; i++){
        uint[] memory count = new uint[](receivers.length);
        _checkDelivering(receivers[i]); //check coordinate
        count[i] = mintedPerWallet[receivers[i]];
        dim = dim + count[i];
        if(i == 0){
            for(uint j = 1; j <= count[i]; j++){
                if(ownerOf(j) == msg.sender){
                    approve(address(this), j);
                    transferFrom(msg.sender, receivers[i], j);
                }
            }
        }
        else {
            for(uint j = count[i - 1] + 1; j <= dim; j++){
                if(ownerOf(j) == msg.sender){
                    approve(address(this), j);
                    transferFrom(msg.sender, receivers[i], j);
                }
            }
        }
    }
}
```



```
{
    "from": "0xdcae1F0f25cdd4d47DdeFF302757A9673A5c7D12",
    "topic": "0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",
    "event": "Transfer",
    "args": {
        "0": "0xb68f9C234B8953b409fc30ddF60DfC9D67F51599",
        "1": "0x6DC8Cd166FF3Dd832FccC397B9A36220643F83a0",
        "2": "1",
        "from": "0xb68f9C234B8953b409fc30ddF60DfC9D67F51599",
        "to": "0x6DC8Cd166FF3Dd832FccC397B9A36220643F83a0",
        "tokenId": "1"
    }
},
```


Frontend Tools

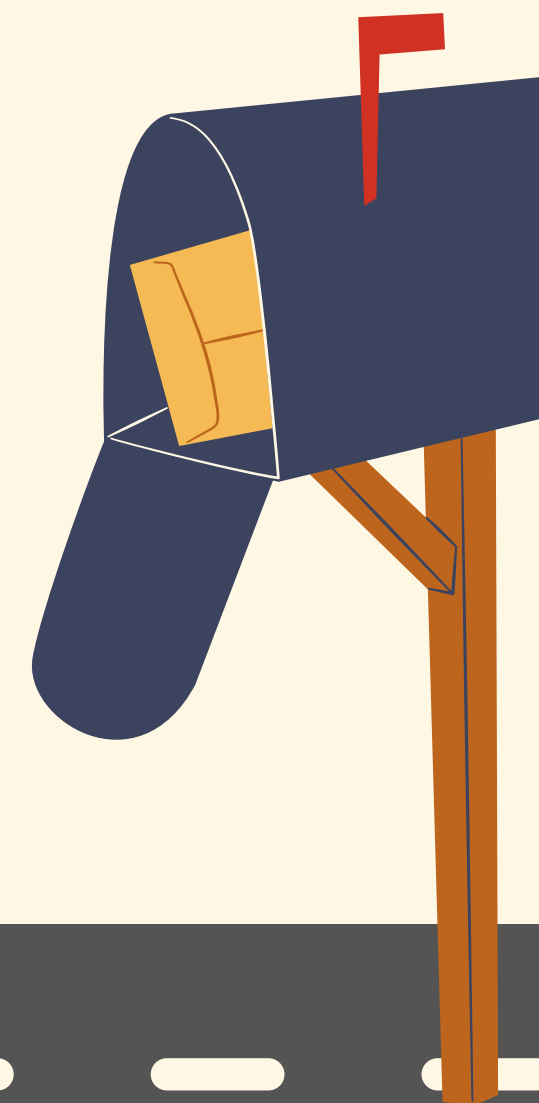


node JS

B Bootstrap

web3

WEB3.JS



dApp

Crypto Pack Delivery

0xA0CC13dB42a1Bd715B27d724E3D43A2D9A680817

Receiver Address

0xAB24e3A9b5C10d904BC052FacCF02f8a26bb9c6a

Parcels to be shipped

Two

Latitude

35685013

Longitude

139752445

Flip Sale State





Create pack

Deliver pack

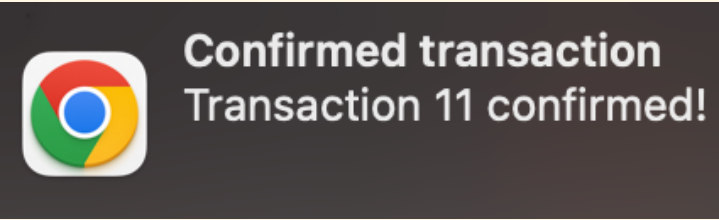




Ganache's Accounts

ADDRESS 0xA0CC13dB42a1Bd715B27d724E3D43A2D9A680817	BALANCE 99.77 ETH	TX COUNT 14	INDEX 0	
ADDRESS 0xf7fd8ca0ACb882584cED073FB5A993660587F96F	BALANCE 100.00 ETH	TX COUNT 10	INDEX 1	
ADDRESS 0xAB24e3A9b5C10d904BC052FacCF02f8a26bb9c6a	BALANCE 100.00 ETH	TX COUNT 0	INDEX 2	
ADDRESS 0x82dD12EF8C40F57e151b7409f11F30bf0a64b59d	BALANCE 100.00 ETH	TX COUNT 0	INDEX 3	

MetaMask: elenco transazioni



1

Localhost 8545

Account 4 0x24c...fBC1

Rilevato un nuovo indirizzo! Clicca qui per aggiungerlo alla tua rubrica.

http://localhost:1234

0x24c...fBC1 : FLIP SALE STATE ⓘ

DETTAGLI DATA HEX

MODIFICA

Estimated gas fee ⓘ

0.00131772 0.001318 ETH

Site suggested Max fee: 0.00131772 ETH

Totale

0.00131772 0.00131772 ETH

Amount + gas fee Max amount: 0.00131772 ETH

Annulla

Conferma

Flip Sale State

2



Localhost 8545

Account 4 0x24c...fBC1

Rilevato un nuovo indirizzo! Clicca qui per aggiungerlo alla tua rubrica.

http://localhost:1234

0x24c...fBC1 : INTERAZIONE CONTRATTO ⓘ

DETTAGLI DATA HEX

MODIFICA

Estimated gas fee ⓘ

0.0131108 0.013111 ETH

Site suggested Max fee: 0.0131108 ETH

Totale

0.0131108 0.0131108 ETH

Amount + gas fee Max amount: 0.0131108 ETH

Annulla

Conferma

Create Pack

3



Localhost 8545

Account 4 0x24c...fBC1

Rilevato un nuovo indirizzo! Clicca qui per aggiungerlo alla tua rubrica.

http://localhost:1234

0x24c...fBC1 : DELIVER ⓘ

DETTAGLI DATA HEX

MODIFICA

Estimated gas fee ⓘ

0.01194198 0.011942 ETH

Site suggested Max fee: 0.01194198 ETH

Totale

0.01194198 0.01194198 ETH

Amount + gas fee Max amount: 0.01194198 ETH

Annulla

Conferma

Delivery

Thank you for listening!



GitHub: <https://github.com/luigidinuzzo/CryptoPackDelivery>

