

# Factory

A factory is a smart contract that stores a compiled contract on itself, and automatizes deploying it into sub-accounts.

We have two factory examples:

1. [Token Factory](#)
2. : A factory that creates [fungible tokens](#)
3. contracts.
4. [A Generic Factory](#)
5. : A factory that creates [donation contracts](#)
6. , but allows to change the contract it deploys.

info In this page we will focus on the Donation factory, to learn more about the token factory visit its repository.

## Generic Factory

The [Generic Factory](#) presents a contract factory that:

1. Creates sub-accounts of itself and deploys its contract on them (`create_factory_subaccount_and_deploy`
2. ).
3. Can change the stored contract using the `update_stored_contract`
4. method.
5. `Rust`
6. `deploy.rs`
7. `update.rs`

`contract/src/deploy.rs` loading ... [See full example on GitHub](#) `contract/src/manager.rs` loading ... [See full example on GitHub](#)

## Quickstart

1. Make sure you have installed [rust](#)
2. .
3. Install the [NEAR CLI](#)

## Build and Deploy the Factory

You can automatically compile and deploy the contract in the NEAR testnet by running:

`./deploy.sh` Once finished, check the `neardev/dev-account` file to find the address in which the contract was deployed:

```
cat ./neardev/dev-account
```

**e.g. dev-1659899566943-21539992274727**

## Deploy the Stored Contract Into a Sub-Account

`create_factory_subaccount_and_deploy` will create a sub-account of the factory and deploy the stored contract on it.

`near call create_factory_subaccount_and_deploy '{ "name": "sub", "beneficiary": "" }' --deposit 1.24 --accountId --gas 3000000000000000` This will create the `sub.`, which will have a donation contract deployed on it:

```
near view sub. get_beneficiary
```

## expected response is:

### Update the Stored Contract

`update_stored_contract` enables to change the compiled contract that the factory stores.

The method is interesting because it has no declared parameters, and yet it takes an input: the new contract to store as a stream of bytes.

To use it, we need to transform the contract we want to store into its base64 representation, and pass the result as input to the method:

## Use near-cli to update stored contract

```
export BYTES=$(cat ./src/to/new-contract/contract.wasm | base64) near call update_stored_contract "BYTES" --base64 --accountId --gas 3000000000000000
```

This works because the arguments of a call can be either a JSON object or a String Buffer

## Factories - Concepts & Limitations

Factories are an interesting concept, here we further explain some of their implementation aspects, as well as their limitations.

### Automatically Creating Accounts

NEAR accounts can only create sub-accounts of itself, therefore, the factory can only create and deploy contracts on its own sub-accounts.

This means that the factory:

1. Can
2. create sub.factory.testnet
3. and deploy a contract on it.
4. Cannot
5. create sub-accounts of the predecessor
6. .
7. Can
8. create new accounts (e.g. account.testnet
9. ), but cannot
10. deploy contracts on them.

It is important to remember that, while factory.testnet can create sub.factory.testnet, it has no control over it after its creation.

### The Update Method

The update\_stored\_contracts has a very short implementation:

## [private]

```
pub
```

```
fn
```

```
update_stored_contract ( & mut
```

```
self )
```

```
{ self . code =
```

```
env :: input ( ) . expect ( "Error: No input" ) . to_vec ( ) ; }
```

On first sight it looks like the method takes no input parameters, but we can see that its only line of code reads from env::input(). What is happening here is that update\_stored\_contract bypasses the step of deserializing the input.

You could implement update\_stored\_contract(&mut self, new\_code: Vec) , which takes the compiled code to store as a Vec, but that would trigger the contract to:

1. Deserialize the new\_code
2. variable from the input.
3. Sanitize it, making sure it is correctly built.

When dealing with big streams of input data (as is the compiled wasm file to be stored), this process of deserializing/checking the input ends up consuming the whole GAS for the transaction. [Edit this page](#) Last updated on Jan 31, 2024 by gagdiez Was this page helpful? Yes No

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