

Transfers & Actions

Smart contracts can perform specific Actions such as transferring NEAR, or calling other contracts.

An important property of Actions is that they can be batched together when acting on the same contract. Batched actions act as a unit: they execute in the same [receipt](#), and if any fails, then they all get reverted.

info Actions can be batched only when they act on the same contract. You can batch calling two methods on a contract, but cannot call two methods on different contracts.

Transfer NEAR ^(N)

You can send NEAR from your contract to any other account on the network. The Gas cost for transferring NEAR is fixed and is based on the protocol's genesis config. Currently, it costs ~0.45 TGas.

- JavaScript
- Rust

```
import
{
  NearBindgen ,
  NearPromise , call }
from
'near-sdk-js' import
{
  AccountId
}
from
'near-sdk-js/lib/types'
@ NearBindgen ( { } ) class
Contract { @ call ( { } ) transfer ( { to , amount } :
{
  to :
  AccountId ,
  amount : bigint } )
{ NearPromise . new ( to ) . transfer ( amount ) ; } } use
near_sdk :: borsh :: { self ,
  BorshDeserialize ,
  BorshSerialize } ; use
near_sdk :: { near_bindgen ,
  AccountId ,
  Promise ,
  Balance } ;
```

[near_bindgen]

[derive(Default, BorshDeserialize, BorshSerialize)]

```
pub
struct
Contract
{
}
```

[near_bindgen]

```
impl
Contract
{ pub
fn
transfer ( & self , to :
AccountId , amount :
Balance ) { Promise :: new ( to ) . transfer ( amount ) ; } }
```

tip The only case where a transfer will fail is if the receiver account doesnot exist. caution Remember that your balance is used to cover for the contract's storage. When sending money, make sure you always leave enough to cover for future storage needs.

Function Call

Your smart contract can call methods in another contract. In the snippet bellow we call a method in a deployed [Hello NEAR](#) contract, and check if everything went right in the callback.

- JavaScript
- Rust

```
import
{
NearBindgen , near , call , bytes ,
NearPromise
}
from
'near-sdk-js' import
{
AccountId
}
from
'near-sdk-js/lib/types'
const
HELLO_NEAR :
AccountId
=
```

```

"hello-nearverse.testnet" ; const
NO_DEPOSIT : bigint =
BigInt ( 0 ) ; const
CALL_GAS : bigint =
BigInt ( "100000000000000" ) ;
@ NearBindgen ( { } ) class
Contract
{ @ call ( { } ) call_method ( { } ) :
NearPromise
{ const args =
bytes ( JSON . stringify ( {
message :
"howdy"
} ) )
return
NearPromise . new ( HELLO_NEAR ) . functionCall ( "set_greeting" , args ,
NO_DEPOSIT ,
CALL_GAS ) . then ( NearPromise . new ( near . currentAccountId ( ) ) . functionCall ( "callback" ,
bytes ( JSON . stringify ( { } ) ) ,
NO_DEPOSIT ,
CALL_GAS ) ) . asReturn ( ) }
@ call ( { privateFunction :
true } ) callback ( { } ) : boolean { let result , success ;
try { result = near . promiseResult ( 0 ) ; success =
true
} catch { result =
undefined ; success =
false
}
if
( success )
{ near . log ( Success! ) return
true }
else
{ near . log ( "Promise failed..." ) return
false } } } use
near_sdk :: borsh :: { self ,

```

```
BorshDeserialize ,  
BorshSerialize } ; use  
near_sdk :: { near_bindgen , env , log ,  
Promise ,  
Gas ,  
PromiseError } ; use  
serde_json :: json ;
```

[near_bindgen]

[derive(Default, BorshDeserialize, BorshSerialize)]

```
pub  
struct  
Contract  
{  
}  
const  
HELLO_NEAR :  
& str  
=  
"hello-nearverse.testnet" ; const  
NO_DEPOSIT :  
u128  
=  
0 ; const  
CALL_GAS :  
Gas  
=  
Gas ( 5_000_000_000_000 ) ;
```

[near_bindgen]

```
impl  
Contract  
{ pub  
fn  
call_method ( & self ) { let args =  
json! ( {  
"message" :
```

```

"howdy" . to_string ( )

} ) . to_string ( ) . into_bytes ( ) . to_vec ( ) ;

Promise :: new ( HELLO_NEAR . parse ( ) . unwrap ( ) ) . function_call ( "set_greeting" . to_string ( ) , args ,
NO_DEPOSIT ,
CALL_GAS ) . then ( Promise :: new ( env :: current_account_id ( ) ) . function_call ( "callback" . to_string ( ) ,
Vec :: new ( ) ,
NO_DEPOSIT ,
CALL_GAS ) ) ; }

pub
fn
callback ( & self ,

```

[callback_result]

result :

Result < () ,

PromiseError

) { if result . is_err () { log! ("Something went wrong") } else { log! ("Message changed") } } } warning The snippet showed above is a low level way of calling other methods. We recommend make calls to other contracts as explained in the [Cross-contract Calls section](#) .

Create a Sub Account

Your contract can create direct sub accounts of itself, for example, `user.near` can create `sub.user.near` .

Accounts doNOT have control over their sub-accounts, since they have their own keys.

Sub-accounts are simply useful for organizing your accounts (e.g. `dao.project.near` , `token.project.near`).

- JavaScript
- Rust

import

```
{
```

```
NearBindgen , near , call ,
```

```
NearPromise
```

```
}
```

```
from
```

```
'near-sdk-js'
```

```
const
```

```
MIN_STORAGE : bigint =
```

```
BigInt ( "1000000000000000000000" )
```

```
// 0.001Ⓝ
```

```
@ NearBindgen ( { } ) class
```

```
Contract
```

```

{ @ call ( { payableFunction : true } ) create ( { prefix } : { prefix :
String } )

{ const account_id =
{ prefix } . { near . currentAccountId ( ) }

NearPromise . new ( account_id ) . createAccount ( ) . transfer ( MIN_STORAGE ) } } use

near_sdk :: borsh :: { self ,
BorshDeserialize ,
BorshSerialize } ; use

near_sdk :: { near_bindgen , env ,
Promise ,
Balance } ;

```

[near_bindgen]

[derive(Default, BorshDeserialize, BorshSerialize)]

```

pub
struct
Contract
{
}

const
MIN_STORAGE :
Balance
=
1_000_000_000_000_000_000_000 ;
//0.001Ⓝ

```

[near_bindgen]

```

impl
Contract
{ pub
fn
create ( & self , prefix :
String ) { let account_id = prefix +
"."
+
& env :: current_account_id ( ) . to_string ( ) ; Promise :: new ( account_id . parse ( ) . unwrap ( ) ) . create_account ( ) .
transfer ( MIN_STORAGE ) ; } } tip Notice that in the snippet we are transferring some money to the new account for storage
caution When you create an account from within a contract, it has no keys by default. If you don't explicitly add keys to it

```

or [deploy a contract](#) on creation then it will be [locked](#) .

Creating Other Accounts

Accounts can only create immediate sub-accounts of themselves.

If your contract wants to create a mainnet or testnet account, then it needs to [call](#) the `create_account` method of near or testnet root contracts.

- JavaScript
- Rust

```
import
{
  NearBindgen , near , call , bytes ,
  NearPromise
}
from
'near-sdk-js'
const
MIN_STORAGE : bigint =
  BigInt ( "1820000000000000000000" ) ;
//0.00182Ⓝ const
CALL_GAS : bigint =
  BigInt ( "28000000000000" ) ;
@ NearBindgen ( { } ) class
Contract
{ @ call ( { } ) create_account ( { account_id , public_key } : { account_id :
  String ,
  public_key :
  String } )
  { const args =
    bytes ( JSON . stringify ( { "new_account_id" : account_id , "new_public_key" : public_key } ) )
    NearPromise . new ( "testnet" ) . functionCall ( "create_account" , args ,
    MIN_STORAGE ,
    CALL_GAS ) ; } } use
near_sdk :: borsh :: { self ,
  BorshDeserialize ,
  BorshSerialize } ; use
near_sdk :: { near_bindgen ,
  Promise ,
  Gas ,
  Balance
```

```
} ; use  
serde_json :: json ;
```

[near_bindgen]

[derive(Default, BorshDeserialize, BorshSerialize)]

```
pub  
struct  
Contract  
{  
}  
const  
CALL_GAS :  
Gas  
=  
Gas ( 28_000_000_000_000 ) ; const  
MIN_STORAGE :  
Balance  
=  
1_820_000_000_000_000_000_000 ;  
//0.00182Ⓝ
```

[near_bindgen]

```
impl  
Contract  
{ pub  
fn  
create_account ( & self , account_id :  
String , public_key :  
String ) { let args =  
json! ( { "new_account_id" : account_id , "new_public_key" : public_key , } ) . to_string ( ) . into_bytes ( ) . to_vec ( ) ;  
// Use "near" to create mainnet accounts Promise :: new ( "testnet" . parse ( ) . unwrap ( ) ) . function_call ( "create_account"  
 . to_string ( ) , args ,  
MIN_STORAGE ,  
CALL_GAS ) ; } }
```

Deploy a Contract

When creating an account you can also batch the action of deploying a contract to it. Note that for this, you will need to pre-load the byte-code you want to deploy in your contract.

- Rust


```

use
near_sdk :: borsh :: { self ,
BorshDeserialize ,
BorshSerialize } ; use
near_sdk :: { near_bindgen , env ,
Promise ,
Balance } ;

```

[near_bindgen]

[derive(Default, BorshDeserialize, BorshSerialize)]

```

pub
struct
Contract
{
}
const
MIN_STORAGE :
Balance
=
1_100_000_000_000_000_000_000_000 ;
//1.1Ⓝ const
HELLO_CODE :
& [ u8 ]
=
include_bytes! ( "./hello.wasm" ) ;

```

[near_bindgen]

```

impl
Contract
{ pub
fn
create_hello ( & self , prefix :
String ) { let account_id = prefix +
"."
+
& env :: current_account_id ( ) . to_string ( ) ; Promise :: new ( account_id . parse ( ) . unwrap ( ) ) . create_account ( ) .
transfer ( MIN_STORAGE ) . deploy_contract ( HELLO_CODE . to_vec ( ) ) ; } } tip If an account with a contract deployed

```

does not have any access keys, this is known as a locked contract. When the account is locked, it cannot sign transactions therefore, actions can only be performed from within the contract code.

Add Keys

When you use actions to create a new account, the created account does not have any [access keys](#), meaning that it cannot sign transactions (e.g. to update its contract, delete itself, transfer money).

There are two options for adding keys to the account:

1. `add_access_key`
2. : adds a key that can only call specific methods on a specified contract.
3. `add_full_access_key`
4. : adds a key that has full access to the account.
5. `add_js_key` JavaScript
6. `add_rust_key` Rust

import

{

NearBindgen, near, call,

NearPromise

}

from

'near-sdk-js' import

{

PublicKey

}

from

'near-sdk-js/lib/types'

const

MIN_STORAGE : bigint =

BigInt ("10000000000000000000")

// 0.001[Ⓝ]

@ NearBindgen ({ }) class

Contract

{ @ call ({ }) create_hello ({ prefix, public_key } : { prefix :

String ,

public_key :

PublicKey })

{ const account_id =

{ prefix } . { near . currentAccountId () }

NearPromise . new (account_id) . createAccount () . transfer (MIN_STORAGE) . addFullAccessKey (public_key) } } use

near_sdk :: borsh :: { self ,

BorshDeserialize ,

```

BorshSerialize } ; use

near_sdk :: { near_bindgen , env ,

Promise ,

Balance ,

PublicKey } ;

```

[near_bindgen]

[derive(Default, BorshDeserialize, BorshSerialize)]

```

pub

struct

Contract

{

}

const

MIN_STORAGE :

Balance

=

1_100_000_000_000_000_000_000_000 ;

//1.1Ⓝ const

HELLO_CODE :

& [ u8 ]

=

include_bytes! ( "../hello.wasm" ) ;

```

[near_bindgen]

```

impl

Contract

{ pub

fn

create_hello ( & self , prefix :

String , public_key :

PublicKey ) { let account_id = prefix +

"."

+

& env :: current_account_id ( ) . to_string ( ) ; Promise :: new ( account_id . parse ( ) . unwrap ( ) ) . create_account ( ) .
transfer ( MIN_STORAGE ) . deploy_contract ( HELLO_CODE . to_vec ( ) ) . add_full_access_key ( public_key ) ; } } Notice
that what you actually add is a "public key". Whoever holds its private counterpart, i.e. the private-key, will be able to use the
newly access key.

```

tip If an account with a contract deployed doesnot have any access keys, this is known as a locked contract. When the account is locked, it cannot sign transactions therefore, actions canonly be performed fromwithin the contract code.

Delete Account

There are two scenarios in which you can use thedelete_account action:

1. As thelast
2. action in a chain of batched actions.
3. To make your smart contract delete its own account.
4. JavaScript
5. Rust

import

{

NearBindgen , near , call ,

NearPromise

}

from

'near-sdk-js' import

{

AccountId

}

from

'near-sdk-js/lib/types'

const

MIN_STORAGE : bigint =

BigInt ("100000000000000000000")

// 0.001[Ⓝ]

@ NearBindgen ({ }) class

Contract

{ @ call ({ }) create_delete ({ prefix , beneficiary } : { prefix :

String ,

beneficiary :

AccountId })

{ const account_id =

{ prefix } . { near . currentAccountId () }

NearPromise . new (account_id) . createAccount () . transfer (MIN_STORAGE) . deleteAccount (beneficiary) }

@ call ({ }) self_delete ({ beneficiary } : { beneficiary :

AccountId })

{ NearPromise . new (near . currentAccountId ()) . deleteAccount (beneficiary) } use

near_sdk :: borsh :: { self ,

```

BorshDeserialize ,
BorshSerialize } ; use

near_sdk :: { near_bindgen , env ,
Promise ,
Balance ,
AccountId } ;

```

[near_bindgen]

[derive(Default, BorshDeserialize, BorshSerialize)]

```

pub
struct
Contract
{
}

const
MIN_STORAGE :
Balance
=
1_000_000_000_000_000_000_000 ;
//0.001Ⓝ

```

[near_bindgen]

```

impl
Contract
{ pub
fn
create_delete ( & self , prefix :
String , beneficiary :
AccountId ) { let account_id = prefix +
"."
+
& env :: current_account_id ( ) . to_string ( ) ; Promise :: new ( account_id . parse ( ) . unwrap ( ) ) . create_account ( ) .
transfer ( MIN_STORAGE ) . delete_account ( beneficiary ) ; }

pub
fn
self_delete ( beneficiary :
AccountId ) { Promise :: new ( env :: current_account_id ( ) ) . delete_account ( beneficiary ) ; } } Token Loss If the
beneficiary account does not exist the funds will be dispersed among validators . Token Loss Donot usedelete to try fund a

```

new account. Since the account doesn't exist the tokens will be lost. [Edit this page](#) Last updated on Jan 31, 2024 by gagdiez
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