

# Project Showcase: On-chain RPG (Part 2)

## Agenda

Testing Sui Move packages

How can we make sure our code does what we want it to do?

Publishing and calling Sui Move code

Now that we've written our code, how can we interact with it?



## **Testing Sui Move packages**



```
module testing::car_testing {
   use sui::transfer;
    use std::string::{Self, String};
    use sui::object::{Self, UID};
    use sui::tx_context::{Self, TxContext};
    struct Car has key, store {
        id: UID,
       name: String
    struct CarFactory has key, store {
        id: UID,
        cars_created: u64,
```



```
fun init(ctx: &mut TxContext) {
   transfer::share_object(
       CarFactory {
            id: object::new(ctx),
            cars_created: 0
public entry fun create_car(car_factory: &mut CarFactory, car_name: vector<u8>, ctx: &mut TxContext) {
   transfer::transfer(
       Car {
           id: object::new(ctx),
           name: string::utf8(car_name)
       }, tx_context::sender(ctx)
   car_factory.cars_created = car_factory.cars_created + 1;
public entry fun transfer_car(car: Car, recipient: address) {
   transfer::transfer(car, recipient);
```



```
• • •
         fun test_car() {
             use sui::test_scenario;
             let admin = @0 \times 123;
             let initial_owner = @0x456;
             let final_owner = @0x789;
             let scenario_val = test_scenario::begin(admin);
             let scenario = &mut scenario_val;
             test_scenario::next_tx(scenario, initial_owner);
                 let car_factory = test_scenario::take_shared<CarFactory>(scenario);
                create_car(&mut car_factory, b"SuiMobile", test_scenario::ctx(scenario));
                assert!(car_factory.cars_created == 1, 0);
                test_scenario::return_shared<CarFactory>(car_factory);
             test_scenario::next_tx(scenario, initial_owner);
                let car = test_scenario::take_from_sender<Car>(scenario);
                transfer_car(car, final_owner);
             test_scenario::next_tx(scenario, final_owner);
                 let car = test_scenario::take_from_sender<Car>(scenario);
                let Car { id, name: _,} = car;
```



```
• • •
   #[test]
   fun test_car() {
       use sui::test_scenario;
       let admin = @0x123;
       let initial_owner = @0x456;
       let final_owner = @0x789;
```



```
let scenario_val = test_scenario::begin(admin);
let scenario = &mut scenario_val;
    init(test_scenario::ctx(scenario));
};
```



```
test_scenario::next_tx(scenario, initial_owner);
    let car_factory = test_scenario::take_shared<CarFactory>(scenario);
    assert!(car_factory.cars_created == 0, 0);
    create_car(&mut car_factory, b"SuiMobile", test_scenario::ctx(scenario));
    assert!(car_factory.cars_created == 1, 0);
    test_scenario::return_shared<CarFactory>(car_factory);
};
```





```
1 // tx 3: `initial_owner` transfers car to `final_owner`
2 test_scenario::next_tx(scenario, initial_owner);
3 {
4    let car = test_scenario::take_from_sender<Car>(scenario);
5    transfer_car(car, final_owner);
6 };
```



```
test_scenario::next_tx(scenario, final_owner);
    let car = test_scenario::take_from_sender<Car>(scenario);
    let Car { id, name: _,} = car;
    object::delete(id);
};
test_scenario::end(scenario_val);
```



### Back to our hero...



```
public fun assert_hero_strength(hero: &Hero, strength: u64) {
    assert!(hero_strength(hero) == strength, ASSERT_ERR);
#[test_only]
public fun delete_hero_for_testing(hero: Hero) {
    let Hero { id, hp: _, experience: _, sword, game_id: _ } = hero;
    object::delete(id);
   let sword = option::destroy_some(sword);
    let Sword { id, magic: _, strength: _, game_id: _ } = sword;
    object::delete(id)
#[test_only]
public fun delete_game_admin_for_testing(admin: GameAdmin) {
    let GameAdmin { id, boars_created: _, potions_created: _, game_id: _ } = admin;
    object::delete(id);
```



```
#[test]
fun slay_boar_test() {
   use sui::coin;
   use sui::test_scenario;
   let admin = @0xAD014;
    let player = @0x0;
    let scenario_val = test_scenario::begin(admin);
    let scenario = &mut scenario_val;
```



```
test_scenario::next_tx(scenario, admin);
    init(test_scenario::ctx(scenario));
};
test_scenario::next_tx(scenario, player);
    let game = test_scenario::take_immutable<GameInfo>(scenario);
    let game_ref = &game;
    let coin = coin::mint_for_testing(500, test_scenario::ctx(scenario));
    acquire_hero(game_ref, coin, test_scenario::ctx(scenario));
    test_scenario::return_immutable(game);
};
```



```
// Admin sends a boar to the Player
    test_scenario::next_tx(scenario, admin);
        let game = test_scenario::take_immutable<GameInfo>(scenario);
        let game ref = &game;
        let admin_cap = test_scenario::take_from_sender<GameAdmin>(scenario);
        send_boar(game_ref, &mut admin_cap, 10, 10, player, test_scenario::ctx(scenario));
        test_scenario::return_to_sender(scenario, admin_cap);
        test_scenario::return_immutable(game);
10 };
```



```
test_scenario::next_tx(scenario, player);
    let game = test_scenario::take_immutable<GameInfo>(scenario);
    let game ref = &game;
    let hero = test_scenario::take_from_sender<Hero>(scenario);
    let boar = test_scenario::take_from_sender<Boar>(scenario);
    slay(game_ref, &mut hero, boar, test_scenario::ctx(scenario));
    test_scenario::return_to_sender(scenario, hero);
    test_scenario::return_immutable(game);
};
test_scenario::end(scenario_val);
```



## Publishing our module



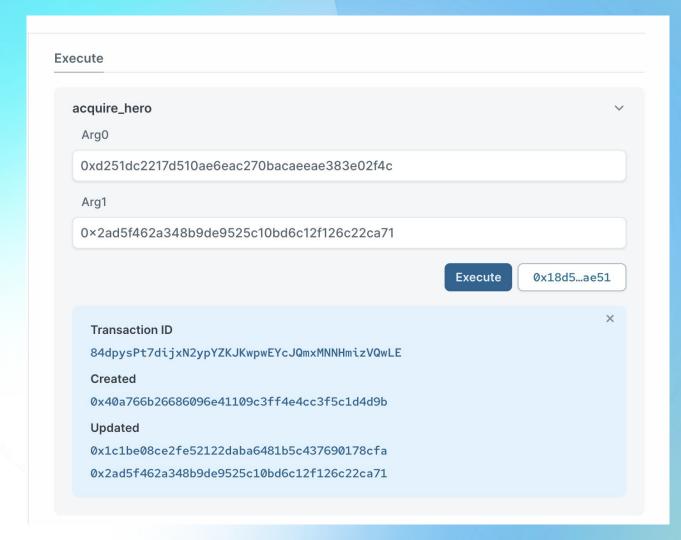
```
shayan@Shayans-MBP lesson-5 % sui client publish --gas-budget 20000
UPDATING GIT DEPENDENCY https://github.com/MystenLabs/sui.git
UPDATING GIT DEPENDENCY https://github.com/MystenLabs/sui.git
UPDATING GIT DEPENDENCY https://github.com/MystenLabs/sui.git
UPDATING GIT DEPENDENCY https://github.com/MystenLabs/sui.git
INCLUDING DEPENDENCY Sui
INCLUDING DEPENDENCY MoveStdlib
BUILDING onchain_rpg
Successfully verified dependencies on-chain against source.
---- Certificate ----
Transaction Hash: TransactionDigest(GMRtYhh7PrYR1KRNY2wXKz1Ewz5VPGYUDvtygSV8ECpP)
Transaction Signature: [Signature(AA==@D8X14lfIc7ICqGM6sP2yHAKFHC4+1h/3nG2fkdR2k3FdTEP7aQUoeXvzv953NQt5/rMc5+88A92ro6L7MfJ+Bq==@e4YQtxKQ4duKseBv0ynZ250d+Quq+AqNh+cPT/DqT5c=)]
Signed Authorities Bitmap: RoaringBitmap<[0, 1, 2]>
Transaction Kind: Publish
Sender: 0x18d5d43fc2b26e974af4a4124f561cc63949ae51
Gas Payment: Object ID: 0x1c1be08ce2fe52122daba6481b5c437690178cfa, version: 0xa4ee, digest: o#5WjMI7ReytKtpuI39NNIsFBIi0HSSbsmy6IYBZRkHAW=
Gas Owner: 0x18d5d43fc2b26e974af4a4124f561cc63949ae51
Gas Price: 1
Gas Budget: 20000
---- Transaction Effects ----
Status : Success
Created Objects:
  - ID: 0x982886deafe18043ccc4f680afd16a04fdac1e32 , Owner: Account Address ( 0x18d5d43fc2b26e974af4a4124f561cc63949ae51 )
  - ID: 0xc8488414e4c1aa7bf3949001829fe2a14d201718 , Owner: Immutable
  - ID: 0xd251dc2217d510ae6eac270bacaeeae383e02f4c , Owner: Immutable
Mutated Objects:
  - ID: 0x1c1be08ce2fe52122daba6481b5c437690178cfa . Owner: Account Address ( 0x18d5d43fc2b26e974af4a4124f561cc63949ae51 )
```



## Time to play!











#### 0xd251dc2217d510ae6eac270bacaeeae383e02f4c 🗆



Type 0xc8488414e4claa7bf3949001829fe2a14d201718::hero::GameInfo

Object ID 0xd251dc2217d510ae6eac270bacaeeae383e02f4c

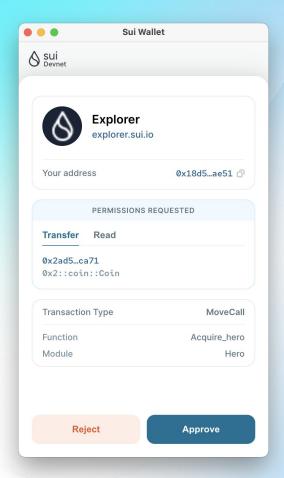
Last Transaction ID GMRtYhh7PrYR1KRNY2wXKz1Ewz5VPGYUDvtygSV8ECpP

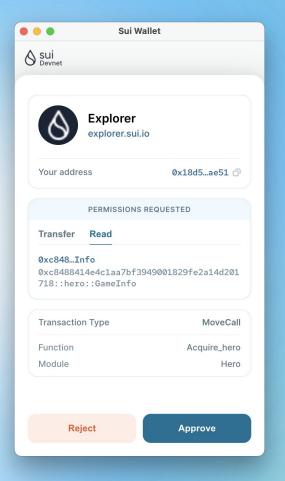
Version 42223

Owner Immutable

Coins		
TYPE	OBJECTS	BALANCE
▼ SUI	5	0.049998723 SUI
Object ID Balance	<b>0x1c1be08ce2fe52122daba</b> 0.009998723 sui	5481b5c437690178cfa
Object ID	0x2ad5f462a348b9de9525c10bd6c12f126c22ca71	
Balance	0.01 SUI	
Object ID	0x7c0434cea621bb50ee1b82697657c12e55c7d9a2	
Balance	<b>0.01</b> sui	
Object ID	0x9880638381fcc9930e9c0a9a8edfc4adc208c473	
Balance	0.01 SUI	
Object ID	0xbd793a1d185bf62e6484041854d630ebf29b1b3e	
Balance	0.01 SUI	









0x982886deafe18043ccc4f680afd16a04fdac1e32

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::GameAdmin

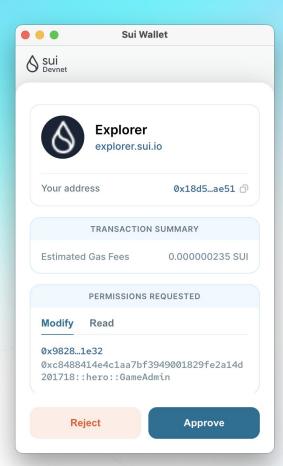
Version 42223

Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51



Arg0			
0xd251dc2217d510ae6ea	c270bacaeeae383e02	2f4c	
Arg1			
0×982886deafe18043ccc	c4f680afd16a04fdac1	e32	
Arg2			
1			
Arg3			
1			
Arg4			
0×18d5d43fc2b26e974af	4a4124f561cc63949a	ie51	





```
struct GameAdmin has key {
    id: UID,
   boars_created: u64,
   potions_created: u64,
   game_id: ID,
```



#### 0x982886deafe18043ccc4f680afd16a04fdac1e32

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::GameAdmin

Object ID 0x982886deafe18043ccc4f680afd16a04fdac1e32

Last Transaction ID HV8P8ZjC3shwBqXLYkwk48nsS16RLf5uaE8qc2H1gxt5

Version 42225

Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51

#### **Properties**

boars\_created 1

game\_id 0xd251dc2217d510ae6eac270bacaeeae383e02f4c

potions\_created 0





#### 

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::Hero

 Object ID
 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

 Last Transaction ID
 84dpysPt7dtjxN2ypYZKJKwpwEYcJQmxMNNHmizVQwLE

Version 42224

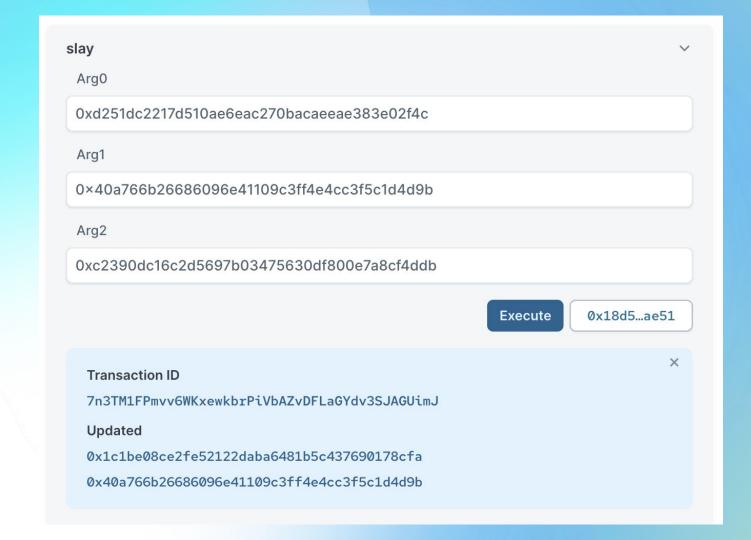
Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51

#### **Properties**

experience	0	
game_id	0xd251c	dc2217d510ae6eac270bacaeeae383e02f4c
hp	100	

```
1  {
2   "type": "0xc8488414e4c1aa7bf3949001829fe2a14d201"
3   "fields": {
4        "game_id": "0xd251dc2217d510ae6eac270bacaeeae3;
5        "id": {
6             "id": "0xb7aadcca3ce9e328a3c5980e32527d048be!
7        }
8        "magic": "10",
9        "strength": "1"
10
11   }
```





🔇 sui

#### 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::Hero

 Object ID
 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

 Last Transaction ID
 84dpysPt7dijxN2ypYZKJKwpwEYcJQmxMNNHmizVQwLE

Version 42224

Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51

#### **Properties**

experience	0
game_id	0xd251dc2217d510ae6eac270bacaeeae383e02f4c
hp	100

#### sword

```
1  {
2   "type": "0xc8488414e4c1aa7bf3949001829fe2a14d201"
3   "fields": {
4       "game_id": "0xd251dc2217d510ae6eac270bacaeeae3i
5       "id": {
6             "id": "0xb7aadcca3ce9e328a3c5980e32527d048be9
7       }.
8       "magic": "10",
9       "strength": "1"
```



#### 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::Hero

 Object ID
 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

 Last Transaction ID
 7n3TM1FPmvv6WKxewkbxPiVbAZvDFLaGYdv3SJAGUimJ

Version 42226

Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51

#### **Properties**

experience	1
game_id	0xd251dc2217d510ae6eac270bacaeeae383e02f4c
hp	100



#### 0x425101dee72de02c37e446345dbed8da2db54eae

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::Boar

Object ID 0x425101dee72de02c37e446345dbed8da2db54eae

Last Transaction ID FGqgTg5ek3oUVUFiGfupHjF9p2p5bLg3sXoEZicDEU42

Version 42227

Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51

#### **Properties**

game\_id 0xd251dc2217d510ae6eac270bacaeeae383e02f4c

hp 20 strength 1

#### **Dynamic Fields**



#### 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::Hero

 Object ID
 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

 Last Transaction ID
 DB1vD1jsJat38AadCzadKJ72c7h9vVv6B2KdMRXt3BzL

Version 42228

Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51

#### **Properties**

experience 21

game\_id 0xd251dc2217d510ae6eac270bacaeeae383e02f4c

hp 100

```
"type": "0xc8488414e4c1aa7bf3949001829fe2a14d201
     "fields": {
4
       "game id": "0xd251dc2217d510ae6eac270bacaeeae3
5
       "id": {
6
         "id": "0xb7aadcca3ce9e328a3c5980e32527d048be!
7
       },
8
        "magic": "10",
       "strength": "3"
9
10
11 }
```

#### 0x1f98f4ec2605575dd706b35cd09da2a97d46ea42

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::Boar

 Object ID
 0x1f98f4ec2605575dd706b35cd09da2a97d46ea42

 Last Transaction ID
 9vhPpdFc7NrwzWarQcYw1xAEmwhFCubDTh8F31d1K4aP

Version 42229

Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51

#### **Properties**

game\_id 0xd251dc2217d510ae6eac270bacaeeae383e02f4c

hp 40

strength 2



#### Object

#### 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

#### Description

Type 0xc8488414e4c1aa7bf3949001829fe2a14d201718::hero::Hero

 Object ID
 0x40a766b26686096e41109c3ff4e4cc3f5c1d4d9b

 Last Transaction ID
 AUPiz2Mq2KkuAFUAJVd1FpJZCW7aCK9BSbFDVSmAkta3

Version 42230

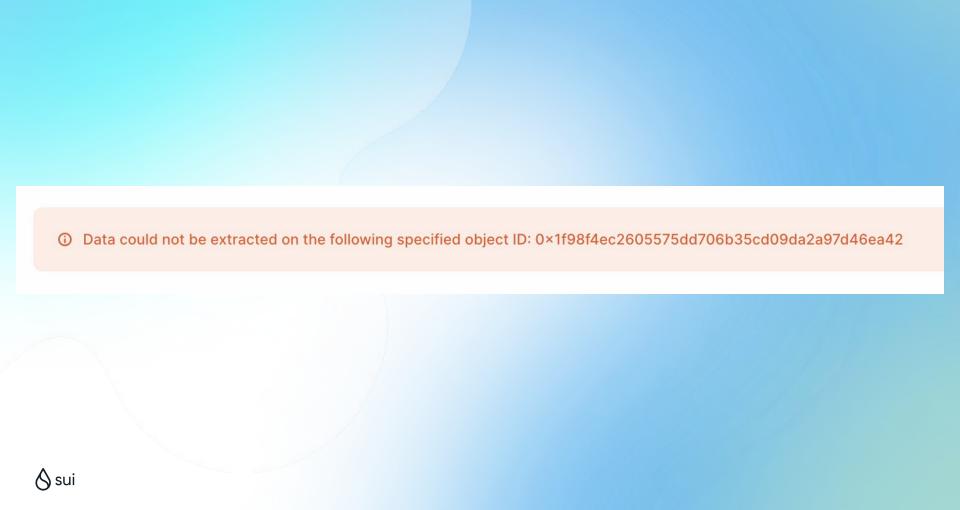
Owner 0x18d5d43fc2b26e974af4a4124f561cc63949ae51

#### **Properties**

experience 61

game\_id 0xd251dc2217d510ae6eac270bacaeeae383e02f4c

hp 100



## Bibliography/ Further Reading

github.com/MystenLabs/sui/blob/main/sui\_programmability/examples/games/sources/hero.move

docs.sui.io/build/move/build-test

github.com/MystenLabs/sui/blob/main/crates/sui-framework/sources/test/test\_scenario.move



## What's Next!



## Sui Hong Kong Builder House!

lu.ma/sui.hongkong



# **Survey + Questions?**

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