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# 1 工厂合约（IIsotopFactory）

## deployContract函数

|  |  |  |  |
| --- | --- | --- | --- |
| **用例编号 -**  **脚本编号** | **调用者** | **参数**  **（\_id）** | **测试结果** |
| 1.1.1 – 1.1 | 用户地址 | “NFT1013” | 交易成功 |
| 1.1.2 – 2.1 | 用户地址 | “NFT101333333” | 交易未发送，返回错误信息 |
| 1.1.3 – 2.2 | 用户地址 | “” | 交易未发送，返回错误信息 |

### 1.1.1 √ deployContract("NFT1013")

#### 执行结果

交易成功，生成新的NFT1013合约地址

监听事件ContractDeployed，得到新创建的NFT1013合约地址、 Owner地址

### 1.1.2 deployContract("NFT101333333") – 非"NFT1013"字符串

#### 执行结果

未发送交易，提示错误信息

错误信息：Error: cannot estimate gas; transaction may fail or may require manual gas limit [ See: https://links.ethers.org/v5-errors-UNPREDICTABLE\_GAS\_LIMIT ] (error={"reason":"rpc error: code = InvalidArgument desc = execution reverted: No contract found: invalid request","code":"UNPREDICTABLE\_GAS\_LIMIT","method":"estimateGas","transaction":{"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"to":"0x002eab063747F1c5a7106E4E4d353491c20BbbEe","data":"0xc32723ed0000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000000c4e46543130313333333333330000000000000000000000000000000000000000","type":2,"accessList":null},"error":{"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":49,\"error\":{\"code\":-32000,\"message\":\"rpc error: code = InvalidArgument desc = execution reverted: No contract found: invalid request\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_estimateGas\",\"params\":[{\"type\":\"0x2\",\"maxFeePerGas\":\"0x59682f00\",\"maxPriorityFeePerGas\":\"0x59682f00\",\"from\":\"0xbb44a15462c5c5042a74b4adc770793a7e57210a\",\"to\":\"0x002eab063747f1c5a7106e4e4d353491c20bbbee\",\"data\":\"0xc32723ed0000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000000c4e46543130313333333333330000000000000000000000000000000000000000\"}],\"id\":49,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}}, tx={"data":"0xc32723ed0000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000000c4e46543130313333333333330000000000000000000000000000000000000000","to":{},"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","type":2,"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"nonce":{},"gasLimit":{},"chainId":{}}, code=UNPREDICTABLE\_GAS\_LIMIT, version=abstract-signer/5.7.0)

### 1.1.3 deployContract("") – 参数为空字符串

#### 执行结果

未发送交易，提示错误信息

错误信息：Error: cannot estimate gas; transaction may fail or may require manual gas limit [ See: https://links.ethers.org/v5-errors-UNPREDICTABLE\_GAS\_LIMIT ] (error={"reason":"rpc error: code = InvalidArgument desc = execution reverted: No contract found: invalid request","code":"UNPREDICTABLE\_GAS\_LIMIT","method":"estimateGas","transaction":{"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"to":"0x002eab063747F1c5a7106E4E4d353491c20BbbEe","data":"0xc32723ed00000000000000000000000000000000000000000000000000000000000000200000000000000000000000000000000000000000000000000000000000000000","type":2,"accessList":null},"error":{"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":56,\"error\":{\"code\":-32000,\"message\":\"rpc error: code = InvalidArgument desc = execution reverted: No contract found: invalid request\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_estimateGas\",\"params\":[{\"type\":\"0x2\",\"maxFeePerGas\":\"0x59682f00\",\"maxPriorityFeePerGas\":\"0x59682f00\",\"from\":\"0xbb44a15462c5c5042a74b4adc770793a7e57210a\",\"to\":\"0x002eab063747f1c5a7106e4e4d353491c20bbbee\",\"data\":\"0xc32723ed00000000000000000000000000000000000000000000000000000000000000200000000000000000000000000000000000000000000000000000000000000000\"}],\"id\":56,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}}, tx={"data":"0xc32723ed00000000000000000000000000000000000000000000000000000000000000200000000000000000000000000000000000000000000000000000000000000000","to":{},"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","type":2,"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"nonce":{},"gasLimit":{},"chainId":{}}, code=UNPREDICTABLE\_GAS\_LIMIT, version=abstract-signer/5.7.0)

# 2 NFT1013合约（IISOTOP1013）

## 2.1 mint函数

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **用例编号 -**  **脚本编号** | **调用者** | **参数**  **（\_to）** | **参数**  **（quantity）** | **测试结果** |
| 2.1.1 – 1.1 | 合约Owner | Owner地址 | 1 | 交易成功 |
| 2.1.1 – 1.2 | 合约Owner | 非Owner地址 | 1 | 交易成功 |
| 2.1.1 – 1.3 | 合约Owner | 合约地址 | 1 | 交易成功 |
| 2.1.2 – 2.1 | 合约Owner | 无效地址 | 1 | 交易未发送，返回错误信息 |
| 2.1.3 – 2.2 | 合约Owner | Owner地址 | 0 | 交易未发送，返回错误信息 |
| 2.1.4 – 2.3 | 合约Owner | Owner地址 | -1 | 交易未发送，返回错误信息 |
| 2.1.5 – 2.4 | 非合约Owner | Owner地址 | 10 | 交易未发送，返回错误信息 |
| 2.1.6 – 2.5 | 合约Owner | Owner地址 | 10000  (gas limit = 300000) | 交易失败，扣除gas费 |

### 2.1.1 √ mint(有效地址, 发行数量[1, 20000]) – Owner调用

发行数量为1、10、20、1000、10000

发行不同数量产生的gas费用不同，详见3.2.1

#### 执行结果

交易成功；

\_to地址数量增加；

总发行量增加；

发行数量范围内token持有者为发送的地址；

### 2.1.2 mint(无效地址, 10) – Owner调用

#### 执行结果

未发起交易，提示错误信息

错误信息：Error: invalid address or ENS name (argument="name", value=undefined, code=INVALID\_ARGUMENT, version=contracts/5.7.0)

### 2.1.3 mint(有效地址, 0) – Owner调用

#### 执行结果

未发起交易，提示错误信息

错误信息：Error: cannot estimate gas; transaction may fail or may require manual gas limit [ See: https://links.ethers.org/v5-errors-UNPREDICTABLE\_GAS\_LIMIT ] (error={"reason":"rpc error: code = InvalidArgument desc = execution reverted: invalid request","code":"UNPREDICTABLE\_GAS\_LIMIT","method":"estimateGas","transaction":{"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"to":"0x6Cd25d0a7A5ED763Aff6ad545C8bE054B3C9A75b","data":"0x40c10f19000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000","type":2,"accessList":null},"error":{"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":60,\"error\":{\"code\":-32000,\"message\":\"rpc error: code = InvalidArgument desc = execution reverted: invalid request\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_estimateGas\",\"params\":[{\"type\":\"0x2\",\"maxFeePerGas\":\"0x59682f00\",\"maxPriorityFeePerGas\":\"0x59682f00\",\"from\":\"0xbb44a15462c5c5042a74b4adc770793a7e57210a\",\"to\":\"0x6cd25d0a7a5ed763aff6ad545c8be054b3c9a75b\",\"data\":\"0x40c10f19000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000\"}],\"id\":60,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}}, tx={"data":"0x40c10f19000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000","to":{},"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","type":2,"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"nonce":{},"gasLimit":{},"chainId":{}}, code=UNPREDICTABLE\_GAS\_LIMIT, version=abstract-signer/5.7.0)

### 2.1.4 mint(有效地址, -1) – Owner调用

#### 执行结果

未发起交易，提示错误信息

错误信息：Error: value out-of-bounds (argument="quantity", value=-1, code=INVALID\_ARGUMENT, version=abi/5.7.0)

### 2.1.5 mint(有效地址, 10) – 非Owner调用

#### 执行结果

未发起交易，提示错误信息

错误信息：Error: insufficient funds for intrinsic transaction cost [ See: https://links.ethers.org/v5-errors-INSUFFICIENT\_FUNDS ] (error={"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":111,\"error\":{\"code\":-32000,\"message\":\"failed to check sender balance: sender balance \\u003c tx cost (0 \\u003c 400000000): insufficient funds: insufficient funds\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_sendRawTransaction\",\"params\":[\"0x02f8ab822fc78001018417d784009477eba978569cfb64f9521f448ffdb5795f6ff97580b84440c10f19000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a000000000000000000000000000000000000000000000000000000000000000ac001a0accd2a58230e60547bb764b9082a2f87b4c568d8ff4e71b3abc9161c9a557522a0288517008b0196621b9f05f8353b80af9cc889b8b643987fb46b134fb3427c50\"],\"id\":111,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}, method="sendTransaction", transaction="0x02f8ab822fc78001018417d784009477eba978569cfb64f9521f448ffdb5795f6ff97580b84440c10f19000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a000000000000000000000000000000000000000000000000000000000000000ac001a0accd2a58230e60547bb764b9082a2f87b4c568d8ff4e71b3abc9161c9a557522a0288517008b0196621b9f05f8353b80af9cc889b8b643987fb46b134fb3427c50", code=INSUFFICIENT\_FUNDS, version=providers/5.7.2)

### 2.1.6 mint(有效地址, 10000) gasLimit小于实际使用的gas - Owner调用

GasLimit默认为300000， 当发行数量大于116时，将超过300000，需要调整对应的gasLimit值

#### 执行结果

发起交易，由于设置的gasLimit小于实际使用的gas，交易上链，但交易失败，扣除gas

交易失败信息：Error: cannot estimate gas; transaction may fail or may require manual gas limit [ See: https://links.ethers.org/v5-errors-UNPREDICTABLE\_GAS\_LIMIT ] (error={"reason":"rpc error: code = InvalidArgument desc = execution reverted: invalid request","code":"UNPREDICTABLE\_GAS\_LIMIT","method":"estimateGas","transaction":{"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"to":"0x30C954cc1648693b7Fb743F793C8C4D1bE26b0c5","data":"0x40c10f19000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000","type":2,"accessList":null},"error":{"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":51,\"error\":{\"code\":-32000,\"message\":\"rpc error: code = InvalidArgument desc = execution reverted: invalid request\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_estimateGas\",\"params\":[{\"type\":\"0x2\",\"maxFeePerGas\":\"0x59682f00\",\"maxPriorityFeePerGas\":\"0x59682f00\",\"from\":\"0xbb44a15462c5c5042a74b4adc770793a7e57210a\",\"to\":\"0x30c954cc1648693b7fb743f793c8c4d1be26b0c5\",\"data\":\"0x40c10f19000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000\"}],\"id\":51,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}}, tx={"data":"0x40c10f19000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000","to":{},"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","type":2,"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"nonce":{},"gasLimit":{},"chainId":{}}, code=UNPREDICTABLE\_GAS\_LIMIT, version=abstract-signer/5.7.0)

## 2.2 safeMint函数

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **用例编号 -**  **脚本编号** | **调用者** | **参数**  **（\_to）** | **参数**  **（quantity）** | **测试结果** |
| 2.2.1 – 1.1 | 合约Owner | Owner地址 | 1 | 交易成功 |
| 2.2.1 – 1.2 | 合约Owner | 非Owner地址 | 1 | 交易成功 |
| 2.2.1 – 1.3 | 合约Owner | 合约地址 | 1 | 交易成功 |
| 2.1.2 – 2.1 | 合约Owner | 无效地址 | 1 | 交易未发送，返回错误信息 |
| 2.1.3 – 2.2 | 合约Owner | Owner地址 | 0 | 交易未发送，返回错误信息 |
| 2.1.4 – 2.3 | 合约Owner | Owner地址 | -1 | 交易未发送，返回错误信息 |
| 2.1.5 – 2.4 | 非合约Owner | Owner地址 | 10 | 交易未发送，返回错误信息 |
| 2.1.6 – 2.5 | 合约Owner | Owner地址 | 10000  (gas limit = 300000) | 交易失败，扣除gas费 |

### 2.2.1 √ safeMint(有效地址, 发行数量[1, 20000]) – Owner调用

发行数量为1、10、20、1000、10000

发行不同数量产生的gas费用不同，详见3.2.1

#### 执行结果

交易成功；

\_to地址数量增加；

总发行量增加；

### 2.2.3 safeMint (Owner地址, 0) – Owner调用

#### 预期结果

未发起交易，提示错误信息

#### 实际结果

同预期

错误信息：Error: cannot estimate gas; transaction may fail or may require manual gas limit [ See: https://links.ethers.org/v5-errors-UNPREDICTABLE\_GAS\_LIMIT ] (error={"reason":"rpc error: code = InvalidArgument desc = execution reverted: invalid request","code":"UNPREDICTABLE\_GAS\_LIMIT","method":"estimateGas","transaction":{"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"to":"0x30C954cc1648693b7Fb743F793C8C4D1bE26b0c5","data":"0xa1448194000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000","type":2,"accessList":null},"error":{"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":86,\"error\":{\"code\":-32000,\"message\":\"rpc error: code = InvalidArgument desc = execution reverted: invalid request\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_estimateGas\",\"params\":[{\"type\":\"0x2\",\"maxFeePerGas\":\"0x59682f00\",\"maxPriorityFeePerGas\":\"0x59682f00\",\"from\":\"0xbb44a15462c5c5042a74b4adc770793a7e57210a\",\"to\":\"0x30c954cc1648693b7fb743f793c8c4d1be26b0c5\",\"data\":\"0xa1448194000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000\"}],\"id\":86,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}}, tx={"data":"0xa1448194000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000000","to":{},"from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","type":2,"maxFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x59682f00"},"nonce":{},"gasLimit":{},"chainId":{}}, code=UNPREDICTABLE\_GAS\_LIMIT, version=abstract-signer/5.7.0)

### 2.2.4 safeMint (Owner地址, -1) – Owner调用

#### 预期结果

未发起交易，提示错误信息

#### 实际结果

同预期

错误信息：Error: value out-of-bounds (argument="quantity", value=-1, code=INVALID\_ARGUMENT, version=abi/5.7.0)

### 2.2.5 safeMint (无效地址, 10) – Owner调用

#### 预期结果

未发起交易，提示错误信息

#### 实际结果

同预期

错误信息：Error: invalid address or ENS name (argument="name", value=undefined, code=INVALID\_ARGUMENT, version=contracts/5.7.0)

### 2.2.6 safeMint (Owner地址, 10) – 非Owner调用

#### 预期结果

未发起交易，提示错误信息

#### 实际结果

同预期

错误信息：Error: insufficient funds for intrinsic transaction cost [ See: https://links.ethers.org/v5-errors-INSUFFICIENT\_FUNDS ] (error={"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":93,\"error\":{\"code\":-32000,\"message\":\"failed to check sender balance: sender balance \\u003c tx cost (0 \\u003c 300000): insufficient funds: insufficient funds\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_sendRawTransaction\",\"params\":[\"0x02f8aa822fc7800101830493e09430c954cc1648693b7fb743f793c8c4d1be26b0c580b844a1448194000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a000000000000000000000000000000000000000000000000000000000000000ac001a0cff24669c07ca4178ca7d14c436bb569f2cf00d374d90060c560e0f9f6bd9fe4a01084a7f1461141efa56d0cfe3e2f5c0ca8bd219031553232b5cbfc734cc00f3c\"],\"id\":93,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}, method="sendTransaction", transaction="0x02f8aa822fc7800101830493e09430c954cc1648693b7fb743f793c8c4d1be26b0c580b844a1448194000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a000000000000000000000000000000000000000000000000000000000000000ac001a0cff24669c07ca4178ca7d14c436bb569f2cf00d374d90060c560e0f9f6bd9fe4a01084a7f1461141efa56d0cfe3e2f5c0ca8bd219031553232b5cbfc734cc00f3c", code=INSUFFICIENT\_FUNDS, version=providers/5.7.2)

### 2.2.7 safeMint (Owner地址, 10000) gasLimit小于实际使用– Owner调用

#### 预期结果

发起交易，由于设置的gasLimit小于实际使用的gas，交易上链，但交易失败，扣除gas

#### 实际结果

同预期

错误信息：Error: transaction failed [ See: https://links.ethers.org/v5-errors-CALL\_EXCEPTION ] (transactionHash="0x4e7ad11a357817c76ea9ccb0e2e18fd84dce61ad6382e6dd888dd9de09511a46", transaction={"type":2,"chainId":12231,"nonce":224,"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x01"},"maxFeePerGas":{"type":"BigNumber","hex":"0x01"},"gasPrice":null,"gasLimit":{"type":"BigNumber","hex":"0x0493e0"},"to":"0x30C954cc1648693b7Fb743F793C8C4D1bE26b0c5","value":{"type":"BigNumber","hex":"0x00"},"data":"0xa1448194000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000002710","accessList":[],"hash":"0x4e7ad11a357817c76ea9ccb0e2e18fd84dce61ad6382e6dd888dd9de09511a46","v":0,"r":"0x3a7cba4c68e61d2bf037b1e3f562c432704013f10415afb2fe48e32155a0f3f6","s":"0x106d9104355378b5ee899694417cfd7bab5cb2967a6580cbf72e5437af64ce07","from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","confirmations":0}, receipt={"to":"0x30C954cc1648693b7Fb743F793C8C4D1bE26b0c5","from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","contractAddress":null,"transactionIndex":0,"gasUsed":{"type":"BigNumber","hex":"0x04832c"},"logsBloom":"0x00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000","blockHash":"0x64c389c2c2e11cad6df820eec3f4a08ad35395ce45753f643fa9c4dddb2b69ac","transactionHash":"0x4e7ad11a357817c76ea9ccb0e2e18fd84dce61ad6382e6dd888dd9de09511a46","logs":[],"blockNumber":9754813,"confirmations":2,"cumulativeGasUsed":{"type":"BigNumber","hex":"0x04832c"},"effectiveGasPrice":{"type":"BigNumber","hex":"0x01"},"status":0,"type":2,"byzantium":true}, code=CALL\_EXCEPTION, version=providers/5.7.2)

### 2.2.8 safeMint(合约地址, 10) – Owner调用

发行量测试值为1、10、20、1000、10000

#### 预期结果

交易失败

#### 实际结果

同预期

错误信息：Error: transaction failed [ See: https://links.ethers.org/v5-errors-CALL\_EXCEPTION ] (transactionHash="0xe439bdea589072fc603f5f400eab474ffb2f5cc59fe19185ef22253dcb00ea88", transaction={"type":2,"chainId":12231,"nonce":253,"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x01"},"maxFeePerGas":{"type":"BigNumber","hex":"0x01"},"gasPrice":null,"gasLimit":{"type":"BigNumber","hex":"0x17d78400"},"to":"0x30C954cc1648693b7Fb743F793C8C4D1bE26b0c5","value":{"type":"BigNumber","hex":"0x00"},"data":"0xa144819400000000000000000000000030c954cc1648693b7fb743f793c8c4d1be26b0c50000000000000000000000000000000000000000000000000000000000000001","accessList":[],"hash":"0xe439bdea589072fc603f5f400eab474ffb2f5cc59fe19185ef22253dcb00ea88","v":0,"r":"0xdac8169874fe55822cdd1830de40b5ffe40f96d57acc676d9800ddf857096798","s":"0x1a8a6c3e5c4012d9ca31ac2ddfb0c5851a027683999f97e01d5b07bf6001581e","from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","confirmations":0}, receipt={"to":"0x30C954cc1648693b7Fb743F793C8C4D1bE26b0c5","from":"0xbb44a15462C5c5042A74b4Adc770793A7E57210a","contractAddress":null,"transactionIndex":0,"gasUsed":{"type":"BigNumber","hex":"0xfd3e"},"logsBloom":"0x00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000","blockHash":"0x520bc2eb495be0c20cd13684215476097fa6efd9fecffeb37b7e761490cb11bc","transactionHash":"0xe439bdea589072fc603f5f400eab474ffb2f5cc59fe19185ef22253dcb00ea88","logs":[],"blockNumber":9759694,"confirmations":2,"cumulativeGasUsed":{"type":"BigNumber","hex":"0xfd3e"},"effectiveGasPrice":{"type":"BigNumber","hex":"0x01"},"status":0,"type":2,"byzantium":true}, code=CALL\_EXCEPTION, version=providers/5.7.2)

## 2.3 setName函数

|  |  |  |  |
| --- | --- | --- | --- |
| **用例编号 -**  **脚本编号** | **调用者** | **参数**  **（name）** | **测试结果** |
| 2.3.1 – 1.1、1.2、1.3、1.4 | 合约Owner | 长度从0 ~ 100 | 交易成功 |
| 2.3.2 – 2.1 | 非合约Owner | “NFT” | 交易未发送，返回错误信息 |

### 2.3.1 √ setName参数（NFT名称）- Owner调用

|  |  |
| --- | --- |
| **参数值（NFT名称）** | **参数长度** |
| "M" | 1 |
| "MyFirstNFT" | 10 |
| "" | 0 |
| "MyFirstNFTMyFirstNFTMyFirstNFTMyFirstNFTMyFirstNFTMyFirstNFTMyFirstNFTMyFirstNFTMyFirstNFTMyFirstNFT" | 100 |

#### 执行结果

交易成功；

NFT名称重置；

### 2.3.2非Owner调用

#### 执行结果

未发送交易，返回错误信息

错误信息：Error: insufficient funds for intrinsic transaction cost [ See: https://links.ethers.org/v5-errors-INSUFFICIENT\_FUNDS ] (error={"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":115,\"error\":{\"code\":-32000,\"message\":\"failed to check sender balance: sender balance \\u003c tx cost (0 \\u003c 300000): insufficient funds: insufficient funds\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_sendRawTransaction\",\"params\":[\"0x02f8ca822fc7800101830493e09430c954cc1648693b7fb743f793c8c4d1be26b0c580b864c47f00270000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000000a49734e6f5369676e657200000000000000000000000000000000000000000000c001a04ad1d21f2c122efdb7f2d09192f528b84ca84ec8060a481b48eb67ee3126bd74a07da236077bc597eece841c7fb2bc9e00768fc14d993fe9739c4125b2bcadc246\"],\"id\":115,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}, method="sendTransaction", transaction="0x02f8ca822fc7800101830493e09430c954cc1648693b7fb743f793c8c4d1be26b0c580b864c47f00270000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000000a49734e6f5369676e657200000000000000000000000000000000000000000000c001a04ad1d21f2c122efdb7f2d09192f528b84ca84ec8060a481b48eb67ee3126bd74a07da236077bc597eece841c7fb2bc9e00768fc14d993fe9739c4125b2bcadc246", code=INSUFFICIENT\_FUNDS, version=providers/5.7.2)

## 2.4 setSymbol函数

### 2.4.1 √ setSymbol参数（NFT符号）- Owner调用

|  |  |  |  |
| --- | --- | --- | --- |
| **参数值（NFT名称）** | **参数长度** |  |  |
| "S" | 1 |  |  |
| "SACTRACYOTH" | 10 |  |  |
| "" | 0 |  |  |
| "SACTRACYOTHSACTRACYOTHSACTRACYOTHSACTRACYOTHSACTRACYOTHSACTRACYOTHSACTRACYOTHSACTRACYOTHSACTRACYOTHSACTRACYOTH" | 100 |  |  |

#### 预期结果

交易成功；

NFT名称重置；

#### 实际结果

同预期

### 2.4.2 setSymbol参数（NFT符号） - 非Owner调用

NFT名称长度为0，1，10，100

#### 预期结果

未发送交易，返回错误信息

#### 实际结果

同预期

错误信息：Error: insufficient funds for intrinsic transaction cost [ See: https://links.ethers.org/v5-errors-INSUFFICIENT\_FUNDS ] (error={"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":64,\"error\":{\"code\":-32000,\"message\":\"failed to check sender balance: sender balance \\u003c tx cost (0 \\u003c 300000): insufficient funds: insufficient funds\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_sendRawTransaction\",\"params\":[\"0x02f8ca822fc7800101830493e09430c954cc1648693b7fb743f793c8c4d1be26b0c580b864b84c82460000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000000a4e657753796d626f6c7300000000000000000000000000000000000000000000c080a0ae92e4266d199f0d8f89ff77d3e6686c1eb728429b9000d814fb649daced0763a024cfb73895a283e100b5d95401db79ca8f3cc594151126326f9d4f7b28fc5549\"],\"id\":64,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"},

method="sendTransaction", transaction="0x02f8ca822fc7800101830493e09430c954cc1648693b7fb743f793c8c4d1be26b0c580b864b84c82460000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000000a4e657753796d626f6c7300000000000000000000000000000000000000000000c080a0ae92e4266d199f0d8f89ff77d3e6686c1eb728429b9000d814fb649daced0763a024cfb73895a283e100b5d95401db79ca8f3cc594151126326f9d4f7b28fc5549", code=INSUFFICIENT\_FUNDS, version=providers/5.7.2)

## 2.5 setBaseURI函数

### 2.5.1 √ setBaseURI参数（URI）- Owner调用

|  |  |
| --- | --- |
| **参数值（URI）** | **参数长度** |
| "https://bafybeigtb3tt4a2eyurd4vk7jrjuiwnetufyfy7evmf4e2nwljatrcsdhq.ipfs.nftstorage.link/" | 89 |
| "" | 0 |

#### 预期结果

交易成功；

BaseURI重置；

#### 实际结果

同预期

### 2.5.2 setBaseURI参数（URI） - 非Owner调用

#### 预期结果

未发送交易，返回错误信息

#### 实际结果

同预期

错误信息：Error: insufficient funds for intrinsic transaction cost [ See: https://links.ethers.org/v5-errors-INSUFFICIENT\_FUNDS ] (error={"reason":"processing response error","code":"SERVER\_ERROR","body":"{\"jsonrpc\":\"2.0\",\"id\":53,\"error\":{\"code\":-32000,\"message\":\"failed to check sender balance: sender balance \\u003c tx cost (0 \\u003c 300000): insufficient funds: insufficient funds\"}}\n","error":{"code":-32000},"requestBody":"{\"method\":\"eth\_sendRawTransaction\",\"params\":[\"0x02f8ea822fc7800101830493e09430c954cc1648693b7fb743f793c8c4d1be26b0c580b88455f804b30000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000003b62616679626569677462337474346132657975726434766b376a726a7569776e657475667966793765766d663465326e776c6a61747263736468710000000000c080a035e03b536bed3490c552cdb8149319011901c3d1c4ec67539f960da95d0210c5a063dcc11c7567cd20793d5f547856a8c9eeb74c3f2c3ec25dc5bd8d70e3d4170c\"],\"id\":53,\"jsonrpc\":\"2.0\"}","requestMethod":"POST","url":"http://testnet.bianjie.ai:8545"}, method="sendTransaction", transaction="0x02f8ea822fc7800101830493e09430c954cc1648693b7fb743f793c8c4d1be26b0c580b88455f804b30000000000000000000000000000000000000000000000000000000000000020000000000000000000000000000000000000000000000000000000000000003b62616679626569677462337474346132657975726434766b376a726a7569776e657475667966793765766d663465326e776c6a61747263736468710000000000c080a035e03b536bed3490c552cdb8149319011901c3d1c4ec67539f960da95d0210c5a063dcc11c7567cd20793d5f547856a8c9eeb74c3f2c3ec25dc5bd8d70e3d4170c", code=INSUFFICIENT\_FUNDS, version=providers/5.7.2)

## 2.6 transferFrom函数

测试脚本：

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **用例编号 -**  **脚本编号** | **调用者** | **参数**  **（from）** | **参数**  **（to）** | **参数**  **（tokenId）** | **测试结果** |
| 2.6.1 - 1.4 | 合约Owner | tokenId持有者 | tokenId持有者 | 1（存在） | 交易成功 （自转） |
| 2.6.1 - 1.1 | 合约Owner | tokenId持有者 | 非合约Owner | 1（存在） | 交易成功 |
| 2.6.1 - 1.5 | 合约Owner | tokenId持有者 | 合约地址 | 1（存在） | 交易成功 |
|  |  |  |  |  |  |
| 2.6.1 - 1.2 | 非合约Owner | tokenId持有者 | 合约Owner | 1（存在） | 交易成功 |
| 2.6.1 - 2.1 | 非合约Owner | tokenId持有者 | 非合约Owner | 1（存在） | 交易成功 |
| 2.6.1 - 2.2 | 非合约Owner | tokenId持有者 | 合约地址 | 1（存在） | 交易成功 |
|  |  |  |  |  |  |
| 2.6.2 - 1.3 | 合约Owner | 不是持有tokenId账户 | 合约Owner | 1（存在） | 交易发送，返回失败信息，扣除gas |
| 2.6.3 - 3.1 | 合约Owner | 零地址 | 地址 | 1（存在） | 交易未发送，返回错误信息 |
| 2.6.3 - 3.2 | 合约Owner | tokenId持有者 | 零地址 | 1（存在） | 交易未发送，返回错误信息 |
| 2.6.3 - 3.3 | 合约Owner | 零地址 | 零地址 | 1（存在） | 交易未发送，返回错误信息 |
| 2.6.4 - 3.4 | 合约Owner | 无效地址 | 有效地址 | 1（存在） | 交易未发送，返回错误信息 |
| 2.6.5 - 3.5 | 合约Owner | tokenId持有者 | 用户地址 | 100000000（不存在） | 交易未发送，返回错误信息 |

### 2.6.1 √ transferFrom(有效地址，有效地址，有效tokenId) – tokenId持有者调用

#### 执行结果

交易成功；

from总量减一；

to总量是否加一；

tokenId持有者由from变为to

总发行量不变

### 2.6.2 非持有tokenId地址调用

#### 执行结果

未发送交易，返回错误信息

错误信息：call revert exception [ See: https://links.ethers.org/v5-errors-CALL\_EXCEPTION ] (method="ownerOf(uint256)", data="0xdf2d9b42", errorArgs=null, errorName=null, errorSignature=null, reason=null, code=CALL\_EXCEPTION, version=abi/5.7.0)

### 2.6.3 参数from或to为零地址

#### 执行结果

未发送交易，返回错误信息

错误信息：invalid address (argument="address", value="0x0", code=INVALID\_ARGUMENT, version=address/5.7.0)

### 2.6.4 参数from为无效地址

#### 执行结果

未发送交易，返回错误信息

错误信息：

invalid address (argument="address", value="0x2BC344895094575cb363DdBCa7FDC8DE66Ad2dD7AB", code=INVALID\_ARGUMENT, version=address/5.7.0)

### 2.6.5 tokenId 大于总发行数量，即tokenId不存在

#### 执行结果

未发送交易，返回错误信息

错误信息：transaction failed [ See: https://links.ethers.org/v5-errors-CALL\_EXCEPTION ] (transactionHash="0x5402f77bb9280a2d2e3ac4f1dd3634c540f8872b4a6341d176dd2fb555861f29", transaction={"type":2,"chainId":12231,"nonce":3,"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x01"},"maxFeePerGas":{"type":"BigNumber","hex":"0x01"},"gasPrice":null,"gasLimit":{"type":"BigNumber","hex":"0x17d78400"},"to":"0x30C954cc1648693b7Fb743F793C8C4D1bE26b0c5","value":{"type":"BigNumber","hex":"0x00"},"data":"0x23b872dd0000000000000000000000002bc344895094575cb363ddbca7fdc8de66ad2dd7000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000000000004","accessList":[],"hash":"0x5402f77bb9280a2d2e3ac4f1dd3634c540f8872b4a6341d176dd2fb555861f29","v":0,"r":"0xea6478c2cdb0414b7119f945bf8afa4b945720c80ec3ede633a32fb0a5d1ff2a","s":"0x5bcf663f412675b9c4a01c4e3429d4dfba828d7041b2a6fbf763491d67d1ff22","from":"0x2BC344895094575cb363DdBCa7FDC8DE66Ad2dD7","confirmations":0}, receipt={"to":"0x30C954cc1648693b7Fb743F793C8C4D1bE26b0c5","from":"0x2BC344895094575cb363DdBCa7FDC8DE66Ad2dD7","contractAddress":null,"transactionIndex":0,"gasUsed":{"type":"BigNumber","hex":"0x7deb"},"logsBloom":"0x00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000","blockHash":"0x180230ba60b7c46e81abd19787d40d9c6f4d238730396acd360d26baaef351e0","transactionHash":"0x5402f77bb9280a2d2e3ac4f1dd3634c540f8872b4a6341d176dd2fb555861f29","logs":[],"blockNumber":9801564,"confirmations":2,"cumulativeGasUsed":{"type":"BigNumber","hex":"0x7deb"},"effectiveGasPrice":{"type":"BigNumber","hex":"0x01"},"status":0,"type":2,"byzantium":true}, code=CALL\_EXCEPTION, version=providers/5.7.2)

## 2.7 setUser函数

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **用例编号 -**  **脚本编号** | **调用者** | **参数**  **（tokenId）** | **参数**  **（user）** | **参数**  **（expires）** | **测试结果** |
| 2.7.1 - 1.1 | 合约Owner | 调用者持有 | 非合约Owner | 有效时间 | 交易成功 |
| 2.7.1 - 1.2 | 合约Owner | 调用者持有 | 合约Owner | 有效时间 | 交易成功（自租） |
| 2.7.1 - 1.3 | 合约Owner | 调用者持有 | 合约地址 | 有效时间 | 交易成功 |
|  |  |  |  |  |  |
| 2.7.1 –2.1 | 非合约Owner | 调用者持有 | 非合约Owner | 有效时间 | 交易成功 |
| 2.7.1 - 2.2 | 非合约Owner | 调用者持有 | 合约Owner | 有效时间 | 交易成功 |
| 2.7.1 - 2.3 | 非合约Owner | 调用者持有 | 合约地址 | 有效时间 | 交易成功 |
|  |  |  |  |  |  |
| 2.7.2 - 3.1 | 合约Owner | 调用者持有 | **零地址** | 有效时间 | 交易发送，返回失败信息，扣除gas |
| 2.7.3 - 3.2 | 合约Owner | 调用者持有 | **无效地址** | 有效时间 | 交易发送，返回失败信息，扣除gas |
| 2.7.4 - 3.3 | 合约Owner | **非调用者持有** | 有效地址 | 有效时间 | 交易未发送，返回失败信息 |
| 2.7.5 - 3.4 | 合约Owner | 调用者持有 | 合约Owner | **无效时间（时间小于当前时间）** | 交易未发送，返回失败信息 |

|  |  |  |
| --- | --- | --- |
| 场景1 | 1. 账户A持有tokenId，租给账户B，过期时间1天； 2. 在1天内，账户A将tokenId 租给账户C; | 交易成功 |

### 2.7.1 √ setUser（参数都有效）

#### 执行结果

交易成功；

tokenId持有者仍为调用者所有；

token总量不变；

tokenId持有者持有token总数量不变

租借者持有token总量不变

租借时间已变更

租借时间期内，使用userOf查看租借者为to

租借时间过期后，使用userOf查看租借者为零地址

### 2.7.2 租借给零地址

#### 执行结果

交易发送，返回错误信息

错误信息：invalid address (argument="address", value="0x0", code=INVALID\_ARGUMENT, version=address/5.7.0)

### 2.7.3 租借给无效地址

#### 执行结果

交易发送，返回错误信息

错误信息：nvalid address (argument="address", value="0x2BC344895094575cb363DdBCa7FDC8DE66Ad2dD7AB", code=INVALID\_ARGUMENT, version=address/5.7.0)

### 2.7.4 tokenId为非调用者持有

#### 执行结果

交易未发送，返回错误信息

错误信息：transaction failed [ See: https://links.ethers.org/v5-errors-CALL\_EXCEPTION ] (transactionHash="0xceaa63f1efe3008df2dee6282e65846c2edfff185f96cbc626b7e661e20207ee", transaction={"type":2,"chainId":12231,"nonce":82,"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x01"},"maxFeePerGas":{"type":"BigNumber","hex":"0x01"},"gasPrice":null,"gasLimit":{"type":"BigNumber","hex":"0x0493e0"},"to":"0xC0ddDf8C195AE6ad73B7ACCdEDF3a655482C9875","value":{"type":"BigNumber","hex":"0x00"},"data":"0xe030565e0000000000000000000000000000000000000000000000000000000000002f0c000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a00000000000000000000000000000000000000000000000000000000636933f2","accessList":[],"hash":"0xceaa63f1efe3008df2dee6282e65846c2edfff185f96cbc626b7e661e20207ee","v":0,"r":"0x28ed1981bc7ab9d65ffaed875d7197c251019b5b43cc01eda1bcbc4ed7c9dd52","s":"0x7469360acdf3b22a69e74891f039b7b9e6e7f18bb8a650705de65a4a968beea6","from":"0x2BC344895094575cb363DdBCa7FDC8DE66Ad2dD7","confirmations":0}, receipt={"to":"0xC0ddDf8C195AE6ad73B7ACCdEDF3a655482C9875","from":"0x2BC344895094575cb363DdBCa7FDC8DE66Ad2dD7","contractAddress":null,"transactionIndex":0,"gasUsed":{"type":"BigNumber","hex":"0x8eb0"},"logsBloom":"0x00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000","blockHash":"0x8a08fdce25828211dab52fc2764151ec8101aafd27db73880db507013bd10266","transactionHash":"0xceaa63f1efe3008df2dee6282e65846c2edfff185f96cbc626b7e661e20207ee","logs":[],"blockNumber":10228091,"confirmations":2,"cumulativeGasUsed":{"type":"BigNumber","hex":"0x8eb0"},"effectiveGasPrice":{"type":"BigNumber","hex":"0x01"},"status":0,"type":2,"byzantium":true}, code=CALL\_EXCEPTION, version=providers/5.7.2)

### 2.7.5 租借过期时间小于当前时间

#### 执行结果

交易未发送，返回错误信息

错误信息：transaction failed [ See: https://links.ethers.org/v5-errors-CALL\_EXCEPTION ] (transactionHash="0x513f7f70b911da0350ae319b4b50c78fc1bf4067e95af2ebf71cf097d79b1b68", transaction={"type":2,"chainId":12231,"nonce":83,"maxPriorityFeePerGas":{"type":"BigNumber","hex":"0x01"},"maxFeePerGas":{"type":"BigNumber","hex":"0x01"},"gasPrice":null,"gasLimit":{"type":"BigNumber","hex":"0x0493e0"},"to":"0xC0ddDf8C195AE6ad73B7ACCdEDF3a655482C9875","value":{"type":"BigNumber","hex":"0x00"},"data":"0xe030565e0000000000000000000000000000000000000000000000000000000000002f0d000000000000000000000000bb44a15462c5c5042a74b4adc770793a7e57210a0000000000000000000000000000000000000000000000000000000063693086","accessList":[],"hash":"0x513f7f70b911da0350ae319b4b50c78fc1bf4067e95af2ebf71cf097d79b1b68","v":0,"r":"0x874736350d2fb18eb898e3844ad564e342385e8272f3ff6b5fc17c4b9519d541","s":"0x28314fc4b02911466656a36ece6a922124de2e6c7c64f65210bf20d11fcc7a34","from":"0x2BC344895094575cb363DdBCa7FDC8DE66Ad2dD7","confirmations":0}, receipt={"to":"0xC0ddDf8C195AE6ad73B7ACCdEDF3a655482C9875","from":"0x2BC344895094575cb363DdBCa7FDC8DE66Ad2dD7","contractAddress":null,"transactionIndex":0,"gasUsed":{"type":"BigNumber","hex":"0x8eb0"},"logsBloom":"0x00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000","blockHash":"0xd076c0a950d36abb2e33a00ff7ed8ff4bd736392dacd92d9f85a1d891947c4b6","transactionHash":"0x513f7f70b911da0350ae319b4b50c78fc1bf4067e95af2ebf71cf097d79b1b68","logs":[],"blockNumber":10228096,"confirmations":2,"cum

## 2.8 approve函数

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **用例编号 -**  **脚本编号** | **调用者** | **参数**  **（to）** | **参数**  **（tokenId）** | **测试结果** |
| 2.8.1 - 1.1 | 合约Owner | 非合约Owner | 调用者持有 | 交易成功 |
| 2.8.1 - 1.2 | 合约Owner | 合约Owner | 调用者持有 | 交易成功（自授权） |
| 2.8.1 - 1.3 | 合约Owner | 合约地址 | 调用者持有 | 交易成功 |
|  |  |  |  |  |
| 2.8.1 –2.1 | 非合约Owner | 非合约Owner | 调用者持有 | 交易成功 |
| 2.8.1 - 2.2 | 非合约Owner | 合约Owner | 调用者持有 | 交易成功 |
| 2.8.1 - 2.3 | 非合约Owner | 合约地址 | 调用者持有 | 交易成功 |
|  |  |  |  |  |
| 2.8.2 - 3.1 | 合约Owner | **零地址** | 调用者持有 | 交易发送，返回失败信息，扣除gas |
| 2.8.2 - 3.2 | 合约Owner | **无效地址** | 调用者持有 |  |
|  | 合约Owner | **有效地址** | **非调用者持有** |  |

### 2.8.1 √ approve（参数都有效）

#### 执行结果

交易成功；

tokenId持有者仍为调用者所有；

token总量不变；

tokenId持有者持有token总数量不变

被授权者持有的token总量不变

被授权者未持有tokenId

查看tokenId的被授权者为to

# 3 Gas费

## 3.1 工厂合约

### 3.1.1 deployContract

|  |  |  |
| --- | --- | --- |
| 参数 | 消耗（单位：能量值） | 消耗（单位：RMB） |
| "NFT1013" | 135092 |  |

## 3.2 NFT1013合约

### 3.2.1 mint与safeMint函数发行不同数量费用消耗

**注：**发行数量最多为 10000

|  |  |  |
| --- | --- | --- |
| 发行数量区间 | Mint 消耗(单位 RMB) | safeMint消耗(单位 RMB) |
| 1 - 100 | ¥0.02 - ¥0.07 | ¥0.02 - ¥0.07 |
| 100 - 200 | ¥0.07 - ¥0.11 | ¥0.07 - ¥0.11 |
| 200 - 300 | ¥0.11 - ¥0.16 | ¥0.11 - ¥0.16 |
| 300 - 400 | ¥0.16 - ¥0.21 | ¥0.16 - ¥0.21 |
| 400 - 500 | ¥0.21 - ¥0.26 | ¥0.21 - ¥0.26 |
| 500 - 1000 | ¥0.26 - ¥0.51 | ¥0.26 - ¥0.51 |
| 1000 - 2000 | ¥0.51 - ¥1.00 | ¥0.51 - ¥1.00 |
| 2000 - 3000 | ¥1.00 - ¥1.49 | ¥1.00 - ¥1.49 |
| 3000 - 4000 | ¥1.49 - ¥1.98 | ¥1.49 - ¥1.98 |
| 4000 - 5000 | ¥1.98 - ¥2.47 | ¥1.98 - ¥2.47 |
| 5000 - 10000 | ¥2.47 - ¥4.93 | ¥2.47 - ¥4.93 |
| 10000 - 20000 | ¥4.93 - ¥9.92 | ¥4.93 - ¥9.92 |

### 3.2.3 setName设置长度不同的名称gas消耗

|  |  |  |
| --- | --- | --- |
| 长度 | 消耗（单位：能量值） | 消耗（单位：RMB） |
| 0 | 29668 | ¥0.01 |
| 1 | 34679 | ¥0.01 |
| 10 | 42186 | ¥0.01 |
| 100 | 539970 | ¥0.13 |

### 3.2.4 setSymbol设置长度不同的符号gas消耗

|  |  |  |
| --- | --- | --- |
| 长度 | 消耗（单位：能量值） | 消耗（单位：RMB） |
| 0 | 29668 | ¥0.01 |
| 1 | 34679 | ¥0.01 |
| 10 | 42186 | ¥0.01 |
| 100 | 539970 | ¥0.13 |

### 3.2.5 setBaseURI设置长度不同的BaseURI gas消耗

|  |  |  |
| --- | --- | --- |
| 长度 | 消耗（单位：能量值） | 消耗（单位：RMB） |
| 0 | 39109 | ¥0.01 |
| 89 | 40316 | ¥0.01 |

### 3.2.6 transfer函数发行不同数量gas费消耗

#### 测试明细

|  |  |  |  |
| --- | --- | --- | --- |
| 发行数量 | 转账索引 | 消耗（GAS） | 消耗（RMB） |
| 1 | 1 （首次） | 49790 | ¥0.01 |
| 2 | 1 （首次） | 72187 | ¥0.02 |
| 2 | 2 （首次） | 71426 | ¥0.02 |
| 2 | 1 | 72187 | ¥0.02 |
| 2 | 52112 | ¥0.01 |
| 2 | 2 | 71426 | ¥0.02 |
| 1 | 51990 | ¥0.01 |
| 3 | 1 （首次） | 72187 | ¥0.02 |
| 3 | 2 （首次） | 91501 | ¥0.02 |
| 3 | 3 （首次） | 73640 | ¥0.02 |
| 3 | 1 | 72187 | ¥0.02 |
| 2 | 72187 | ¥0.02 |
| 3 | 52112 | ¥0.01 |
| 3 | 2 | 91501 | ¥0.02 |
| 1 | 51990 | ¥0.01 |
| 3 | 52112 | ¥0.01 |
| 3 | 2 | 91501 | ¥0.02 |
| 3 | 52112 | ¥0.01 |
| 1 | 51990 | ¥0.01 |
| 3 | 3 | 73640 | ¥0.02 |
| 2 | 71304 | ¥0.02 |
| 1 | 51990 | ¥0.01 |
| 3 | 3 | 73640 | ¥0.02 |
| 1 | 72187 | ¥0.02 |
| 2 | 51990 | ¥0.01 |
| 10 | 1 （首次） | 72187 | ¥0.02 |
| 10 | 5 （首次） | 98143 | ¥0.02 |
| 10 | 10 （首次） | 89138 | ¥0.02 |
|  |  |  |  |
| 100 | 1 （首次） | 72211 | ¥0.02 |
| 100 | 20 （首次） | 131377 | ¥0.03 |
| 100 | 50 （首次） | 197797 | ¥0.05 |
| 100 | 70 （首次） | 242077 | ¥0.06 |
| 100 | 100 （首次） | 288422 | ¥0.07 |
| 100 | 65 （A转B） | 231007 | ¥0.06 |
| 17 （A转B） | 124735 | ¥0.03 |
| 82 （A转B） | 124735 | ¥0.03 |
| 95 （A转B） | 115879 | ¥0.03 |
| 1 （A转B） | 72211 | ¥0.02 |
| 70 （A转B） | 98167 | ¥0.02 |
| 50 （A转B） | 160159 | ¥0.04 |
| 100 （A转B） | 78092 | ¥0.02 |
| 70 （B回转A） | 49814 | ¥0.01 |
| 17 （B回转A） | 49814 | ¥0.01 |
| 100 （B回转A） | 49814 | ¥0.01 |
| 1 （B回转A） | 49814 | ¥0.01 |
| 90 （A转B） | 104809 | ¥0.03 |
| 60 （A转B） | 109237 | ¥0.03 |
| 60 （B转C） | 66914 | ¥0.02 |
| 90 （B转C） | 49814 | ¥0.01 |
|  |  |  |  |
| 1000 | 1 （首次） | 72211 | ¥0.02 |
| 1000 | 200 （首次） | 529897 | ¥0.13 |
| 1000 | 500 （首次） | 1194097 | ¥0.30 |
| 1000 | 700 （首次） | 1636897 | ¥0.41 |
| 1000 | 900 （首次） | 2079697 | ¥0.52 |
| 1000 | 1000 （首次） | 2281022 | ¥0.57 |
|  |  |  |  |
| 5000 | 1 （首次） | 72211 | ¥0.02 |
| 5000 | 5000 （首次） | 11137022 | ¥2.78 |
|  |  |  |  |
| 10000 | 1 （首次） | 72199 | ¥0.02 |
| 10000 | 100 （首次） | 308497 | ¥0.08 |
| 10000 | 500 （首次） | 1194097 | ¥0.30 |
| 10000 | 1000 （首次） | 2301097 | ¥0.58 |
| 10000 | 5000 （首次） | 11157097 | ¥2.79 |
| 10000 | 7000 （首次） | 15585097 | ¥3.90 |
| 10000 | 9000 （首次） | 20013097 | ¥5.00 |
| 10000 | 10000 （首次） | 22207022 | ¥5.55 |
|  |  |  |  |
| 10000 | 10000 （A转B） | 22207022 | ¥5.55 |
| 5000 （A转B） | 11157097 | ¥2.79 |
| 1000 （A转B） | 2301097 | ¥0.58 |
| 500 （A转B） | 1194097 | ¥0.30 |
| 9000 （A转B） | 8943097 | ¥2.24 |
| 7000 （A转B） | 4515097 | ¥1.13 |
| 100 （A转B） | 308497 | ¥0.08 |
| 1 （A转B） | 72211 | ¥0.02 |
| 10000 （B转A） | 49814 | ¥0.01 |
| 1 （B转A） | 49814 | ¥0.01 |
| 5000 （B回转A） | 49814 | ¥0.01 |
| 1000 （B回转A） | 49814 | ¥0.01 |
| 9000 （B回转A） | 49814 | ¥0.01 |
| 500 （B回转A） | 49814 | ¥0.01 |
| 5000 （A回转B） | 49814 | ¥0.01 |
| 9000 （A回转B） | 49814 | ¥0.01 |
| 1 （A回转B） | 49814 | ¥0.01 |
| 5500 （A转B） | 1194097 | ¥0.30 |
| 9500 （A转B） | 1194097 | ¥0.30 |
| 2 （A转B） | 72211 | ¥0.02 |
| 200 （A转B） | 308497 | ¥0.08 |
| 800 （A转B） | 751297 | ¥0.19 |
| 1500 （A转B） | 1194097 | ¥0.30 |
| 2500 （A转B） | 2301097 | ¥0.58 |
| 3500 （A转B） | 2301097 | ¥0.58 |
| 4500 （A转B） | 2301097 | ¥0.58 |
| 6500 （A转B） | 2301097 | ¥0.58 |
| 7500 （A转B） | 1194097 | ¥0.30 |
| 8500 （A转B） | 2301097 | ¥0.58 |
| 8500 （B转C） | 66914 | ¥0.02 |
| 3500 （B转C） | 49814 | ¥0.01 |
| 800 （B转C） | 49814 | ¥0.01 |
| 7000 （B转C） | 49814 | ¥0.01 |
| 200 （B转C） | 49814 | ¥0.01 |
| 7500 （B转C） | 49814 | ¥0.01 |
| 2 （B转C） | 49814 | ¥0.01 |
|  |  |  |  |
| 20000 | 1 （首次） | 72199 | ¥0.02 |
| 20000 | 100 （首次） | 308485 | ¥0.08 |
| 20000 | 500 （首次） | 1194097 | ¥0.30 |
| 20000 | 1000 （首次） | 2301097 | ¥0.58 |
| 20000 | 5000 （首次） | 11157097 | ¥2.79 |
| 20000 | 7000 （首次） | 15602185 | ¥3.90 |
| 20000 | 9000 （首次） | 20013085 | ¥5.00 |
| 20000 | 10000 （首次） | 22227085 | ¥5.56 |
| 20000 | 11000 （首次） | 24441097 | ¥6.11 |
| 20000 | 12000 （首次） | 转账失败 |  |
|  |  |  |  |

#### 测试汇总

|  |  |  |
| --- | --- | --- |
| **发行数量** | **首次转次消耗**  **（单位RMB）** | **同一tokenId多于1次转账消耗**  **（单位RMB）** |
| 1 - 100 | ¥0.01 - ¥0.07 | ¥0.01 - ¥0.02 |
| 100 - 1000 | ¥0.01 - ¥0.57 | ¥0.01 - ¥0.02 |
| 1000 - 5000 | ¥0.01 - ¥2.78 | ¥0.01 - ¥0.02 |
| 5000 - 10000 | ¥0.01 - ¥5.55 | ¥0.01 - ¥0.02 |

### 3.2.7 setUser租借消耗

|  |  |  |  |
| --- | --- | --- | --- |
| 发行数量 | 租借索引 | 消耗（GAS） | 消耗（RMB） |
| 1 | 1  （首次） | 55616 | ¥0.01 |
| 10 | 1 （首次） | 55616 | ¥0.01 |
| 10 | 5 （首次） | 64472 | ¥0.02 |
| 10 | 10 （首次） | 75542 | ¥0.02 |
| 100 | 1 （首次） | 55628 | ¥0.01 |
| 100 | 50 （首次） | 164114 | ¥0.04 |
| 100 | 100 （首次） | 274802 | ¥0.07 |
| 1000 | 1 （首次） | 55628 | ¥0.01 |
| 1000 | 500 （首次） | 1160414 | ¥0.29 |
| 1000 | 1000 （首次） | 2267402 | ¥0.57 |
| 5000 | 1 （首次） | 55628 | ¥0.01 |
| 5000 | 2500 （首次） | 5588414 | ¥1.40 |
| 5000 | 5000 （首次） | 11123414 | ¥2.78 |
| 10000 | 1 （首次） | 55628 | ¥0.01 |
| 10000 | 5000 （首次） | 11123414 | ¥2.78 |
| 10000 | 10000（首次） | 22193402 | ¥5.55 |
|  |  |  |  |
| 1000 | 1 | 55604 | ¥0.01 |
| 2 | 57830 | ¥0.01 |
| 10 | 75542 | ¥0.02 |
| 100 | 274802 | ¥0.07 |
| 500 | 1160402 | ¥0.29 |
| 1000 | 2267402 | ¥0.57 |
| 1 （二次租借） | 38516 | ¥0.01 |
| 500 （二次租借） | 1143302 | ¥0.29 |
| 1000 （二次租借） | 2250302 | ¥0.56 |
|  |  |  |  |
| 5000 | 1 | 55616 | ¥0.01 |
| 2500 | 5588402 | ¥1.40 |
| 5000 | 11123402 | ¥2.78 |
| 1 （二次租借，未过期） | 38516 | ¥0.01 |
| 2500 （二次租借，未过期） | 5571302 | ¥1.39 |
| 5000 （二次租借，未过期） | 11106302 | ¥2.78 |
| 1 （再次租借，过期） | 55616 | ¥0.01 |
| 2500 （再次租借，过期） | 5588402 | ¥1.40 |
| 5000 （再次租借，过期） | 11106302 | ¥2.78 |
|  |  |  |  |
| 10000 | 1 | 55616 | ¥0.01 |
| 5000 | 11123402 | ¥2.78 |
| 10000 | 22193402 | ¥5.55 |
| 1 （二次租借，过期） | 38516 | ¥0.01 |
| 5000 （二次租借，过期） | 11106302 | ¥2.78 |
| 10000（二次租借，过期） | 22176302 | ¥5.54 |
| 1 （再次租借，未过期） | 38516 | ¥0.01 |
| 5000 （再次租借，未过期） | 11106302 | ¥2.78 |
| 10000（再次租借，未过期） | 22176302 | ¥5.54 |
|  |  |  |  |
| 租借给0地址 |  | 67926 | ¥0.02 |

#### 测试汇总

|  |  |  |
| --- | --- | --- |
| **发行数量** | **首次租借消耗**  **（单位RMB）** | **同一tokenId多于1次转租借消耗**  **（单位RMB）** |
| 1 - 100 | ¥0.01 - ¥0.07 | ¥0.01 - ¥0.07 |
| 100 - 1000 | ¥0.01 - ¥0.57 | ¥0.01 - ¥0.57 |
| 1000 - 5000 | ¥0.01 - ¥2.78 | ¥0.01 - ¥2.78 |
| 5000 - 10000 | ¥0.01 - ¥5.55 | ¥0.01 - ¥5.55 |