CTDSEC

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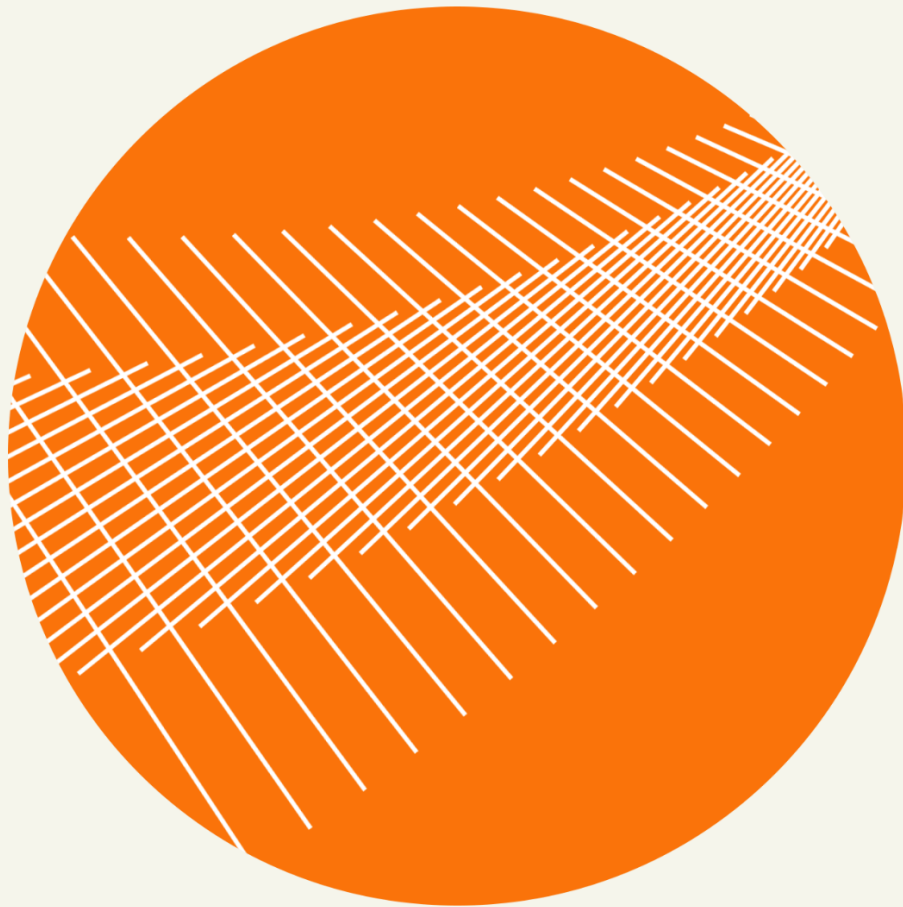
TERMS

Smart contract security audit MemeFactory

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1.0 Introduction

1.1 Project engagement

During February of 2024, VaporFiteam engaged CTDSec to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. VaporFi provided CTDSec with access to their code repository and whitepaper.

1.2 Disclaimer

It should be noted that this audit is not an endorsement of the reliability or effectiveness of the contract, rather limited to an assessment of the logic and implementation. In order to ensure a secure contract that's able to withstand the network's fast-paced and rapidly changing environment, we at CTDSec recommend that Vaporfi team put in place a bug bounty program to encourage further and active analysis of the smart contract.

2.0 Coverage

2.1 Target Code and Revision

For this audit, we performed research, investigation, and review of the MemeFactory contracts

followed by issue reporting, along with mitigation and remediation instructions outlined in this report.

The following code files are considered in-scope for the review:

Source file [commit - a4ef671033533f7db5e719f850edf369dfebf2a5]:

https://github.com/VaporFi/memefactory-contracts

Fix version:

Source file [commit - efd5773dbf1468780d86fa2b22f7a7dff26f2647

https://github.com/VaporFi/memefactory-contracts/pull/10

2.2 Attacks made to the contract

In order to check for the security of the contract, we tested several attacks in order to make sure that the contract is secure and follows best practices.

№	Issue description.	Checking status
1	Compiler warnings.	PASSED
2	Race conditions and Reentrancy. Cross-function race conditions.	PASSED
3	Possible delays in data delivery.	PASSED
4	Oracle calls.	PASSED
5	Front running.	PASSED
6	Timestamp dependence.	PASSED
7	Integer Overflow and Underflow.	PASSED
8	DoS with Revert.	PASSED
9	DoS with block gas limit.	PASSED
10	Methods execution permissions.	PASSED
11	Economy model. If application logic is based on an incorrect economic model, the application would not function correctly and participants would incur financial losses. This type of issue is most often found in bonus rewards systems, Staking and Farming contracts, Vault and Vesting contracts, etc.	PASSED
12	The impact of the exchange rate on the logic.	PASSED
13	Private user data leaks.	PASSED
14	Malicious Event log.	PASSED
15	Scoping and Declarations.	PASSED
16	Uninitialized storage pointers.	PASSED

17	Arithmetic accuracy.	PASSED
18	Design Logic.	PASSED
19	Cross-function race conditions.	PASSED
20	Safe Zeppelin module.	PASSED
21	Fallback function security.	PASSED
22	Overpowered functions / Owner privileges	PASSED

3.0 Security Issues

3.1 High severity issues [Acknowledge]

1. Reentrancy attacks

Contract: MemeFactory

Functions: launch(), unlockLiquidityTokens(), transferLock()

Issue: The functions launch(), unlockLiquidityTokens(), transferLock() are exploitable by re-entrancy attacks.

Fix: Add nonReentrant guard modifier.

Dev team: Team confirms that there is no risk of reentrancy.

3.2 Medium severity issues [Not apply]

1. Unlimited fees

Contract: MemeFactory

Functions: setLaunchFee()

Issue: The fees do not have any set limit, allowing if they are set wrong the contract can become a honey pot or have abusive conditions if the limit is set to 100%.

Fix: We recommend adding a limit to 10-15%.

Dev update: Fee is fixed to 250 USDC.

3.3 Low severity issues [FIXED]

1. Zero address Validation Missing

Contract: MemeFactory

Function: setVaporDEXAdapter()

Fix: Check to implement validations in order to verify that the address is not the zero address (0x0) in vaporDexAdapter.

4.0 Testing coverage - python

During the testing phase, custom use cases were written to cover all the logic of contracts in python language. *Check "5 Annexes" to see the testing code.*

Factory Testing:

```
tests/test_meme_factory.py::test_constructor RUNNING
Transaction sent: 0xfeb8f236d7942e1015a328e5d72bb31505743ec94f5c78af01461b92d2a46b7b
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 0
  WETH9.constructor confirmed   Block: 1   Gas used: 476546 (3.97%)
  WETH9 deployed at: 0x3194cBDC3dbcd3E11a07892e7bA5c3394048Cc87

Transaction sent: 0xefd37132fc1a6c9cec3f481aa08d2217d07da07201d598d04469094499b86709
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 1
  ERC20Mock.constructor confirmed   Block: 2   Gas used: 619873 (5.17%)
  ERC20Mock deployed at: 0x602C71e4DAC47a042Ee7f46E0aee17F94A3bA0B6

Transaction sent: 0x85dacf0a83bef50d76e91fc319bb1bad73ab27c06a291f1293a8bc85d9f1a278
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 2
  UniswapV2Factory.constructor confirmed   Block: 3   Gas used: 2412742 (20.11%)
  UniswapV2Factory deployed at: 0xE7eD6747FaC5360f88a2EFC03E00d25789F69291

Transaction sent: 0x618f67d59008693453c4ad2e60ab01c55411562547bb7e80ce2e963d92b3e991
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 3
  UniswapV2Router02.constructor confirmed   Block: 4   Gas used: 3895418 (32.46%)
  UniswapV2Router02 deployed at: 0x6951b5Bd815043E3F842c1b026b0Fa888Cc2DD85

Transaction sent: 0x6d088344b3c799cce99916dea54278c9eed9b658cc396993796b51b40ec623b0
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 4
  StratosphereMock.constructor confirmed   Block: 5   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0xe0aA552A10d7EC8760Fc6c246D391E698a82dDf9

Transaction sent: 0x553ae0c297aee44d5359b7575d01a9d1f0ae3d8bf3fcf91a2437ad0a5e85affe
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 5
  SablierV2Comptroller.constructor confirmed   Block: 6   Gas used: 329684 (2.75%)
  SablierV2Comptroller deployed at: 0x6b4BDe1086912A6Cb24ce3dB43b3466e6c72AFd3

Transaction sent: 0x72846785c63d7c1dc4d9fe88dac6ebc5a5b83d40737ce899ee79b62605898cad
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 6
  SablierV2NFTDescriptor.constructor confirmed   Block: 7   Gas used: 4378624 (36.49%)
  SablierV2NFTDescriptor deployed at: 0x9E4c14403d7d9A8A782044E86a93CAE09D7B2ac9

Transaction sent: 0xa9a27b4cf540faleebd6cc507fa98473d011321a42a2c4fa0400c9cf4ad72a3b
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 7
  SablierV2LockupLinear.constructor confirmed   Block: 8   Gas used: 4151780 (34.60%)
  SablierV2LockupLinear deployed at: 0xcCB53c9429d32594F404d01fbe9E65ED1DCda8D9

Transaction sent: 0x8d8314aebed585375c63f29da0b07b9536612eeda2e1221e92c2c5b7317bcc83
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 0
  MemeFactory.constructor confirmed (MemeFactory__WrongConstructorArguments: )   Block: 9   Gas used: 315006 (2.63%)

Transaction sent: 0x4447107780fc9ed2a2872f1cd38f1ce3e3ae17f06cbc38a19b47db9d812814bc
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 8
  MemeFactory.constructor confirmed (MemeFactory__WrongConstructorArguments: )   Block: 10   Gas used: 334232 (2.79%)

Transaction sent: 0x72e31e1308e8496eb321d139b121737cd3bafe69b2f31ef631d28955a67477cd
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 9
  MemeFactory.constructor confirmed   Block: 11   Gas used: 3629794 (30.25%)
  MemeFactory deployed at: 0xa3B53dDCd2E3fC28e8E130288F2aBD8d5EE37472

tests/test_meme_factory.py::test_constructor PASSED
```

```
tests/test_meme_factory.py::test_set_launch_fee RUNNING
Transaction sent: 0x4338e44fd367dd8928ee58b418793e945a64756a9e276219e243136d9846ed7e
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 10
  WETH9.constructor confirmed   Block: 12   Gas used: 476546 (3.97%)
  WETH9 deployed at: 0xb6286fAFd0451320ad6A8143089b216C2152c025

Transaction sent: 0xb8f84516c3306e348c1906d4fbfeade37a4ab04d5edfdee0e9989bcb7bd2946d
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 11
  ERC20Mock.constructor confirmed   Block: 13   Gas used: 619873 (5.17%)
  ERC20Mock deployed at: 0x7a3d735ee6873f17Dbdcab1d51B604928dc10d92

Transaction sent: 0xb5b1ed6ae45843e310eb4e135c87a17f3568c1518526b53f247dcad02678e685
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 12
  UniswapV2Factory.constructor confirmed   Block: 14   Gas used: 2412742 (20.11%)
  UniswapV2Factory deployed at: 0x2c15A315610Bfa5248E4CbCbd693320e9D8E03Cc

Transaction sent: 0xad131e2e3cf26de0cc4ea387e427b70fae8aabe8f3bc50f43851cd31627cb64a
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 13
  UniswapV2Router02.constructor confirmed   Block: 15   Gas used: 3895430 (32.46%)
  UniswapV2Router02 deployed at: 0xe692Cf21B12e0B2717C4bF647F9768Fa58861c8b

Transaction sent: 0x16f3161c9a5d3a0be282c344806c5bb231a3e8907d3720a4e720b983fcae6cb0
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 14
  StratosphereMock.constructor confirmed   Block: 16   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0xe65A7a341978d59d40d30FC23F5014FACB4f575A

Transaction sent: 0xe807bb26811b658b9aa3333b5f472951e7ab821774799f5138c561e6ad1f8121
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 15
  SablierV2Comptroller.constructor confirmed   Block: 17   Gas used: 329684 (2.75%)
  SablierV2Comptroller deployed at: 0x30375B532345B01cB8c2AD12541b09E9Aa53A93d

Transaction sent: 0xe874dd48c7de3e071e0cc6fa4ed9b69a4f41b63660bd54a5e295cccdc7a6fb78
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 16
  SablierV2NFTDescriptor.constructor confirmed   Block: 18   Gas used: 4378624 (36.49%)
  SablierV2NFTDescriptor deployed at: 0x26f15335BB1C6a4C0B660eDd694a0555A9F1cce3

Transaction sent: 0x0eddbebaa2f9d2dd88b8aefc1599041209053d7660753b0ff6b9a903357ac8cc
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 17
  SablierV2LockupLinear.constructor confirmed   Block: 19   Gas used: 4151780 (34.60%)
  SablierV2LockupLinear deployed at: 0xFbD588c72B438faD4Cf7cD879c8F730Faa213Da0

Transaction sent: 0xba7c4627a0b28d6dce4e1d7089a40530c97b157d813b25da17525299f780826b
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 18
  MemeFactory.constructor confirmed   Block: 20   Gas used: 3629794 (30.25%)
  MemeFactory deployed at: 0xed00238F9A0F7b4d93842033cdF56cCB32C781c2

Transaction sent: 0x4d1ca3019d5e2307fb39669feee978c56b969c244e4b0505bdc6ae6170af2433
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 0
  MemeFactory.setLaunchFee confirmed (Ownable: caller is not the owner)   Block: 21   Gas used: 22481 (0.19%)

Transaction sent: 0x8b6f563d3cb3f11c68048472aa2dc23ca030222fc3fab71535d90c50711823e3
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 19
  MemeFactory.setLaunchFee confirmed (reverted)   Block: 22   Gas used: 22408 (0.19%)

Transaction sent: 0xaf35cbc0ba2b4e9134eacac119d1658f77022a09392feb7cbf3c2036232c6685
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 20
  MemeFactory.setLaunchFee confirmed   Block: 23   Gas used: 28483 (0.24%)

tests/test_meme_factory.py::test_set_launch_fee PASSED
```

```
tests/test_meme_factory.py::test_set_vapor_dex_adapter RUNNING
Transaction sent: 0xe880285664801f17ee070ad8b9fad34b920746d44110768d8212c4fe49d6a3dd
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 21
  WETH9.constructor confirmed   Block: 24   Gas used: 476546 (3.97%)
  WETH9 deployed at: 0xBcb61491F1859f53438918F1A5aFCA542Af9D397

Transaction sent: 0xdf0884260c869eac39d412518772a39ba66283840d79e3dc17c008ecbda66dbe
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 22
  ERC20Mock.constructor confirmed   Block: 25   Gas used: 619873 (5.17%)
  ERC20Mock deployed at: 0xD22363efee93190f82b52FCD62B7Dbcb920eF658

Transaction sent: 0x1d7d08386c1277eea87389355ddc8c48b78a4c8b45f109409c8fc0b00748694c
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 23
  UniswapV2Factory.constructor confirmed   Block: 26   Gas used: 2412742 (20.11%)
  UniswapV2Factory deployed at: 0x4D1B781ce59B8C184F63B99D39d6719A522f46B5

Transaction sent: 0x7dd6680f0c87b79f40ee876b9aeefaa848ed47b96575309830df559d86955506
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 24
  UniswapV2Router02.constructor confirmed   Block: 27   Gas used: 3895430 (32.46%)
  UniswapV2Router02 deployed at: 0xf9C8Cf55f2E520B08d869df7bc76aa3d3ddDF913

Transaction sent: 0x833d5a88e00fa72bacfdcbce11ff94031a78458d00dbae5cbdcf232d26f7cbec
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 25
  StratosphereMock.constructor confirmed   Block: 28   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0x654f70d8442EA18904FA1AD79114f7250F7E9336

Transaction sent: 0x1d6965877c53a84df7080e8c0c74bb1cc109861a3826f0de7b834a2f86f290b5
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 26
  SablierV2Comptroller.constructor confirmed   Block: 29   Gas used: 329684 (2.75%)
  SablierV2Comptroller deployed at: 0xADeD61D42dE86f9058386D1D0d739d20C7eAfC43

Transaction sent: 0xe9f65b3ec34d4bc6cc015a4c15d057c0f5074b74eaf2bea05f34c8f69891331f
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 27
  SablierV2NFTDescriptor.constructor confirmed   Block: 30   Gas used: 4378624 (36.49%)
  SablierV2NFTDescriptor deployed at: 0x832698Daec363C9A7aB036C224Af5B21280b3AC6

Transaction sent: 0xa3d10c9b0eb22cf94c9abe6a65492cac565ea87c4fc1379f7c1f9f3d76a786c0
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 28
  SablierV2LockupLinear.constructor confirmed   Block: 31   Gas used: 4151780 (34.60%)
  SablierV2LockupLinear deployed at: 0xA95916C3D979400C7443961330b3092510a229Ba

Transaction sent: 0x7569b0d90022731b0066b66ac122b18f102689b3351119336cacbf78356a7123
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 29
  MemeFactory.constructor confirmed   Block: 32   Gas used: 3629794 (30.25%)
  MemeFactory deployed at: 0x42E8D004c84E6B5Bad559D3b5CE7947AADb9E0bc

Transaction sent: 0x4df16a8ff79f516757957911f4e59306be2d13dc551b0f82ae46ba7a8a01b957
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 1
  MemeFactory.setVaporDEXAdapter confirmed (Ownable: caller is not the owner)   Block: 33   Gas used: 22717 (0.19%)

Transaction sent: 0x9ca9fe63bf0edd40a9db8e20d22efac569c67ac6a1e9c2047da54e8e924e9b72
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 30
  MemeFactory.setVaporDEXAdapter confirmed (reverted)   Block: 34   Gas used: 23510 (0.20%)

Transaction sent: 0x92379e19f510597d1792aa0210d58772e85e13b730da3de04bc30217979db097
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 31
  MemeFactory.setVaporDEXAdapter confirmed   Block: 35   Gas used: 30392 (0.25%)

tests/test_meme_factory.py::test_set_vapor_dex_adapter PASSED
```

```
tests/test_meme_factory.py::test_withdraw_fee RUNNING
Transaction sent: 0xe1a0783d3e73f4938d26f5c2cd407c97929ca1ee8de60aec86189222eb3d53bd
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 32
  WETH9.constructor confirmed   Block: 36   Gas used: 476546 (3.97%)
  WETH9 deployed at: 0x724Ca58E1e6e64BFB1E15d7Eec0fe1E5f581c7bD

Transaction sent: 0x53a21e387076dddacf46f9a7d16096e3837e415732306e3e18a61e69dac5f2f2
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 33
  ERC20Mock.constructor confirmed   Block: 37   Gas used: 619873 (5.17%)
  ERC20Mock deployed at: 0x34b97ffa01dc0DC959c5f1176273D0de3be914C1

Transaction sent: 0x7eed0c94a53742d4623e48546b3383ad7062d85e9eb1efe895ca4d44c2450fae
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 34
  UniswapV2Factory.constructor confirmed   Block: 38   Gas used: 2412742 (20.11%)
  UniswapV2Factory deployed at: 0xc830Ad2FDfCC2f368fE5DeC93b1Dc72ecABb3691

Transaction sent: 0xf125684c00cf920be58d840c3dbd517721d1e94cf074fda5beca7c96fe656795
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 35
  UniswapV2Router02.constructor confirmed   Block: 39   Gas used: 3895430 (32.46%)
  UniswapV2Router02 deployed at: 0xbc8eCccb89650c3E796e803CB009BF9b898CB359

Transaction sent: 0x8e5fd29e5fc8d9ccf1b7e44c9e71c56f10b0aedfb5c18b01ae2307340000a803
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 36
  StratosphereMock.constructor confirmed   Block: 40   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0x741e3E1f81041c62C2A97d0b6E567AcaB09A6232

Transaction sent: 0xf78b9d1463a3a70e1f2c96f4c795bc7e66555103ebbcd411e160c82152aaa365
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 37
  SablierV2Comptroller.constructor confirmed   Block: 41   Gas used: 329684 (2.75%)
  SablierV2Comptroller deployed at: 0x4B0FccF53589c1F185B35db88bB315a0bBF9a3e0

Transaction sent: 0x2fbc674e09ebd4a04cac67778045355171e5fdb7bdc4a39265ff210af574a4cc
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 38
  SablierV2NFTDescriptor.constructor confirmed   Block: 42   Gas used: 4378624 (36.49%)
  SablierV2NFTDescriptor deployed at: 0xFE0F4Cf81B5c0a6Fd65a610FD9488F33aE9095cB

Transaction sent: 0x1d142e6b4d6a0902cf78ff09cf1176dbc720cf00cd5e302f15458b2a25388af9
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 39
  SablierV2LockupLinear.constructor confirmed   Block: 43   Gas used: 4151780 (34.60%)
  SablierV2LockupLinear deployed at: 0x4e3E7dC9D84dA7BE8f017f4C36153A61341736d4

Transaction sent: 0x310cd27843105bded9557039cca19eaa51124395ba5541bca2a1b5af9e258cbe
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 40
  MemeFactory.constructor confirmed   Block: 44   Gas used: 3629794 (30.25%)
  MemeFactory deployed at: 0x0AC45e945A008D3fc19da8f591be8601C1F63130

Transaction sent: 0x34a204e4e6fdf770552c528ea2196cb0a7e563199a03c5484bf3c7bd0c07527f
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 2
  MemeFactory.withdrawFee confirmed (Ownable: caller is not the owner)   Block: 45   Gas used: 22739 (0.19%)

Transaction sent: 0xd5c9c62d5efc2ab4676355165309c4ac0e4b9df0dd6d2ccbbe20d20a7cc02522
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 41
  MemeFactory.withdrawFee confirmed (reverted)   Block: 46   Gas used: 22474 (0.19%)

Transaction sent: 0x0b71b0f47d184f88606c0ded47f10b0f2968a34c4a866fc6c0adcacf837ebba3
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 42
  MemeFactory.withdrawFee confirmed   Block: 47   Gas used: 35506 (0.30%)

Transaction sent: 0x5f34f3f9b7f13617fc0b6159bb57ea716657d983b8c6cd33e87a73e4f4ebe27a
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 43
  ERC20Mock.mint confirmed   Block: 48   Gas used: 65625 (0.55%)

Transaction sent: 0xb8debba81c6ccd77be0210ec543050adcb376831e0f62edcd7aa4f951d7821f9
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 44
  MemeFactory.withdrawFee confirmed   Block: 49   Gas used: 43906 (0.37%)

tests/test_meme_factory.py::test_withdraw_fee PASSED
```

```
tests/test_meme_factory.py::test_launch_token RUNNING
Transaction sent: 0x57055fd1a78dbf90b610e38f372a4ef0319d301f39dc757be7d6787fa7c4a3bb
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 45
  WETH9.constructor confirmed   Block: 50   Gas used: 476546 (3.97%)
  WETH9 deployed at: 0xa1910C6e0Fbd0E38cfBabAeC5D1C1D539F81CC63

Transaction sent: 0xd1f62132c6d36f62cd9b41b6b361df092825c4b8d96dc3a395ee064d71d0cc19
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 46
  ERC20Mock.constructor confirmed   Block: 51   Gas used: 619873 (5.17%)
  ERC20Mock deployed at: 0x8BE16B874F47371C42498b499837Ed87D7661E86

Transaction sent: 0xc8d80406acbb45ac6ce440a75b56ade5970c9f54dc947435ec60f66454ce5b42
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 47
  UniswapV2Factory.constructor confirmed   Block: 52   Gas used: 2412742 (20.11%)
  UniswapV2Factory deployed at: 0x1aa96efd2B002541E830CB7f60e473AA24e31F9A

Transaction sent: 0x03fa376c09e6e2e96eee0ad7b0ddf614881e2e5347858e612b660ad9305f02c2
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 48
  UniswapV2Router02.constructor confirmed   Block: 53   Gas used: 3895418 (32.46%)
  UniswapV2Router02 deployed at: 0x8b1B440724DCe2EE9779B58af841Ec59F545838B

Transaction sent: 0x007266639208c248b0a7d80ef4ba0a8d95f1a3a9566d16054c8becd781db99b8
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 49
  StratosphereMock.constructor confirmed   Block: 54   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0xC6D563d5c2243b27e7294511063f563ED701EA2C

Transaction sent: 0x5ebe0e2797d416228c61a45f072e814181ed26c55da5034e29eab4d405b29eb6
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 50
  SablierV2Comptroller.constructor confirmed   Block: 55   Gas used: 329684 (2.75%)
  SablierV2Comptroller deployed at: 0xD537bF4b795b7D07Bd5F4bAf7017e3ce8360B1DE

Transaction sent: 0x668c9de6640f2dd99b29e8be2bb751257378d5dbe5865d954a4593436982e7c7
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 51
  SablierV2NFTDescriptor.constructor confirmed   Block: 56   Gas used: 4378624 (36.49%)
  SablierV2NFTDescriptor deployed at: 0x70bC6D873D110Da59a9c49E7485a27B0F605E5db

Transaction sent: 0xc547622435eda51cb0c6ecd1c48ed073e16d82e9423b02c0efe2fce55309c43e
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 52
  SablierV2LockupLinear.constructor confirmed   Block: 57   Gas used: 4151780 (34.60%)
  SablierV2LockupLinear deployed at: 0xFb7C5F938835aE34aF48c278C6763E134907Acdb

Transaction sent: 0xf0e73516dfd893f775351abc07fe7ae433603f94242a888ee04d2fb271ab6740
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 53
  MemeFactory.constructor confirmed   Block: 58   Gas used: 3629794 (30.25%)
  MemeFactory deployed at: 0xb291024F4b2E4C3767A96aB44566a8e93cC828C5

Transaction sent: 0x3f28296f71e3da6ceaab4f9c50873cd757ee58112292347e2d43cca8850bbe91
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 3
  MemeFactory.launch confirmed (reverted)   Block: 59   Gas used: 26778 (0.22%)

Transaction sent: 0xe334b2733c81e0aa49113a1aab027aaaf7abd9cc07dc96371acbbff838f0bfcb
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 54
  ERC20Mock.mint confirmed   Block: 60   Gas used: 65613 (0.55%)

Transaction sent: 0x0da310eb8987b0152d631ab6d3f30a69cb1b578009ae0b4522e454cacf6861ca
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 4
  MemeFactory.launch confirmed (ERC20: insufficient allowance)   Block: 61   Gas used: 30134 (0.25%)

Transaction sent: 0xae3809cc6a69d261eb2d336941038e866213bb816ef92cddedc2baa602cbe0d0
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 5
  ERC20Mock.approve confirmed   Block: 62   Gas used: 44136 (0.37%)

Transaction sent: 0xfde4308208375b37e895fdf81f72046ee59fd153026f58ca889890cac22a4969
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 6
  MemeFactory.launch confirmed   Block: 63   Gas used: 3652517 (30.44%)

Transaction sent: 0x4acb32b3c185c8eb5d561ce6844584772b3061adde0ef7851b7a6db91d331ff6
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 7
  MemeFactory.launch confirmed   Block: 64   Gas used: 3822174 (31.85%)

tests/test_meme_factory.py::test_launch_token PASSED
```

```
tests/test_meme_factory.py::test_unlock_tokens RUNNING
Transaction sent: 0x958663ac588e3cbf7c8e1d65b7389c6437ba22407a617f59362ab9d20cc1123a
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 55
  WETH9.constructor confirmed   Block: 65   Gas used: 476546 (3.97%)
  WETH9 deployed at: 0xEFDE7eC452f9A203559896F64267809E248D044f

Transaction sent: 0xbab0c3d727a8d707e62f3e26923b6b200911fab492bec6a221bec17471a4a93e
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 56
  ERC20Mock.constructor confirmed   Block: 66   Gas used: 619873 (5.17%)
  ERC20Mock deployed at: 0x93F6bA0E6DcB1Ec0F1aBD80Be31e025d6e64Ad97

Transaction sent: 0x8e176210af024441343c3729cb4d01f087f3a0af365ce49808e239df9076cb8c
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 57
  UniswapV2Factory.constructor confirmed   Block: 67   Gas used: 2412742 (20.11%)
  UniswapV2Factory deployed at: 0x342216ff4b4D6899DDE6535D6E50b6Db71654bc4

Transaction sent: 0x9b03be4948018797d3968ed35850a69fa9c9198e731d6ed2ce586033dc6a9919
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 58
  UniswapV2Router02.constructor confirmed   Block: 68   Gas used: 3895430 (32.46%)
  UniswapV2Router02 deployed at: 0xa5659Fa683b71C907cd346397c694b93aFF40b51

Transaction sent: 0xecc3a6942ed3f48610a769dbf387de46416725a1a921cb47e16ce4270f36fde5
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 59
  StratosphereMock.constructor confirmed   Block: 69   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0x286677F2b204be093ABBee3e35074352b339243B

Transaction sent: 0xd2fdb80df3f3df47c7588b23c91bec1a7a3e22c0b4580bd0e8340efd52e2ec78
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 60
  SablierV2Comptroller.constructor confirmed   Block: 70   Gas used: 329684 (2.75%)
  SablierV2Comptroller deployed at: 0xA83Fad7514B39b12C0bAcA71e0A7cc63D2Ff1941

Transaction sent: 0x8eb05001c680233b603bb20081a4a884aec3de1cc2b13294880dcdb42ff8086f
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 61
  SablierV2NFTDescriptor.constructor confirmed   Block: 71   Gas used: 4378624 (36.49%)
  SablierV2NFTDescriptor deployed at: 0x64B334435888bb5E44D890a7B319981c4Bb4B47d

Transaction sent: 0x97a09890191259bc08189b80714c1002c92fe0c7543a9c056162341d4ab001c2
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 62
  SablierV2LockupLinear.constructor confirmed   Block: 72   Gas used: 4151780 (34.60%)
  SablierV2LockupLinear deployed at: 0xFB87C36009603855163ABe3BbF512D3F58fd3819

Transaction sent: 0x685b5b5898e24f5948de5c7e4d2688bb6faedc45346904fb77f45f4e58108ab8
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 63
  MemeFactory.constructor confirmed   Block: 73   Gas used: 3629794 (30.25%)
  MemeFactory deployed at: 0x0764A8da0FCAa127b31E13b79E9a273Fb5B2bF26

Transaction sent: 0x81212cf5ec36371dcb0f902541807fd55704cc3f9c8f248522580e91c576d5e8
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 64
  ERC20Mock.mint confirmed   Block: 74   Gas used: 65613 (0.55%)

Transaction sent: 0x499d4a08ca794f24525cb7613560990ab25c790c79504594416682312d08da58
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 8
  ERC20Mock.approve confirmed   Block: 75   Gas used: 44136 (0.37%)

Transaction sent: 0x7a15f9c05397c1e4d12ed209c981067d48df862e03d9691f8636e0906558753c
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 9
  MemeFactory.launch confirmed   Block: 76   Gas used: 3852174 (32.10%)

Transaction sent: 0xd08ac4d5a28b5517193aaadf316bdf9c4e5d5b7eaeaf4f3f0a028711ec592ba7
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 0
  MemeFactory.unlockLiquidityTokens confirmed (reverted)   Block: 77   Gas used: 23291 (0.19%)

Transaction sent: 0x3caa1e9a1a06f693e2f1251953008c1beef7c0aaac210f6e1f41e0746b8182e3
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 10
  MemeFactory.unlockLiquidityTokens confirmed (reverted)   Block: 78   Gas used: 23086 (0.19%)

Transaction sent: 0x2367caeaa1a6d5804b32746c5f3df10abd9772c4ccace1af00fa4972bc743174
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 11
  MemeFactory.unlockLiquidityTokens confirmed (reverted)   Block: 79   Gas used: 31379 (0.26%)

Transaction sent: 0x2b1f34cd04ffdcce1397d38477e38035c9c1ebb9072ae2f8643aa525f70fd54d
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 65
  ERC20Mock.mint confirmed   Block: 80   Gas used: 35613 (0.30%)

Transaction sent: 0x2ccd2d1b191cc1b5e8860a9534c9e5630e547429b4c0a3d5d5adfe0bd4509c0d
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 12
  MemeFactory.unlockLiquidityTokens confirmed   Block: 81   Gas used: 92924 (0.77%)

tests/test_meme_factory.py::test_unlock_tokens PASSED
```

```
tests/test_meme_factory.py::test_transfer_lock RUNNING
Transaction sent: 0x1863738482d445b49575bf117534e7a4219bca5a3d598f6cced95d265b6c07e5
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 66
  WETH9.constructor confirmed   Block: 82   Gas used: 476546 (3.97%)
  WETH9 deployed at: 0x7e4ED6273177126c48503850a526B45bed16E747

Transaction sent: 0x975735ee26547f9c110fcf5d88d6438cc3bc202c0d7a4523027f0779b7ab1a46
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 67
  ERC20Mock.constructor confirmed   Block: 83   Gas used: 619873 (5.17%)
  ERC20Mock deployed at: 0xA2ea57c9C7ED08D48F5d92Dd774b6Fe55465d86f

Transaction sent: 0x2375fc6ca6794af3a97146dcef83444ee1e149a3ba6a2b082abb79b26caef616
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 68
  UniswapV2Factory.constructor confirmed   Block: 84   Gas used: 2412742 (20.11%)
  UniswapV2Factory deployed at: 0x6a21483D01cFb6FAf0D5346C1e7813374250713B

Transaction sent: 0x74df9419d5df7a9f8ac6d00a1a4d98e7f0deebe2ec43d28a32c7eae34a07817f
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 69
  UniswapV2Router02.constructor confirmed   Block: 85   Gas used: 3895430 (32.46%)
  UniswapV2Router02 deployed at: 0x7BCbd5DCBE1d42458D8C5b2397C68d1819BE8066

Transaction sent: 0xd251e977a61941e6c0899e80d7f17a9a202af5012c82aaf4350d73998323a9ba
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 70
  StratosphereMock.constructor confirmed   Block: 86   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0xaE4059E2E23958f627eF75d2467343F4d8838709

Transaction sent: 0x73398e4c1acfca321c23ec68ecac564121569a1c8c00c55f19d39bafc87a9c9f
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 71
  SablierV2Comptroller.constructor confirmed   Block: 87   Gas used: 329684 (2.75%)
  SablierV2Comptroller deployed at: 0x47a27C9881B5C5eC78c38FBBEE7DD0A5eb68633C

Transaction sent: 0xb8d88a8b58e038cf90645c69dcc8c81982aa1d0940ab53a6670a602e458fc1c3
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 72
  SablierV2NFTDescriptor.constructor confirmed   Block: 88   Gas used: 4378624 (36.49%)
  SablierV2NFTDescriptor deployed at: 0x63Cf24e22bbFAA28316Cca9b179eEC7810b8037B

Transaction sent: 0x35402bb32ae6b46674ea9717eb3336be06e1d74bb42292e4319c6a4a67ee4904
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 73
  SablierV2LockupLinear.constructor confirmed   Block: 89   Gas used: 4151780 (34.60%)
  SablierV2LockupLinear deployed at: 0x8dB41305cA5f2852135dC2B969ba6084A32D4700

Transaction sent: 0x5caaa4e48e90ae5cc2344fb45ffcbfff2429e7d0692836b158c6d41020c1394d
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 74
  MemeFactory.constructor confirmed   Block: 90   Gas used: 3629782 (30.25%)
  MemeFactory deployed at: 0x795af5f6648254fFAA8fCd35ff03a4dCEe5054c9

Transaction sent: 0x6d50dae703ccefc2ff458b311b9d57109840c2b95c4a6eaf9c56009bd0bf315a
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 75
  ERC20Mock.mint confirmed   Block: 91   Gas used: 65613 (0.55%)

Transaction sent: 0xe9ae58d888409e51df96585fdaf090030022aa7fa1e0b3fc50d00b18626fccf5
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 13
  ERC20Mock.approve confirmed   Block: 92   Gas used: 44136 (0.37%)

Transaction sent: 0x94c3886a87657f640ca96d5eb908e0588b2de0c8b76510e9d84140eb4f349742
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 14
  MemeFactory.launch confirmed   Block: 93   Gas used: 3852174 (32.10%)

Transaction sent: 0x8c9d8df6df2d2566a35661d7f50d404736b05e72f2c835fe6e8ff0e9b6beda67
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 1
  MemeFactory.transferLock confirmed (reverted)   Block: 94   Gas used: 23345 (0.19%)

Transaction sent: 0x8cb290e9c178718926205d9fef7f0de43487523f549009ef6ee715aa9366c466
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 15
  MemeFactory.transferLock confirmed (reverted)   Block: 95   Gas used: 23131 (0.19%)

Transaction sent: 0x30eea9d0f182f29c8f6fdabb57828f43666f76f82d350f8f5ddf06f880b9aa95
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 16
  MemeFactory.transferLock confirmed (ERC721: caller is not token owner or approved)   Block: 96   Gas used: 32994 (0.27%)

Transaction sent: 0xdc3add6636b1029d0753aade13672fc6e10caae4f4441b6c239cb6d605bb020a
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 17
  SablierV2LockupLinear.approve confirmed   Block: 97   Gas used: 47021 (0.39%)

Transaction sent: 0x5a3c0af4d4ca4dd585ca36014289b23e759197dc13c5b137811f888064f9e787
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 76
  ERC20Mock.mint confirmed   Block: 98   Gas used: 35613 (0.30%)

Transaction sent: 0x3865c21acecc796396b4c3ad2d51aed45f85b0ba47a92c804dce626da78a860b
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 18
  MemeFactory.transferLock confirmed   Block: 99   Gas used: 60480 (0.50%)
```

Token Testing:

```
tests/test_token.py::test_set_liquidity_pool RUNNING
Transaction sent: 0x6eb8fde43c92863adb5a5c9bf94e29fcb567fdbaeafa72c8734fe68c270948f6
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 0
  StratosphereMock.constructor confirmed   Block: 1   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0x3194cBDC3dbcd3E11a07892e7bA5c3394048Cc87

Transaction sent: 0xe64acfab5d41f4db8080999f4960387f18b146c0948992c1ebe1f6f08b295660
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 1
  Token.constructor confirmed   Block: 2   Gas used: 1508353 (12.57%)
  Token deployed at: 0x602C71e4DAC47a042Ee7f46E0aee17F94A3bA0B6

Transaction sent: 0xed98845978acac266b82fdf8c14868e0c117c224ffc248d561bab4b841ca2204
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 0
  Token.setLiquidityPool confirmed (Ownable: caller is not the owner)   Block: 3   Gas used: 22723 (0.19%)

Transaction sent: 0x64506759454e2478c9428c629769b05f4d4e8ec15693d5de487ea95affb8547c
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 2
  Token.setLiquidityPool confirmed (reverted)   Block: 4   Gas used: 22458 (0.19%)

Transaction sent: 0x9277744326b918a8886a4a6f78c462de6fdce2045fe923e0a27b306575cc2239
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 3
  Token.setLiquidityPool confirmed   Block: 5   Gas used: 43526 (0.36%)

tests/test_token.py::test_set_liquidity_pool PASSED
tests/test_token.py::test_transfer RUNNING
Transaction sent: 0x6d088344b3c799cce99916dea54278c9eed9b658cc396993796b51b40ec623b0
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 4
  StratosphereMock.constructor confirmed   Block: 6   Gas used: 836052 (6.97%)
  StratosphereMock deployed at: 0xe0aA552A10d7EC8760Fc6c246D391E698a82dDf9

Transaction sent: 0x90d5f06f308ea4b1384500e4b5c2233b484e4b34478c5b4a074c0eb040686d14
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 5
  Token.constructor confirmed   Block: 7   Gas used: 1508353 (12.57%)
  Token deployed at: 0x6b4BDe1086912A6Cb24ce3dB43b3466e6c72AFd3

Transaction sent: 0x190dffccc8ad395691252db3b89e33bd176157fae741627997e03f198c4ad8a4
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 6
  Token.transfer confirmed   Block: 8   Gas used: 52719 (0.44%)

Transaction sent: 0x53c9446af82938dea0127834f40b879fa0f3baaf075ba021bba2b2120b1fd1d3
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 1
  Token.transfer confirmed (Patience – Trading Not Started Yet!)   Block: 9   Gas used: 24843 (0.21%)

Transaction sent: 0x49367c8cd1070c103f359160f73f0f9c45663d2f808200cb7b82df859231f003
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 7
  Token.setLiquidityPool confirmed   Block: 10   Gas used: 43526 (0.36%)

Transaction sent: 0x7faf2e525acce762931635b69e5705e5a41f36d176ea0a8b580c0f015764a985
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 2
  Token.transfer confirmed (reverted)   Block: 11   Gas used: 23062 (0.19%)

Transaction sent: 0xb1690c38b8a2abe4a83a85d8b5e373470f27412dd7d5406f57c100735232dbd7
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 3
  Token.transfer confirmed (reverted)   Block: 12   Gas used: 30895 (0.26%)

Transaction sent: 0xacbadac1b509d99147b4199ba99198015f35425e7c6f85f4d7d0f1cdf8c23149
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 8
  Token.transfer confirmed (reverted)   Block: 13   Gas used: 25067 (0.21%)

Transaction sent: 0x89a0f5164327a95a1b078686b0f9e7ca9291966cca52e268994710d8cc5d166c
  Gas price: 0.0 gwei   Gas limit: 12000000   Nonce: 4
  Token.transfer confirmed   Block: 14   Gas used: 51975 (0.43%)

tests/test_token.py::test_transfer PASSED
```

5.0 Annexes

Testing code:

```
Meme Factory Testing:
from brownie import (
    reverts,
)

from scripts.helpful_scripts import (
    ZERO_ADDRESS,
    DAY_TIMESTAMP,
    get_account,
    get_timestamp,
    evm_increase_time,
)

from scripts.deploy import (
    deploy_stratos_mock,
    deploy_token,
    deploy_erc,
    deploy_factory,
    deploy_weth,
    deploy_router,
    deploy_meme_factory,
    deploy_lockup_linear
)

def test_constructor(only_local):
    # Arrange
    owner = get_account(0)
    fee_addr = get_account(8)
    dex_aggregator = get_account(2)
    dex_adapter = get_account(3)

    weth = deploy_weth(owner)
    usdc = deploy_erc(owner, "USDC", "USDC")
    factory = deploy_factory(owner, fee_addr)
    router = deploy_router(owner, factory.address, weth.address)
    stratos = deploy_stratos_mock(owner)
```

```python
    sablier = deploy_lockup_linear(owner)

    with reverts("MemeFactory__WrongConstructorArguments: "):
        deploy_meme_factory(
            ZERO_ADDRESS, router.address, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
sablier.address)

    with reverts("MemeFactory__WrongConstructorArguments: "):
        deploy_meme_factory(
            owner, ZERO_ADDRESS, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
sablier.address)

    meme = deploy_meme_factory(
            owner, router.address, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
sablier.address)

def test_set_launch_fee(only_local):
    # Arrange
    owner = get_account(0)
    other = get_account(1)
    fee_addr = get_account(8)
    dex_aggregator = get_account(2)
    dex_adapter = get_account(3)

    weth = deploy_weth(owner)
    usdc = deploy_erc(owner, "USDC", "USDC")
    factory = deploy_factory(owner, fee_addr)
    router = deploy_router(owner, factory.address, weth.address)
    stratos = deploy_stratos_mock(owner)
    sablier = deploy_lockup_linear(owner)

    meme = deploy_meme_factory(
            owner, router.address, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
sablier.address)

    with reverts("Ownable: caller is not the owner"):
        meme.setLaunchFee(2e6, {"from": other})
    with reverts("MemeFactory__Invalid: "):
```

```python
        meme.setLaunchFee(0, {"from": owner})
    assert meme.launchFee() == 1e6
    meme.setLaunchFee(2e6, {"from": owner})
    assert meme.launchFee() == 2e6

def test_set_vapor_dex_adapter(only_local):
    # Arrange
    owner = get_account(0)
    other = get_account(1)
    fee_addr = get_account(8)
    dex_aggregator = get_account(2)
    dex_adapter = get_account(3)
    dex_adapter_new = get_account(4)

    weth = deploy_weth(owner)
    usdc = deploy_erc(owner, "USDC", "USDC")
    factory = deploy_factory(owner, fee_addr)
    router = deploy_router(owner, factory.address, weth.address)
    stratos = deploy_stratos_mock(owner)
    sablier = deploy_lockup_linear(owner)

    meme = deploy_meme_factory(
            owner, router.address, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
sablier.address)

    with reverts("Ownable: caller is not the owner"):
        meme.setVaporDEXAdapter(dex_adapter_new, {"from": other})
    with reverts("MemeFactory__Invalid: "):
        meme.setVaporDEXAdapter(dex_adapter, {"from": owner})
    assert meme.vaporDexAdapter() == dex_adapter
    meme.setVaporDEXAdapter(dex_adapter_new, {"from": owner})
    assert meme.vaporDexAdapter() == dex_adapter_new

def test_withdraw_fee(only_local):
    # Arrange
    owner = get_account(0)
    other = get_account(1)
    fee_addr = get_account(8)
    dex_aggregator = get_account(2)
    dex_adapter = get_account(3)
```

```python
    weth = deploy_weth(owner)
    usdc = deploy_erc(owner, "USDC", "USDC")
    factory = deploy_factory(owner, fee_addr)
    router = deploy_router(owner, factory.address, weth.address)
    stratos = deploy_stratos_mock(owner)
    sablier = deploy_lockup_linear(owner)

    meme = deploy_meme_factory(
            owner, router.address, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
 sablier.address)

    with reverts("Ownable: caller is not the owner"):
        meme.withdrawFee(fee_addr, {"from": other})
    with reverts("MemeFactory__ZeroAddress: "):
        meme.withdrawFee(ZERO_ADDRESS, {"from": owner})

    tx = meme.withdrawFee(fee_addr, {"from": owner})
    assert tx.events['Transfer'][0]['from'] == meme.address
    assert tx.events['Transfer'][0]['to'] == fee_addr
    assert tx.events['Transfer'][0]['value'] == 0

    usdc.mint(meme.address, 10e18)
    tx = meme.withdrawFee(fee_addr, {"from": owner})
    assert tx.events['Transfer'][0]['from'] == meme.address
    assert tx.events['Transfer'][0]['to'] == fee_addr
    assert tx.events['Transfer'][0]['value'] == 10e18

def test_launch_token(only_local):
    # Arrange
    owner = get_account(0)
    other = get_account(1)
    fee_addr = get_account(8)
    dex_aggregator = get_account(2)
    dex_adapter = get_account(3)
    trading_start_at = get_timestamp(days=2.5)

    weth = deploy_weth(owner)
    usdc = deploy_erc(owner, "USDC", "USDC")
    factory = deploy_factory(owner, fee_addr)
    router = deploy_router(owner, factory.address, weth.address)
    stratos = deploy_stratos_mock(owner)
```

```python
    sablier = deploy_lockup_linear(owner)

    meme = deploy_meme_factory(
            owner, router.address, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
sablier.address)

    with reverts("MemeFactory__InsufficientBalance: "):
        meme.launch("Meme", "MEME", 100e18, trading_start_at, True,
{"from": other})
    usdc.mint(other, 50e6)
    with reverts("ERC20: insufficient allowance"):
        meme.launch("Meme", "MEME", 100e18, trading_start_at, True,
{"from": other})
    usdc.approve(meme.address, 50e6, {"from": other})

    tx = meme.launch("Meme", "MEME", 1000000e18, trading_start_at, True,
{"from": other, "value": 1e17})
    assert tx.events['LiquidityBurned'][0]['_burner'] == other

    tx = meme.launch("Meme", "MEME", 1000000e18, trading_start_at, False,
{"from": other, "value": 1e17})
    assert tx.events['StreamCreated'][0]['_streamId'] == 1

def test_unlock_tokens(only_local):
    # Arrange
    owner = get_account(0)
    other = get_account(1)
    extra = get_account(4)
    fee_addr = get_account(8)
    dex_aggregator = get_account(2)
    dex_adapter = get_account(3)
    trading_start_at = get_timestamp(days=2.5)

    weth = deploy_weth(owner)
    usdc = deploy_erc(owner, "USDC", "USDC")
    factory = deploy_factory(owner, fee_addr)
    router = deploy_router(owner, factory.address, weth.address)
    stratos = deploy_stratos_mock(owner)
    sablier = deploy_lockup_linear(owner)

    meme = deploy_meme_factory(
```

```python
            owner, router.address, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
sablier.address)

    usdc.mint(other, 50e6)
    usdc.approve(meme.address, 50e6, {"from": other})
    tx = meme.launch("Meme", "MEME", 1000000e18, trading_start_at, False,
{"from": other, "value": 1e17})

    created_pair = tx.events['TokenLaunched'][0]['_pairAddress']
    with reverts("MemeFactory__Unauthorized: "):
        meme.unlockLiquidityTokens(created_pair, other, {"from": extra})
    with reverts("MemeFactory__ZeroAddress: "):
        meme.unlockLiquidityTokens(created_pair, ZERO_ADDRESS, {"from":
other})
    with reverts("MemeFactory__LiquidityLockedOrDepleted: "):
        meme.unlockLiquidityTokens(created_pair, extra, {"from": other})

    assert sablier.withdrawableAmountOf(1) == 0
    evm_increase_time(DAY_TIMESTAMP * 366)
    usdc.mint(other, 50e6)
    assert sablier.withdrawableAmountOf(1) > 0
    tx = meme.unlockLiquidityTokens(created_pair, other, {"from": other})
    assert tx.events['LiquidityTokensUnlocked'][0]['_pairAddress'] ==
created_pair
    assert tx.events['LiquidityTokensUnlocked'][0]['_receiver'] == other

def test_transfer_lock(only_local):
    # Arrange
    owner = get_account(0)
    other = get_account(1)
    extra = get_account(4)
    fee_addr = get_account(8)
    dex_aggregator = get_account(2)
    dex_adapter = get_account(3)
    trading_start_at = get_timestamp(days=2.5)

    weth = deploy_weth(owner)
    usdc = deploy_erc(owner, "USDC", "USDC")
    factory = deploy_factory(owner, fee_addr)
    router = deploy_router(owner, factory.address, weth.address)
    stratos = deploy_stratos_mock(owner)
```

```python
    sablier = deploy_lockup_linear(owner)

    meme = deploy_meme_factory(
            owner, router.address, stratos.address,
            dex_aggregator, dex_adapter, usdc.address, 1e6,
 sablier.address)

    usdc.mint(other, 50e6)
    usdc.approve(meme.address, 50e6, {"from": other})
    tx = meme.launch("Meme", "MEME", 1000000e18, trading_start_at, False,
{"from": other, "value": 1e17})

    created_pair = tx.events['TokenLaunched'][0]['_pairAddress']
    with reverts("MemeFactory__Unauthorized: "):
        meme.transferLock(created_pair, other, {"from": extra})
    with reverts("MemeFactory__Unauthorized: "):
        meme.transferLock(created_pair, ZERO_ADDRESS, {"from": other})
    with reverts("ERC721: caller is not token owner or approved"):
        meme.transferLock(created_pair, extra, {"from": other})
    sablier.approve(meme.address, 1, {"from": other})

    evm_increase_time(DAY_TIMESTAMP * 366)
    usdc.mint(other, 50e6)

    assert sablier.withdrawableAmountOf(1) > 0
    tx = meme.transferLock(created_pair, extra, {"from": other})
    assert tx.events['LiquidityTransferred'][0]['_to'] == extra
    meme.unlockLiquidityTokens(created_pair, extra, {"from": extra})
    assert sablier.withdrawableAmountOf(1) == 0
```

Token test:

```python
from brownie import (
    reverts,
)

from scripts.helpful_scripts import (
    ZERO_ADDRESS,
    DAY_TIMESTAMP,
```

```python
        get_account,
        get_timestamp,
        evm_increase_time,
)

from scripts.deploy import (
        deploy_stratos_mock,
        deploy_token,
)

def test_set_liquidity_pool(only_local):
        # Arrange
        owner = get_account(0)
        other = get_account(1)
        dex_aggregator = get_account(2)
        dex_adapter = get_account(3)
        random_addr = get_account(4)
        trading_start_at = get_timestamp(days=2)

        stratos = deploy_stratos_mock(owner)
        token = deploy_token(
                "Token", "TOKEN", 100e18,
                stratos.address, owner, trading_start_at,
                dex_aggregator, dex_adapter)

        # Assert
        with reverts("Ownable: caller is not the owner"):
                token.setLiquidityPool(random_addr, {"from": other})
        with reverts("Token__MissingLiquidityPool: "):
                token.setLiquidityPool(ZERO_ADDRESS, {"from": owner})

        assert token.liquidityPool() == ZERO_ADDRESS
        token.setLiquidityPool(random_addr, {"from": owner})
        assert token.liquidityPool() == random_addr

def test_transfer(only_local):
        # Arrange
        owner = get_account(0)
        other = get_account(1)
        extra = get_account(2)
        dex_aggregator = get_account(2)
        dex_adapter = get_account(3)
```

```python
random_addr = get_account(4)
trading_start_at = get_timestamp(days=2)

stratos = deploy_stratos_mock(owner)
token = deploy_token(
    "Token", "TOKEN", 100e18,
    stratos.address, owner, trading_start_at,
    dex_aggregator, dex_adapter)

tx = token.transfer(other, 1e18, {"from": owner})
assert tx.events['Transfer'][0]['from'] == owner
assert tx.events['Transfer'][0]['to'] == other
assert tx.events['Transfer'][0]['value'] == 1e18

with reverts("Patience - Trading Not Started Yet!"):
    token.transfer(random_addr, 1e17, {"from": other})
token.setLiquidityPool(random_addr, {"from": owner})

with reverts("Token__TradingNotStarted: "):
    token.transfer(extra, 1e17, {"from": other})

evm_increase_time(DAY_TIMESTAMP * 2.01)
with reverts("Token__NonStratosphereNFTHolder: "):
    token.transfer(extra, 1e17, {"from": other})

with reverts("Token__ExceedsMaximumHolding: "):
    token.transfer(extra, 15e18, {"from": owner})

evm_increase_time(DAY_TIMESTAMP * 1)
token.transfer(extra, 1e17, {"from": other})
```

6.0 Summary of the audit

High and medium vulnerabilities were found during the audit process, after a review by the development team contract is safe to be deployed.

Vulnerability Level	Total	Pending	Not Apply	Acknowledged	Resolved
High	1			1	
Medium	1		1		
Low	1				1
Informational	0				