

Assure DeFi[®]

THE VERIFICATION **GOLD STANDARD**



Security Assessment

TaiNET

Date: 04/10/2024

Audit Status: PASS

Audit Edition: Advanced



Risk Analysis

Vulnerability summary

Classification	Description
 High	High-level vulnerabilities can result in the loss of assets or manipulation of data.
 Medium	Medium-level vulnerabilities can be challenging to exploit, but they still have a considerable impact on smart contract execution, such as allowing public access to critical functions.
 Low	Low-level vulnerabilities are primarily associated with outdated or unused code snippets that generally do not significantly impact execution, sometimes they can be ignored.
 Informational	Informational vulnerabilities, code style violations, and informational statements do not affect smart contract execution and can typically be disregarded.

Executive Summary

According to the Assure assessment, the Customer's smart contract is **Well Secured**.



Scope

Target Code And Revision

For this audit, we performed research, investigation, and review of the TaiNET contracts followed by issue reporting, along with mitigation and remediation instructions outlined in this report.

Target Code And Revision

Project	Assure
Language	Solidity
Codebase	<p>taiNET_contracts-main.zip [SHA256] 275ee886a19d74e8fe5998eb26a910395c35a4e3c57f5805c57c7f0105aac627</p> <p>taiFrontEnd-main.zip [SHA256] a67bc844f5567187c1b1a9cf4972fb2c90e04b30eac583c38a047f15cde8ab56</p> <p>Fixed version: taiNET_contracts-032401cab150a421212c5c7c4d2d3342c6d13c95.zip [SHA256] c0b4c3efb7b0556decefee634998e9e9210a7ca7d3c690c5572ec9b136d0d6b6</p> <p>Deployed address: https://etherscan.io/address/0x595fb90b23660556c62400e893747d9662c16a35</p>
Audit Methodology	Static, Manual

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.

Category	Item
Code review & Functional Review	<ul style="list-style-type: none">• Compiler warnings.• Race conditions and Reentrancy. Cross-function race conditions.• Possible delays in data delivery.• Oracle calls.• Front running.• Timestamp dependence.• Integer Overflow and Underflow.• DoS with Revert.• DoS with block gas limit.• Methods execution permissions.• Economy model.• Private user data leaks.• Malicious Event log.• Scoping and Declarations.• Uninitialized storage pointers.• Arithmetic accuracy.• Design Logic.• Cross-function race conditions.• Safe Zeppelin module.• Fallback function security.• Overpowered functions / Owner privileges

AUDIT OVERVIEW



1. Potential Zero Minting in wrap() Due to Un Updated exchangeRate [Fixed ✓]

Contract: yTao

Function: wrap()

Issue: If exchangeRate is not updated and its value is 0 when wrap() and getYTAObByWTAO are called, the returned amount will be 0, preventing tokens from being minted for msg.sender.

Recommendation: Set a default exchangeRate value before allowing the contract to execute wrap() to prevent this issue.

Fix: Default exchange rate added, commit 032401cab150a421212c5c7c4d2d3342c6d13c95



1. Gas Exhaustion Risk Due to Excessive Array Length in bridgedTo() Function [Acknowledged ✓]

Contract: wTao

Function: bridgedTo()

Issue: Excessive array length can lead to gas exhaustion, potentially causing the contract to fail.

Recommendation: Implement a require() statement to enforce a maximum array length, mitigating the risk of gas exhaustion.

2. Gas Exhaustion Risk in approveMultipleUnstakes() Due to Excessive Array Length [Fixed ✓]

Contract: yTao

Function: approveMultipleUnstakes()

Issue: Excessive array length can cause gas exhaustion, potentially leading to contract failure.

Recommendation: Add a require() statement to enforce a maximum array length, preventing gas exhaustion.

Fix: Max request 20 at once added, commit 032401cab150a421212c5c7c4d2d3342c6d13c95

3. ABI Mismatch in Unstake() Function [Frontend] [Acknowledged ✓]

Function: Unstake()

Issue: The yTAO ABI does not match the contract's ABI. The src/blockchain/abis/yTAO.ts file expects one input (yTAOAmt), while the contract expects three inputs.

Recommendation: Update the contract ABI to align with the unstake() function requirements.



1. Risk of Negative Number Input in Stake and Unstake Functions [Frontend] [Acknowledged ✓]

Function: Stake and Unstake

Issue: Negative numbers can lead to unintended contract behavior if the input types are not properly checked.

Recommendation: Implement input validation to disallow negative numbers.



No Informational severity issues were found.

Testing coverage

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

TaiNET contracts tests:

```
contract: wTAO - 54.4%
Ownable._checkOwner - 100.0%
wTAO.bridgeBack - 100.0%
ERC20._update - 91.7%
wTAO.bridgedTo - 91.7%
AccessControl._checkRole - 75.0%
ERC20._burn - 75.0%
ERC20._mint - 75.0%
AccessControl._grantRole - 62.5%
AccessControl._revokeRole - 0.0%
AccessControl.renounceRole - 0.0%
ERC20._approve - 0.0%
ERC20._spendAllowance - 0.0%
ERC20._transfer - 0.0%
```

```
contract: YTAO - 69.7%
YTAO._checkValidFinneyWallet - 100.0%
YTAO._requireNonZeroAddress - 100.0%
YTAO.initialize - 100.0%
YTAO.setBridgingFee - 100.0%
YTAO.setMaxDepositPerRequest - 100.0%
YTAO.setMaxSupply - 100.0%
YTAO.setMaxUnstakeRequest - 100.0%
YTAO.setMinStakingAmt - 100.0%
YTAO.setMinimumUnstakeAmount - 100.0%
YTAO.setProtocolVault - 100.0%
YTAO.setServiceFee - 100.0%
YTAO.setStakingFee - 100.0%
YTAO.setUnstakingFee - 100.0%
YTAO.setWTAO - 100.0%
YTAO.wrap - 93.8%
ERC20Upgradeable._update - 91.7%
YTAO.safePullERC20 - 91.7%
YTAO.updateExchangeRate - 91.7%
YTAO.setUpperExchangeRateBound - 87.5%
YTAO.unstake - 87.5%
YTAO.depositNative - 83.3%
YTAO.setLowerExchangeRateBound - 83.3%
AccessControlUpgradeable._checkRole - 75.0%
ERC20Upgradeable._burn - 75.0%
ERC20Upgradeable._mint - 75.0%
OwnableUpgradeable._Ownable_init_unchained - 75.0%
ReentrancyGuardUpgradeable._nonReentrantBefore - 75.0%
SafeERC20._callOptionalReturn - 75.0%
YTAO._mintWithSupplyCap - 75.0%
YTAO._transferToContract - 75.0%
YTAO.requestUnstake - 75.0%
YTAO.setWithdrawalManager - 75.0%
YTAO.approveMultipleUnstakes - 65.7%
AccessControlUpgradeable._grantRole - 62.5%
YTAO.calculateAmtAfterFee - 62.5%
Address.verifyCallResultFromTarget - 50.0%
YTAO.setPaused - 50.0%
```



```

tests/test_wtao.py::test_bridged_to RUNNING
Transaction sent: 0x9e8c9b417ea20341941113ad76dca0da7824c5b845d67b4fb3f4f6895d202750
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 0
WTAO.constructor confirmed Block: 1 Gas used: 1450875 (12.09%)
WTAO deployed at: 0x3194c8DC3dbcd3E11a07892e7bA5c3394048Cc87

Transaction sent: 0x55e6c91647040fc450732964f807acalc03667d3db65d866e24218e8802545ec
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 0
WTAO.bridgedTo confirmed (Caller is not the bridge) Block: 2 Gas used: 24681 (0.21%)

Transaction sent: 0x288f85716b3fb1e35981e53d4417649857407b8295536d1b304d79e3fbcdf20
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 1
WTAO.grantRole confirmed Block: 3 Gas used: 48298 (0.40%)

Transaction sent: 0x79eab2eca26cb2dd7ee336f309f726ef12acd5be99460dd105f56fa9f992fa4b
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 1
WTAO.bridgedTo confirmed (Arrays are not the same length) Block: 4 Gas used: 28617 (0.24%)

Transaction sent: 0xfdbdc316d056cfb0ac4a469cf03090e8a9241e6b14d2fd335dde6697b8172bb6
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 2
WTAO.bridgedTo confirmed Block: 5 Gas used: 102012 (0.85%)

Transaction sent: 0x61a5d9c377de73666b17aeedb84c7b3936c2a241a931a383b44dac0f41fe7c3c
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 3
WTAO.bridgedTo confirmed Block: 6 Gas used: 72012 (0.60%)

tests/test_wtao.py::test_bridged_to PASSED
tests/test_wtao.py::test_bridged_back RUNNING
Transaction sent: 0x74d3c3088d49a4a97cf1d6c35d5a02225e1106e9508c3e0fe571b159ebf47ae6
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 2
WTAO.constructor confirmed Block: 7 Gas used: 1450875 (12.09%)
WTAO deployed at: 0xE7eD6747FaC5360f88a2EFC03E00d25789F69291

Transaction sent: 0xb71a23f61a5ee0ce55e00ac70e55a0efd2360ec9f6182054cdb0af00c974774
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 0
WTAO.bridgeBack confirmed (Not enough balance) Block: 8 Gas used: 24174 (0.20%)

Transaction sent: 0x6f3e677a4d8eed32a40eec6a92761b11995abefe81ba06050dacb3b5fc643fba
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 3
WTAO.grantRole confirmed Block: 9 Gas used: 48298 (0.40%)

Transaction sent: 0xb4d69dbfd004d2e77486e95fa75741b60659add42083ca5b7a1bce35e8719a5
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 4
WTAO.bridgedTo confirmed Block: 10 Gas used: 102012 (0.85%)

Transaction sent: 0xc2ee75d2ee9e91a1f4ad0cdc9070f10115cba015a072c82def1aec7d7df97df2
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 1
WTAO.bridgeBack confirmed (Does not meet minimum amount for gas (0.125000144 wtao)) Block: 11 Gas used: 24985 (0.21%)

Transaction sent: 0xf2c7a1164b443753df55a7919c642dea697bee433ae14f3864787b1a2a9d1eab
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 2
WTAO.bridgeBack confirmed Block: 12 Gas used: 69557 (0.58%)

tests/test_wtao.py::test_bridged_back PASSED
tests/test_wtao.py::test_reclaim_token RUNNING
Transaction sent: 0xa72a692a1444fb087ef42c6c34c69ae445ec513e7ca099f240f089a1b6bcaaa7
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 4
ERC20Mock.constructor confirmed Block: 13 Gas used: 523880 (4.37%)
ERC20Mock deployed at: 0xe0aA552A10d7EC8760Fc6c246D391E698a82d0f9

Transaction sent: 0x167bcd5247b8519be7f39ca5188d70d98d78fcd5a5e5f38d339dbc3bb349114e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 5
WTAO.constructor confirmed Block: 14 Gas used: 1450875 (12.09%)
WTAO deployed at: 0x6b4BD0e1086912A6Cb24ce3d843b3466e6c72AFd3

Transaction sent: 0xa087e3a0b9bf20d2dae858eb13390350bc4f56336c4d93afbb0020274cca2257
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 5
WTAO.reclaimToken confirmed (reverted) Block: 15 Gas used: 22749 (0.19%)

Transaction sent: 0xc7d9b292bbdc9fc8b06af52f38419adb159e17e8122ff6dd0711a917a250ab50
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 6
ERC20Mock.mint confirmed Block: 16 Gas used: 65821 (0.55%)

Transaction sent: 0x47893eecd3461e1eae558f182a7ecf8818b16a8829b163637bfe8fa34b61c3ee
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 7
WTAO.reclaimToken confirmed Block: 17 Gas used: 42940 (0.36%)

tests/test_wtao.py::test_reclaim_token PASSED

```

```
tests/test_ytao.py::test_initialize RUNNING
Transaction sent: 0x9e8c9b417ea20341941113ad76dca0da7824c5b845d67b4fb3f4f6895d202750
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 0
YTAO.constructor confirmed Block: 1 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x3194c8DC3dbcd3E11a07892e7bA5c3394048Cc87

Transaction sent: 0xa7cdb29a9662f8f2a35f4932c23e3083be57fb28526bbba3c3ebe0f6775371ef
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 1
YTAO.constructor confirmed Block: 2 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x602C71e4DAC47a042Ee7f46E0ae17F94A3bA086

Transaction sent: 0x445539f7eff1cb21d16dd2150faddfa8bd911ea9fa7cb6908f897e88c3e267
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 2
YTAO.initialize confirmed (owner cannot be null) Block: 3 Gas used: 45940 (0.38%)

Transaction sent: 0xc58ad5746e8d9424b39381560d31adf65abe3b89b165e08c5f508ef7f167328a
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 3
YTAO.initialize confirmed (Initial supply must be more than 0) Block: 4 Gas used: 46137 (0.38%)

Transaction sent: 0x4b01ade693b524efd7fe05b72433a03e86823abe938352e9d77015973e1be144
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 4
YTAO.initialize confirmed (YTAO address cannot be null) Block: 5 Gas used: 46321 (0.39%)

Transaction sent: 0xaa705ad5b4ef3e1327b29714faa3f335c0a2348535f120853c24a74f93fb68e3
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 5
YTAO.initialize confirmed Block: 6 Gas used: 215548 (1.80%)

tests/test_ytao.py::test_initialize PASSED
tests/test_ytao.py::test_set_srv_fee RUNNING
Transaction sent: 0xf6161964c01e9135bda5e5e6a2990aa902f67c6c92164cfea7504287eacae9c
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 6
YTAO.constructor confirmed Block: 7 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x9E4c14403d7d9ABA782044E86a93CAE0907B2ac9

Transaction sent: 0x66636d8aa597aefe9ed42631ff17e4037660073857e476ed8a31be8fabb9c5a6
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 7
YTAO.constructor confirmed Block: 8 Gas used: 5209610 (43.41%)
YTAO deployed at: 0xcC853c9429d32594F404d01f8e9E65ED1DCda809

Transaction sent: 0xffcaa8396f8c98778c702bbcc08ab8ffca0711867c40b4f9e2839f0f3cebd2
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 8
YTAO.initialize confirmed Block: 9 Gas used: 215548 (1.80%)

Transaction sent: 0xdddf7fa439b660f1fde1371a6bac15a63e553a3f35575cf3591d3ac306be2a202
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 9
YTAO.setServiceFee confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 10 Gas used: 22854 (0.19%)

Transaction sent: 0xee2c399435e2adbe8c255f212f356af5f98d2b507be7bbc68b294df4b8e49be7
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 10
YTAO.grantRole confirmed Block: 11 Gas used: 48532 (0.40%)

Transaction sent: 0xf22abc84839ec45f8169bae2e8e48536bd74967c1fa397da8718ff99484af2ff
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 0
YTAO.setServiceFee confirmed (Service fee cannot be more than 0.01 ETH) Block: 12 Gas used: 22859 (0.19%)

Transaction sent: 0xe318ca369717cf24f46367a780c3225c7e71e33d8fe5d1b231433482ac2f6c3a
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 1
YTAO.setServiceFee confirmed Block: 13 Gas used: 43808 (0.37%)

tests/test_ytao.py::test_set_srv_fee PASSED
```

```
tests/test_ytao.py::test_set_withdraw_manager RUNNING
Transaction sent: 0x670f43e1871a6f43c8e5865f63b65e9cc344d0f25caa908d52974e2cb2696613
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 11
YTAO.constructor confirmed Block: 14 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x7a3d735ee6873f170bdcab1d518604928dc10d92

Transaction sent: 0x4770556a3d536c35e80d216bf7f580745675594e87c57ca2b0588ea0d82e2dec
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 12
YTAO.constructor confirmed Block: 15 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x2c15A315610Bfa5248E4CbCbd693320e9D8E03Cc

Transaction sent: 0x3db01e5828d79c0a88359731cffffc0514977e39b27ee31f3b0cccc66ce7316277
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 13
YTAO.initialize confirmed Block: 16 Gas used: 215548 (1.80%)

Transaction sent: 0xb2fee400f7c21411a3418ef4f686cdc6dc8df65689b0c27dcfd7f092d4c8eda3
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 14
YTAO.setWithdrawalManager confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 17 Gas used: 23111 (0.19%)

Transaction sent: 0x32f0d64d4a5e9b9fe442146b44223f9625a61965db83540515145915d56227d1
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 15
YTAO.grantRole confirmed Block: 18 Gas used: 48532 (0.40%)

Transaction sent: 0xe5ee3f6478f1180be101dd4c157bd5f4f64237ba9671a02eae65eec219fc8160
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 2
YTAO.setWithdrawalManager confirmed (reverted) Block: 19 Gas used: 22855 (0.19%)

Transaction sent: 0x605efe7474dd78679a988333280114c8b39798628d7ae49d10184ea3f05747aa
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 3
YTAO.setWithdrawalManager confirmed Block: 20 Gas used: 44928 (0.37%)

tests/test_ytao.py::test_set_withdraw_manager PASSED
tests/test_ytao.py::test_set_proto_vault RUNNING
Transaction sent: 0x7287e8d9f7d5de3caa7aec3a9d01b3649d2d072aba84a9447e11ad6edb5d7f7f
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 16
wTAO.constructor confirmed Block: 21 Gas used: 1450875 (12.09%)
wTAO deployed at: 0x26f153358B1C6a4C0B660eDd694a0555A9Flcce3

Transaction sent: 0x82ccf99504d7d4ee4428344ab0bf433ae046626d3551315eb161098fc68dalc5
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 17
YTAO.constructor confirmed Block: 22 Gas used: 5209610 (43.41%)
YTAO deployed at: 0xFbD588c72B438fa04Cf7c0879c8F730Faa213Da0

Transaction sent: 0x2f818042bebb8fbc2607902e0cc67612b73ac6d50c6531ee73029272aaa3ba5b
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 18
YTAO.initialize confirmed Block: 23 Gas used: 215548 (1.80%)

Transaction sent: 0x8ba7d1d75e8d36574ec3004da8f469a9bbc52eeb2c6673e5c110c43e8b90fd13
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 19
YTAO.setProtocolVault confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 24 Gas used: 23048 (0.19%)

Transaction sent: 0x02c0fdb683342e1941baf365bf7367437f5bfbe5f96ae8b10f513db8fb06563
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 20
YTAO.grantRole confirmed Block: 25 Gas used: 48532 (0.40%)

Transaction sent: 0xb0e2441278f8b50f858d6ee888dfafb71f695839b486aac885838648569a4262
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 4
YTAO.setProtocolVault confirmed (reverted) Block: 26 Gas used: 22792 (0.19%)

Transaction sent: 0xee61ecc0428f07bcb42d2f8fd3738b1dcd83be09147e9d61fcdd0fe45ba70cd5
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 5
YTAO.setProtocolVault confirmed Block: 27 Gas used: 44865 (0.37%)

tests/test_ytao.py::test_set_proto_vault PASSED
```

```
tests/test_ytao.py::test_set_max_supply RUNNING
Transaction sent: 0xfc745362224acd5c7111c56b502217b086d384ddc2cef3dff9b579933183f58b
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 21
YTAO.constructor confirmed Block: 28 Gas used: 1450875 (12.09%)
YTAO deployed at: 0xBcb61491F1859f53438918F1A5aFCA542A9D397

Transaction sent: 0x8d9167cfeea33d65a2ca4138c8ace8be4b78ad29d07c5fefe9e109ae6a93bd83
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 22
YTAO.constructor confirmed Block: 29 Gas used: 5209610 (43.41%)
YTAO deployed at: 0xD22363efee93190f82b52FCD6287D0cb920eF658

Transaction sent: 0xa951522adca7eba20e657e5e7b654fdbcad858976a43ce7e609c5d3578238e79
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 23
YTAO.initialize confirmed Block: 30 Gas used: 215548 (1.80%)

Transaction sent: 0x26915d1f157c20df2ab87950512e6650f5b64a34457de4dbc284d3794bde9cfc
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 24
YTAO.setMaxSupply confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 31 Gas used: 22887 (0.19%)

Transaction sent: 0x47c0ba721a039df514061a57d3240a1e2d69185cb45ada98881d45675506e69
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 25
YTAO.grantRole confirmed Block: 32 Gas used: 48532 (0.40%)

Transaction sent: 0x143b8cab8ba215a23ab9b6acca45f132e8e18fc79fb765a87c2f61eebf5af9b6
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 6
YTAO.setMaxSupply confirmed (Max supply must be greater than the current total supply) Block: 33 Gas used: 23632 (0.20%)

Transaction sent: 0x8960c2c622af2556c5691d5583fc9d53733fc9dda67a5645767c23ab3839098b
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 7
YTAO.setMaxSupply confirmed Block: 34 Gas used: 29671 (0.25%)

tests/test_ytao.py::test_set_max_supply PASSED
tests/test_ytao.py::test_set_min_staking_amt_and_bridging_fee RUNNING
Transaction sent: 0x47f644702b325ecc5c74549f6b2ec3e64785390162e7812e01f6742e6f7801a8
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 26
YTAO.constructor confirmed Block: 35 Gas used: 1450875 (12.09%)
YTAO deployed at: 0xADEd61D42dE86f9058386D1D0d739d20C7eAfc43

Transaction sent: 0x36d597fbd3a6f0a70ad7d90560220a6f3f248a7cf8df5a4f3050b459ff0fe04
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 27
YTAO.constructor confirmed Block: 36 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x832698Daec363C9A7a8036C224A5F5821280b3AC6

Transaction sent: 0xee76142bc34c7db9539e185f878d0393c656599028fbc6274d23d59b7d5dbf5
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 28
YTAO.initialize confirmed Block: 37 Gas used: 215548 (1.80%)

Transaction sent: 0x69f3bbcb3012167cd23655d81cc3bfbcbbaaa92ed87024025c9f791cefa3443c2
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 29
YTAO.setBridgingFee confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 38 Gas used: 22787 (0.19%)

Transaction sent: 0x8c293a5c2cf31a7a210d7a8ab98073cfe9571ad14aeeb3673febedee16acacc3
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 30
YTAO.grantRole confirmed Block: 39 Gas used: 48532 (0.40%)

Transaction sent: 0x49ce041becfadf318d74dfa20b4912553bcc606461dc0b73fc8fb5bf703bb412
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 8
YTAO.setBridgingFee confirmed (Bridging fee cannot be more than 0.2 TAO) Block: 40 Gas used: 22792 (0.19%)

Transaction sent: 0xc0314e49fcd4e622fcf4e15485dca605cd24221bd28220fcb8e56105dc03e35
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 9
YTAO.setBridgingFee confirmed Block: 41 Gas used: 43717 (0.36%)

Transaction sent: 0x6360fe2f4d5b519b575c551075f7dcd91a2fc79862eab91ecaaff2c8b12a7561
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 31
YTAO.setMinStakingAmt confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 42 Gas used: 22831 (0.19%)

Transaction sent: 0x617b6ef77103df4d169baba7f257a72d4c683479e353aa7916e7ce9d6523e525
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 10
YTAO.setMinStakingAmt confirmed (Min staking amount must be more than bridging fee) Block: 43 Gas used: 23564 (0.20%)

Transaction sent: 0x30b01bf5ba251b7c5ed009e1d24c55facb2a97bb401fc260d647aa3489747ebc
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 11
YTAO.setMinStakingAmt confirmed Block: 44 Gas used: 44573 (0.37%)

tests/test_ytao.py::test_set_min_staking_amt_and_bridging_fee PASSED
```



```
tests/test_ytao.py::test_set_min_unstake_amount RUNNING
Transaction sent: 0x3bdea160805d6372620547c5ea72868c492b5411761393dd681f314a9a22ddab
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 32
YTAO.constructor confirmed Block: 45 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x724Ca58E1e6e64BF81E15d7Eec0fe1E5f581c7bD

Transaction sent: 0xe89e94d9133bc6524b8df725a674af878fe71aelac81d1855aldff53668520f8
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 33
YTAO.constructor confirmed Block: 46 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x34b97ffa01dc0DC959c5f1176273D0de3be914C1

Transaction sent: 0x0276257ee19a7a894905b6e51eb722bf6d90e99815a0b8e7c0ecdf33ff5339b2
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 34
YTAO.initialize confirmed Block: 47 Gas used: 215548 (1.80%)

Transaction sent: 0xacce5f360be1072820341e5b1b62ab3b733f6e746437228fd75e6268af458b4e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 35
YTAO.setMinimumUnstakeAmount confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 48 Gas used: 22811 (0.19%)

Transaction sent: 0x8ba8ef8c2a251de4bb4c12bd47c9925bcdalb7e826ad5a83f35218ce4636c810
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 36
YTAO.grantRole confirmed Block: 49 Gas used: 48532 (0.40%)

Transaction sent: 0xd1c983b4243bff63232a38eea2d95bb8aa09375bca20829d81d96dd3cd5866e1
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 12
YTAO.setMinimumUnstakeAmount confirmed (Minimum unstake amount must be more than 0) Block: 50 Gas used: 22741 (0.19%)

Transaction sent: 0xc8bb9a1f9023d885214a9eff334e9a653024644a3af4c00bb9f434827bbfe827
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 13
YTAO.setMinimumUnstakeAmount confirmed Block: 51 Gas used: 43750 (0.36%)

tests/test_ytao.py::test_set_min_unstake_amount PASSED
tests/test_ytao.py::test_set_staking_fee RUNNING
Transaction sent: 0x1a1299dd2027fc9e2ef49fe82fda7a064fffa04f11ae5dac5abc4c5878bf0b60
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 37
YTAO.constructor confirmed Block: 52 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x480FccF53589c1F185835db88b8315a0bBF9a3e0

Transaction sent: 0xedae8393e25f992d4076bcb61bcf470e90ea4e430941963b137d8682170623b9
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 38
YTAO.constructor confirmed Block: 53 Gas used: 5209610 (43.41%)
YTAO deployed at: 0xFE0F4Cf8185c0a6Fd65a610FD9488F33aE9095cB

Transaction sent: 0x0bd94a5d263881070545e334d6468505c78bead5aa9f1cc8e38771bdf8e6a29c
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 39
YTAO.initialize confirmed Block: 54 Gas used: 215548 (1.80%)

Transaction sent: 0x1c5da46fac994db770b25c5935665ed89483dca43b6898161b49dcc112785154
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 40
YTAO.setStakingFee confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 55 Gas used: 22795 (0.19%)

Transaction sent: 0x933bbb5d9587ad3f9b22e43201f17a94468aa338a379f8208ffe29d6118ab40a
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 41
YTAO.grantRole confirmed Block: 56 Gas used: 48532 (0.40%)

Transaction sent: 0x290b8bc1c908e8cae1edb0f3949d9aa71d42fcf0903afcf66e7a8e5014ac26fc
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 14
YTAO.setStakingFee confirmed (Staking fee cannot be more than equal to 20) Block: 57 Gas used: 22797 (0.19%)

Transaction sent: 0x8a9600fdc90921ccfaf973e4165d5abcd08c8eea57cb1821130e83f371c8ac88
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 15
YTAO.setStakingFee confirmed Block: 58 Gas used: 43746 (0.36%)

tests/test_ytao.py::test_set_staking_fee PASSED
```

```
tests/test_ytao.py::test_set_max_deposit_per_req RUNNING
Transaction sent: 0x6d593503c1e10db97de383ea3ea9df00f8eeec9d2ea58b98904f6b371d96a513
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 42
YTAO.constructor confirmed Block: 59 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x0C60536783db9ED5A28216970B10FF2243d317d0

Transaction sent: 0x0db38914387d87197d0dd97dfd17a5b01e69df5151d57db3310e56f4693b59fb
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 43
YTAO.constructor confirmed Block: 60 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x0e19E87b363DD7a3af5c45C95ab6885367251894

Transaction sent: 0xf4d9a1d731c5ad764bc0bcd77ee0e21839705e3fd12846bc62a02bf3b21c860e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 44
YTAO.initialize confirmed Block: 61 Gas used: 215548 (1.80%)

Transaction sent: 0x0467e8bf35309b02fae010f1737b19aabe33229a709b071ff6c231430649513e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 45
YTAO.setMaxDepositPerRequest confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 62 Gas used: 22772 (0.19%)

Transaction sent: 0x8df6583b7b55ee0d79e26f6f10405b92f86dec278bf62cead630cf3bf990045
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 46
YTAO.grantRole confirmed Block: 63 Gas used: 48532 (0.40%)

Transaction sent: 0xafd62054edfa02cb8927915907299c31c0a8ed6c7b6478b7f0d438f8ab132f69
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 16
YTAO.setMaxDepositPerRequest confirmed (Max deposit per request must be more than 0) Block: 64 Gas used: 22762 (0.19%)

Transaction sent: 0xeb9fb0c0d9f9bc95366514ea086aff7ac2125419978cdd07b49e3df1a105faef
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 17
YTAO.setMaxDepositPerRequest confirmed Block: 65 Gas used: 43723 (0.36%)

tests/test_ytao.py::test_set_max_deposit_per_req PASSED
tests/test_ytao.py::test_set_max_unstake_req RUNNING
Transaction sent: 0xa5f98d242a823e554e7e7ab1de0097f3fda62844a1aaec3f8e2ea505b85b8559
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 47
YTAO.constructor confirmed Block: 66 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x1aa96efd2B002541E830CB7f60e473AA24e31f9A

Transaction sent: 0x3f544ebaeb6f708ffea1bba52bbb0e3c157c09ea6f8d51849f2f885a17874dd3
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 48
YTAO.constructor confirmed Block: 67 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x8b18440724DCe2EE9779858af841Ec59F545838B

Transaction sent: 0x485905c810c862d5ea97e052797c0269b7cc603742f9cd4a01232394df1b3658
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 49
YTAO.initialize confirmed Block: 68 Gas used: 215536 (1.80%)

Transaction sent: 0xb56836680075801516b45c80ac2e25ed3f5ffe426af43699ad8068bbeb10e161
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 50
YTAO.setMaxUnstakeRequest confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 69 Gas used: 22751 (0.19%)

Transaction sent: 0x9a78ce688e8456b3ca376c6fb6418bddc0d4245432d06e442aee94055006a93d
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 51
YTAO.grantRole confirmed Block: 70 Gas used: 48532 (0.40%)

Transaction sent: 0x8edde9040a497a043af02ac57de2f3283ab4c534f0d3961a59c26353f2f94df1
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 18
YTAO.setMaxUnstakeRequest confirmed (Max unstake requests must be more than 0) Block: 71 Gas used: 22741 (0.19%)

Transaction sent: 0xc507905974d16c1b76bbd8d6216e388a30982ee7dfc8440d3adf63ab7b3edbee
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 19
YTAO.setMaxUnstakeRequest confirmed Block: 72 Gas used: 43691 (0.36%)

tests/test_ytao.py::test_set_max_unstake_req PASSED
```



```
tests/test_ytao.py::test_set_exchange_rate_bound RUNNING
Transaction sent: 0x5babdb066199b16eb436ccf970955219d3e086c1139b593d3f70bbc936e06f5
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 52
YTAO.constructor confirmed Block: 73 Gas used: 1450875 (12.09%)
YTAO deployed at: 0xFb7C5F938835aE34aF48c278C6763E134907Acdb

Transaction sent: 0x49831be027fb50ecb637a2a5addab0e547e3dd46397f938beb28a63020c56939
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 53
YTAO.constructor confirmed Block: 74 Gas used: 5209610 (43.41%)
YTAO deployed at: 0xb291024F4b2E4C3767A96aB44566a8e93c828C5

Transaction sent: 0xef1d3d1202f021ecb21c859ac9449c35c2aa2d2264c5b75af7e32c276471dfb7
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 54
YTAO.initialize confirmed Block: 75 Gas used: 215548 (1.80%)

Transaction sent: 0xc5c0c137d464aa53b18c2a314eefbaa40f68df89e37e01587eb3966947eb1de8
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 55
YTAO.setLowerExchangeRateBound confirmed (Caller does not have EXCHANGE_UPDATE_ROLE) Block: 76 Gas used: 22749 (0.19%)

Transaction sent: 0xf92f483f0b69ebe50093eb9d2cbbdc07e1216417ffe6d0d126c2a90321f09a43
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 56
YTAO.grantRole confirmed Block: 77 Gas used: 48532 (0.40%)

Transaction sent: 0x57892845b2ef060ef1fad3da76a072a4aee5f5aa56da77c9ba738f4912a187f
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 20
YTAO.setLowerExchangeRateBound confirmed (New lower bound must be more than 0) Block: 78 Gas used: 22739 (0.19%)

Transaction sent: 0xd977739daba877cf489c12cdc4182457629d2f902a509d9b02428aa25e1flacc
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 57
YTAO.setUpperExchangeRateBound confirmed (Caller does not have EXCHANGE_UPDATE_ROLE) Block: 79 Gas used: 22817 (0.19%)

Transaction sent: 0x4bf37962a9d27eb54e882662cc8004c714dc9f84b442e5015a72c71a72fd5ce8
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 21
YTAO.setUpperExchangeRateBound confirmed Block: 80 Gas used: 44591 (0.37%)

Transaction sent: 0x7f01bebc3a0f06f6d02a2c231ff2898c41d69326884dbbca6c3300c2e537f67
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 22
YTAO.setLowerExchangeRateBound confirmed (New lower bound must be less than current upper bound) Block: 81 Gas used: 23574 (0.20%)

Transaction sent: 0x1495c58a6f3e8e968a23e5b3443054d536be4c7efe0c35ccbd47c863fad750e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 23
YTAO.setLowerExchangeRateBound confirmed Block: 82 Gas used: 44523 (0.37%)

Transaction sent: 0xe329fe492c03c0a2f125bb7898c2c508dfcca053ae2c2c058940687bac0eal75
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 24
YTAO.setUpperExchangeRateBound confirmed (New upper bound must be greater than current lower bound) Block: 83 Gas used: 23636 (0.20%)
tests/test_ytao.py::test_set_exchange_rate_bound PASSED
```

```
tests/test_ytao.py::test_update_exchange_rate RUNNING
Transaction sent: 0x297a2367673c03a4dd72ed06b75a3be60fee5e53e088eab237c59d25303568b5
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 58
YTAO.constructor confirmed Block: 84 Gas used: 1450875 (12.09%)
YTAO deployed at: 0xa5659Fa683b71C907cd346397c694b93aFF40b51

Transaction sent: 0x76c3e037218ece93e05ed088e8099d2fd2903e78bc51d15451fe2a4a59951e92
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 59
YTAO.constructor confirmed Block: 85 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x286677F2b204be093AB8ee3e35074352b339243B

Transaction sent: 0x17a1199feff4bad8033c3368f843e10d4bed85c5998fcb9226122edfd1164af9
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 60
YTAO.initialize confirmed Block: 86 Gas used: 215548 (1.80%)

Transaction sent: 0xe784163dd477bdf86ef28223226b60f9fc6ed7ef485ee4307d4b1a482044a797
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 61
YTAO.grantRole confirmed Block: 87 Gas used: 48532 (0.40%)

Transaction sent: 0x047e2dfb9403b5c056ce82516d55f00ef04e09b29bb711b36bc9cba8ce643ce0
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 25
YTAO.setUpperExchangeRateBound confirmed Block: 88 Gas used: 44591 (0.37%)

Transaction sent: 0x95c9cdd2dccc13d6b4179568960f3ab211d7f407be993109db0392908d4ba89c2
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 26
YTAO.setLowerExchangeRateBound confirmed Block: 89 Gas used: 44523 (0.37%)

Transaction sent: 0x4c4a174b14fe6e2fa69113f64da2ce403629a17360f9197599c15f8de97d1435
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 62
YTAO.updateExchangeRate confirmed (Caller does not have EXCHANGE_UPDATE_ROLE) Block: 90 Gas used: 22772 (0.19%)

Transaction sent: 0xec347818cd31735a2fc3509de81985379ce07a64139670e29e05206df4801903
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 27
YTAO.updateExchangeRate confirmed (New rate must be more than 0) Block: 91 Gas used: 22738 (0.19%)

Transaction sent: 0x223a30cf275290f113a86424b320f64fd24d802c3463484621050d40c2e6962a
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 28
YTAO.updateExchangeRate confirmed (New rate must be within bounds) Block: 92 Gas used: 24410 (0.20%)

Transaction sent: 0xf26ea7c3c11f1295b5e5444d2fb7d57f8e7763f38c67a16b317736ac7c38a032
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 29
YTAO.updateExchangeRate confirmed Block: 93 Gas used: 45383 (0.38%)

tests/test_ytao.py::test_update_exchange_rate PASSED
tests/test_ytao.py::test_set_paused RUNNING
Transaction sent: 0x28553544ba462f702ec5bed6a7219208f9f98d9b867dd5fe9077e68a863cd2ff
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 63
YTAO.constructor confirmed Block: 94 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x0764A8da0FCAa127b31E13b79E9a273Fb582bF26

Transaction sent: 0x02e48fbf11ab658302b063e84b4795285993e2952a0e86234f9c7dea71e5fcd4
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 64
YTAO.constructor confirmed Block: 95 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x2acc1AbFdC76E48e49c91f55512066840D06555Dd

Transaction sent: 0x816f440a5d6549ddb27bb9aedeeef44c3fb678eba12666602c6897812c75eb69
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 65
YTAO.initialize confirmed Block: 96 Gas used: 215548 (1.80%)

Transaction sent: 0x106f5c3a0311f953956d738ee93ff71372981e61707c26ed8e2136baa06a2394
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 66
YTAO.setPaused confirmed (Caller does not have PAUSE_ROLE) Block: 97 Gas used: 22758 (0.19%)

Transaction sent: 0x6d5d3ab0cc537f878dab9a16cc68c53a0103390afc379150c5394a4cb2aa6ee3
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 67
YTAO.grantRole confirmed Block: 98 Gas used: 48532 (0.40%)

Transaction sent: 0x560eb6fb7ccf6e8125cb6710ad1dfff22d554ea706c01efaafb8e026af61f76c
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 30
YTAO.setPaused confirmed Block: 99 Gas used: 44576 (0.37%)

tests/test_ytao.py::test_set_paused PASSED
```

```
tests/test_ytao.py::test_set_unstaking_fee RUNNING
Transaction sent: 0xf51e7bd4f46c0cf3a1f16722ef661a0ed420c48ca73675e1300719c0e2941a2b
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 68
YTAO.constructor confirmed Block: 100 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x6a21483001cFb6FAf005346C1e78133742507138

Transaction sent: 0xb684e86b53bef0fall14bed74e7b0d0aab671e24110ac7298ab2d2ec373bfb321
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 69
YTAO.constructor confirmed Block: 101 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x7BCbd5DCBE1d4245808C5b2397C68d18198E8066

Transaction sent: 0xd6fc19a979070belbab537ca3af25c2f886a7c13e9c44fe73ca4c3dfe1bcfb15
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 70
YTAO.initialize confirmed Block: 102 Gas used: 215548 (1.80%)

Transaction sent: 0x23d75f05b2a9171251cc7a0053135852ffa381138f75d204d9cc9ea446e54033
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 71
YTAO.setUnstakingFee confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 103 Gas used: 22794 (0.19%)

Transaction sent: 0xa7ee1398218d94cdbca7bab60490678e9d31dc709334de4e250e284db05255b2
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 72
YTAO.grantRole confirmed Block: 104 Gas used: 48532 (0.40%)

Transaction sent: 0xa72754f8e4b6e607e25d236b05df5bb37d058967e78e8080d893287af0ed0b15
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 31
YTAO.setUnstakingFee confirmed (Unstaking fee cannot be more than 20%) Block: 105 Gas used: 22799 (0.19%)

Transaction sent: 0x5c1ff42844802a8378cee2858bea57adea142721f00a663fe754427dbcc0ed8a
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 32
YTAO.setUnstakingFee confirmed Block: 106 Gas used: 43748 (0.36%)

tests/test_ytao.py::test_set_unstaking_fee PASSED
tests/test_ytao.py::test_set_wtao RUNNING
Transaction sent: 0xb54263287e22d97195f63796bdc0d99fccc76e26deaed4c5b6a42e0aae2c28
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 73
WTAO.constructor confirmed Block: 107 Gas used: 1450875 (12.09%)
WTAO deployed at: 0x8d841305cA5f2852135dC2B969ba6084A32D4700

Transaction sent: 0xcffecf0ab6493bbb420b2ad1c5934254e16be2eab1f6183e63877a9cc6e8688d
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 74
WTAO.constructor confirmed Block: 108 Gas used: 1450875 (12.09%)
WTAO deployed at: 0x795af5f6648254fFAA8fCd35ff03a4dCEe5054c9

Transaction sent: 0x7eacba695380e319096c5f749663e029e7e2fd9c9f083180c5229d00911b90464
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 75
YTAO.constructor confirmed Block: 109 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x8cdA0807D6251FED06361710b50f5592C6A74f15

Transaction sent: 0xf5689c939245ae6cc2ad83f1a3ba58a7fb696327898a5b6acee40930e5b34f6c
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 76
YTAO.initialize confirmed Block: 110 Gas used: 215536 (1.80%)

Transaction sent: 0x2d6e37f09132108d39ab66be9f5f86bbf242536f7483d474ddfd5d747f298b246
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 77
YTAO.setWTAO confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 111 Gas used: 23125 (0.19%)

Transaction sent: 0x445a87a1b18c2e34986ded331f00f899e01a19d94b3c2882cf552ff22ce3fc1a
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 78
YTAO.grantRole confirmed Block: 112 Gas used: 48532 (0.40%)

Transaction sent: 0x847eef2bab621ffeee7e0ae6b3c5c17348cc0161e6d7cc365405a8ba98bbcd72
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 33
YTAO.setWTAO confirmed (reverted) Block: 113 Gas used: 22857 (0.19%)

Transaction sent: 0x8eac07db2470e6086d90d6549f2ad83a3f7e210e3ef8b5e13c232795f8b080e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 34
YTAO.setWTAO confirmed Block: 114 Gas used: 29942 (0.25%)

tests/test_ytao.py::test_set_wtao PASSED
```

```
tests/test_ytao.py::test_wrap RUNNING
Transaction sent: 0xe8c8ae37f2818b1c36547be897539496ddd4dfb33b97c44803add2c7dcb15fd
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 79
  YTAO.constructor confirmed Block: 115 Gas used: 1450875 (12.09%)
  YTAO deployed at: 0xc859A0721d3EF2449556a85753B177Ac37bb3666

Transaction sent: 0x158a5557fe44d20d52f19261261e26fcc13440c715b307b3530902eb07fb37eb
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 80
  YTAO.constructor confirmed Block: 116 Gas used: 5209610 (43.41%)
  YTAO deployed at: 0xfADA48d21d03c18FA2511F84Ca81aB3c5Cfd0c9D

Transaction sent: 0xe554a55a8a9bbf697e8c0023548e4b73d8ad4658181d805b862f360ba8f10571
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 81
  YTAO.initialize confirmed Block: 117 Gas used: 215548 (1.80%)

Transaction sent: 0x7dd4b267aa5c5ca9966a1911c53f73974b927a506c8cf9d779d43616a541ac84
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 82
  YTAO.grantRole confirmed Block: 118 Gas used: 48532 (0.40%)

Transaction sent: 0x3328b0580e8ee091a90b392024a44cd3920099d88b278caa6d2bf513dfceb88c
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 83
  YTAO.setMaxDepositPerRequest confirmed Block: 119 Gas used: 43783 (0.36%)

Transaction sent: 0x55e20d7d85b9fc85d9d3b3256fc7252f05b48ccb8ad5684ccffc91fdc48f31cf
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 35
  YTAO.wrap confirmed (Deposit amount exceeds maximum) Block: 120 Gas used: 29291 (0.24%)

Transaction sent: 0x5a67a602b1b04fea72600b9515adacacc56d897c0577b8d878a8914ff5644b8
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 36
  YTAO.setNativeTokenReceiver confirmed (Caller does not have MANAGE_STAKING_UPDATE_ROLE) Block: 121 Gas used: 24124 (0.20%)

Transaction sent: 0x1dd97b06a10d8458b5227878f06b069c45c2f98a7e238fff0ealfe608484b106
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 84
  YTAO.setNativeTokenReceiver confirmed (nativeWalletReceiver must be of length 48) Block: 122 Gas used: 23644 (0.20%)

Transaction sent: 0x6f98ea1959c27433cb8dfa2cce9192628694ce7b0190ccf0cc674561677cfd15
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 37
  YTAO.wrap confirmed (nativeWalletReceiver must be of length 48) Block: 123 Gas used: 32155 (0.27%)

Transaction sent: 0x79aa64623dda886802542e809df46d34a3810857e3bd702306f18a86bae7329b
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 85
  YTAO.setNativeTokenReceiver confirmed Block: 124 Gas used: 87604 (0.73%)

Transaction sent: 0x56e0ef14422a4433fe84c0053c4d1d31e49bd8b85ff83404b581a759e40c345f
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 86
  YTAO.setBridgingFee confirmed Block: 125 Gas used: 43717 (0.36%)

Transaction sent: 0x560b72d8fda3f92df685d19edd60fca867175d9d40cacee874329cc868209bef
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 87
  YTAO.setMinStakingAmt confirmed Block: 126 Gas used: 44573 (0.37%)

Transaction sent: 0x0ccfc936ba4ab1c0656d44b1432b20c38c7b36d2792a0b4222d87998d2b01785
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 38
  YTAO.wrap confirmed (Does not meet minimum staking amount) Block: 127 Gas used: 34768 (0.29%)

Transaction sent: 0x65218befb4a066284dd09b38b6af6d91a7c584dc9af022884d3a125eb01d43d7
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 88
  YTAO.setProtocolVault confirmed Block: 128 Gas used: 44877 (0.37%)

Transaction sent: 0x4844af0c4961f40f428bec25b3e898588fc0bad33ccb484b6c269c82157b149b
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 39
  YTAO.wrap confirmed (Insufficient YTAO balance) Block: 129 Gas used: 61076 (0.51%)

Transaction sent: 0xb8f4187e2876f8c2d72c76094383b1b4a4f2e8c9e2240e8514d166b59943626c
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 89
  YTAO.transfer confirmed Block: 130 Gas used: 51106 (0.43%)

Transaction sent: 0x05465380e1d7644d5767748f8902453c00ca08dde3b2f4550b9306ac7eb883e
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 40
  YTAO.approve confirmed Block: 131 Gas used: 44279 (0.37%)

Transaction sent: 0x97332be1e410e4fc266f795fd866090a0fa368d69098931cd2f9484821626901
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 90
  YTAO.grantRole confirmed Block: 132 Gas used: 48532 (0.40%)

Transaction sent: 0xc8213dcbcc1c2060f2961b0113cc034b69b3cc1033b43973347629e34a52829b
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 91
  YTAO.setUpperExchangeRateBound confirmed Block: 133 Gas used: 44651 (0.37%)

Transaction sent: 0x7a028986036410e28bd57509ba1fdc86e0ecc6a24486a237299f2070737d1efe
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 92
  YTAO.setLowerExchangeRateBound confirmed Block: 134 Gas used: 44583 (0.37%)
```



```
Transaction sent: 0x2f9a0420cc06641f2daae8dd45bca50761edc822d3e92dea5077fcd6fbb5ffa
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 93
YTAO.updateExchangeRate confirmed Block: 135 Gas used: 45443 (0.38%)

Transaction sent: 0xab46863627dce80aa52ef696d2fc0142012457326db5334d09dac120b3b55700
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 41
YTAO.wrap confirmed Block: 136 Gas used: 164527 (1.37%)

tests/test_ytao.py::test_wrap PASSED
tests/test_ytao.py::test_pull_erc20 RUNNING
Transaction sent: 0xfa3b40de0ce80d5aff487cc3e4b3e4a302cd0da61bf1aa8e5f0a025ee5c969ad
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 94
YTAO.constructor confirmed Block: 137 Gas used: 1450875 (12.09%)
YTAO deployed at: 0x9E2341550043dac781A6c36fbdc8b3590bd18C08

Transaction sent: 0xd117fe73f14c63bacdc1d1b741deef7c51f5f7eda06f256cc476180b44461454
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 95
YTAO.constructor confirmed Block: 138 Gas used: 5209610 (43.41%)
YTAO deployed at: 0xE67cf20A24c85f0417070668123102247a6cfcC1

Transaction sent: 0xad7d6976fd5af41292eae6a1c3fe4be6a13a06eb499a2c2974b4ea0d2835cd
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 96
YTAO.initialize confirmed Block: 139 Gas used: 215548 (1.80%)

Transaction sent: 0x6e0e4846bd451e481c89f3afd8d550abdc2ffff87932fea423ea417d5e852a10
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 97
YTAO.transfer confirmed Block: 140 Gas used: 51106 (0.43%)

Transaction sent: 0xc8fd56385d966de7867c43ee43befabe07d102188ff53d10f2df7b60c6904281
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 42
YTAO.safePullERC20 confirmed (Caller does not have TOKEN_SAFE_PULL_ROLE) Block: 141 Gas used: 23694 (0.20%)

Transaction sent: 0x97ca9d94ee327dc5f9aed63f0464124aaa9275c0749903d9023373ec0097d47a
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 98
YTAO.grantRole confirmed Block: 142 Gas used: 48520 (0.40%)

Transaction sent: 0xca158c3a9c42eb4ffbd5cd63e6efc077240e7ac8fd0b7ca924ce14a566c9af78
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 0
YTAO.safePullERC20 confirmed (Recipient address cannot be null address) Block: 143 Gas used: 24679 (0.21%)

Transaction sent: 0xedcc04bc7dbcb3f5e07647220bae98b509f3916e93991387de3ea598e0bebf85
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 1
YTAO.safePullERC20 confirmed (Amount must be greater than 0) Block: 144 Gas used: 24584 (0.20%)

Transaction sent: 0x9bc18a3bb71c52e678c519ba9f46dca998d17e70b85febfa06a770d71287a9d8
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 2
YTAO.safePullERC20 confirmed (Not enough tokens in contract) Block: 145 Gas used: 27825 (0.23%)

Transaction sent: 0xbe89e60cf787311f2a814e2e653a5dbf010bc61b2d4431e3aa4490cf415b9420
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 3
YTAO.safePullERC20 confirmed Block: 146 Gas used: 44973 (0.37%)

tests/test_ytao.py::test_pull_erc20 PASSED
```

```
tests/test_ytao.py::test_pull_native RUNNING
Transaction sent: 0x1bb327d2ba2b3826f49cbeb274dcf8b4775c49dc91a3697f5a0f381ba950b9d5
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 99
  YTAO.constructor confirmed Block: 147 Gas used: 1450875 (12.09%)
  YTAO deployed at: 0xa2c283f11108596AB76e47af4e487Ec5D9d6c58F

Transaction sent: 0xd09ac6e6849787e34f38276fd9cacf54db960df58e1a789b380f1c0bb8f7f958
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 100
  YTAO.constructor confirmed Block: 148 Gas used: 5209610 (43.41%)
  YTAO deployed at: 0x2711D43E99752B654E6925861Aec015E1F635c8b

Transaction sent: 0xd2c410bc3c32a329d8cd89985761911ba7e0f74d0a417daacc308d188efdd30b
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 101
  YTAO.initialize confirmed Block: 149 Gas used: 215548 (1.80%)

Transaction sent: 0xdd26f3df315d392157fc391ff25e9e57800786a8f7ba2101f3585f09befa9ecc
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 43
  YTAO.pullNativeToken confirmed (Caller does not have TOKEN_SAFE_PULL_ROLE) Block: 150 Gas used: 23247 (0.19%)

Transaction sent: 0x5c00b0d390096066dde0b007712fa580f02d663e44f5e6b0f1ba2ad3337902d2
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 102
  YTAO.grantRole confirmed Block: 151 Gas used: 48520 (0.40%)

Transaction sent: 0x22d4a79cb1f39ea6bb27b3d0e52832aeb696771f5462d735bebe2dfd4b7584bf
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 4
  YTAO.pullNativeToken confirmed (Recipient address cannot be null address) Block: 152 Gas used: 24232 (0.20%)

Transaction sent: 0x88c96cc96db51e3761fe92fccd3999bbcccc120951b22abb8fd30a81140189a89
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 5
  YTAO.pullNativeToken confirmed (Amount must be greater than 0) Block: 153 Gas used: 24137 (0.20%)

Transaction sent: 0x5177fc1de367604f9b5868b041b3b3c35b40e12510f552a6d3d99f9ea8b07a46
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 6
  YTAO.pullNativeToken confirmed (Not enough native tokens in contract) Block: 154 Gas used: 24243 (0.20%)

Transaction sent: 0xedb3831300d75d30b5ca413945c23b8711c7c5ccd74955cea009dd6dd3f4ded8
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 44
  YTAO.depositNative confirmed (Caller does not have NATIVE_DEPOSIT_ROLE) Block: 155 Gas used: 23229 (0.19%)

Transaction sent: 0x1b7060cbd0f564f6ca342f002d1fe3b3be2e47c3033a2700718c37f5a23a1d12
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 103
  YTAO.grantRole confirmed Block: 156 Gas used: 48520 (0.40%)

Transaction sent: 0x667fa79fcd3bf20257f2e49b518a1cdf230fc58e95186a70cd0298643ae828da
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 7
  YTAO.depositNative confirmed (Amount must be greater than 0) Block: 157 Gas used: 24003 (0.20%)

Transaction sent: 0x4eeeb1ebc960e5eb023728907cb67e9e2cfaaff1c5deaf5d0bead0babbbb74a7b8
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 8
  YTAO.depositNative confirmed (Recipient address cannot be null address) Block: 158 Gas used: 23873 (0.20%)

Transaction sent: 0xaf54165d5ce1d5f2f3ec82cd771a8df3e6c151b3b57f44f728e3c0fa47710ae7
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 104
  YTAO.grantRole confirmed Block: 159 Gas used: 48520 (0.40%)

Transaction sent: 0x97ef80826abd97c9e08fbb6b6bcf9cbe2bbe954d387b6034adf1046b54c8554f5
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 9
  YTAO.setUpperExchangeRateBound confirmed Block: 160 Gas used: 44651 (0.37%)

Transaction sent: 0xe7115dff86d12e46a2de2723a02f87195b99a4344631db49b483c18f51f95368
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 10
  YTAO.setLowerExchangeRateBound confirmed Block: 161 Gas used: 44583 (0.37%)

Transaction sent: 0xaa4a595db22ab5a32e7c55bcd240f24404ca5de2e98af8bd959affb66e8dd1a4
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 11
  YTAO.updateExchangeRate confirmed Block: 162 Gas used: 45443 (0.38%)

Transaction sent: 0xbf9695a2e41b6a1a492656385d4e49f2350d15a0a3b306f72e8ec93928dc4bbc
  Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 12
  YTAO.depositNative confirmed Block: 163 Gas used: 75414 (0.63%)

tests/test_ytao.py::test_pull_native PASSED
```



```
tests/test_ytao.py::test_unstake RUNNING
Transaction sent: 0x06f75722b35fd08d29106e0d6ff7dfad3d463854eb20631669ea12c9c2dc2006
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 105
wTAO.constructor confirmed Block: 164 Gas used: 1450875 (12.09%)
wTAO deployed at: 0xeb1f9ba62709AbAc983207991adfe45028714149

Transaction sent: 0x180b94344e235a86f4b9aea96f849ad5961e5af0a81fa20010f5f0b8a00dce0e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 106
YTAO.constructor confirmed Block: 165 Gas used: 5209610 (43.41%)
YTAO deployed at: 0x588C2BA3e918a7e52e08F06Cae73f3CEB7a5a0bd

Transaction sent: 0x01c03ae789787a6b2c5a0f2aebcbldc663594af1d7ec270c8363b4efa49229fa
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 107
YTAO.initialize confirmed Block: 166 Gas used: 215548 (1.80%)

Transaction sent: 0xfadaf0eb4b341ab5667f1ca70bf2bdf181dd6f2d8607555fda13e7d25056c9e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 108
YTAO.grantRole confirmed Block: 167 Gas used: 48520 (0.40%)

Transaction sent: 0x92f47f398b511764e71e56367e1e5c9259c271dbe553773f06fb8ea56da53f1b
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 109
YTAO.grantRole confirmed Block: 168 Gas used: 48520 (0.40%)

Transaction sent: 0x81746a9c0a9488b2424172b4cb707c4b8b828066967e54f215f37c2482b09115
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 13
YTAO.setMaxDepositPerRequest confirmed Block: 169 Gas used: 43783 (0.36%)

Transaction sent: 0x60b05506bbb4820fd0fd1dc11058a81761269e81af92dc4b1bfed2a7f0fa6b0
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 14
YTAO.setUpperExchangeRateBound confirmed Block: 170 Gas used: 44651 (0.37%)

Transaction sent: 0x5264f00d0c11525b0d5ba4be04afe3211427d65ba4acdfc43157acd06ab97e22
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 15
YTAO.setLowerExchangeRateBound confirmed Block: 171 Gas used: 44583 (0.37%)

Transaction sent: 0x2315e8f39a4914d4bba91466b789f51bb760410eb63356ccd3d15374743dd634
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 16
YTAO.updateExchangeRate confirmed Block: 172 Gas used: 45443 (0.38%)

Transaction sent: 0xef15a4a63c4a549c8b24580ea052961db8c0b27672238e851b8b67d1d547cb11
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 17
YTAO.setNativeTokenReceiver confirmed Block: 173 Gas used: 87604 (0.73%)

Transaction sent: 0x0e7853e6f3142922c326f7cd5556b473df9da837269f18c04dbfcc3783b0b1ab
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 18
YTAO.setProtocolVault confirmed Block: 174 Gas used: 44877 (0.37%)

Transaction sent: 0x797464ad0bb2cbe823414d06a06ec4350a96b6a3027f6592b5c8ab2ecfaf5bf0
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 19
YTAO.setServiceFee confirmed Block: 175 Gas used: 43808 (0.37%)

Transaction sent: 0x3a7ff8fad9bf5f754d576e73492bfa7bf2bea23fc4110be0d3afae1f80accd6
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 20
YTAO.setMinimumUnstakeAmount confirmed Block: 176 Gas used: 43750 (0.36%)

Transaction sent: 0xf1c19148d34aa9a4a1fdf2f24dbe896cda318449106228a10390802543282a2d8
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 110
wTAO.transfer confirmed Block: 177 Gas used: 51106 (0.43%)

Transaction sent: 0xa93d7772ec55f3c84cef0cdce94198c6d79a59f987d40787af7a4d4fc23e8d50
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 111
wTAO.transfer confirmed Block: 178 Gas used: 51094 (0.43%)

Transaction sent: 0x8935bc2ddcb0196a4a91430284f079a0e1ff6b6c39ffe4209c62571d2d32ddae
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 45
wTAO.approve confirmed Block: 179 Gas used: 44279 (0.37%)

Transaction sent: 0x9cc534cabbe5ed3a8aa4bf0132fe0abd092c5d0c7dfd08554cea6713b6a75a43
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 46
YTAO.wrap confirmed Block: 180 Gas used: 179527 (1.50%)

Transaction sent: 0xb4a492a8196818c37cc5721d63eebe797b4defa5cb793edb8607dd4e822ef062
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 47
YTAO.requestUnstake confirmed (Fee amount is not sufficient) Block: 181 Gas used: 30454 (0.25%)

Transaction sent: 0x9471f903edad43d6918144edc9466d09138097fe18771a0ab731bcb10de27056
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 48
YTAO.requestUnstake confirmed (Unstake amount is less than minimum) Block: 182 Gas used: 31304 (0.26%)

Transaction sent: 0x574741902ffb5b074db9fb951fcbdb773315f8051aefa77300af6720d59d7f02
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 49
YTAO.requestUnstake confirmed (Insufficient yTAO balance) Block: 183 Gas used: 32252 (0.27%)
```

```
Transaction sent: 0x1a9758940fc4d377b8c50df2012bd2d3a13bf0f69ff5d9ef44a9a72426ba9a0
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 50
YTAO.requestUnstake confirmed (Maximum unstake requests exceeded) Block: 184 Gas used: 36939 (0.31%)

Transaction sent: 0x4d1cacle059d430afecfa934515d349e4b6cff8b7b34868a5fe9d7baa7f21724
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 21
YTAO.setMaxUnstakeRequest confirmed Block: 185 Gas used: 43691 (0.36%)

Transaction sent: 0xb96394c51f51b2878e3939f84d4be9866d539f50d8baf88442b1046c55c45bca
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 51
YTAO.requestUnstake confirmed Block: 186 Gas used: 214846 (1.79%)

Transaction sent: 0x5f33cf8217509e3ae4565fa5c16e4770f633abdc50fa99003d5bcc7389716a8a
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 52
YTAO.requestUnstake confirmed Block: 187 Gas used: 176769 (1.47%)

Transaction sent: 0x3c693f0cfb9bd80676637ec5dd86c83c77d74a9c88f80b1083d6bba2ae75aa9e
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 53
YTAO.unstake confirmed (Invalid request index) Block: 188 Gas used: 29237 (0.24%)

Transaction sent: 0x7b4f7aacb13f3d30a628c5e0b67d8be192c34f332d39dbbfc4abdefbf96e48c2
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 54
YTAO.unstake confirmed (Unstake not approved yet) Block: 189 Gas used: 38204 (0.32%)

Transaction sent: 0x64350885ad6583bf1b9d574c71cb5cf8551c6a7fce6910de93e3f36dbeb3aa15
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 22
YTAO.approveMultipleUnstakes confirmed (Caller does not have APPROVE_WITHDRAWAL_ROLE) Block: 190 Gas used: 29623 (0.25%)

Transaction sent: 0xfa423683ddf1a6a550a242262a32455143cflb0300c9db31e49d012e5e880cc8
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 112
YTAO.grantRole confirmed Block: 191 Gas used: 48520 (0.40%)

Transaction sent: 0xf0cc398abe6e570eb46cde06977720ed09596b8a3044e02a0cbcf0f1692f3946
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 23
YTAO.approveMultipleUnstakes confirmed (Requests array is empty) Block: 192 Gas used: 28922 (0.24%)

Transaction sent: 0x083e5713d517262c2592ac17b39b033e3728150aae06181e1b54e14384780b5d
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 24
YTAO.approveMultipleUnstakes confirmed (First request index out of bounds) Block: 193 Gas used: 30884 (0.26%)

Transaction sent: 0x382e31b996248b276ddfedd91e1970efc11c90812916832dc831da9a43b899ec
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 25
wTAO.approve confirmed Block: 194 Gas used: 44279 (0.37%)

Transaction sent: 0x7791262ea88e6b3597975c5658b6db8cd45f02de079ddf9468754bc37c6cca3b
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 26
YTAO.approveMultipleUnstakes confirmed Block: 195 Gas used: 112735 (0.94%)

Transaction sent: 0x81fa5b78d6268214a8229fe2f9b340ca31e4f8d6c2949784a7180c0d5ced2a2c
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 27
YTAO.approveMultipleUnstakes confirmed (Request is already approved) Block: 196 Gas used: 38192 (0.32%)

Transaction sent: 0x99712778ed0b05c8ec6f2b50fff1e79d411ccafc85854a53b3009fd12ac27c31
Gas price: 0.0 gwei Gas limit: 12000000 Nonce: 55
YTAO.unstake confirmed Block: 197 Gas used: 46258 (0.39%)

tests/test_ytao.py::test_unstake PASSED
```

Annexes

Testing code:

Testing wTAO:

```
from brownie import (

    reverts,

)

from scripts.helpful_scripts import (

    ZERO_ADDRESS,

    DAY_TIMESTAMP,

    get_account,

    get_bridge_role

)

from scripts.deploy import (

    deploy_erc,

    deploy_wtao

)

def test_bridged_to(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    extra = get_account(2)

    another = get_account(3)

    token = deploy_wtao(owner)
```

```

with reverts("Caller is not the bridge"):

    token.bridgedTo(

        [], [], [], {"from": other}

    )

token.grantRole(get_bridge_role(), other, {"from": owner})

with reverts("Arrays are not the same length"):

    token.bridgedTo(

        [0xE56feb1446CE72849d064E3cFB66Fa097A9bc70e,

         0x2b9d77d14E6bAE226A8347c097A9546Ea82fF77d],

        [other], [1e18], {"from": other}

    )


tx = token.bridgedTo(

    [0xE56feb1446CE72849d064E3cFB66Fa097A9bc70e],

    [extra], [1e18], {"from": other}

)

assert tx.events['BridgedTo'][0]['from'] ==
str(0xE56feb1446CE72849d064E3cFB66Fa097A9bc70e)

assert tx.events['BridgedTo'][0]['to'] == extra

assert tx.events['BridgedTo'][0]['amount'] == 1e18

assert tx.events['BridgedTo'][0]['nonce'] == 0


tx = token.bridgedTo(

    [0x2b9d77d14E6bAE226A8347c097A9546Ea82fF77d],

    [another], [2e18], {"from": other}

)

```

```

    assert tx.events['BridgedTo'][0]['from'] ==
str(0x2b9d77d14E6bAE226A8347c097A9546Ea82fF77d)

    assert tx.events['BridgedTo'][0]['to'] == another

    assert tx.events['BridgedTo'][0]['amount'] == 2e18

    assert tx.events['BridgedTo'][0]['nonce'] == 1

def test_bridged_back(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    extra = get_account(2)

    token = deploy_wtao(owner)

    with reverts("Not enough balance"):

        token.bridgeBack(1e18, 0xE56feb1446CE72849d064E3cFB66Fa097A9bc70e, {"from": extra}

        )

    token.grantRole(get_bridge_role(), other, {"from": owner})

    token.bridgedTo(

        [0xE56feb1446CE72849d064E3cFB66Fa097A9bc70e],

        [extra], [1e18], {"from": other}

        )

    with reverts("Does not meet minimum amount for gas (0.125000144 wTAO)"):

        token.bridgeBack(

            125000100, 0xE56feb1446CE72849d064E3cFB66Fa097A9bc70e, {"from": extra}

            )

    tx = token.bridgeBack(

```

```

        1e17, 0xE56feb1446CE72849d064E3cFB66Fa097A9bc70e, {"from": extra}
    )

    assert tx.events['BridgedBack'][0]['from'] == extra

    assert tx.events['BridgedBack'][0]['to'] ==
str(0xE56feb1446CE72849d064E3cFB66Fa097A9bc70e)

    assert tx.events['BridgedBack'][0]['amount'] == 1e17

    assert tx.events['BridgedBack'][0]['nonce'] == 2

def test_reclaim_token(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    mock_erc = deploy_erc(owner, "test", "test")

    token = deploy_wtao(owner)

    with reverts():

        token.reclaimToken(mock_erc.address, {"from": other})

    mock_erc.mint(token.address, 1e18)

    tx = token.reclaimToken(mock_erc.address, {"from": owner})

    assert tx.events['Transfer'][0]['from'] == token.address

    assert tx.events['Transfer'][0]['to'] == owner

    assert tx.events['Transfer'][0]['value'] == 1e18

```

Testing yTAO:

```

from brownie import (
    reverts,
)

```



```
from scripts.helpful_scripts import (

    ZERO_ADDRESS,

    DAY_TIMESTAMP,

    get_account,

    get_bridge_role,

    get_pause_role,

    get_manage_staking_role,

    get_token_safe_pull_role,

    get_native_deposit_role,

    get_approve_withdrawal_role,

    get_exchange_role

)
```

```
from scripts.deploy import (

    deploy_erc,

    deploy_wtao,

    deploy_ytao

)
```

```
def test_initialize(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    extra = get_account(2)

    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)
```

```

# Assert

with reverts("Owner cannot be null"):

    ytao.initialize(ZERO_ADDRESS, 100e18, wtao.address, {"from": owner})

with reverts("Initial supply must be more than 0"):

    ytao.initialize(owner, 0, wtao.address, {"from": owner})

with reverts("wTAO address cannot be null"):

    ytao.initialize(owner, 100e18, ZERO_ADDRESS, {"from": owner})

tx = ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

assert tx.events['OwnershipTransferred'][0]['previousOwner'] == ZERO_ADDRESS

assert tx.events['OwnershipTransferred'][0]['newOwner'] == owner


def test_set_srv_fee(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

    # Assert

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

    with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

        ytao.setServiceFee(0.001e18, {"from": owner})

    ytao.grantRole(get_manage_staking_role(), other, {"from": owner})

    with reverts("Service fee cannot be more than 0.01 ETH"):

        ytao.setServiceFee(1e18, {"from": other})

    tx = ytao.setServiceFee(0.001e18, {"from": other})

    assert tx.events['UpdateServiceFee'][0]['serviceFee'] == 0.001e18

```

```

def test_set_withdraw_manager(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    extra = get_account(2)


    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

    # Assert

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

    with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

        ytao.setWithdrawalManager(extra, {"from": owner})

    ytao.grantRole(get_manage_staking_role(), other, {"from": owner})

    with reverts("InvalidAddress: 0x0000000000000000000000000000000000000000"):

        ytao.setWithdrawalManager(ZERO_ADDRESS, {"from": other})

    tx = ytao.setWithdrawalManager(extra, {"from": other})

    assert tx.events['UpdateWithdrawalManager'][0]['withdrawalManager'] == extra

```

```

def test_set_proto_vault(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    extra = get_account(2)


    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

    # Assert

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

```

```

with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

    ytao.setProtocolVault(extra, {"from": owner})

ytao.grantRole(get_manage_staking_role(), other, {"from": owner})

with reverts("InvalidAddress: 0x0000000000000000000000000000000000000000"):

    ytao.setProtocolVault(ZERO_ADDRESS, {"from": other})

tx = ytao.setProtocolVault(extra, {"from": other})

assert tx.events['UpdateProtocolVault'][0]['newProtocolVault'] == extra

```

```

def test_set_max_supply(only_local):

```

```

    # Arrange

```

```

    owner = get_account(0)

```

```

    other = get_account(1)

```

```

    wtao = deploy_wtao(owner)

```

```

    ytao = deploy_ytao(owner)

```

```

    # Assert

```

```

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

```

```

    with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

```

```

        ytao.setMaxSupply(150e18, {"from": owner})

```

```

    ytao.grantRole(get_manage_staking_role(), other, {"from": owner})

```

```

    with reverts("Max supply must be greater than the current total supply"):

```

```

        ytao.setMaxSupply(0, {"from": other})

```

```

    tx = ytao.setMaxSupply(150e18, {"from": other})

```

```

    assert tx.events['UpdateMaxSupply'][0]['newMaxSupply'] == 150e18

```

```

def test_set_min_staking_amt_and_bridging_fee(only_local):

```

```

    # Arrange

```

```

    owner = get_account(0)

```

```

other = get_account(1)

wtao = deploy_wtao(owner)

ytao = deploy_ytao(owner)

# Assert

ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

    ytao.setBridgingFee(1e18, {"from": owner})

ytao.grantRole(get_manage_staking_role(), other, {"from": owner})

with reverts("Bridging fee cannot be more than 0.2 TAO"):

    ytao.setBridgingFee(1e18, {"from": other})

tx = ytao.setBridgingFee(150000000, {"from": other})

assert tx.events['UpdateBridgeFee'][0]['bridgingFee'] == 150000000

with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

    ytao.setMinStakingAmt(1e18, {"from": owner})

with reverts("Min staking amount must be more than bridging fee"):

    ytao.setMinStakingAmt(0, {"from": other})

tx = ytao.setMinStakingAmt(0.01e18, {"from": other})

assert tx.events['UpdateMinStakingAmt'][0]['minStakingAmt'] == 0.01e18

def test_set_min_unstake_amount(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

```

```

# Assert

y tao.initialize(owner, 100e18, w tao.address, {"from": owner})

with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

    y tao.setMinimumUnstakeAmount(1e18, {"from": owner})

y tao.grantRole(get_manage_staking_role(), other, {"from": owner})

with reverts("Minimum unstake amount must be more than 0"):

    y tao.setMinimumUnstakeAmount(0, {"from": other})

tx = y tao.setMinimumUnstakeAmount(0.01e18, {"from": other})

assert tx.events['UpdateMinUnstakeAmount'][0]['minUnstakeAmount'] == 0.01e18

def test_set_staking_fee(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    w tao = deploy_w tao(owner)

    y tao = deploy_y tao(owner)

    # Assert

    y tao.initialize(owner, 100e18, w tao.address, {"from": owner})

    with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

        y tao.setStakingFee(15, {"from": owner})

    y tao.grantRole(get_manage_staking_role(), other, {"from": owner})

    with reverts("Staking fee cannot be more than equal to 20"):

        y tao.setStakingFee(25, {"from": other})

    tx = y tao.setStakingFee(10, {"from": other})

    assert tx.events['UpdateStakingFee'][0]['stakingFee'] == 10

def test_set_max_deposit_per_req(only_local):

```



```
# Arrange
```

```
owner = get_account(0)
```

```
other = get_account(1)
```

```
wtao = deploy_wtao(owner)
```

```
ytao = deploy_ytao(owner)
```

```
# Assert
```

```
ytao.initialize(owner, 100e18, wtao.address, {"from": owner})
```

```
with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):
```

```
    ytao.setMaxDepositPerRequest(15, {"from": owner})
```

```
ytao.grantRole(get_manage_staking_role(), other, {"from": owner})
```

```
with reverts("Max deposit per request must be more than 0"):
```

```
    ytao.setMaxDepositPerRequest(0, {"from": other})
```

```
tx = ytao.setMaxDepositPerRequest(10, {"from": other})
```

```
assert tx.events['UpdateMaxDepositPerRequest'][0]['maxDepositPerRequest'] == 10
```

```
def test_set_max_unstake_req(only_local):
```

```
# Arrange
```

```
owner = get_account(0)
```

```
other = get_account(1)
```

```
wtao = deploy_wtao(owner)
```

```
ytao = deploy_ytao(owner)
```

```
# Assert
```

```
ytao.initialize(owner, 100e18, wtao.address, {"from": owner})
```

```
with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):
```

```
    ytao.setMaxUnstakeRequest(15, {"from": owner})
```

```
ytao.grantRole(get_manage_staking_role(), other, {"from": owner})
```

```

with reverts("Max unstake requests must be more than 0"):

    ytao.setMaxUnstakeRequest(0, {"from": other})

tx = ytao.setMaxUnstakeRequest(10, {"from": other})

assert tx.events['UpdateMaxUnstakeRequest'][0]['maxUnstakeRequests'] == 10

def test_set_exchange_rate_bound(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

    # Assert

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

    with reverts("Caller does not have EXCHANGE_UPDATE_ROLE"):

        ytao.setLowerExchangeRateBound(15, {"from": owner})

    ytao.grantRole(get_exchange_role(), other, {"from": owner})

    with reverts("New lower bound must be more than 0"):

        ytao.setLowerExchangeRateBound(0, {"from": other})

    with reverts("Caller does not have EXCHANGE_UPDATE_ROLE"):

        ytao.setUpperExchangeRateBound(15, {"from": owner})

    tx = ytao.setUpperExchangeRateBound(10, {"from": other})

    assert tx.events['UpperBoundUpdated'][0]['newUpperBound'] == 10

    with reverts("New lower bound must be less than current upper bound"):

        ytao.setLowerExchangeRateBound(11, {"from": other})

    tx = ytao.setLowerExchangeRateBound(5, {"from": other})

```

```
assert tx.events['LowerBoundUpdated'][0]['newLowerBound'] == 5

with reverts("New upper bound must be greater than current lower bound"):

    ytao.setUpperExchangeRateBound(4, {"from": other})
```

```
def test_update_exchange_rate(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

    # Assert

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

    ytao.grantRole(get_exchange_role(), other, {"from": owner})

    ytao.setUpperExchangeRateBound(10, {"from": other})

    ytao.setLowerExchangeRateBound(5, {"from": other})

    with reverts("Caller does not have EXCHANGE_UPDATE_ROLE"):

        ytao.updateExchangeRate(7, {"from": owner})

    with reverts("New rate must be more than 0"):

        ytao.updateExchangeRate(0, {"from": other})

    with reverts("New rate must be within bounds"):

        ytao.updateExchangeRate(15, {"from": other})

    tx = ytao.updateExchangeRate(7, {"from": other})

    assert tx.events['UpdateExchangeRate'][0]['newRate'] == 7
```

```

def test_set_paused(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)


    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

    # Assert

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

    with reverts("Caller does not have PAUSE_ROLE"):

        ytao.setPaused(True, {"from": owner})

    ytao.grantRole(get_pause_role(), other, {"from": owner})

    tx = ytao.setPaused(True, {"from": other})

    assert tx.events['ContractPaused'][0]['paused'] == True


def test_set_unstaking_fee(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)


    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

    # Assert

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

    with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

        ytao.setUnstakingFee(True, {"from": owner})

    ytao.grantRole(get_manage_staking_role(), other, {"from": owner})

    with reverts("Unstaking fee cannot be more than 20%"):

```

```
        ytao.setUnstakingFee(250, {"from": other})

    tx = ytao.setUnstakingFee(100, {"from": other})

    assert tx.events['UpdateUnstakingFee'][0]['newUnstakingFee'] == 100
```

```
def test_set_wtao(only_local):
```

```
    # Arrange
```

```
    owner = get_account(0)
```

```
    other = get_account(1)
```

```
    wtao = deploy_wtao(owner)
```

```
    new_wtao = deploy_wtao(owner)
```

```
    ytao = deploy_ytao(owner)
```

```
    # Assert
```

```
    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})
```

```
    with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):
```

```
        ytao.setWTAO(new_wtao.address, {"from": owner})
```

```
    ytao.grantRole(get_manage_staking_role(), other, {"from": owner})
```

```
    with reverts("InvalidAddress: 0x0000000000000000000000000000000000000000000000000000000000000000"):
```

```
        ytao.setWTAO(ZERO_ADDRESS, {"from": other})
```

```
    tx = ytao.setWTAO(new_wtao.address, {"from": other})
```

```
    assert tx.events['UpdateWTao'][0]['newWTAO'] == new_wtao.address
```

```
def test_wrap(only_local):
```

```
    # Arrange
```

```
    owner = get_account(0)
```

```
    other = get_account(1)
```

```
    extra = get_account(2)
```

```
    vault = get_account(3)
```

```

random_account = "5EhvL1FVkJQpMjZX4MAADcW42i3xPSF1KiCpuaxTYVr28sux"

wtao = deploy_wtao(owner)

ytao = deploy_ytao(owner)

# Assert

ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

ytao.grantRole(get_manage_staking_role(), owner, {"from": owner})

ytao.setMaxDepositPerRequest(5e18, {"from": owner})

with reverts("Deposit amount exceeds maximum"):

    ytao.wrap(10e18, {"from": other})

with reverts("Caller does not have MANAGE_STAKING_UPDATE_ROLE"):

    ytao.setNativeTokenReceiver(random_account, {"from": other})

with reverts("nativeWalletReceiver must be of length 48"):

    ytao.setNativeTokenReceiver("no_valid_receiver", {"from": owner})


with reverts("nativeWalletReceiver must be of length 48"):

    ytao.wrap(1e18, {"from": other})

ytao.setNativeTokenReceiver(random_account, {"from": owner})

ytao.setBridgingFee(150000000, {"from": owner})

ytao.setMinStakingAmt(0.05e18, {"from": owner})

with reverts("Does not meet minimum staking amount"):

    ytao.wrap(0.04e18, {"from": other})

ytao.setProtocolVault(vault, {"from": owner})

with reverts("Insufficient wTAO balance"):

    ytao.wrap(1e18, {"from": other})


wtao.transfer(other, 5e18, {"from": owner})

```

```

wtao.approve(ytao.address, 1e18, {"from": other})

ytao.grantRole(get_exchange_role(), owner, {"from": owner})

ytao.setUpperExchangeRateBound(2e18, {"from": owner})

ytao.setLowerExchangeRateBound(0.5e18, {"from": owner})

ytao.updateExchangeRate(1e18, {"from": owner})

tx = ytao.wrap(1e18, {"from": other})

assert tx.events['UserStake'][0]['user'] == other

assert tx.events['UserStake'][0]['inTaoAmt'] == 1e18

assert tx.events['UserStake'][0]['yTAOAmount'] == 999999999850000000

```

```

def test_pull_erc20(only_local):

```

```

    # Arrange

```

```

    owner = get_account(0)

```

```

    other = get_account(1)

```

```

    extra = get_account(2)

```

```

    wtao = deploy_wtao(owner)

```

```

    ytao = deploy_ytao(owner)

```

```

    # Assert

```

```

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

```

```

    wtao.transfer(ytao.address, 1e18, {"from": owner})

```

```

    with reverts("Caller does not have TOKEN_SAFE_PULL_ROLE"):

```

```

        ytao.safePullERC20(wtao.address, other, 1e18, {"from": other})

```

```

    ytao.grantRole(get_token_safe_pull_role(), extra, {"from": owner})

```

```

    with reverts("Recipient address cannot be null address"):

```

```

        ytao.safePullERC20(wtao.address, ZERO_ADDRESS, 1e18, {"from": extra})

```

```

    with reverts("Amount must be greater than 0"):

```



```

        ytao.safePullERC20(wtao.address, other, 0, {"from": extra})

    with reverts("Not enough tokens in contract"):

        ytao.safePullERC20(wtao.address, other, 2e18, {"from": extra})

tx = ytao.safePullERC20(wtao.address, other, 1e18, {"from": extra})

assert tx.events['ERC20TokenPulled'][0]['tokenAddress'] == wtao.address

assert tx.events['ERC20TokenPulled'][0]['to'] == other

assert tx.events['ERC20TokenPulled'][0]['amount'] == 1e18

def test_pull_native(only_local):

    # Arrange

    owner = get_account(0)

    other = get_account(1)

    extra = get_account(2)

    wtao = deploy_wtao(owner)

    ytao = deploy_ytao(owner)

    # Assert

    ytao.initialize(owner, 100e18, wtao.address, {"from": owner})

    with reverts("Caller does not have TOKEN_SAFE_PULL_ROLE"):

        ytao.pullNativeToken(other, 1e18, {"from": other})

    ytao.grantRole(get_token_safe_pull_role(), extra, {"from": owner})

    with reverts("Recipient address cannot be null address"):

        ytao.pullNativeToken(ZERO_ADDRESS, 1e18, {"from": extra})

    with reverts("Amount must be greater than 0"):

        ytao.pullNativeToken(other, 0, {"from": extra})

    with reverts("Not enough native tokens in contract"):

        ytao.pullNativeToken(other, 2e18, {"from": extra})

```

```

with reverts("Caller does not have NATIVE_DEPOSIT_ROLE"):
    ytao.depositNative(1e18, other, {"from": other})

ytao.grantRole(get_native_deposit_role(), extra, {"from": owner})

with reverts("Amount must be greater than 0"):
    ytao.depositNative(0, other, {"from": extra})

with reverts("Recipient address cannot be null address"):
    ytao.depositNative(1e18, ZERO_ADDRESS, {"from": extra})

ytao.grantRole(get_exchange_role(), extra, {"from": owner})

ytao.setUpperExchangeRateBound(2e18, {"from": extra})

ytao.setLowerExchangeRateBound(0.5e18, {"from": extra})

ytao.updateExchangeRate(1e18, {"from": extra})

tx = ytao.depositNative(1e18, other, {"from": extra})

assert tx.events['NativeStake'][0]['user'] == other

assert tx.events['NativeStake'][0]['inTaoAmt'] == 1e18

assert tx.events['NativeStake'][0]['yTAOAmount'] == 1e18

```

```
def test_unstake(only_local):
```

```
    # Arrange
```

```
    owner = get_account(0)
```

```
    other = get_account(1)
```

```
    extra = get_account(2)
```

```
    vault = get_account(3)
```

```
    random_account = "5EhvL1FVkJQPpMjZX4MAADcW42i3xPSF1KiCpuaxTYVr28sux"
```

```
    random_account_extra = 0x02D58870F7D2592b1Fb12d8e59bCB62B7AeC25ee
```

```
    wtao = deploy_wtao(owner)
```

```

y tao = deploy_y tao(owner)

# Assert

y tao.initialize(owner, 100e18, w tao.address, {"from": owner})

y tao.grantRole(get_exchange_role(), extra, {"from": owner})

y tao.grantRole(get_manage_staking_role(), extra, {"from": owner})

y tao.setMaxDepositPerRequest(5e18, {"from": extra})

y tao.setUpperExchangeRateBound(2e18, {"from": extra})

y tao.setLowerExchangeRateBound(0.5e18, {"from": extra})

y tao.updateExchangeRate(1e18, {"from": extra})

y tao.setNativeTokenReceiver(random_account, {"from": extra})

y tao.setProtocolVault(vault, {"from": extra})

service_fee = 0.001e18

y tao.setServiceFee(service_fee, {"from": extra})

y tao.setMinimumUnstakeAmount(0.01e18, {"from": extra})


w tao.transfer(other, 5e18, {"from": owner})

w tao.transfer(extra, 5e18, {"from": owner})

w tao.approve(y tao.address, 5e18, {"from": other})

tx = y tao.wrap(2e18, {"from": other})

assert tx.events['UserStake'][0]['user'] == other

assert tx.events['UserStake'][0]['inTaoAmt'] == 2e18

assert tx.events['UserStake'][0]['yTAOAmount'] == 2e18


with reverts("Fee amount is not sufficient"):

    y tao.requestUnstake(1e18, False, random_account_extra, {"from": other})

with reverts("Unstake amount is less than minimum"):

    y tao.requestUnstake(0.001e18, False, random_account_extra, {"from": other, "value":
service_fee})

```

```

    with reverts("Insufficient yTAO balance"):

        ytao.requestUnstake(3e18, False, random_account_extra, {"from": other, "value":
service_fee})

    with reverts("Maximum unstake requests exceeded"):

        ytao.requestUnstake(0.5e18, False, random_account_extra, {"from": other, "value":
service_fee})

    ytao.setMaxUnstakeRequest(2, {"from": extra})

    tx = ytao.requestUnstake(0.5e18, False, random_account_extra, {"from": other, "value":
service_fee})

    assert tx.events['UserUnstakeRequested'][0]['user'] == other

    assert tx.events['UserUnstakeRequested'][0]['idx'] == 0

    assert tx.events['UserUnstakeRequested'][0]['yTaoAmount'] == 0.5e18

    assert tx.events['UserUnstakeRequested'][0]['outTaoAmt'] == 0.5e18

    tx = ytao.requestUnstake(0.5e18, False, random_account_extra, {"from": other, "value":
service_fee})

    assert tx.events['UserUnstakeRequested'][0]['user'] == other

    assert tx.events['UserUnstakeRequested'][0]['idx'] == 1

    assert tx.events['UserUnstakeRequested'][0]['yTaoAmount'] == 0.5e18

    assert tx.events['UserUnstakeRequested'][0]['outTaoAmt'] == 0.5e18

    with reverts("Invalid request index"):

        ytao.unstake(2, {"from": other})

    with reverts("Unstake not approved yet"):

        ytao.unstake(0, {"from": other})

    ...

    struct UserRequest {

    address user;

```

```

uint256 requestIndex;

uint256 rewardAmount;

}

...

with reverts("Caller does not have APPROVE_WITHDRAWAL_ROLE"):

    ytao.approveMultipleUnstakes([[other, 0, 0.5e18]], {"from": extra})

ytao.grantRole(get_approve_withdrawal_role(), extra, {"from": owner})

with reverts("Requests array is empty"):

    ytao.approveMultipleUnstakes([], {"from": extra})

with reverts("First request index out of bounds"):

    ytao.approveMultipleUnstakes([[other, 2, 0.5e18]], {"from": extra})


wtao.approve(ytao.address, 5e18, {"from": extra})

tx = ytao.approveMultipleUnstakes([[other, 0, 0]], {"from": extra})

assert tx.events['AdminUnstakeApproved'][0]['user'] == other

assert tx.events['AdminUnstakeApproved'][0]['idx'] == 0


with reverts("Request is already approved"):

    ytao.approveMultipleUnstakes([[other, 0, 0.5e18]], {"from": extra})


tx = ytao.unstake(0, {"from": other})

assert tx.events['Transfer'][0]['from'] == ytao.address

assert tx.events['Transfer'][0]['to'] == other

assert tx.events['Transfer'][0]['value'] == 0.5e18

assert tx.events['UserUnstake'][0]['user'] == other

assert tx.events['UserUnstake'][0]['idx'] == 0

```

Technical Findings Summary

Findings

Vulnerability Level	Total	Pending	Not Apply	Acknowledged	Partially Fixed	Fixed
<div><div></div>High</div>	1					1
<div><div></div>Medium</div>	3			2		1
<div><div></div>Low</div>	1			1		
<div><div></div>Informational</div>	0					

Assessment Results

Score Results

Review	Score
Global Score	95/100
Assure KYC	https://assuredefi.com/projects/tainet/
Audit Score	90/100

The Following Score System Has been Added to this page to help understand the value of the audit, the maximum score is 100, however to attain that value the project must pass and provide all the data needed for the assessment. Our Passing Score has been changed to 84 Points for a higher standard, if a project does not attain 85% is an automatic failure. Read our notes and final assessment below. The Global Score is a combination of the evaluations obtained between having or not having KYC and the type of contract audited together with its manual audit.

Audit PASS

Following our comprehensive security audit of the token contract for TaiNET project, we inform you that the project has met the necessary security standards after addressing the critical issues highlighted in the report.

Disclaimer

Assure Defi has conducted an independent security assessment to verify the integrity of and highlight any vulnerabilities or errors, intentional or unintentional, that may be present in the reviewed code for the scope of this assessment. This report does not constitute agreement, acceptance, or advocating for the Project, and users relying on this report should not consider this as having any merit for financial advice in any shape, form, or nature. The contracts audited do not account for any economic developments that the Project in question may pursue, and the veracity of the findings thus presented in this report relate solely to the proficiency, competence, aptitude, and discretion of our independent auditors, who make no guarantees nor assurance that the contracts are entirely free of exploits, bugs, vulnerabilities or deprecation of technologies.

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