Cyberscope

Audit Report

Quarashi Staking ETH

April 2022

Type	ERC20
Network	ETH
Address	0xee7B65E341DE03621964c0f2CDAee78690e2cEe9
Audited by	© cyberscope

Table of Contents

Contract Review

Contract Name	QuaStaking
Compiler Version	v0.8.11+commit.d7f03943
Optimization	200000 runs
Licence	MIT
Explorer	https://etherscan.io/address/0xee7B65E341DE036219 64c0f2CDAee78690e2cEe9

Audit Updates

Initial Audit	13th April 2022
Corrected	

Source Files

Filename	SHA256
@openzeppelin/contracts/access/AccessControl.sol	0b280a0fe505b5b8bcb700e0b1f6242acf73e0b509372ef3acc46db051512e32
@openzeppelin/contracts/access/IAccessControl.sol	d03c1257f2094da6c86efa7aa09c1c07ebd33dd31046480c5097bc2542140e45
@openzeppelin/contracts/interfaces/IERC20.sol	1e78c90db4e4838c0a603bfbd2bafa2c38ba997769043e2a6045ad9e73764b60
@openzeppelin/contracts/token/ERC20/IERC20.sol	c2b06bb4572bb4f84bfc5477dadc0fcc497cb66c3a1bd53480e68bedc2e154a6
@openzeppelin/contracts/utils/Context.sol	1458c260d010a08e4c20a4a517882259a23a4baa0b5bd9add9fb6d6a1549814a
@openzeppelin/contracts/utils/introspection/ERC165.sol	8806a632d7b656cadb8133ff8f2acae4405b3a64d8709d93b0fa6a216a8a6154
@openzeppelin/contracts/utils/introspection/IERC165.sol	701e025d13ec6be09ae892eb029cd83b3064325801d73654847a5fb11c58b1e5
@openzeppelin/contracts/utils/Strings.sol	8597c62818dcbc6cf85c21179b90b714fb4f70a4347ca2eed23e88c87b08b8a1
contracts/QuaStaking.sol	b7a836810301a9c0aa8a3daa59618d2c01dc91992c79ada47201dfbb7644985e

Contract Analysis

The contract implements a basic staking feature. The users have the ability to deposit tokens to three different pools. Each pool provides a different combination of A.P.Y. (Annual Percentage Yield), locking period and commission. The commission is only applied if the user withdraws the tokens earlier than the locking period.

Pools

The pool options are 3 and cannot be changed.

Pool Id	A.P.Y. (percentage)	Locking Period (months)	Commission (percentage)
0	0.0055	1	0.01
1	0.0125	6	0.03
3	0.028	12	0.08

Reward calculation

The APY percentage is added every month to the previous month's APY. So for instance, if a user stake 10000 tokens in the pool id 1, then the withdrawn amount after 6 months will be 10773.9. As a result the APY does not work as an annual percentage but as an accumulated monthly percentage.

Early Withdraw

The depositors have the ability to withdraw the tokens earlier than the locking period. As a result the depositor will receive the APY percentage proportional to the time that has been elapsed. Additionally, the depositor will be taxed with a commission amount. The commission amount is calculated based on the initial deposit, not in the awarded amount.

Contract Owner privileges

- The Admin role is renounced
- The Admin role has the ability to set the commission address
- The Admin role has the ability to withdraw the contract’s excessed tokens.

Deposit Info Id Event Emit

Criticality	minor
Location	contract.sol#L34,41

Description

Since the TokensStaked and Withdraw() are based on the user's deposit info index, it would be more informative to emit the depositInfoId number in the event as well.

Recommendation

The depositInfoId could be emitted in the events.

Minimum Deposit Amount

Criticality	minor
Location	contract.sol#L109

Description

The calculation of award amount is a production of division. Hence, there is a minimum amount that the division will return zero.

The minimum amount are:

- if a user deposits 181 tokens in the pool id 1, then the awards amount will be zero.
- if a user deposits 79 tokens in the pool id 2, then the awards amount will be zero.
- if a user deposits 35 tokens in the pool id 3, then the awards amount will be zero.

```
_maxUnstakeAmount * pools[_poolId].APY / PERSENT_BASE;
```

Recommendation

The contract could have a minimum amount check, so it is guaranteed that all the depositors will receive rewards.

Contract Diagnostics

Critical Medium Minor

Severity	Code	Description
	L04	Conformance to Solidity Naming Conventions
	L14	Uninitialized Variables in Local Scope

L04 - Conformance to Solidity Naming Conventions

Criticality	minor
Location	contracts/QuaStaking.sol#L85,100,140,196,227,228

Description

Solidity defines a naming convention that should be followed. Rule exceptions:

- Allow constant variable name/symbol/decimals to be lowercase.
- Allow _ at the beginning of the mixed_case match for private variables and unused parameters.

```
_depositInfoId
_user
_poolId
_commissionAddress
```

Recommendation

Follow the Solidity naming convention.
https://docs.soliditylang.org/en/v0.4.25/style-guide.html#naming-conventions

L14 - Uninitialized Variables in Local Scope

Criticality	minor
Location	contracts/QuaStaking.sol#L108,207,243,76,249

Description

The are variables that are defined in the local scope and are not initialized.

```
i
commissionAmount
```

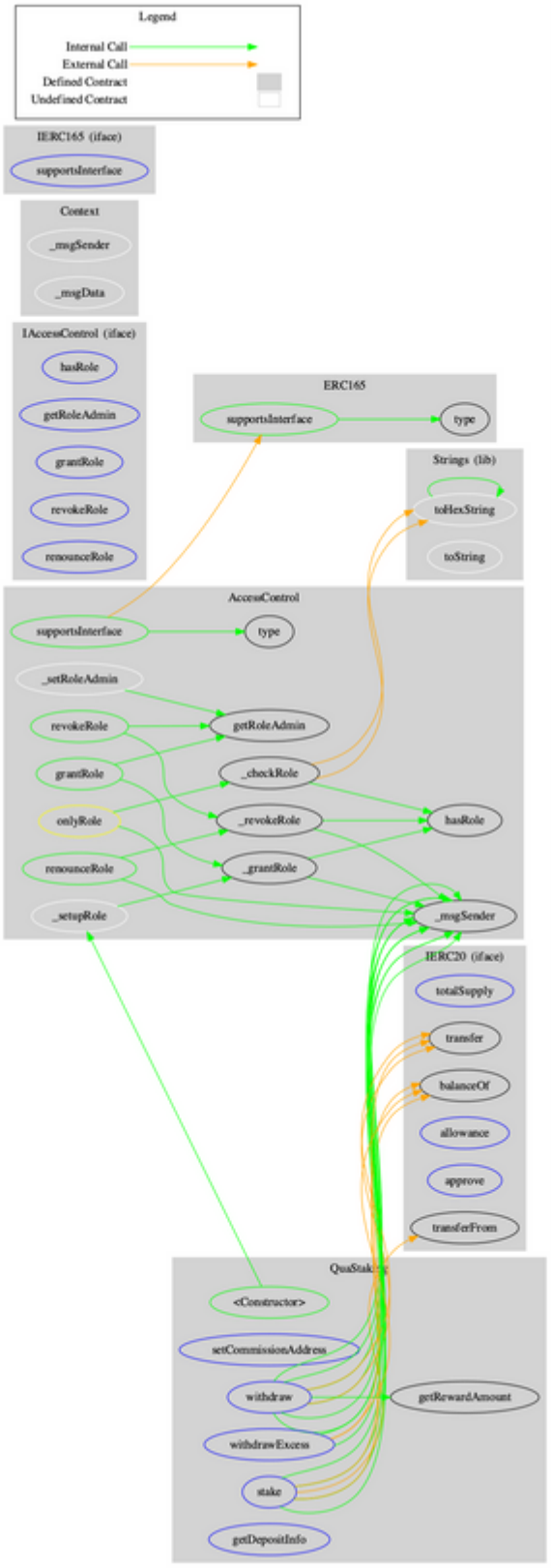
Recommendation

All the local scoped variables should be initialized.

Contract Functions

Contract	Type	Bases		
	Function Name	Visibility	Mutability	Modifiers
QuaStaking	Implementation	AccessControl		
	<Constructor>	Public	✓	-
	setCommissionAddress	External	✓	onlyRole
	stake	External	✓	-
	withdraw	External	✓	-
	withdrawExcess	External	✓	onlyRole
	getDepositInfo	External		-
	getRewardAmount	Public		-

Contract Flow



Summary

Quarashi Staking is a typical implementation of staking functionality. The users have the ability to stake tokens and get the rewards once the locked period has elapsed. This audit focuses on the business logic and potential optimizations.

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The Cyberscope team

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