Competitive Security Assessment

QnA3_ERC20

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Secure3

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Summary

This report is prepared for the project to identify vulnerabilities and issues in the smart contract source code. A group of NDA covered experienced security experts have participated in the Secure3's Audit Contest to find vulnerabilities and optimizations. Secure3 team has participated in the contest process as well to provide extra auditing coverage and scrutiny of the finding submissions.
The comprehensive examination and auditing scope includes:
• Cross checking contract implementation against functionalities described in the documents and white paper disclosed by the project owner.
• Contract Privilege Role Review to provide more clarity on smart contract roles and privilege.
• Using static analysis tools to analyze smart contracts against common known vulnerabilities patterns.
• Verify the code base is compliant with the most up-to-date industry standards and security best practices.
• Comprehensive line-by-line manual code review of the entire codebase by industry experts.
The security assessment resulted in findings that are categorized in four severity levels: Critical, Medium, Low, Informational. For each of the findings, the report has included recommendations of fix or mitigation for security and best practices.

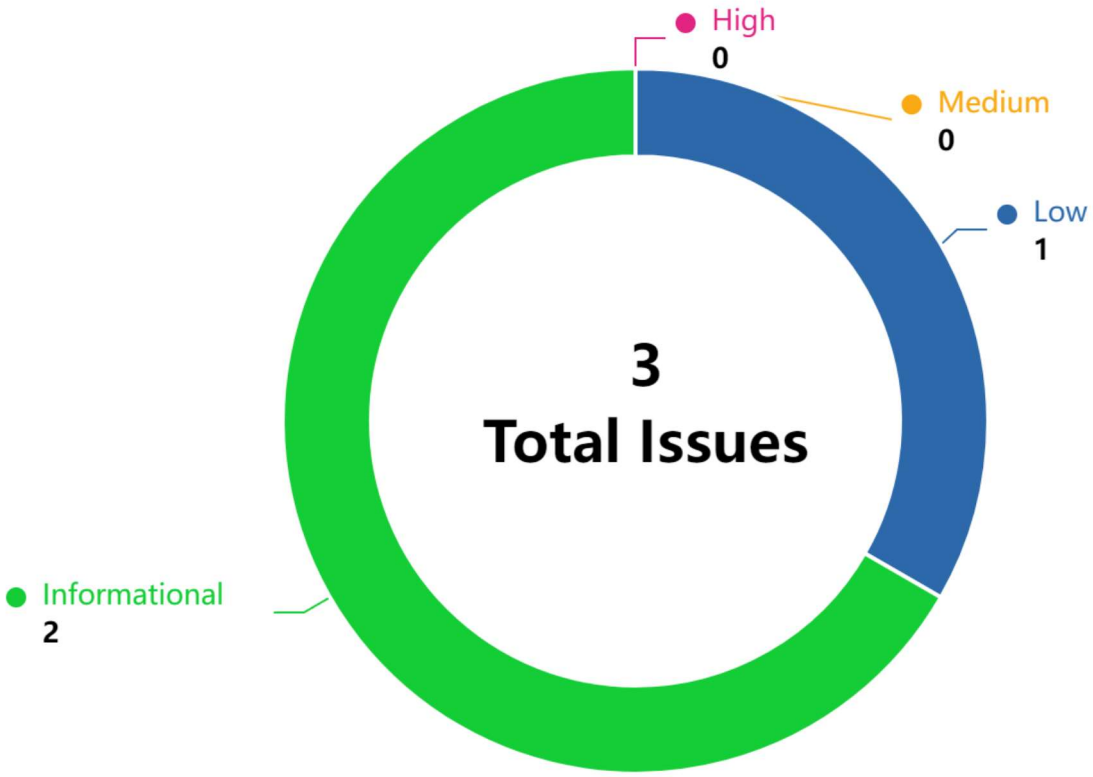
Overview

Project Name	QnA3_ERC20
Language	Solidity
Codebase	• QNA_ERC20.sol • audit version - 891e3b22d49992eb2b9a6cefb15cf8caa689f6f7 • final version - 891e3b22d49992eb2b9a6cefb15cf8caa689f6f7

Audit Scope

File	SHA256 Hash
QNA_ERC20.sol	66a36cbc94e47a08fb6ed74f7d128e80f4937f8314758ef36e86b5ce21d28ae9

Code Assessment Findings



ID	Name	Category	Severity	Client Response	Contributor
QAE-1	Use Ownable2Step Instead	Logical	Low	Acknowledged	***
QAE-2	Use The Latest Solidity Version	Language Specific	Informational	Acknowledged	***
QAE-3	Missing Zero Address Check on `_recipient` in Constructor	Logical	Informational	Acknowledged	***

QAE-1:Use Ownable2Step Instead

Category	Severity	Client Response	Contributor
Logical	Low	Acknowledged	***

Code Reference

- code/QNA_ERC20.sol#L4
- code/QNA_ERC20.sol#L9
- code/QNA_ERC20.sol#L18

```
4: import "@openzeppelin/contracts/access/Ownable.sol";
```

```
9: contract GPTToken is ERC20Burnable, ERC20Votes, ERC20Permit, Ownable {
```

```
18: Ownable(msg.sender)
```

Description

***: Ownable2Step is safer than Ownable for smart contracts because the owner cannot accidentally transfer smart contract ownership to a mistyped address. Rather than directly transferring to the new owner, the transfer only completes when the new owner accepts ownership.
Check the docs and the code here.
***: The contract QNA_ERC20.sol does not implement a 2-Step-Process for transferring ownership.
So ownership of the contract can easily be lost when making a mistake when transferring ownership.

Recommendation

***: It is recommended to use `Ownable2Step.sol`.
***: Use the Ownable2Step variant of the Ownable contract to better safeguard against accidental transfers of access control.

Client Response

client response for 0xCO2: Acknowledged - There are currently no plans to transfer ownership
client response for xyzqwe123: Acknowledged - There are currently no plans to transfer ownership

QAE-2:Use The Latest Solidity Version

Category	Severity	Client Response	Contributor
Language Specific	Informational	Acknowledged	***

Code Reference

- code/QNA_ERC20.sol#L2

```
2: pragma solidity ^0.8.21;
```

Description

***: Developers should stay away from using floating and outdated pragma. Contracts should be deployed with the same compiler version and flags that they have been tested with thoroughly. Locking the pragma helps to ensure that contracts do not accidentally get deployed using, for example, an outdated compiler version that might introduce bugs that affect the contract system negatively.

Recommendation

***: It is recommended to lock a recent version of the Solidity compiler.

```
pragma solidity 0.8.25;
```

Client Response

client response for 0xCO2: Declined - The contract is currently running smoothly
Secure3: Acknowledged - Developers should stay away from using floating and outdated pragma. Contracts should be deployed with the same compiler version and flags that they have been tested with thoroughly. Locking the pragma helps to ensure that contracts do not accidentally get deployed using, for example, an outdated compiler version that might introduce bugs that affect the contract system negatively.
We need to ensure contract security, not just currently running smoothly.

QAE-3:Missing Zero Address Check on `_recipient` in Constructor

Category	Severity	Client Response	Contributor
Logical	Informational	Acknowledged	***

Code Reference

- code/QNA_ERC20.sol#L20

```
20: _mint(_recipient, maxSupply);
```

Description

***: As all the `maxSupply` is mint to `_recipient`, there is no validation on the `_recipient`

Recommendation

***: Add `require(_recipient != address(0), "invalid address")` in the constructor

Client Response

client response for toffee: Acknowledged - At present, the mint tokens are already in the _recipient wallet, so there's no risk involved.

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