



Preliminary Comments

ENTC

Mar 23rd, 2022

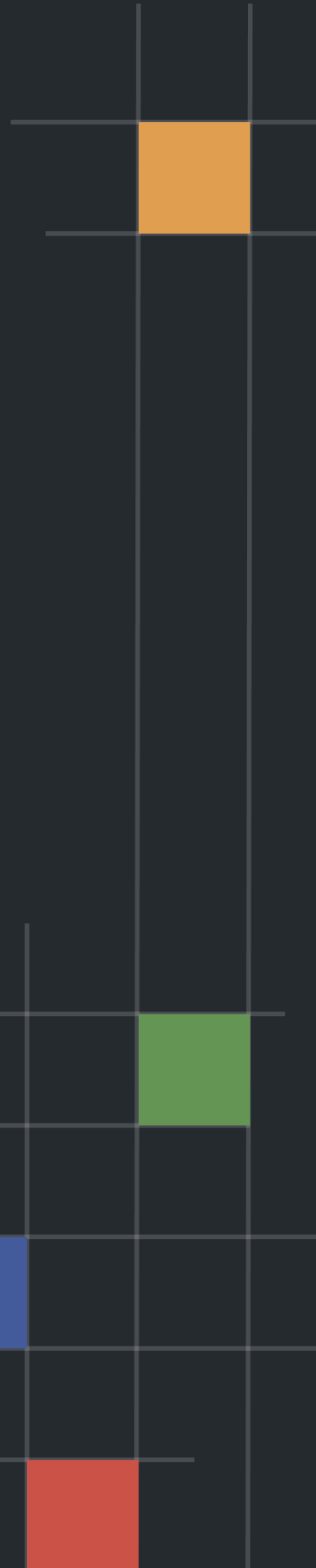


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Disclaimer

About

Summary

This report has been prepared for ENTC to discover issues and vulnerabilities in the source code of the ENTC project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Static Analysis and Manual Review techniques.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases;
- Provide more comments per each function for readability, especially contracts that are verified in public;
- Provide more transparency on privileged activities once the protocol is live.

Overview

Project Summary

Project Name	ENTC
Platform	Ethereum
Language	Solidity
Codebase	https://etherscan.io/address/0x3ecab35b64345bfc472477a653e4a3abe70532d9
Commit	

Audit Summary

Delivery Date	Mar 23, 2022 UTC
Audit Methodology	Static Analysis, Manual Review

Vulnerability Summary

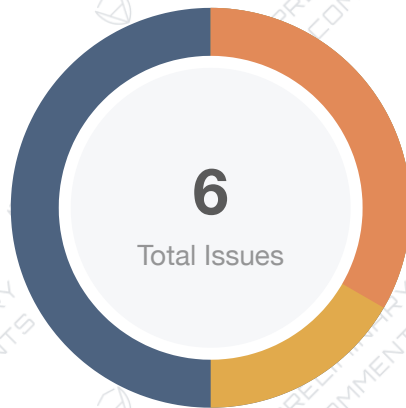
Vulnerability Level	Total	Pending	Declined	Acknowledged	Partially Resolved	Mitigated	Resolved
🔴 Critical	0	0	0	0	0	0	0
🟠 Major	2	2	0	0	0	0	0
🟡 Medium	1	1	0	0	0	0	0
🟠 Minor	0	0	0	0	0	0	0
🟢 Informational	3	3	0	0	0	0	0
🟢 Discussion	0	0	0	0	0	0	0



Audit Scope

ID	File	SHA256 Checksum
ENT	ENTERBUTTON.sol	3d1bfa2b66fb8c8fd8daf9751241603a98c3e69f02a72eff5ff9297705685d68

Findings



Critical	0 (0.00%)
Major	2 (33.33%)
Medium	1 (16.67%)
Minor	0 (0.00%)
Informational	3 (50.00%)
Discussion	0 (0.00%)

ID	Title	Category	Severity	Status
ENT-01	Centralization Risk in ENTERBUTTON.sol	Centralization / Privilege	Major	⚠ Pending
ENT-02	Redundant Code Components	Volatile Code	Informational	⚠ Pending
ENT-03	Missing Emit Events	Coding Style	Informational	⚠ Pending
ENT-04	Improper Usage of public and external Type	Gas Optimization	Informational	⚠ Pending
ENT-05	Initial Token Distribution	Centralization / Privilege	Major	⚠ Pending
ENT-06	Potential Underflow	Mathematical Operations	Medium	⚠ Pending

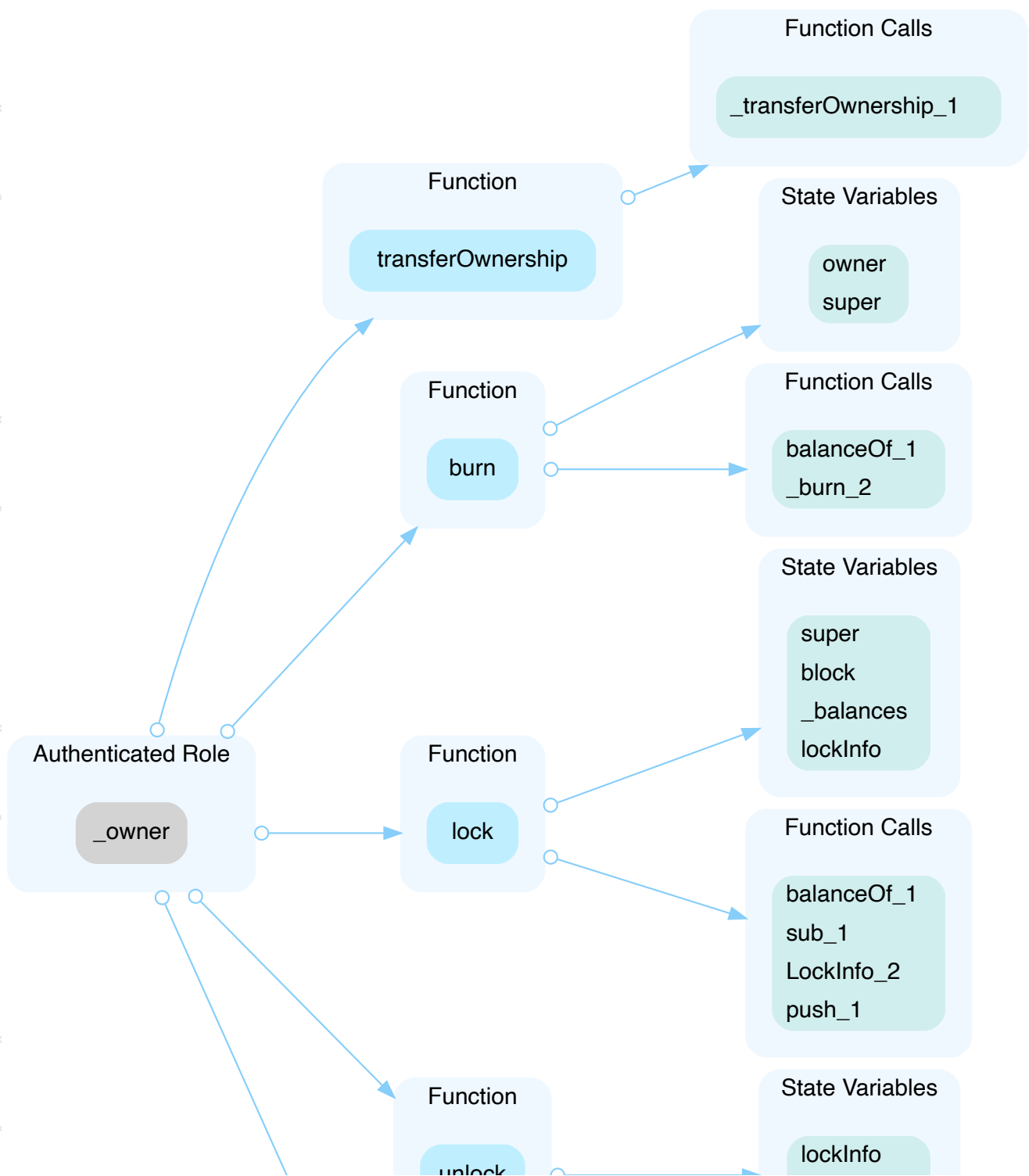
ENT-01 | Centralization Risk In ENTERBUTTON.sol

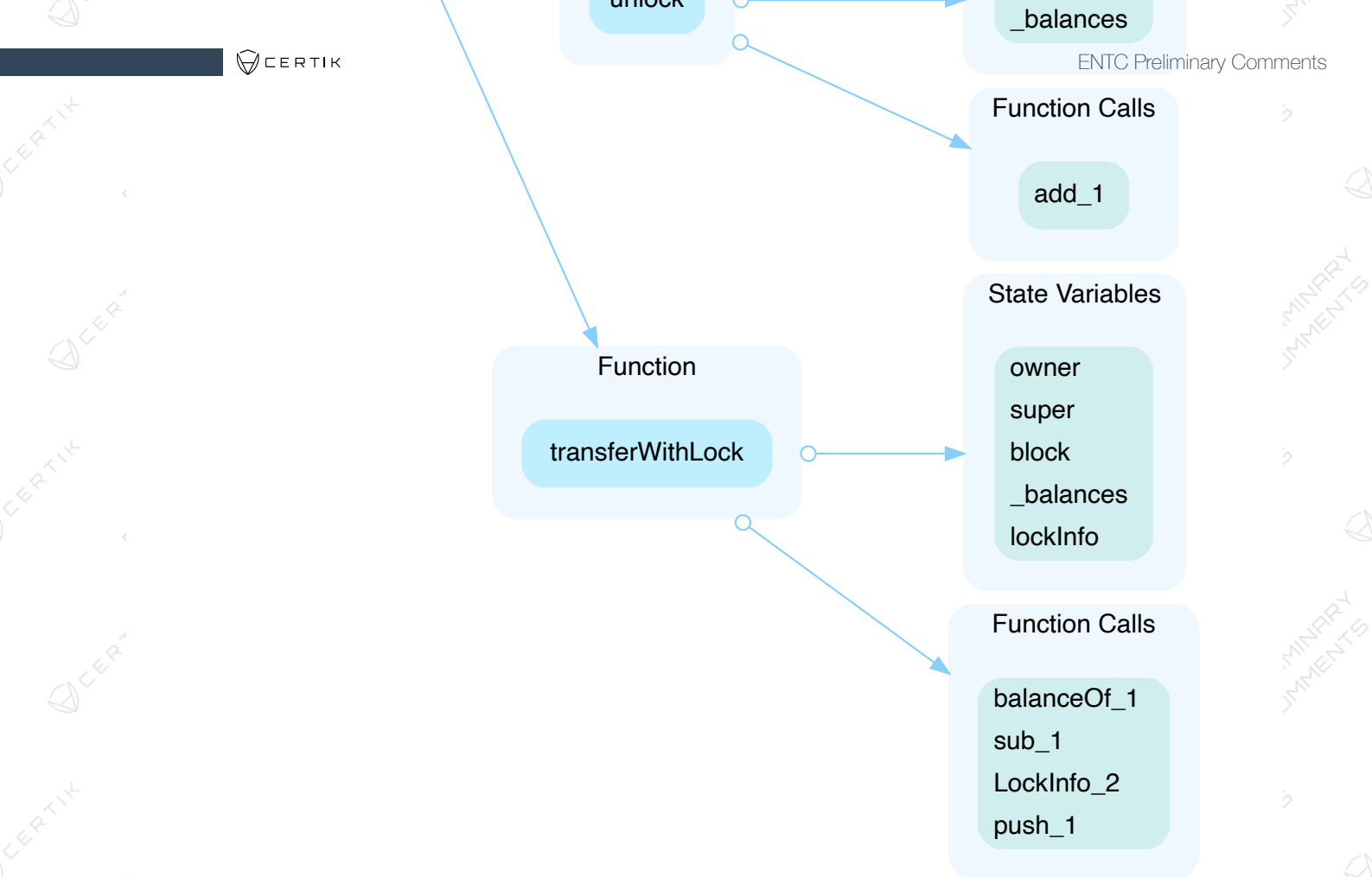
Category	Severity	Location	Status
Centralization / Privilege	Major	ENTERBUTTON.sol: 181~183, 218~223, 266~275, 277~288, 290~303	⚠ Pending

Description

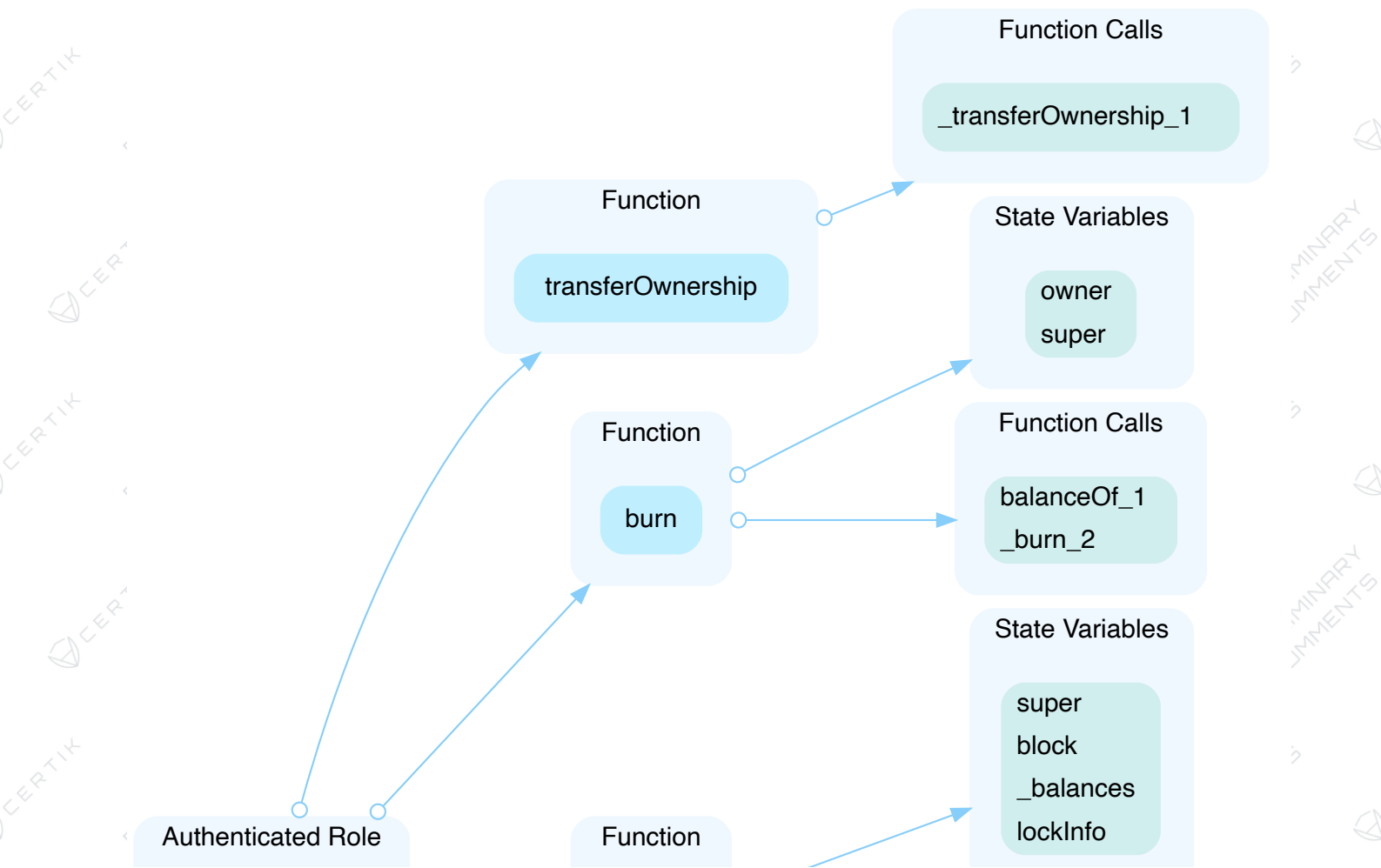
In the contract ENTERBUTTON the role `_owner` has authority over the functions shown in the diagram below.

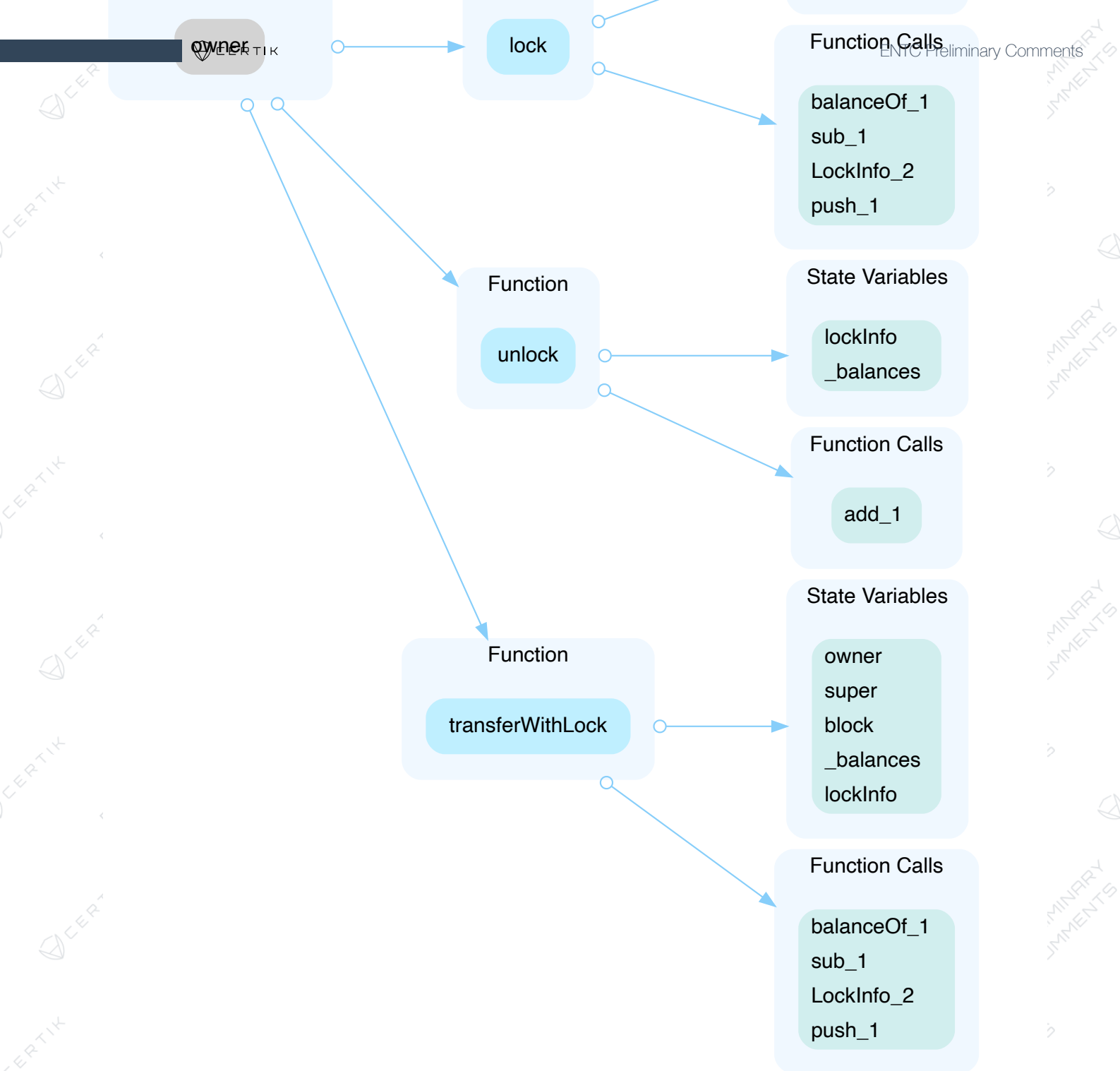
Any compromise to the `_owner` account may allow the hacker to take advantage of this authority.





In the contract `ENTERBUTTON` the role `owner` has authority over the functions shown in the diagram below. Any compromise to the `owner` account may allow the hacker to take advantage of this authority.





Recommendation

The risk describes the current project design and potentially makes iterations to improve in the security operation and level of decentralization, which in most cases cannot be resolved entirely at the present stage. We advise the client to carefully manage the privileged account's private key to avoid any potential risks of being hacked. In general, we strongly recommend centralized privileges or roles in the protocol be improved via a decentralized mechanism or smart-contract-based accounts with enhanced security practices, e.g., multisignature wallets.

Indicatively, here are some feasible suggestions that would also mitigate the potential risk at a different level in terms of short-term, long-term and permanent:

Short Term:

Timelock and Multi sign ($\frac{2}{3}$, $\frac{3}{5}$) combination *mitigate* by delaying the sensitive operation and avoiding a single point of key management failure.

- Time-lock with reasonable latency, e.g., 48 hours, for awareness on privileged operations;
AND
- Assignment of privileged roles to multi-signature wallets to prevent a single point of failure due to the private key compromised;
AND
- A medium/blog link for sharing the timelock contract and multi-signers addresses information with the public audience.

Long Term:

Timelock and DAO, the combination, *mitigate* by applying decentralization and transparency.

- Time-lock with reasonable latency, e.g., 48 hours, for awareness on privileged operations;
AND
- Introduction of a DAO/governance/voting module to increase transparency and user involvement.
AND
- A medium/blog link for sharing the timelock contract, multi-signers addresses, and DAO information with the public audience.

Permanent:

Renouncing the ownership or removing the function can be considered *fully resolved*.

- Renounce the ownership and never claim back the privileged roles.
OR
- Remove the risky functionality.

ENT-02 | Redundant Code Components

Category	Severity	Location	Status
Volatile Code	● Informational	ENTERBUTTON.sol: 151~154	ⓘ Pending

Description

The linked statements do not affect the functionality of the codebase and appear to be either leftovers from test code or older functionality.

Recommendation

We advise to remove the redundant statements for production environments.

ENT-03 | Missing Emit Events

Category	Severity	Location	Status
Coding Style	<div><div></div> Informational</div>	ENTERBUTTON.sol: 181~183	<div><div></div> Pending</div>

Description

There should always be events emitted in the sensitive functions that are controlled by centralization roles.

Recommendation

It is recommended emitting events for the sensitive functions that are controlled by centralization roles.

ENT-04 | Improper Usage Of `public` And `external` Type

Category	Severity	Location	Status
Gas Optimization	● Informational	ENTERBUTTON.sol: 80, 84, 88, 93, 97, 102, 108, 113, 181, 218, 259, 262, 266, 277, 290	ⓘ Pending

Description

`public` functions that are never called by the contract could be declared as `external`. `external` functions are more efficient than `public` functions.

Recommendation

Consider using the `external` attribute for public functions that are never called within the contract.

ENT-05 | Initial Token Distribution

Category	Severity	Location	Status
Centralization / Privilege	● Major	ENTERBUTTON.sol: 164	ⓘ Pending

Description

All of the ENTC tokens are sent to the contract deployer when deploying the contract. This could be a centralization risk as the deployer can distribute ENTC tokens without obtaining the consensus of the community.

Recommendation

We recommend the team to be transparent regarding the initial token distribution process, and the team shall make enough efforts to restrict the access of the private key.

ENT-06 | Potential Underflow

Category	Severity	Location	Status
Mathematical Operations	● Medium	ENTERBUTTON.sol: 252	ⓘ Pending

Description

When i=0, the highlighted line can cause an integer underflow.

Recommendation

We recommend altering the logic in function `releaseLock` to avoid such issues.

Appendix

Finding Categories

Centralization / Privilege

Centralization / Privilege findings refer to either feature logic or implementation of components that act against the nature of decentralization, such as explicit ownership or specialized access roles in combination with a mechanism to relocate funds.

Gas Optimization

Gas Optimization findings do not affect the functionality of the code but generate different, more optimal EVM opcodes resulting in a reduction on the total gas cost of a transaction.

Mathematical Operations

Mathematical Operation findings relate to mishandling of math formulas, such as overflows, incorrect operations etc.

Volatile Code

Volatile Code findings refer to segments of code that behave unexpectedly on certain edge cases that may result in a vulnerability.

Coding Style

Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

Checksum Calculation Method

The "Checksum" field in the "Audit Scope" section is calculated as the SHA-256 (Secure Hash Algorithm 2 with digest size of 256 bits) digest of the content of each file hosted in the listed source repository under the specified commit.

The result is hexadecimal encoded and is the same as the output of the Linux "sha256sum" command against the target file.

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