Security Assessment

Xan

Oct 26th, 2021

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Summary

This report has been prepared for Xan to discover issues and vulnerabilities in the source code of the Xan 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.

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	Xan
Platform	TRON
Language	Solidity
Codebase	https://tronscan.io/#/token20/TQS5UxB745AnGAwv3CoLJcFtaUDANEJFmA/code
Commit	

Audit Summary

Delivery Date	Oct 26, 2021
Audit Methodology	Static Analysis, Manual Review
Key Components	

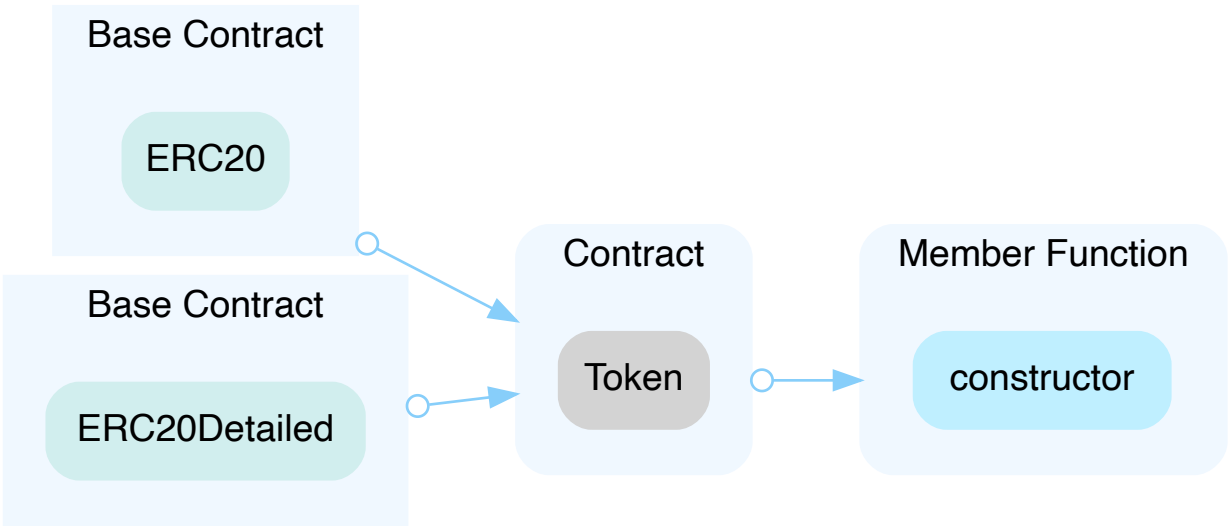
Vulnerability Summary

Vulnerability Level	Total	Pending	Declined	Acknowledged	Partially Resolved	Resolved
Critical	0	0	0	0	0	0
Major	1	0	0	1	0	0
Medium	0	0	0	0	0	0
Minor	0	0	0	0	0	0
Informational	1	0	0	1	0	0
Discussion	0	0	0	0	0	0

Audit Scope

ID	File	SHA256 Checksum
ERC	ERC20.sol	15182c769796730b6dd9f9ef5afcfa5f14cc9d2f1c208cb6ea3ae4f35db99c69
ERD	ERC20Detailed.sol	368c5875c8e976e1fec5776c043ff78c3c93a9c08d42a38617b38480a627523f
IER	IERC20.sol	7f5961b8cc5d251a28e3385bbc043fde4a44e48224a375e476e1ffdc359079ad
SMX	SafeMath.sol	38d61179ebe62a2bd1e77383348d057c64b45aae42afd2ce3282071d081842f6
TXA	Token.sol	6bfdc21d2fa742c18926951b34d615a4ebbabf6f4e9b2445a39c446ff0389c46

Diagrams


Base Contract
ERC20
Base Contract
ERC20Detailed
Contract
Token
Member Function
constructor

Findings

Critical	0 (0.00%)
Major	1 (50.00%)
Medium	0 (0.00%)
Minor	0 (0.00%)
Informational	1 (50.00%)
Discussion	0 (0.00%)

ID	Title	Category	Severity	Status
XAN-01	Unlocked Compiler Version	Language Specific	Informational	Acknowledged
XAN-02	Centralization Risk	**Centralization / Privilege**	**Major**	Acknowledged

XAN-01 | Unlocked Compiler Version

Category	Severity	Location	Status
Language Specific	Informational	Global	Acknowledged

Description

The contract has an unlocked compiler version. An unlocked compiler version in the source code of the contract permits the user to compile it at or above a particular version. This, in turn, leads to differences in the generated bytecode between compilations due to differing compiler version numbers. This can lead to ambiguity when debugging as compiler-specific bugs may occur in the codebase that would be hard to identify over a span of multiple compiler versions rather than a specific one.

Recommendation

We advise that the compiler version is alternatively locked at the lowest version possible that the contract can be compiled at. For example, for version `v0.5.0` the contract should contain the following line:

```
pragma solidity 0.5.0;
```

Alleviation

No Alleviation.

XAN-02 | Centralization Risk

Category	Severity	Location	Status
Centralization / Privilege	**Major**	**Global**	Acknowledged

Description

In this contract, all tokens are pre-assigned to the creator. The creator can later distribute these tokens as he wishes using `transfer` and other `ERC20` functions.

Recommendation

We advise the client to carefully manage the creator account's private key to avoid any potential risks of being hacked. In general, we strongly recommend centralized privileges or roles in the protocol to 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 the different levels in terms of short-term and long-term:

- Time-lock with reasonable latency, e.g., 48 hours, for awareness on privileged operations;
- Assignment of privileged roles to multi-signature wallets to prevent a single point of failure due to the private key;
- Introduction of a DAO/governance/voting module to increase transparency and user involvement.

Alleviation

The team response that they will use multi-signature wallets.

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.

Language Specific

Language Specific findings are issues that would only arise within Solidity, i.e. incorrect usage of private or delete.

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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