Cyberscope

Audit Report

Venus Protocol

February 2025

Network	ETH
Address	0xd3CC9d8f3689B83c91b7B59cAB4946B063EB894A
Audited by	© cyberscope

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Risk Classification

The criticality of findings in Cyberscope's smart contract audits is determined by evaluating multiple variables. The two primary variables are:

1. **Likelihood of Exploitation**: This considers how easily an attack can be executed, including the economic feasibility for an attacker.
2. **Impact of Exploitation**: This assesses the potential consequences of an attack, particularly in terms of the loss of funds or disruption to the contract's functionality.

Based on these variables, findings are categorized into the following severity levels:

1. **Critical**: Indicates a vulnerability that is both highly likely to be exploited and can result in significant fund loss or severe disruption. Immediate action is required to address these issues.
2. **Medium**: Refers to vulnerabilities that are either less likely to be exploited or would have a moderate impact if exploited. These issues should be addressed in due course to ensure overall contract security.
3. **Minor**: Involves vulnerabilities that are unlikely to be exploited and would have a minor impact. These findings should still be considered for resolution to maintain best practices in security.
4. **Informative**: Points out potential improvements or informational notes that do not pose an immediate risk. Addressing these can enhance the overall quality and robustness of the contract.

Severity	Likelihood / Impact of Exploitation
Critical	Highly Likely / High Impact
Medium	Less Likely / High Impact or Highly Likely/ Lower Impact
Minor / Informative	Unlikely / Low to no Impact

Review

Contract Name	XVS
Compiler Version	v0.8.13+commit.abaa5c0e
Optimization	200 runs
Explorer	https://etherscan.io/address/0xd3cc9d8f3689b83c91b7b59cab4946b063eb894a
Address	0xd3cc9d8f3689b83c91b7b59cab4946b063eb894a
Network	ETH
Symbol	XVS
Decimals	18
Total Supply	757,828.359

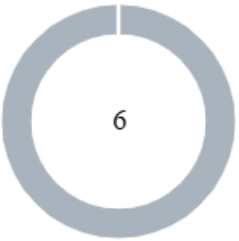
Audit Updates

Initial Audit	03 Feb 2025

Source Files

Filename	SHA256
XVS.sol	7ee4213317c0be104f80ed0414b61b2c25098e7ed15d3fbf1e70cf67bf80c961
TokenController.sol	63f9cb2342c0f5ce877009aab2136e80da39cac5d0baf75acb96e105844035ad

Findings Breakdown



Critical	0
Medium	0
Minor / Informative	6

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	0	0	0	0
Medium	0	0	0	0
Minor / Informative	0	6	0	0

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
●	BC	Blacklists Addresses	Acknowledged
●	BT	Burns Tokens	Acknowledged
●	CCR	Contract Centralization Risk	Acknowledged
●	MT	Mints Tokens	Acknowledged
●	ST	Stops Transactions	Acknowledged
●	UTPD	Unverified Third Party Dependencies	Acknowledged

BC - Blacklists Addresses

Criticality	Minor / Informative
Location	TokenController.sol#L118
Status	Acknowledged

Description

The authorized addresses have the authority to stop addresses from transactions. Those addresses may take advantage of it by calling the `updateBlacklist` function.

```
   function updateBlacklist(address user_, bool value_)
external {
        _ensureAllowed("updateBlacklist(address,bool)");
        _blacklist[user_] = value_;
        emit BlacklistUpdated(user_, value_);
    }
```

Recommendation

The team should carefully manage the private keys of the authorized addresses. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions.

Temporary Solutions:

These measurements do not decrease the severity of the finding

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-signature wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

Permanent Solution:

- Renouncing the ownership, which will eliminate the threats but it is non-reversible.

Team Update

The team has acknowledged that this is not a security issue and states: *Only timelocks contracts and a multisig wallet are authorized to call this function, as you can check here.*

BT - Burns Tokens

Criticality	Minor / Informative
Location	XVS.sol#L41
Status	Acknowledged

Description

The authorized addresses have the authority to burn tokens from a specific address. Those addresses may take advantage of it by calling the `burn` function. As a result, the targeted address will lose the corresponding tokens, and the authorized address will increase its minting limit.

```
    function burn(address account_, uint256 amount_) external
whenNotPaused {
        _ensureAllowed("burn(address,uint256)");
        _burn(account_, amount_);
        _increaseMintLimit(msg.sender, amount_);
    }
```

Recommendation

The team should carefully manage the private keys of the authorized addresses. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions.

Temporary Solutions:

These measurements do not decrease the severity of the finding

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-signature wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

Permanent Solution:

- Renouncing the ownership, which will eliminate the threats but it is non-reversible.

Team Update

The team has acknowledged that this is not a security issue and states: *Only the XVSBridgeDest contract is authorized to burn XVS tokens on Ethereum. That is the expected (and needed) behaviour, when XVS tokens are transferred from Ethereum to any other chain. See permissions here.*

CCR - Contract Centralization Risk

Criticality	Minor / Informative
Location	TokenController.sol#L131,150,166
Status	Acknowledged

Description

The contract's functionality and behavior are heavily dependent on external parameters or configurations. While external configuration can offer flexibility, it also poses several centralization risks that warrant attention. Centralization risks arising from the dependence on external configuration include Single Point of Control, Vulnerability to Attacks, Operational Delays, Trust Dependencies, and Decentralization Erosion.

```
    function setAccessControlManager(address
newAccessControlAddress_) external onlyOwner {
        ensureNonzeroAddress(newAccessControlAddress_);
        emit NewAccessControlManager(accessControlManager,
newAccessControlAddress_);
        accessControlManager = newAccessControlAddress_;
    }
```

```
    function setMintCap(address minter_, uint256 amount_)
external {
        _ensureAllowed("setMintCap(address,uint256)");
        ...
        minterToCap[minter_] = amount_;
        emit MintCapChanged(minter_, amount_);
    }

    function migrateMinterTokens(address source_, address
destination_) external {
        _ensureAllowed("migrateMinterTokens(address,address)");
    ...
    }
```

Recommendation

To address this finding and mitigate centralization risks, it is recommended to evaluate the feasibility of migrating critical configurations and functionality into the contract's codebase itself. This approach would reduce external dependencies and enhance the contract's self-sufficiency. It is essential to carefully weigh the trade-offs between external configuration flexibility and the risks associated with centralization.

Team Update

The team has acknowledged that this is not a security issue and states: *Only timelock contracts (Governance) or Guardian multisig wallets can perform privileged functions.*

MT - Mints Tokens

Criticality	Minor / Informative
Location	XVS.sol#L27
Status	Acknowledged

Description

The authorized addresses have the authority to mint tokens. These addresses may take advantage of it by calling the `mint` function. As a result, the contract tokens will be highly inflated.

```
   function mint(address account_, uint256 amount_) external
whenNotPaused {
        _ensureAllowed("mint(address,uint256)");
        _isEligibleToMint(msg.sender, account_, amount_);
        _mint(account_, amount_);
    }
```

Recommendation

The team should carefully manage the private keys of the authorized addresses' accounts. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions.

Temporary Solutions:

These measurements do not decrease the severity of the finding

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-signature wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

Permanent Solution:

- Renouncing the ownership, which will eliminate the threats but it is non-reversible.

Team Update

The team has acknowledged that this is not a security issue and states: *It's the expected behaviour in the lock/mint bridge model we are following. Only the XVSBridgeDest contract can call this function (see here).*

ST - Stops Transactions

Criticality	Minor / Informative
Location	XVS.sol#L55
Status	Acknowledged

Description

The authorized addresses have the authority to stop the transactions for all users including the owner. Those addresses take advantage of it by calling the `pause` function. As a result, the contract will revert all transactions, including buys, sells and transfers.

```
function pause() external {
        _ensureAllowed("pause()");
        _pause();
    }

    function unpause() external {
        _ensureAllowed("unpause()");
        _unpause();
    }

    function _beforeTokenTransfer(address from_, address to_,
uint256 amount_) internal override whenNotPaused {
    ...
    }
```

Recommendation

The team should carefully manage the private keys of the authorized addresses. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions.

Temporary Solutions:

These measurements do not decrease the severity of the finding

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-signature wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

Permanent Solution:

- Renouncing the ownership, which will eliminate the threats but it is non-reversible.

Team Update

The team has acknowledged that this is not a security issue and states: *Pause and unpause can be only invoked by the Governance timelock contracts and the Guardian wallet. It's the expected configuration. See here and here.*

UTPD - Unverified Third Party Dependencies

Criticality	Minor / Informative
Location	TokenController.sol#L258
Status	Acknowledged

Description

The contract uses an external contract in order to determine the transaction's flow. The external contract is untrusted. As a result, it may produce security issues and harm the transactions.

```
    function _ensureAllowed(string memory functionSig_) internal view
{
        if
(!IAccessControlManagerV8(accessControlManager).isAllowedToCall(msg.
sender, functionSig_)) {
            revert Unauthorized();
        }
    }
```

Recommendation

The contract should use a trusted external source. A trusted source could be either a commonly recognized or an audited contract. The pointing addresses should not be able to change after the initialization.

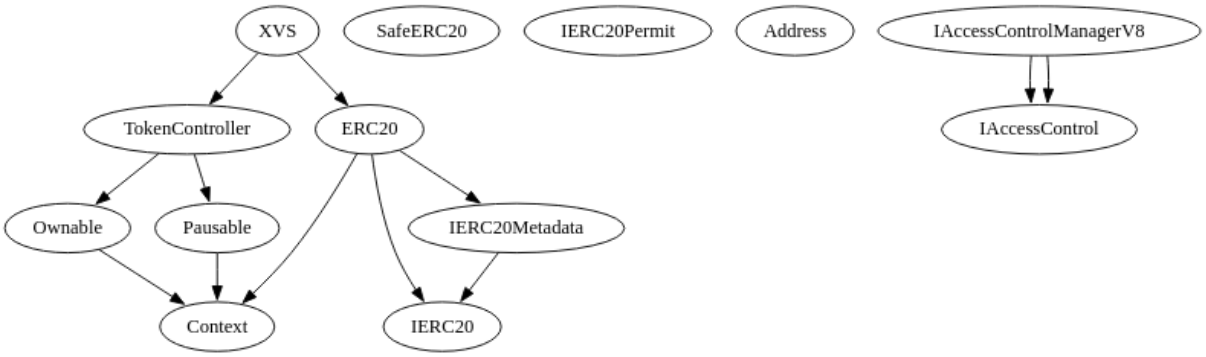
Team Update

The team has acknowledged that this is not a security issue and states: *The AccessControlManager used by the XVS deployed to Ethereum is https://etherscan.io/address/0x230058da2D23eb8836EC5DB7037ef7250c56E25E. That contract was audited at least by Quantstamp and Certik.*

Functions Analysis

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
XVS	Implementation	ERC20, TokenController		
		Public	✓	ERC20 TokenController
	mint	External	✓	whenNotPaused
	burn	External	✓	whenNotPaused
	_beforeTokenTransfer	Internal	✓	whenNotPaused
TokenController	Implementation	Ownable, Pausable		
		Public	✓	-
	pause	External	✓	-
	unpause	External	✓	-
	updateBlacklist	External	✓	-
	setMintCap	External	✓	-
	setAccessControlManager	External	✓	onlyOwner
	migrateMinterTokens	External	✓	-
	isBlackListed	External		-
	_isEligibleToMint	Internal	✓	
	_increaseMintLimit	Internal	✓	
	_ensureAllowed	Internal		

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
Pausable
Ownable
IAccessControl
IAccessControlManagerV8
Context
IERC20Metadata
ERC20
XVS
IERC20
SafeERC20
IERC20Permit
TokenController
Address

Summary

Venus Protocol is an interesting project that has a friendly and growing community. This audit investigates security issues, business logic concerns, and potential improvements.

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About Cyberscope

Cyberscope is a blockchain cybersecurity company that was founded with the vision to make web3.0 a safer place for investors and developers. Since its launch, it has worked with thousands of projects and is estimated to have secured tens of millions of investors' funds.

Cyberscope is one of the leading smart contract audit firms in the crypto space and has built a high-profile network of clients and partners.

The Cyberscope team

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