

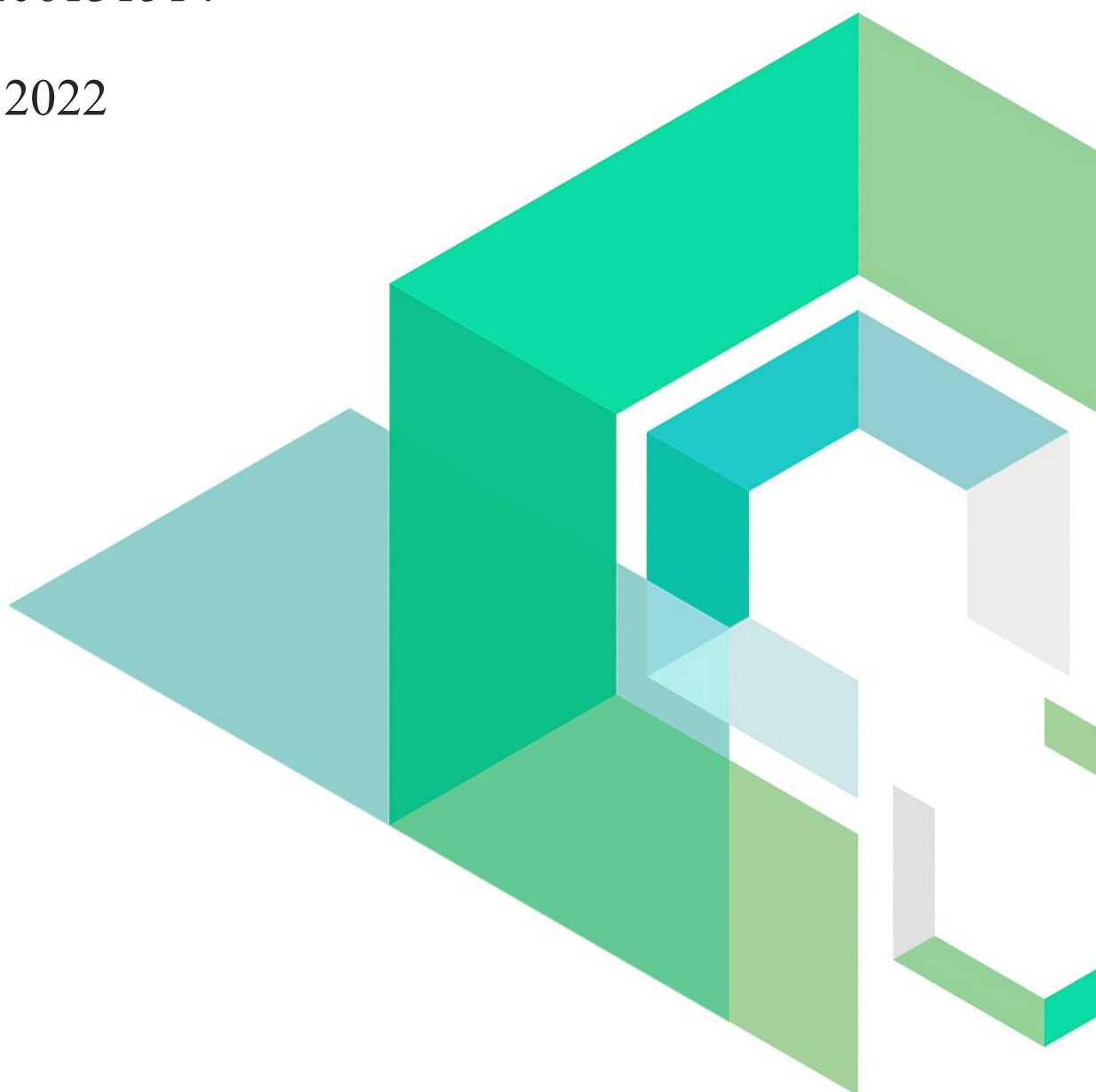
# Versailles-heroes

Smart Contract Security Audit

V1.2

No. 202206131514

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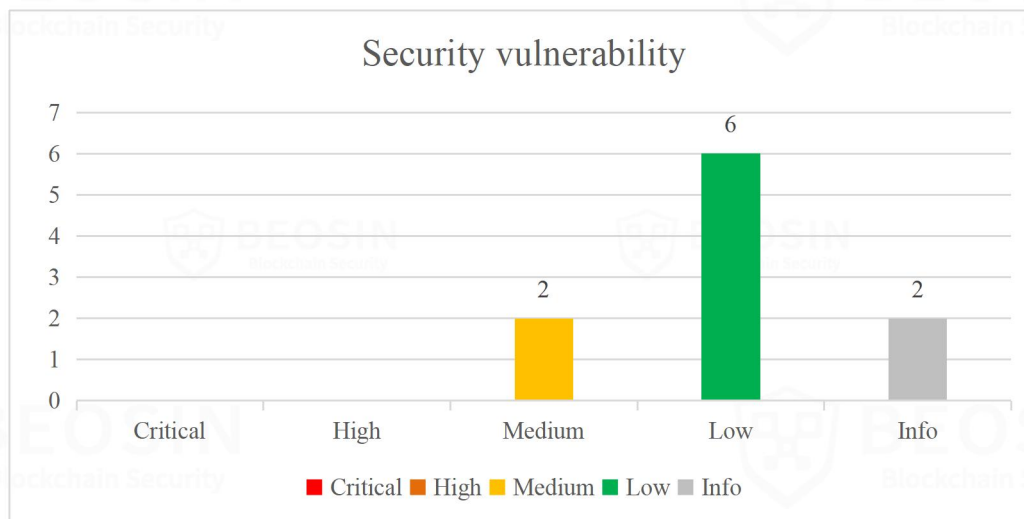


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## Summary of audit results

After auditing, 2 Medium-risks, 6 Low-risks and 2 Info items were identified in the Versailles-heroes project. Specific audit details will be presented in the **Findings** section. Users should pay attention to the following aspects when interacting with this project:



### Notes:

- **Risk Description:**

#### 1. Tokens required to create a guild are higher than expected

When a user creates a guild, a stake of 100,000 VRH for 4 years or 400,000 VRH for one year cannot meet the minimum requirements for creating a guild. Users need to stake more VRH to do so.

#### 2. Risk of accidental token lockup

If the specified address has excess authorization value for the contract, the specified address token may be locked in the contract by any address. When users authorize, it is best to authorize on demand.

#### 3. Token minimum lock time is lower than expected

In the VotingEscrow contract, a WEEK is added when judging whether the minimum lock time is reached, so that the minimum VRH lock time can be less than 365 days. The project team replied that this is for front-end considerations.

#### 4. The owner's data is not updated when creating a guild

When the administrator address in the GuildController contract calls *create\_guild* function to create a guild, the relevant data of the owner is not updated. If the guild owner address forgets to update its own data, it may cause the guild's overall data to be abnormal.

- **Project Description:**

## 1. Basic Token Information

Token name	Medal of Honour
Token symbol	MOH
Decimals	18
Total supply	Initial supply is 0 (Mintable without cap, burnable)
Token type	ERC20

Table 1 MOH Token Info

Token name	Versailles Heroes Token
Token symbol	VRH
Decimals	18
Pre-mint	727.2 million
Total supply	Initial supply is 727.2 million (Mintable, burnable)
Token type	ERC20

Table 2 ERC20VRH Token Info

## 2. Business overview

The project mainly implements a blockchain game. Users gain veVRH tokens by locking VRH tokens (The minimum lock-up period is one year, and the maximum lock-up period is 4 years). After that, they can create or join guilds (After joining a guild, it takes a certain amount of time to exit) where VRH rewards will be generated, 30% of the rewards will be acquired immediately and the remaining 70% will be unlocked over time. And the rewards obtained can be increased by burning the GAS tokens (The operation is irreversible). The reward rate and GAS are not necessarily the same for different guilds.

# 1 Overview

## 1.1 Project Overview

<b>Project Name</b>	Versailles-heroes
<b>Platform</b>	ETH
<b>Github Link</b>	<a href="https://github.com/Versailles-heroes-com/versailles-heroes-DAO">https://github.com/Versailles-heroes-com/versailles-heroes-DAO</a>
<b>Commit Hash</b>	9b69992e04da46b5d8f3fc9d4172561330120441

## 1.2 Audit Overview

Audit work duration: May 07, 2022 – June 13, 2022

Update date: Aug 24, 2022

Update details: Updated Github commit hash.

Audit methods: Formal Verification, Static Analysis, Typical Case Testing and Manual Review.

Audit team: Beosin Technology Co. Ltd.

## 2 Findings

Index	Risk description	Severity level	Status
VH-1	<i>deposit_for</i> function without permission check	Medium	Fixed
VH-2	The amount of veVRH obtained by locking VRH is not as expected	Medium	Acknowledged
VH-3	Missing address check in <i>deposit_for</i> function	Low	Fixed
VH-4	No time limit for the initial owner of the guild to exit	Low	Fixed
VH-5	Guild rate modification limit error	Low	Fixed
VH-6	Incorrect minimum lock time judgment	Low	Acknowledged
VH-7	Risk of accidental token lockup	Low	Acknowledged
VH-8	The owner's data is not updated when creating a guild	Low	Acknowledged
VH-9	Abnormal increase in period	Info	Acknowledged
VH-10	<i>belongs_to_guild</i> function lacks view modifier	Info	Fixed

### Risk Details Description:

- VH-2 is not fixed and may cause the users have to stake more VRH to create a guild.
- VH-6 is not fixed and may cause the user lockout time to be less than 365 days.
- VH-7 is not fixed and may cause the user's tokens to be accidentally locked in the contract (if the user has excess authorization to the VotingEscrow contract).
- VH-8 is not fixed and may cause the guild data in the contract to be abnormal (if the guild owner does not manually update their own data).
- VH-9 is not fixed and will not cause any security issue.

## [VH-1] *deposit\_for* function without permission check

Severity Level	Medium
Type	Business Security
Lines	GasEscrow.vy#L335-365, 376-392
Description	Any address can call the <i>deposit_for</i> function to maliciously stake the specific tokens of users who have excess authorization value in the contract into the contract, and the operation cannot be undone.

```

376 @external
377 @nonreentrant('lock')
378 def deposit_for(_addr: address, _value: uint256):
379     """
380     @notice Deposit `_value` tokens for `_addr` and add to the burn
381     @dev Anyone (even a smart contract) can deposit for someone else, but
382         cannot extend their burntime and deposit for a brand new user
383     @param _addr User's wallet address
384     @param _value Amount to add to user's burn
385     """
386     _burned: BurnedBalance = self.burned[_addr]
387
388     assert _value > 0 # dev: need non-zero value
389     assert _burned.amount > 0, "No existing burn found"
390     assert _burned.end > block.timestamp, "Cannot add to expired burn"
391
392     self._deposit_for(_addr, _value, 0, self.burned[_addr], DEPOSIT_FOR_TYPE)

```

Figure 1 Source code of *deposit\_for* function

```

335 @internal
336 def _deposit_for(_addr: address, _value: uint256, end_time: uint256, burned_balance: BurnedBalance, type: int128):
337     """
338     @notice Deposit and burn tokens for a user
339     @param _addr User's wallet address
340     @param _value Amount to deposit
341     @param end_time New time when to burn the tokens, or 0 if unchanged
342     @param burned_balance Previous burned amount / timestamp
343     """
344     _burned: BurnedBalance = burned_balance
345     supply_before: uint256 = self.supply
346
347     self.supply = supply_before + _value
348     old_burned: BurnedBalance = _burned
349     # Adding to existing burn, or if a burn is expired - creating a new one
350     _burned.amount += convert(_value, int128)
351     if end_time != 0:
352         _burned.end = end_time
353     self.burned[_addr] = _burned
354
355     # Possibilities:
356     # Both old_burned.end could be current or expired (>/< block.timestamp)
357     # value == 0 (extend burn) or value > 0 (add to burn)
358     # _burned.end > block.timestamp (always)
359     self.checkpoint(_addr, old_burned, _burned)
360
361     if _value != 0:
362         assert ERC20(self.token).transferFrom(_addr, ZERO_ADDRESS, _value) # burn the tokens
363
364     log Deposit(_addr, _value, _burned.end, type, block.timestamp)
365     log Supply(supply before, supply before + _value)

```

Figure 2 Source code of *\_deposit\_for* function

Recommendations	It is recommended to remove the <i>deposit_for</i> function or add a permission check.
Status	Fixed. This function has been removed.



## [VH-2] The amount of veVRH obtained by locking VRH is not as expected

Severity Level	Medium
Type	Business Security
Lines	VotingEscrow.vy#L390-407
Description	In the VotingEscrow contract, user cannot get 100,000 veVRH by locking 100,000 VRH for four years or 400,000 VRH for one year. This is inconsistent with the description in the white paper.

```

390 @external
391 @nonreentrant('lock')
392 def create_lock(_value: uint256, _unlock_time: uint256):
393     """
394     @notice Deposit `_value` tokens for `msg.sender` and lock until `_unlock_time`
395     @param _value Amount to deposit
396     @param _unlock_time Epoch time when tokens unlock, rounded down to whole weeks
397     """
398     self.assert_not_contract(msg.sender)
399     unlock_time: uint256 = (_unlock_time / WEEK) * WEEK # Locktime is rounded down to weeks
400     _locked: LockedBalance = self.locked[msg.sender]
401
402     assert _value > 0 # dev: need non-zero value
403     assert _locked.amount == 0, "Withdraw old tokens first"
404     assert unlock_time > block.timestamp, "Can only lock until time in the future"
405     assert unlock_time <= block.timestamp + MAXTIME, "Voting lock can be 4 years max"
406
407     self._deposit_for(msg.sender, _value, unlock_time, _locked, CREATE_LOCK_TYPE)

```

Figure 3 Source code of `create_lock` function

Recommendations	It is recommended to allow a certain error when judging the conditions for creating a guild.
Status	Acknowledged. The project team has changed the description in the white paper and recommends that users stake more tokens to meet the requirements.



### [VH-3] Missing address check in *deposit\_for* function

Severity Level	Low
Type	Business Security
Lines	GasEscrow.vy#L376-392
Description	The <i>deposit_for</i> function in the GasEscrow contract does not check whether the <code>_addr</code> address is the contract address.

```

376 @external
377 @nonreentrant('lock')
378 def deposit_for(_addr: address, _value: uint256):
379     """
380     @notice Deposit `_value` tokens for `_addr` and add to the burn
381     @dev Anyone (even a smart contract) can deposit for someone else, but
382         cannot extend their burntime and deposit for a brand new user
383     @param _addr User's wallet address
384     @param _value Amount to add to user's burn
385     """
386     _burned: BurnedBalance = self.burned[_addr]
387
388     assert _value > 0 # dev: need non-zero value
389     assert _burned.amount > 0, "No existing burn found"
390     assert _burned.end > block.timestamp, "Cannot add to expired burn"
391
392     self._deposit_for(_addr, _value, 0, self.burned[_addr], DEPOSIT_FOR_TYPE)

```

Figure 4 Source code of *deposit\_for* function

Recommendations	It is recommended to add contract address judgment to the <i>deposit_for</i> function.
Status	Fixed. This function has been removed.

## [VH-4] No time limit for the initial owner of the guild to exit

Severity Level	Low
Type	Business Security
Lines	GuildController.vy#L366-375
Description	In the GuildController contract, the initial owner of the guild can immediately quit the guild after transferring the owner permission to others, and will not quit the guild after joining the guild like other users after WEIGHT_VOTE_DELAY.

```

366         if _isSuccess:
367             n: int128 = self.n_guilds
368             self.n_guilds = n + 1
369             self.guilds[n] = guild_address
370
371             self.guild_types[guild_address] = guild_type + 1
372             self.guild_owner_list[owner] = guild_address
373             self.global_member_list[owner] = guild_address
374             log NewGuild(guild_address, weight, rate)
375             return guild_address

```

Figure 5 Source code of *create\_guild* function (Unfixed)

Recommendations	It is recommended to set the current time as the initial owner joining time of the guild when creating a guild.
-----------------	---

Status	Fixed.
--------	--------

```

405         if _isSuccess:
406             n: int128 = self.n_guilds
407             self.n_guilds = n + 1
408             self.guilds[n] = guild_address
409
410             self.guild_types[guild_address] = guild_type + 1
411             self.guild_owner_list[owner] = guild_address
412             self.global_member_list[owner] = guild_address
413             self.last_user_join[owner][guild_address] = block.timestamp
414             log NewGuild(guild_address, weight, commission_rate)
415             return guild_address

```

Figure 6 Source code of *create\_guild* function (Fixed)

## [VH-5] Guild rate modification limit error

Severity Level	Low
Type	Business Security
Lines	Guild.vy#L274-292
Description	According to the white paper, the rate of the guild in the Guild contract can be modified once a week, but the current code seems to be modified once every 2 weeks.

```

274 @external
275 def set_commission_rate(increase: bool):
276     assert self.owner == msg.sender, 'Only guild owner can change commission rate'
277     assert block.timestamp >= self.last_change_rate + WEEK, "Can only change commission
278
279     next_time: uint256 = (block.timestamp + WEEK) / WEEK * WEEK
280     commission_rate: uint256 = self.commission_rate[self.last_change_rate]
281
282     # 0 == decrease, 1 equals increase
283     if increase == True :
284         commission_rate += 1
285         assert commission_rate <= 20, 'Maximum is 20'
286     else:
287         commission_rate -= 1
288         assert commission_rate >= 0, 'Minimum is 0'
289
290     self.commission_rate[next_time] = commission_rate
291     self.last_change_rate = next_time
292     log SetCommissionRate(commission_rate, next_time)

```

Figure 7 Source code of `set_commission_rate` function (Unfixed)

**Recommendations** It is recommended not to add WEEK in the judgment.

**Status** Fixed.

```

243 def set_commission_rate(increase: bool):
244     assert self.owner == msg.sender, 'Only guild owner can change commission rate'
245     assert block.timestamp >= self.last_change_rate, "Can only change commission rate once
246
247     next_time: uint256 = (block.timestamp + WEEK) / WEEK * WEEK
248     commission_rate: uint256 = self.commission_rate[self.last_change_rate]
249
250     # 0 == decrease, 1 equals increase
251     if increase == True :
252         commission_rate += 1
253         assert commission_rate <= 20, 'Maximum is 20'
254     else:
255         commission_rate -= 1
256         assert commission_rate >= 0, 'Minimum is 0'
257
258     self.commission_rate[next_time] = commission_rate
259     self.last_change_rate = next_time
260     log SetCommissionRate(commission_rate, next_time)

```

Figure 8 Source code of `set_commission_rate` function (Fixed)

## [VH-6] Incorrect minimum lock time judgment

Severity Level	Low
Type	Business Security
Lines	VotingEscrow.vy#L401-417
Description	In the VotingEscrow contract, a WEEK is added when judging whether the minimum lock time is reached, so that the minimum VRH lock time can be less than 365 days.

```

400 ~nonreentrant('lock')
401 def create_lock(_value: uint256, _unlock_time: uint256):
402     """
403     @notice Deposit `_value` tokens for `msg.sender` and lock until `_unlock_time`
404     @param _value Amount to deposit
405     @param _unlock_time Epoch time when tokens unlock, rounded down to whole weeks
406     """
407     self.assert_not_contract(msg.sender)
408     unlock_time: uint256 = (_unlock_time / WEEK) * WEEK # Locktime is rounded down to weeks
409     _locked: LockedBalance = self.locked[msg.sender]
410
411     assert _value > 0 # dev: need non-zero value
412     assert _locked.amount == 0, "Withdraw old tokens first"
413     assert unlock_time > block.timestamp, "Can only lock until time in the future"
414     assert unlock_time + WEEK >= block.timestamp + MINTIME, "Voting lock must be 1 year min"
415     assert unlock_time <= block.timestamp + MAXTIME, "Voting lock can be 4 years max"
416
417     self._deposit_for(msg.sender, msg.sender, _value, unlock_time, _locked, CREATE_LOCK_TYPE)
418 
```

Figure 9 Source code of `create_lock` function (Unfixed)

Recommendations	If the return value is not needed, it is recommended to eliminate the return of the variable.
Status	Acknowledged. The project team confirms that it meets the design requirements.

## [VH-7] Risk of accidental token lockup

Severity Level	Low
Type	Business Security
Lines	VotingEscrow.vy#L380-396
Description	Any address can call the <i>deposit_for</i> function in the VotingEscrow contract to transfer the tokens of users who have authorized values to the contract to the contract and lock them.

```

380 @external
381 @nonreentrant('lock')
382 def deposit_for(_addr: address, _value: uint256):
383     """
384     @notice Deposit `_value` tokens for `_addr` and add to the lock
385     @dev Anyone (even a smart contract) can deposit for someone else, but
386         cannot extend their locktime and deposit for a brand new user
387     @param _addr User's wallet address
388     @param _value Amount to add to user's lock
389     """
390     _locked: LockedBalance = self.locked[_addr]
391
392     assert _value > 0 # dev: need non-zero value
393     assert _locked.amount > 0, "No existing lock found"
394     assert _locked.end > block.timestamp, "Cannot add to expired lock. Withdraw"
395
396     self._deposit_for(_addr, _addr, _value, 0, self.locked[_addr], DEPOSIT_FOR_TYPE)

```

Figure 10 Source code of *deposit\_for* function

Recommendations	It is recommended to delete the <i>deposit_for</i> function or set the token source address to msg.sender.
Status	Acknowledged. The project team confirms that it meets the design requirements. Note: If the specified address has excess authorization value for the contract, the specified address token may be locked in the contract by any address.



## [VH-8] The owner's data is not updated when creating a guild

Severity Level	Low
Type	Business Security
Lines	VotingEscrow.vy#L380-396
Description	When the administrator address in the GuildController contract calls <i>create_guild</i> to create a guild, the relevant data of the owner is not updated.

```

374 @external
375 @nonreentrant('lock')
376 def create_guild(owner: address, guild_type: int128, commission_rate: uint256) -> address:
377     """
378     @notice Add guild with type `guild_type` and guild owner commission rate `rate`
379     @param owner Owner address
380     @param guild_type Guild type
381     @param commission_rate Guild owner commission rate
382     """
383     assert msg.sender == self.create_guild_admin
384     assert (guild_type >= 0) and (guild_type < self.n_guild_types), "Guild type not supported"
385     assert self.global_member_list[owner] == ZERO_ADDRESS, "Already in a guild"
386     assert self.guild_owner_list[owner] == ZERO_ADDRESS, "Only can create one guild"
387
388     # Check if game token is supported
389     gas_escrow: address = self.gas_type_escrow[guild_type]
390     assert gas_escrow != ZERO_ADDRESS, "Guild type is not supported"
391
392     # Retrieve guild owner voting power
393     weight: uint256 = VotingEscrow(self.voting_escrow).balanceOf(owner)
394     assert weight >= REQUIRED_CRITERIA * MULTIPLIER, "Does not meet requirement to create guild"
395
396     # Check if user has created a guild before or not
397     guild_address: address = create_forwarder_to(self, guild)
398     _isSuccess: bool = Guild(guild_address).initialize(owner, commission_rate, self.token, gas_escrow, self.minter)
399
400     next_time: uint256 = (block.timestamp + WEEK) / WEEK * WEEK
401     if self.time_sum[guild_type] == 0:
402         self.time_sum[guild_type] = next_time
403     self.time_weight[guild_address] = next_time
404
405     if _isSuccess:
406         n: int128 = self.n_guilds
407         self.n_guilds = n + 1
408         self.guilds[n] = guild_address
409
410         self.guild_types_[guild_address] = guild_type + 1
411         self.guild_owner_list[owner] = guild_address
412         self.global_member_list[owner] = guild_address
413         self.last_user_join[owner][guild_address] = block.timestamp
414         log NewGuild(guild_address, weight, commission_rate)
415         return guild_address
416
417     return ZERO_ADDRESS

```

Figure 11 Source code of *create\_guild* function

Recommendations	It is recommended to update owner-related data when creating a guild.
Status	Acknowledged. The project team confirms that it meets the design requirements.

## [VH-9] Abnormal increase in period

Severity Level	Info
Type	Business Security
Lines	Guild.vy#L257-260
Description	<p>The <code>_period</code> in <code>_checkpoint</code> function is increasing each time it is called, which may result in multiple periods corresponding to the same timestamp in the <code>period_timestamp</code>.</p> <pre> 250         log CheckpointValues(i, prev_future_epoch, prev_week_time, week_time, commission_rate, dt, w, rate, _integrate_inv_supply, 251                               _working_supply, _owner_bonus / 10 ** 18) 252 253         if week_time == block.timestamp: 254             break 255         prev_week_time = week_time 256         week_time = min(week_time + WEEK, block.timestamp) 257         _period += 1 258         self.period = _period 259         self.period_timestamp[_period] = block.timestamp 260         self.integrate_inv_supply[_period] = _integrate_inv_supply                 </pre>
<p>Figure 12 Source code of <code>_checkpoint</code> function</p>	
Recommendations	It is recommended to update period when the data has changed.
Status	Acknowledged. The project team confirms that it meets the design requirements.



## [VH-10] *belongs\_to\_guild* function lacks view modifier

Severity Level	Info
Type	Coding Conventions
Lines	GuildController.vy#L714-716
Description	The <i>belongs_to_guild</i> function in the GuildController contract can add view modifiers to save gas consumption.

```

714 @external
715 def belongs_to_guild(user_addr: address, guild_addr: address) -> bool:
716     return self.global_member_list[user_addr] == guild_addr

```

Figure 13 Source code of *belongs\_to\_guild* function (Unfixed)

Recommendations	It is recommended to add the view modifier to the <i>belongs_to_guild</i> function.
Status	Fixed.

```

714 @external
715 @view
716 def belongs_to_guild(user_addr: address, guild_addr: address) -> bool:
717     return self.global_member_list[user_addr] == guild_addr

```

Figure 14 Source code of *belongs\_to\_guild* function (Fixed)

## 3 Appendix

### 3.1 Vulnerability Assessment Metrics and Status in Smart Contracts

#### 3.1.1 Metrics

In order to objectively assess the severity level of vulnerabilities in blockchain systems, this report provides detailed assessment metrics for security vulnerabilities in smart contracts with reference to CVSS 3.1 (Common Vulnerability Scoring System Ver 3.1).

According to the severity level of vulnerability, the vulnerabilities are classified into four levels: "critical", "high", "medium" and "low". It mainly relies on the degree of impact and likelihood of exploitation of the vulnerability, supplemented by other comprehensive factors to determine of the severity level.

Impact Likelihood	Severe	High	Medium	Low
Probable	Critical	High	Medium	Low
Possible	High	High	Medium	Low
Unlikely	Medium	Medium	Low	Info
Rare	Low	Low	Info	Info

#### 3.1.2 Degree of impact

- **Severe**

Severe impact generally refers to the vulnerability can have a serious impact on the confidentiality, integrity, availability of smart contracts or their economic model, which can cause substantial economic losses to the contract business system, large-scale data disruption, loss of authority management, failure of key functions, loss of credibility, or indirectly affect the operation of other smart contracts associated with it and cause substantial losses, as well as other severe and mostly irreversible harm.

- **High**

High impact generally refers to the vulnerability can have a relatively serious impact on the confidentiality, integrity, availability of the smart contract or its economic model, which can cause a greater economic loss, local functional unavailability, loss of credibility and other impact to the contract business system.

- **Medium**

Medium impact generally refers to the vulnerability can have a relatively minor impact on the confidentiality, integrity, availability of the smart contract or its economic model, which can cause a small amount of economic loss to the contract business system, individual business unavailability and other impact.

- **Low**

Low impact generally refers to the vulnerability can have a minor impact on the smart contract, which can pose certain security threat to the contract business system and needs to be improved.

### 3.1.4 Likelihood of Exploitation

- **Probable**

Probable likelihood generally means that the cost required to exploit the vulnerability is low, with no special exploitation threshold, and the vulnerability can be triggered consistently.

- **Possible**

Possible likelihood generally means that exploiting such vulnerability requires a certain cost, or there are certain conditions for exploitation, and the vulnerability is not easily and consistently triggered.

- **Unlikely**

Unlikely likelihood generally means that the vulnerability requires a high cost, or the exploitation conditions are very demanding and the vulnerability is highly difficult to trigger.

- **Rare**

Rare likelihood generally means that the vulnerability requires an extremely high cost or the conditions for exploitation are extremely difficult to achieve.

### 3.1.5 Fix Results Status

Status	Description
<b>Fixed</b>	The project party fully fixes a vulnerability.
<b>Partially Fixed</b>	The project party did not fully fix the issue, but only mitigated the issue.
<b>Acknowledged</b>	The project party confirms and chooses to ignore the issue.

### 3.2 Audit Categories

No.	Categories	Subitems
1	Coding Conventions	Compiler Version Security
		Deprecated Items
		Redundant Code
		require/assert Usage
		Gas Consumption
2	General Vulnerability	Reentrancy
		Pseudo-random Number Generator (PRNG)
		Transaction-Ordering Dependence
		DoS (Denial of Service)
		Function Call Permissions
		call/delegatecall Security
		Returned Value Security
		tx.origin Usage
		Replay Attack
		Overriding Variables
3	Business Security	Third-party protocol interface consistency
		Business Logics
		Business Implementations
		Manipulable token price
		Centralized asset control
		Asset tradability
		Arbitrage attack

Beosin classified the security issues of smart contracts into three categories: Coding Conventions, General Vulnerability, Business Security. Their specific definitions are as follows:

- **Coding Conventions**

Audit whether smart contracts follow recommended language security coding practices. For example, smart contracts developed in Solidity language should fix the compiler version and do not use deprecated keywords.

- **General Vulnerability**

General Vulnerability include some common vulnerabilities that may appear in smart contract projects. These vulnerabilities are mainly related to the characteristics of the smart contract itself, such as integer overflow/underflow and denial of service attacks.

- **Business Security**

Business security is mainly related to some issues related to the business realized by each project, and has a relatively strong pertinence. For example, whether the lock-up plan in the code match the white paper, or the flash loan attack caused by the incorrect setting of the price acquisition oracle.

\*Note that the project may suffer stake losses due to the integrated third-party protocol. This is not something Beosin can control.

Business security requires the participation of the project party. The project party and users need to stay vigilant at all times.

### 3.3 Disclaimer

The Audit Report issued by Beosin is related to the services agreed in the relevant service agreement. The Project Party or the Served Party (hereinafter referred to as the "Served Party") can only be used within the conditions and scope agreed in the service agreement. Other third parties shall not transmit, disclose, quote, rely on or tamper with the Audit Report issued for any purpose.

The Audit Report issued by Beosin is made solely for the code, and any description, expression or wording contained therein shall not be interpreted as affirmation or confirmation of the project, nor shall any warranty or guarantee be given as to the absolute flawlessness of the code analyzed, the code team, the business model or legal compliance.

The Audit Report issued by Beosin is only based on the code provided by the Served Party and the technology currently available to Beosin. However, due to the technical limitations of any organization, and in the event that the code provided by the Served Party is missing information, tampered with, deleted, hidden or subsequently altered, the audit report may still fail to fully enumerate all the risks.

The Audit Report issued by Beosin in no way provides investment advice on any project, nor should it be utilized as investment suggestions of any type. This report represents an extensive evaluation process designed to help our customers improve code quality while mitigating the high risks in Blockchain.

### 3.4 About BEOSIN

Affiliated to BEOSIN Technology Pte. Ltd., BEOSIN is the first institution in the world specializing in the construction of blockchain security ecosystem. The core team members are all professors, postdocs, PhDs, and Internet elites from world-renowned academic institutions. BEOSIN has more than 20 years of research in formal verification technology, trusted computing, mobile security and kernel security, with overseas experience in studying and collaborating in project research at well-known universities. Through the security audit and defense deployment of more than 2,000 smart contracts, over 50 public blockchains and wallets, and nearly 100 exchanges worldwide, BEOSIN has accumulated rich experience in security attack and defense of the blockchain field, and has developed several security products specifically for blockchain.



**Official Website**

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