



Security Assessment

IDRX

CertiK Assessed on Jul 7th, 2023





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IDRX

The security assessment was prepared by CertiK, the leader in Web3.0 security.

Executive Summary

TYPES

DeFi

ECOSYSTEM

Polygon (MATIC)

METHODS

Manual Review, Static Analysis

LANGUAGE

Solidity

TIMELINE

Delivered on 07/07/2023

KEY COMPONENTS

N/A

CODEBASE

<https://polygonscan.com/address/0x20fad183dc35f4ae0d1d125ae2f3c4c43a53bbd0><https://polygonscan.com/address/0x649a2da7b28e0d54c13d5eff95d3a>[View All in Codebase Page](#)**Vulnerability Summary**

10

Total Findings

6

Resolved

0

Mitigated

0

Partially Resolved

4

Acknowledged

0

Declined

0 Critical

Critical risks are those that impact the safe functioning of a platform and must be addressed before launch. Users should not invest in any project with outstanding critical risks.

5 Major

1 Resolved, 4 Acknowledged



Major risks can include centralization issues and logical errors. Under specific circumstances, these major risks can lead to loss of funds and/or control of the project.

2 Medium

2 Resolved



Medium risks may not pose a direct risk to users' funds, but they can affect the overall functioning of a platform.

1 Minor

1 Resolved



Minor risks can be any of the above, but on a smaller scale. They generally do not compromise the overall integrity of the project, but they may be less efficient than other solutions.

2 Informational

2 Resolved



Informational errors are often recommendations to improve the style of the code or certain operations to fall within industry best practices. They usually do not affect the overall functioning of the code.

TABLE OF CONTENTS | IDRX

I **Summary**

[Executive Summary](#)

[Vulnerability Summary](#)

[Codebase](#)

[Audit Scope](#)

[Approach & Methods](#)

I **Findings**

[GLOBAL-01 : Centralized Control of Contract Upgrade](#)

[IDR-01 : Centralized Balance Manipulation](#)

[IDR-05 : Arbitrary account blacklisting leading to potential fund loss](#)

[IDR-08 : Centralization Related Risks](#)

[IDR-09 : Potential Bypass of Blacklisted Users](#)

[IDR-02 : No Upper Limit in `setMarketplaceFee` function](#)

[IDR-10 : Zero Address Can be Blacklisted](#)

[IDR-07 : Missing Zero Address Validation](#)

[IDR-03 : Inconsistency in Bridge Nonce Incrementing](#)

[IDX-01 : Usage of Hardhat's Console](#)

I **Appendix**

I **Disclaimer**

CODEBASE | IDRX





I Repository

<https://polygonscan.com/address/0x20fad183dc35f4ae0d1d125ae2f3c4c43a53bbd0>

<https://polygonscan.com/address/0x649a2da7b28e0d54c13d5eff95d3a660652742cc>

AUDIT SCOPE | IDRX

4 files audited ● 1 file with Acknowledged findings ● 1 file with Resolved findings ● 2 files without findings

ID	Repo	File	SHA256 Checksum
● IDR	mainnet	 contracts/IDRX.sol	751efda268d626a30bb262eb6863543b89c778e6d821cdc44c4599ceec2a63e1
● IDX	mainnet	 contracts/IDRXBasicToken.sol	06dcceb6d2c79b11fdee9978f39e688019cfd31bc04c75106336d33f77a1f1a3
● ERC	mainnet	 contracts/ERC20BurnableUpgradeable.sol	a58320c20fe5c162397b34cf6c145c7b041b7cb51338805d0f23a2b5ed5c7198
● IMP	mainnet	 contracts/import.sol	fbd2dbc1a472e4e58973c7554b906b2fb5012114018ce69bf6f13a0de5b949fa

APPROACH & METHODS | IDRX

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

- Testing the smart contracts against both common and uncommon attack vectors;
- 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.

FINDINGS | IDRX



10
Total Findings

0
Critical

5
Major

2
Medium

1
Minor

2
Informational

This report has been prepared to discover issues and vulnerabilities for IDRX. Through this audit, we have uncovered 10 issues ranging from different severity levels. Utilizing the techniques of Manual Review & Static Analysis to complement rigorous manual code reviews, we discovered the following findings:

ID	Title	Category	Severity	Status
GLOBAL-01	Centralized Control Of Contract Upgrade	Centralization	Major	● Acknowledged
IDR-01	Centralized Balance Manipulation	Centralization	Major	● Acknowledged
IDR-05	Arbitrary Account Blacklisting Leading To Potential Fund Loss	Centralization	Major	● Acknowledged
IDR-08	Centralization Related Risks	Centralization	Major	● Acknowledged
IDR-09	Potential Bypass Of Blacklisted Users	Logical Issue	Major	● Resolved
IDR-02	No Upper Limit In <code>setMarketplaceFee</code> Function	Logical Issue	Medium	● Resolved
IDR-10	Zero Address Can Be Blacklisted	Logical Issue	Medium	● Resolved
IDR-07	Missing Zero Address Validation	Volatile Code	Minor	● Resolved
IDR-03	Inconsistency In Bridge Nonce Incrementing	Inconsistency	Informational	● Resolved
IDX-01	Usage Of Hardhat's Console	Coding Style	Informational	● Resolved

GLOBAL-01 | CENTRALIZED CONTROL OF CONTRACT UPGRADE

Category	Severity	Location	Status
Centralization	● Major		● Acknowledged

I Description

The privileged role has the authority to update the implementation contract behind the proxy contract.

Any compromise to the privileged account may allow a hacker to take advantage of this authority and change the implementation contract which is pointed by proxy and therefore execute potential malicious functionality in the implementation contract.

I Recommendation

We recommend that the team make efforts to restrict access to the admin of the proxy contract. A strategy of combining a time-lock and a multi-signature (2/3, 3/5) wallet can be used to prevent a single point of failure due to a private key compromise. In addition, the team should be transparent and notify the community in advance whenever they plan to migrate to a new implementation contract.

Here are some feasible short-term and long-term suggestions that would mitigate the potential risk to a different level and suggestions that would permanently fully resolve the risk.

Short Term:

A combination of a time-lock and a multi signature (2/3, 3/5) wallet mitigate the risk by delaying the sensitive operation and avoiding a single point of key management failure.

- A time-lock with reasonable latency, such as 48 hours, for awareness of privileged operations;
AND
- Assignment of privileged roles to multi-signature wallets to prevent a single point of failure due to a private key compromised;
AND
- A medium/blog link for sharing the time-lock contract and multi-signers addresses information with the community.

For remediation and mitigated status, please provide the following information:

- Provide the deployed time-lock address.
- Provide the **gnosis** address with **ALL** the multi-signer addresses for the verification process.

- Provide a link to the **medium/blog** with all of the above information included.

Long Term:

A combination of a time-lock on the contract upgrade operation and a DAO for controlling the upgrade operation mitigate the contract upgrade risk by applying transparency and decentralization.

- A time-lock with reasonable latency, such as 48 hours, for community awareness of privileged operations;
AND
- Introduction of a DAO, governance, or voting module to increase decentralization, transparency, and user involvement;
AND
- A medium/blog link for sharing the time-lock contract, multi-signers addresses, and DAO information with the community.

For remediation and mitigated status, please provide the following information:

- Provide the deployed time-lock address.
- Provide the **gnosis** address with **ALL** the multi-signer addresses for the verification process.
- Provide a link to the **medium/blog** with all of the above information included.

Permanent:

Renouncing ownership of the `admin` account or removing the upgrade functionality can *fully* resolve the risk.

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

Note: we recommend the project team consider the long-term solution or the permanent solution. The project team shall make a decision based on the current state of their project, timeline, and project resources.

I Alleviation

[IDRX, 20230626] : The multi-sig proxy has been given the roles Proposer, Executor and Canceler to interact with TimeLock.

Once the IDRX contract changes are completely audited and deployed, we will assign the Upgrader role to TimeLock

[Certik, 20230626] : The team deployed timelock and multisig wallet on polygon:

Timelock: <https://polygonscan.com/address/0x58aa9720f456667c97093aaf87623d656f1ee6fa>

CANCELLER_ROLE: 0xf80dF246928B7862B23e094b3a14C4E36eE117E EXECUTOR_ROLE:
0xf80dF246928B7862B23e094b3a14C4E36eE117E PROPOSER_ROLE:
0xf80dF246928B7862B23e094b3a14C4E36eE117E TIMELOCK_ADMIN_ROLE:
0xcac3cf6b226317d91c2e72ac7193a83c34728b2c, 0x58aa9720f456667c97093aaf87623d656f1ee6fa

Multisig Wallet: <https://polygonscan.com/address/0xf80dF246928B7862B23e094b3a14C4E36eE117E>

There are 3 signers:

- matic:0xE51b67864A38F42126231d30eD8f3e72Ec7F32f4
- matic:0xb4fcA8725a9E65B4cD1Ef27d71e7C7537148061b
- matic:0x0f9f4cbBEc64524DEB0D743F9CAF34be81BD1576

Any transaction requires the confirmation of 2 out of 3 owners.

IDR-01 | CENTRALIZED BALANCE MANIPULATION

Category	Severity	Location	Status
Centralization	● Major	contracts/IDRX.sol (IDRX): 64, 68	● Acknowledged

Description

In the contract `IDRX`, the role `MINTER_ROLE` has the authority to update the token balance of an arbitrary account without sanity restriction.

Any compromise to the `MINTER_ROLE` account may allow a hacker to take advantage of this authority and manipulate users' balances by calling `mint()` and/or `mintBridge()` functions

Recommendation

We recommend the team makes efforts to restrict access to the private key of the privileged account. A strategy of multi-signature (2/3, 3/5) wallet can be used to prevent a single point of failure due to a private key compromise. In addition, the team should be transparent and notify the community in advance whenever they plan to mint more tokens or engage in similar balance-related operations.

Here are some feasible short-term and long-term suggestions that would mitigate the potential risk to a different level and suggestions that would permanently *fully* resolve the risk:

Short Term:

A multi signature (2/3, 3/5) wallet *mitigate* the risk by avoiding a single point of key management failure.

- Assignment of privileged roles to multi-signature wallets to prevent a single point of failure due to a private key compromised;
AND
- A medium/blog link for sharing the time-lock contract and multi-signers' addresses information with the community.

For remediation and mitigated status, please provide the following information:

- Provide the **gnosis** address with **ALL** the multi-signer addresses for the verification process.
- Provide a link to the **medium/blog** with all of the above information included.

Long Term:

A DAO for controlling the operation *mitigate* the risk by applying transparency and decentralization.

- Introduction of a DAO, governance, or voting module to increase decentralization, transparency, and user involvement;
- AND
- A medium/blog link for sharing the multi-signers' addresses, and DAO information with the community.

For remediation and mitigated status, please provide the following information:

- Provide the **gnosis** address with **ALL** the multi-signer addresses for the verification process.
- Provide a link to the **medium/blog** with all of the above information included.

Permanent:

The following actions can *fully* resolve the risk:

- Renounce the ownership and never claim back the privileged role.
- OR
- Remove the risky functionality.
- ORa
- Add minting logic (such as a vesting schedule) to the contract instead of allowing the owner account to call the sensitive function directly.

Note: we recommend the project team consider the long-term solution or the permanent solution. The project team shall make a decision based on the current state of their project, timeline, and project resources.

I Alleviation

[IDRX, 20230626] : IDR-X is a stable token and our platform has to mint the token in an instant, therefore we can not use time-lock for this particular function.

MINTER_ROLE will be assigned to an MPC wallet, rather than Multisig wallet.

IDR-05 | ARBITRARY ACCOUNT BLACKLISTING LEADING TO POTENTIAL FUND LOSS

Category	Severity	Location	Status
Centralization	● Major	contracts/IDRX.sol (IDRX): 120~130, 130	● Acknowledged

Description

The contract provides an arbitrary account blacklisting feature, where a privileged role (holder of `BLACKLIST_ROLE`) can blacklist a user's account, and then destroy any funds held in the blacklisted account.

Scenario

If the privilege is wrongly assigned or gets into malicious hands, it can lead to huge fund loss for users as the bad actor can blacklist any account and destroy its funds.

Proof of Concept

An account with the `BLACKLIST_ROLE` can call `addBlackList(address _evilUser)` to add any user to the blacklist, and then call `destroyBlackFunds(address _blackListedUser)` to destroy all funds of that blacklisted user.

Recommendation

Consider removing the ability to blacklist users and destroy their funds or add further checks and balances to this process to prevent misuse. For the `BLACKLIST_ROLE` role accounts, in order to avoid single point of failure, we recommend carefully managing 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., multi-signature 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 (2/3, 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 of privileged operations;
AND
- Assignment of privileged roles to multi-signature wallets to prevent a single point of failure due to the private key being 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 of 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.

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 recommend carefully managing 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., multi-signature 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 (2/3, 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 of privileged operations;
AND
- Assignment of privileged roles to multi-signature wallets to prevent a single point of failure due to the private key being 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 of 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.

I Alleviation

[IDRX, 20230626] : For law enforcement, we are required to have blacklist feature.

We also need the function to run instantly therefore we cannot implement timelock.

The BLACKLIST_ROLE will be assigned to an MPC wallet on Qredo platform

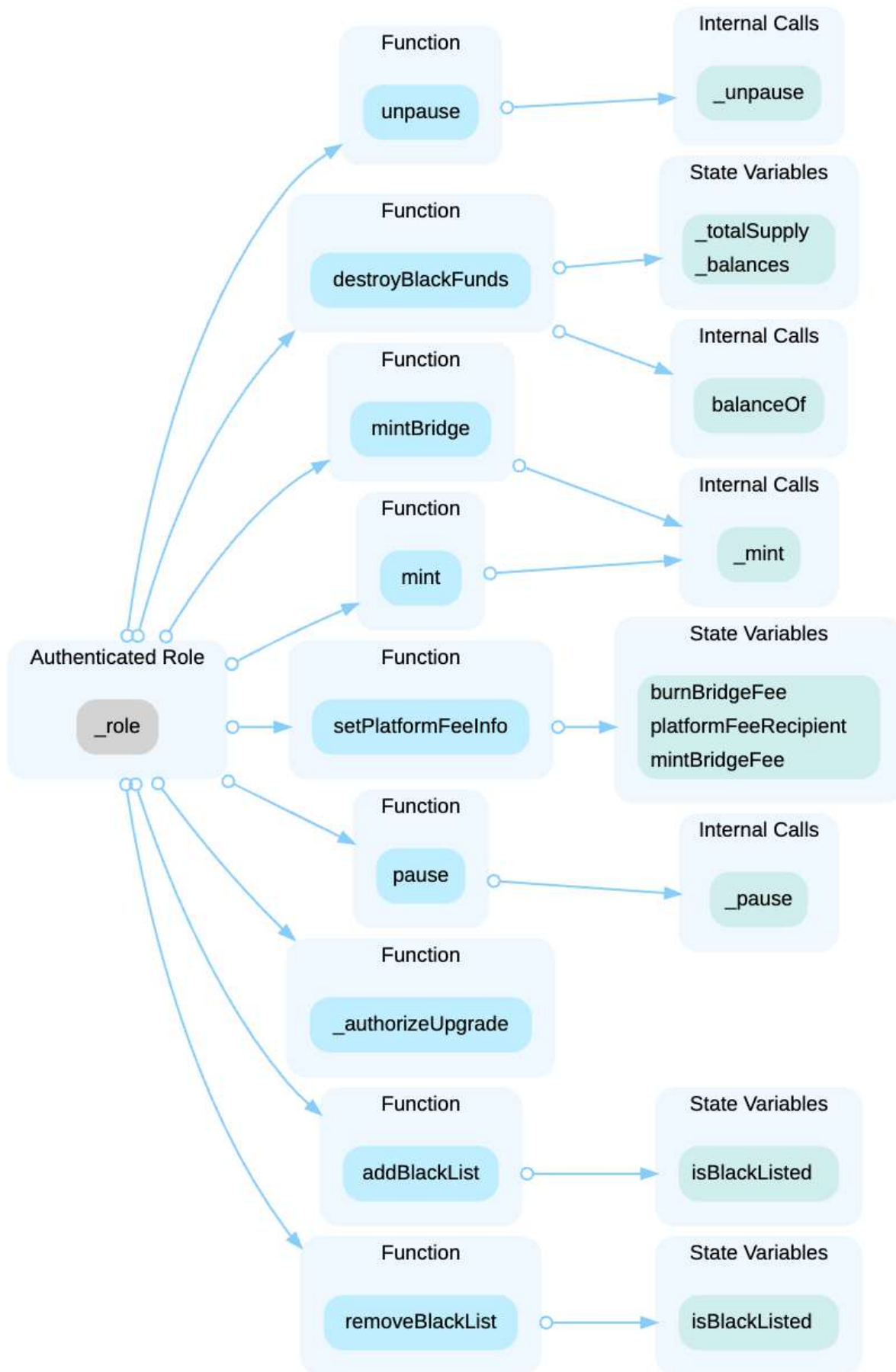
[Certik, 20230626] : The team clarified the context and will remain the current setting

IDR-08 | CENTRALIZATION RELATED RISKS

Category	Severity	Location	Status
Centralization	● Major	contracts/IDRX.sol (IDRX): 56, 60, 64, 68, 110, 120, 125, 130, 138	● Acknowledged

I Description

In the contract `IDRX` the privileged roles have authority over the functions shown in the diagram below.



- `pause()` : Pauses all token transfer functionality. Only accessible to addresses with the `PAUSER_ROLE` .
- `unpause()` : Unpauses the token transfer functionality. Only accessible to addresses with the `PAUSER_ROLE` .
- `mint(address to, uint256 amount)` : Mints the specified amount of tokens to the specified address. Only accessible to addresses with the `MINTER_ROLE` .
- `mintBridge(address to, uint256 amount, uint fromChain, uint fromChainBridgeNonce)` : Mints tokens and transfers them to a bridge after deducting a fee. Only accessible to addresses with the `MINTER_ROLE` .
- `_authorizeUpgrade(address newImplementation)` : Authorizes a new implementation for the contract. Only accessible to addresses with the `UPGRADER_ROLE` .
- `addBlackList(address _evilUser)` : Adds the specified address to the blacklist. Only accessible to addresses with the `BLACKLIST_ROLE` .
- `removeBlackList(address _clearedUser)` : Removes the specified address from the blacklist. Only accessible to addresses with the `BLACKLIST_ROLE` .
- `destroyBlackFunds(address _blackListedUser)` : Destroys the funds of a blacklisted address. Only accessible to addresses with the `BLACKLIST_ROLE` .
- `setPlatformFeeInfo(address _platformFeeRecipient, uint64 _burnBridgeFee, uint64 _mintBridgeFee)` : Sets the platform fee recipient and the fees for burning and minting on the bridge. Only accessible to addresses with the `MINTER_ROLE` .

Any compromise to the `_role` account may allow the hacker to take advantage of this authority and update the sensitive settings and execute sensitive functions of the project.

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 (2/3, 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.

Alleviation

[IDRX, 20230626] : The multi sig proxy has been given the roles Proposer, Executor and Canceler to interact with TimeLock.

Once the IDRX contract changes are completely audited and upgraded, we will assign the Upgrader role and PlatformFeeSetter role to TimeLock

[Certik, 20230626] : The team deployed timelock and multisig wallet on polygon:

Timelock: <https://polygonscan.com/address/0x58aa9720f456667c97093aaf87623d656f1ee6fa>

CANCELLER_ROLE: 0xf80dF246928B7862B23e094b3a14C4E36eE117E EXECUTOR_ROLE:

0xf80dF246928B7862B23e094b3a14C4E36eE117E PROPOSER_ROLE:

0xf80dF246928B7862B23e094b3a14C4E36eE117E TIMELOCK_ADMIN_ROLE:

0xcac3cf6b226317d91c2e72ac7193a83c34728b2c, 0x58aa9720f456667c97093aaf87623d656f1ee6fa

Multisig Wallet: <https://polygonscan.com/address/0xf80dF246928B7862B23e094b3a14C4E36eE117E>

There are 3 signers:

- matic:0xE51b67864A38F42126231d30eD8f3e72Ec7F32f4
- matic:0xb4fcA8725a9E65B4cD1Ef27d71e7C7537148061b

- `matic:0x0f9f4cbBEc64524DEB0D743F9CAF34be81BD1576`

Any transaction requires the confirmation of 2 out of 3 owners.

IDR-09 | POTENTIAL BYPASS OF BLACKLISTED USERS

Category	Severity	Location	Status
Logical Issue	Major	contracts/IDRX.sol (IDRX): 106	Resolved

Description

The blacklist feature is designed to prevent the blacklisted users from transferring the `IDRX` to others by validating the following **require** statement in the `_beforeTokenTransfer()` of `IDRX` contract:

```
106 require(!isBlackListed[msg.sender], "Blacklist: account is blacklisted");
```

The **require** statement prohibits the blacklisted users from calling `transfer()` and `transferFrom()` to move their funds by requiring the `msg.sender` not blacklisted. However, this feature can be bypassed by using a combination of the `approve()` / `increaseAllowance()` and `transferFrom()` functions. The blacklisted user could approve another account to transfer his tokens on his behalf.

Recommendation

We recommend validating the `msg.sender` is not blacklisted in the function `approve()`. Or we recommend checking the `from` address is not blacklisted in the function `transferFrom()`.

Alleviation

[IDRX, 20230705]: We have followed your recommendation for validating the `msg.sender` is not blacklisted in the function `approve()`.

Please find the changes in the following link

<https://github.com/nusa-idrx/idrx-backend/blob/345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247/packages/smartcontract/contracts/IDRX.sol#L177>

[Certik, 20230705]: The team heeded the advice and resolved the finding in the commit [345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247](https://github.com/nusa-idrx/idrx-backend/commit/345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247)

IDR-02 | NO UPPER LIMIT IN `setMarketplaceFee` FUNCTION

Category	Severity	Location	Status
Logical Issue	● Medium	contracts/IDRX.sol (IDRX): 143, 144	● Resolved

Description

There are no upper boundaries for `_burnBridgeFee` and `_mintBridgeFee` which are used to calculate fees that would be charged in the bridge. It is possible to set the total fee rate up to any arbitrary amount.

```
138 function setPlatformFeeInfo(  
139     address _platformFeeRecipient,  
140     uint64 _burnBridgeFee,  
141     uint64 _mintBridgeFee  
142 ) external onlyRole(MINTER_ROLE) {  
143     burnBridgeFee = _burnBridgeFee;  
144     mintBridgeFee = _mintBridgeFee;  
145     ...  
146 }
```

Recommendation

We recommend adding reasonable boundaries for the fees.

Alleviation

[IDRX, 20230705] : Please find the changes in the following link

<https://github.com/nusa-idrx/idrx-backend/blob/345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247/packages/smartcontract/contracts/IDRX.sol#L26C28-L26C42>

[CertiK, 20230705] : The team heeded the advice and resolved the finding in the commit [345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247](https://github.com/nusa-idrx/idrx-backend/blob/345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247)

IDR-10 | ZERO ADDRESS CAN BE BLACKLISTED

Category	Severity	Location	Status
Logical Issue	● Medium	contracts/IDRX.sol (IDRX): 101	● Resolved

Description

If the zero address is blacklisted, calls to internal ERC20 functions `_mint()` and `_burn()` will fail because the `beforeTokenTransfer()` or `afterTokenTransfer()` hook disallow transferring to/from the zero address.

Recommendation

We recommend adding checks to ensure the zero address cannot be blacklisted in the contract.

Alleviation

[IDRX, 20230705] : Please find the changes in the following link

<https://github.com/nusa-idrx/idrx-backend/blob/345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247/packages/smartcontract/contracts/IDRX.sol#L128C81-L128C81>

[Certik, 20230705] : The team heeded the advice and resolved the finding in the commit [345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247](https://github.com/nusa-idrx/idrx-backend/blob/345baa4c7ddc2dcf8bdab90ed6cb9d1aef386247)

IDR-07 | MISSING ZERO ADDRESS VALIDATION

Category	Severity	Location	Status
Volatile Code	Minor	contracts/IDRX.sol (IDRX): 145	Resolved

Description

Addresses are not validated before assignment or external calls, potentially allowing the use of zero addresses and leading to unexpected behavior or vulnerabilities. For example, transferring tokens to a zero address can result in a permanent loss of those tokens.

```
145 platformFeeRecipient = _platformFeeRecipient;
```

- `_platformFeeRecipient` is not zero-checked before being used.

Recommendation

It is recommended to add a zero-check for the passed-in address value to prevent unexpected errors.

Alleviation

[IDRX, 20230626] : Issue acknowledged. Changes have been reflected in the commit hash [8ecd9513e13be892b9a39a89ed19e2e93b32f9da](#)

[CertiK, 20230626] : The team heeded the advice and resolved the finding in the updated commit

IDR-03 | INCONSISTENCY IN BRIDGE NONCE INCREMENTING

Category	Severity	Location	Status
Inconsistency	● Informational	contracts/IDRX.sol (IDRX): 68, 86	● Resolved

Description

The `_bridgeNonce` value is incremented in the `burnBridge()` function, but not in the `mintBridge()` function. The `_bridgeNonce` is supposed to represent the unique count of transactions that move funds between bridges, but this count is currently only updated in the `burnBridge()` function and not when minting through the bridge.

Scenario

If multiple transactions are executed using the minting bridge, these transactions will not be reflected in the `_bridgeNonce` count. This may potentially cause confusion or misalignment in the bridge transaction count, especially in scenarios where accurate transaction tracking is essential.

Proof of Concept

Run the `mintBridge()` function multiple times and observe that `_bridgeNonce` does not change. This shows that the nonce is not being incremented when `mintBridge()` is called. Conversely, executing `burnBridge()` increments the nonce as expected.

Recommendation

We would like to double confirm the intention of using `_bridgeNonce` whether it is used to count the burn transaction or any transaction(mint/burn) counts.

If its intention is to count all transactions, to maintain consistency and accurate tracking of bridge transactions, it is recommended to increment `_bridgeNonce` in the `mintBridge()` function as well, similar to how it is done in `burnBridge()`. This can be done by calling the `incrementNonce()` function inside `mintBridge()`.

Alleviation

[IDRX, 20230626] : The process of bridging is done manually. The user will call the `burnBridge` function, and the `mintBridge` function is done manually through the an MPC wallet. There is a high chance that the minting will not be done incrementally based on the `bridgeNonce` of the source chain. However we will add a condition on the `mintBridge` function, which checks if the `bridgeNonce` of the source chain has been minted yet.

The changes can be seen here:

[c104b1f9ec5e0bfe8093c1f01f3c966896c84ffb](#)

[Certik, 20230626] : The team clarified the context and resolved the finding by checking the `fromChainNonceUsed` status of certain `fromChain` id and `fromChainBridgeNonce` in the updated commit

IDX-01 | USAGE OF HARDHAT'S CONSOLE

Category	Severity	Location	Status
Coding Style	● Informational	contracts/IDRXBasicToken.sol (IDRX): 10, 120, 170	● Resolved

Description

The contract uses the console contract from Hardhat, which is meant to be used for testing purposes.

Recommendation

It is recommended to remove the import of Hardhat's contract for better code readability and simplicity.

Alleviation

[IDRX, 20230626] : Issue acknowledged. Changes have been reflected in the commit hash [8ecd9513e13be892b9a39a89ed19e2e93b32f9da](#)

[Certik, 20230626] : The team heeded the advice and resolved the finding in the updated commit

APPENDIX | IDRX

Finding Categories

Categories	Description
Coding Style	Coding Style findings may not affect code behavior, but indicate areas where coding practices can be improved to make the code more understandable and maintainable.
Inconsistency	Inconsistency findings refer to different parts of code that are not consistent or code that does not behave according to its specification.
Volatile Code	Volatile Code findings refer to segments of code that behave unexpectedly on certain edge cases and may result in vulnerabilities.
Logical Issue	Logical Issue findings indicate general implementation issues related to the program logic.
Centralization	Centralization findings detail the design choices of designating privileged roles or other centralized controls over the code.

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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