



**PALADIN**  
BLOCKCHAIN SECURITY

# Smart Contract Security Assessment

Final Report

For WINR Protocol  
(Whitelist Pool)

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# 1 Overview

This report has been prepared for WINR Protocol's Whitelist Pool contract on the Arbitrum network. Paladin provides a user-centred examination of the smart contracts to look for vulnerabilities, logic errors or other issues from both an internal and external perspective.

## 1.1 Summary

<b>Project Name</b>	WINR Protocol
<b>URL</b>	<a href="https://winr.games/">https://winr.games/</a>
<b>Platform</b>	Arbitrum
<b>Language</b>	Solidity
<b>Preliminary Contracts</b>	<a href="https://github.com/WINRLabs/winr-protocol/blob/b7f469c79a8a4787e3fcc4d3aad5716aa6e2c37b/contracts/tokens/vesting/WhitelistPool.sol">https://github.com/WINRLabs/winr-protocol/blob/b7f469c79a8a4787e3fcc4d3aad5716aa6e2c37b/contracts/tokens/vesting/WhitelistPool.sol</a>
<b>Resolution</b>	<a href="https://github.com/WINRLabs/winr-protocol/commit/238343d8ec17f1fd9fb06bd4c5e6decba4385dd3">https://github.com/WINRLabs/winr-protocol/commit/238343d8ec17f1fd9fb06bd4c5e6decba4385dd3</a>
<b>Final Contracts</b>	<a href="https://github.com/WINRLabs/winr-protocol/blob/ff630f790fa0cbf1010bbfcc6d5ec91a77d6dd5b/contracts/tokens/vesting/WhitelistPool.sol">https://github.com/WINRLabs/winr-protocol/blob/ff630f790fa0cbf1010bbfcc6d5ec91a77d6dd5b/contracts/tokens/vesting/WhitelistPool.sol</a>

## 1.2 Contracts Assessed

Name	Contract	Live Code Match
WhitelistPool	0x2798419F2Db8ea5F0f3A9b405313801e052B9cA7	 MATCH

## 1.3 Findings Summary

Severity	Found	Resolved	Partially Resolved	Acknowledged (no change made)
● High	0	-	-	-
● Medium	1	1	-	-
● Low	2	2	-	-
● Informational	2	2	-	-
<b>Total</b>	<b>5</b>	<b>5</b>	-	-

### Classification of Issues

Severity	Description
● High	Exploits, vulnerabilities or errors that will certainly or probabilistically lead towards loss of funds, control, or impairment of the contract and its functions. Issues under this classification are recommended to be fixed with utmost urgency.
● Medium	Bugs or issues with that may be subject to exploit, though their impact is somewhat limited. Issues under this classification are recommended to be fixed as soon as possible.
● Low	Effects are minimal in isolation and do not pose a significant danger to the project or its users. Issues under this classification are recommended to be fixed nonetheless.
● Informational	Consistency, syntax or style best practices. Generally pose a negligible level of risk, if any.

## 1.3.1 WhitelistPool

ID	Severity	Summary	Status
01	MEDIUM	Users can still deposit even after the dueDate	✓ RESOLVED
02	LOW	Users will appear to have very little gWLP tokens due to a decimal error	✓ RESOLVED
03	LOW	Governance risk: Contract admins can withdraw all USDC from the WhitelistPool	✓ RESOLVED
04	INFO	Typographical error	✓ RESOLVED
05	INFO	Gas optimization	✓ RESOLVED

# 2 Findings

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## 2.1 WhitelistPool

`WhitelistPool` represents a component of the Winr presale where presale participants can exchange their USDC tokens for gWLP (Genesis WLP tokens).

The `deposit` function allows users to exchange any amount of USDC for an equivalent amount of gWLP. Meanwhile, the `withdraw` function allows the contract administrators to take out this USDC after the due date has passed. The due date is configured a few days after the deployment.



The due date can be updated via the `updateDueDate` function, however, they cannot shorten it. This means that they can only extend the due date.

### 2.1.1 Privileged Functions

- `withdraw` [ `DEFAULT_ADMIN_ROLE` ]
- `updateDueDate` [ `DEFAULT_ADMIN_ROLE` ]




## 2.1.2 Issues & Recommendations

<b>Issue #01</b>	<b>Users can still deposit even after the dueDate</b>
<b>Severity</b>	 MEDIUM SEVERITY
<b>Description</b>	The WhitelistPool contract has a due date set at a fixed number of days after the pool has been deployed. However, there is currently no logic that prevents users from exchanging USDC for gWLP after this date has been reached. This means that users can continue to purchase gWLP forever.
<b>Recommendation</b>	Consider whether this is desired. If not, consider adding a requirement.  <pre>require(block.timestamp &lt; dueDate, "WP: Due Date has passed");</pre>
<b>Resolution</b>	 RESOLVED The recommended requirement has been implemented.





**Issue #02****Users will appear to have very little gWLP tokens due to a decimal error****Severity** LOW SEVERITY**Description**

The WhitelistPool token, gWLP, has 18 decimals. However, the USDC which users deposit has 6 decimals. This causes the conversion to exchange a single USDC for a very small apparent amount of gWLP.

**Recommendation**

Consider adding an immutable `_decimals` variable:


```
uint256 private immutable _decimals;

constructor(IERC20Metadata _USDC) ... {
    _decimals = _USDC.decimals();
}

function decimals() external override view returns (uint8) {
    return _decimals;
}
```

**Resolution** RESOLVED

The client has taken a different approach by minting a whole  $1e18$  token for every  $1e6$  USDC which is deposited. This works as well and is valid.

**Issue #03****Governance risk: Contract admins can withdraw all USDC from the WhitelistPool****Severity** LOW SEVERITY**Description**

The contract admins can call `withdraw` to withdraw all the collected USDC once the `dueDate` expires. As there is no way for users to request a refund before the `dueDate`, the USDC could be lost if the governance keys are compromised or governance turns malicious.

Another governance risk for the team itself is accidentally calling `updateDueDate` with a very large number (e.g. milliseconds) as this would effectively lock the team out of all USDC in the contract.

**Recommendation**

Consider whether it makes sense to allow users to exchange their gWLP for USDC again before the `dueDate`. This might not make sense for the tokenomics, however, we strongly urge the team to exclusively grant the `DEFAULT_ADMIN_ROLE` to a reputable multi-signature wallet with a minimum quorum of 3 unique and reputable parties.

We also recommend adding a requirement that `newDueDate` is not too far in the future to avoid accidental lockouts.

**Resolution** RESOLVED

The role has been transferred to a 2/3 multi-signature wallet with Myrddin and Percival from Camelot as confirmed owners.

Multi-signature wallet:

<https://arbiscan.io/address/>



[0x6cD370d150aE45066d95aF610e251D7fFE7DCF57](https://arbiscan.io/address/0x6cD370d150aE45066d95aF610e251D7fFE7DCF57)



Myrddin: 0xd8dc994FE2b075c697e5051c89b713Bf15fa9294

Percival: 0x01E5d631ba707a029C8A1555bDAc4805d7853E21

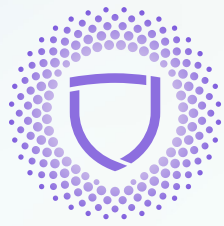
Owner #3 (0xJack from Winr):

0xd8dc994FE2b075c697e5051c89b713Bf15fa9294

<b>Issue #04</b>	<b>Typographical error</b>
<b>Severity</b>	 INFORMATIONAL
<b>Location</b>	<u>Line 52</u> * @notice new due date can not be before than the current one
<b>Description</b>	The word <i>than</i> can be removed from the sentence.
<b>Recommendation</b>	Consider fixing the typographical error.
<b>Resolution</b>	 RESOLVED

<b>Issue #05</b>	<b>Gas optimization</b>
<b>Severity</b>	 INFORMATIONAL
<b>Location</b>	<u>Line 14</u> IERC20 public USDC;
<b>Description</b>	This token can be marked as immutable to save on gas usage.
<b>Recommendation</b>	Consider implementing the gas optimization mentioned above.
<b>Resolution</b>	 RESOLVED





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