**T1** 2023

Coverity Scan Static Analysis Report

Hardhard Enterprises

Statement of Intent

Overview

This document aims to provide a record of static code analysis performed on a specific issue from the Coverity SAST scan for the NASA ION Open-Source code 4.1.1 project.

The primary purpose of this document is to validate the issue identified via the automated detection process to eliminate false positives.

Depending on findings, secondary purposes can include but are not limited to listing/providing recommended fixes alongside a list of attack vectors and potential exploits for consideration.

Reporting Best Practices

Please ensure best practices are kept when completing the document via regularly updating the Acronyms and Abbreviations table alongside any iterations made to the Document History table. This will allow other members to identify any updates and progress made across trimesters easily.

When using code snippets, please use screenshots that are clear and easy to read, alternatively, use words built-in code formatter found [here](https://appsource.microsoft.com/en-us/product/office/WA104382008?tab=Overview).

Document Naming Conventions

Naming conventions for this file are as follow; SAR\_{CID}. For example, when investigating issue 123456 the file name would be SAR\_123456.docx

Document History

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# Introduction

## Objective

The primary objective of this analysis is to determine whether the defects identified in the Coverity Report for the ION Open Source 4.1.1 project are:

* Indeed, defects.
* Potentially exploitable.

The secondary objective of this analysis, where applicable, is to provide the following:

* Recommendation(s) to fix.
* Any exploit for consideration.

## Scope

This static code analysis is limited to the ***Out of Bounds*** type defect identified in the following CIDs:  
***CID\_1520662***

# Acronyms and Abbreviations

Please keep an updated list of acronyms and abbreviations used throughout the report.

|  |  |
| --- | --- |
| **Acronym** | **Meaning** |
| DTN | Delay/Disruption Tolerant Network |
| ION | Interplanetary Overlay Network |
|  |  |

# Code Review and Analysis

## Overview

The out of Bounds access error occurs when the memory allocation of the value is greater than or less than the validation for the value. This particular error is referring to the address of the element being more then the number of elements in the buffer.

## Observations

As with previous out of bound access errors, this one deals with the specific value that the ‘elt’ value throws.

A close-up of a computer code

Description automatically generated with low confidence

This is the same return value that appears in all other Out of bound Access reports.

This appears to be caused by the validation of the value being lower than the actual value that let throws. So the return error is the out of bounds error.

Below we can see the error attempting to validate itself.

A screenshot of a computer

Description automatically generated with medium confidence

## Supporting Evidence

This is supported through the reports for the following CIDS

***CID-1520755***

***CID-1520753***

***CID-1520749***

# Conclusions and Recommendations

It is recommended that the validation be fixed and this should hopefully eliminate most if not all of the Out of Bounds Access errors within the code. If left this may cause a security breach if a malicious attacker where to access the memory through the Out of bounds value.

References  
Please keep an updated references list in APA7; The Deakin referencing guide can be found [here](https://www.deakin.edu.au/__data/assets/pdf_file/0009/2236752/Deakin-guide-to-APA7.pdf).

SAR\_1520755

SAR\_1520743

SAR\_1520749

Appendix

Include additional information/documentation here to help the readers understand complex information.