**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 ***High Impact Quality*** type defect identified in the following CIDs:  
***1520882***

# 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

Coverity discovered a "high impact quality" vulnerability with the usage of casting INT to the 32-bit time\_t data type at line 177, which originally impacted lines 67 and 77 in the appendStateStats function by examining the "bpstats2.c" code base under the /bpv7/test/" directory.

## Observations

The problem here is that if a basic data structure is given a value that exceeds its capacity, the program may lose data where as non-negative integer in the range 0 to 4294967295 is encoded using a 32-bit unsigned integer. As a result, the program's execution may fail if the "currentTime" and “startTime” function returns a number that the unsigned integer data type cannot store. This is because converting a large input like time\_t to a small input like an int value causes the program to covert the vast amount of time\_t data, which may result in the data being truncated.

## Supporting Evidence

# 





# Conclusions and Recommendations

This problem can be resolved by using a method that could contain the time represent the time using other methods such as struct currentTime and struct startTime.

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).

Appendix

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