The National Vulnerability Intelligence Platform User Interface

Christian Reasoner, Sienne Rodwell, Zolbo Tomita
Sponsor: Dr. Mehdi Mirakhorli, University of Hawaii Information and Computer Sciences and The Department of Homeland Security
ICS 496 Capstone Project – Spring 2024

Introduction

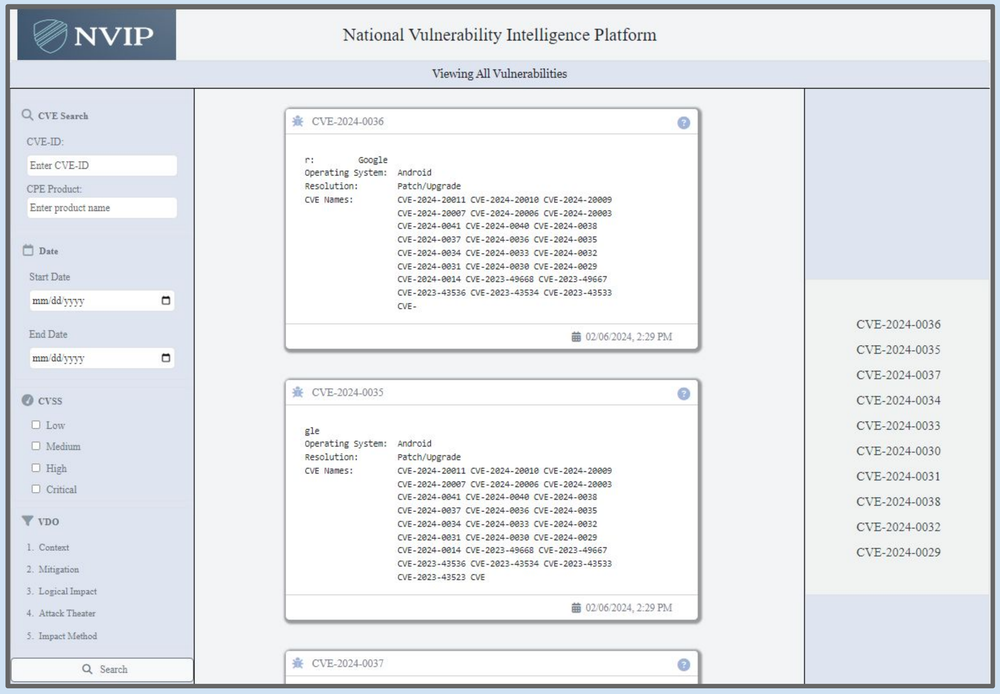
The National Vulnerability Intelligence Platform is an application that will provide real-time detection and reporting of vulnerabilities using automated mining techniques to check CVE Numbering Authority (CNA) web sites and other online sources. The NVIP is sponsored by the Department of Homeland Security and is intended to enhance the public domain of vulnerability intelligence.

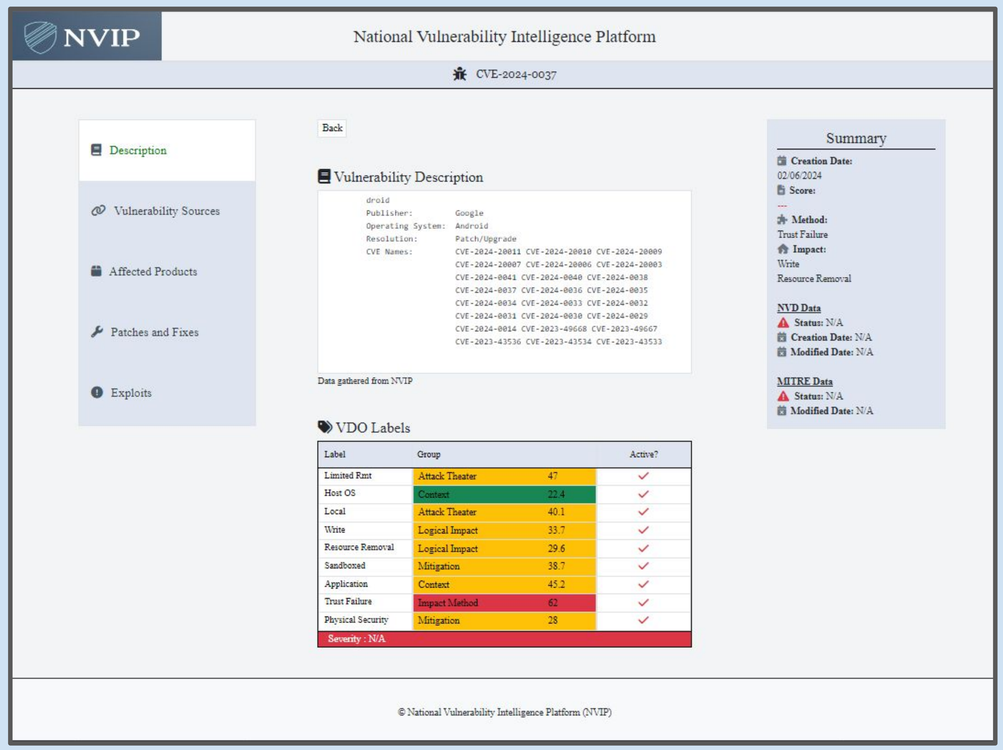
Project Description

At its core, NVIP is envisioned as an indispensable tool facilitating real-time detection and meticulous reporting of vulnerabilities. A pivotal component of this initiative resides in the development of a User Interface (UI) meticulously crafted to empower users with intuitive and seamless access to the wealth of vulnerability intelligence amassed by NVIP. This UI serves as the primary portal through which users engage with the platform, facilitating effortless navigation, robust search functionalities, and intuitive visualization of vulnerability data. Key Features incorporated into production of the UI include usability, accessibility, data visualization, interoperability, and integration.

Accomplishments

The UI for the NVIP boasts a modular user interface replete with reusable components. The NVIP displays troves of vulnerability information in a digestible and intuitive manner, ensuring that users can effortlessly comprehend complex data sets. Custom linking functionalities enhance user exploration, facilitating seamless navigation throughout. NVIP's dedication to developer empowerment is evident in its meticulously designed custom styles, characterized by their manipulability, scalability, and transferability, fostering a conducive environment for agile development practices.





Technology Stack

The UI for the National Vulnerability Intelligence Platform (NVIP) was crafted with precision using NestJS 10.3.8 for backend architecture, MySQL 8.036 for database management, and Bootstrap 5.3.3 for frontend design. Angular 17.2.0, coupled with Typescript 5.3.2, facilitated dynamic user interfaces. This comprehensive toolchain enabled the creation of a modular, navigable, and visually compelling UI.

Challenges

This endeavor involved an ongoing project constructed using the Angular framework. Preceding this initiative, our team possessed limited to no familiarity with Angular and the NVIP, presenting a substantial learning curve to comprehend the intricacies of Angular and TypeScript implementations. This posed considerable challenges during the project's initial phases, as our team navigated the complexities of both configuring the project and grasping the nuances of Angular and TypeScript functionality. Through perseverance and a commitment to excellence, ultimately a seamless UI which surpassed project requirements was delivered.

Moving Forward

In the future, NVIP teams will take steps to refine the data retrieved from web crawlers to ensure heightened accuracy in all vulnerability information. Additionally, we aim to augment the search bar functionality, expanding its parameters to encompass CVSS scores and VDO labels. Furthermore, efforts will be directed towards rectifying discrepancies in SSVC Scores, Patches and Fixes, and the Exploits section, ensuring seamless integration of pertinent data within the CVE descriptions. Finally, continuous updates to the styling elements is envisaged to enhance the visual appeal and user experience.