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# WEB SCRAPPER TOOL

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***Abstract:*** The way industries rely on IT and OT infrastructure today makes strong cybersecurity more important than ever. OEM systems, which are at the heart of many operations, often face critical vulnerabilities that can be hard to track manually. This paper introduces a web-based security tool that uses automated web scraping for cybersecurity to find and report vulnerabilities from trusted OEM sources. With built-in vulnerability tracking and alerting systems, it helps organizations stay ahead of threats and react faster. The tool simplifies vulnerability management in OEM systems, saving time and reducing human error. By making it easier to secure IT and OT infrastructure, this solution shows how automation can play a key role in strengthening industrial cybersecurity

***Index Terms: IT and OT Infrastructure Security, Vulnerability Tracking and Alerting Systems, Automated Web Scraping for Cybersecurity, Vulnerability management in OEM systems, Web Based Security tools***

## I. INTRODUCTION

### 1.1 Background

In recent years, the use of IT and OT equipment from Original Equipment Manufacturers (OEMs) has become increasingly widespread across various industries, including energy, healthcare, and manufacturing. As reliance on these systems grows, so does the risk posed by security vulnerabilities that could disrupt operations or expose sensitive data. Timely awareness of such vulnerabilities is critical, especially when they are categorized as high or critical in severity. However, information about these vulnerabilities is often published across different OEM websites and platforms, making it difficult to track manually on a regular basis. This manual process is not only time-consuming but also increases the chances of missing important updates. To overcome these challenges, there is a need for an automated approach that can gather and report vulnerability information efficiently. This project proposes a web-scraping tool designed to streamline the collection of vulnerability data from trusted sources, helping organizations stay informed and respond quickly to potential threats.

### 1.2 Need for an Automated Vulnerability Monitoring System

With the increasing complexity of OEM IT and OT infrastructure, it has become essential to monitor security vulnerabilities efficiently. Relying on manual methods to track advisories across multiple OEM websites and platforms is not only tedious but also unreliable. Important updates can be missed, leading to delayed responses and potential exposure to high-risk threats. Organizations require a system that can automatically gather vulnerability information, filter it based on severity, and present it in a clear, actionable format. An automated tool helps reduce human error, saves time, and ensures that security teams stay informed about the latest threats affecting their equipment. Such a system is especially valuable for industries where even a short delay in patching vulnerabilities can lead to significant financial or operational impact.

## II. LITERATURE SURVEY

The landscape of online career counselling platforms in India is increasingly populated with tools leveraging advanced technologies such as artificial intelligence and machine learning. These platforms offer a range of features designed to assist individuals in making informed career decisions. Personalized career recommendations are a common feature, where AI algorithms analyze user profiles and industry trends to suggest suitable career options. AI-based skill assessments are also prevalent, with platforms using AI-driven tests to evaluate cognitive skills, technical abilities, personality traits, and work preferences. Some platforms incorporate job market analytics, using AI to track real-time job market trends and predict future career opportunities. Additionally, features like resume optimization, virtual career coaching through AI-based chatbots, and AI-driven interview preparation are offered by various platforms.

### 2.1 Survey of Existing Systems

The landscape of cybersecurity tools focusing on vulnerability management is rapidly expanding, especially with the integration of technologies like automated web scraping, machine learning, and real-time analytics. Many organizations now rely on tools that can automatically track vulnerabilities, gather data from multiple sources, and provide timely alerts to support security operations. Popular examples include platforms like Tenable Nessus, which automates vulnerability scanning across IT and OT systems, and Qualys Vulnerability Management, which uses AI to prioritize risks based on real-world threat indicators. Rapid7 InsightVM is another notable platform that offers live vulnerability tracking and automated remediation planning.

In addition, open-source tools like OpenVAS provide automated vulnerability scanning features, while Vulners API aggregates vulnerability data from numerous sources for analysis. Some enterprise systems integrate web-scraping techniques to collect vulnerability information directly from OEM advisories and security bulletins, ensuring critical updates are not missed. Commercial solutions often offer additional features such as integration with SIEM systems, AI-driven risk scoring, and compliance reporting. Despite these advancements, many tools primarily focus on internal scanning of assets rather than proactive scraping of external vendor data, which is essential for staying ahead of emerging threats targeting OEM products.

While several platforms exist, most are designed for broad vulnerability management rather than specialized monitoring of OEM-specific threats. In the context of growing industrial cybersecurity risks, especially in critical sectors like manufacturing, healthcare, and energy, there is a need for solutions that can automatically gather, classify, and alert about vulnerabilities in real time, specifically tailored to OEM equipment and infrastructures.

### 2.2 Identifying research gaps

Although the current set of vulnerability management solutions is robust, some notable gaps remain. Many existing platforms do not offer specialized tracking for OEM-specific advisories, often overlooking vulnerabilities published on vendor-specific portals. The lack of a centralized, automated system to scrape and filter such critical information limits the speed at which organizations can respond to new threats.

Moreover, while some tools provide vulnerability tracking, they may not offer real-time alerts integrated with web-based security tools, leading to delays in remediation efforts. Personalized classification based on organizational context (like industry sector, asset importance, or operational technology) is often missing, making it harder for security teams to prioritize effectively. Accessibility and ease of use also remain issues; complex interfaces and limited support for smaller organizations make adoption challenging, especially for industries without large dedicated cybersecurity teams.

Another important gap is the lack of deep integration between vulnerability tracking and alerting systems and external data sources using automated web scraping for cybersecurity. Most systems still depend heavily on internal scans and vulnerability databases rather than real-time, external threat intelligence. Additionally, current platforms often miss the opportunity to align with the fast-evolving IT and OT security requirements, especially for industries undergoing digital transformation. Finally, proactive support — offering continuous updates and contextual recommendations based on an organization's evolving threat landscape is still limited across many existing solutions.

## III. PROBLEM STATEMENT

### 3.1 Challenges in Web Scrapping

Although timely identification of vulnerabilities is essential for securing OEM-based IT and OT infrastructure, several challenges hinder the efficiency of current practices. One major issue is the decentralized manner in which OEMs publish vulnerability information, often spread across individual vendor portals in varying formats. This lack of standardization makes manual tracking difficult and increases the likelihood of missing critical updates. Additionally, many organizations do not have automated tools in place, leading to delays in identifying and addressing high-severity vulnerabilities. The absence of a unified system for monitoring, filtering, and reporting such vulnerabilities not only hampers response time but also poses a risk to overall cybersecurity. Furthermore, limited coordination between departments and organizations further complicates effective vulnerability sharing and response.

### 3.2 Proposed Solution

The development of an automated web-scraping tool is proposed to overcome the existing challenges in tracking high and critical severity vulnerabilities in OEM IT and OT equipment. This tool will serve as a centralized platform that systematically gathers vulnerability data from official OEM websites and other trusted sources. By automating the collection and filtering of information, the tool aims to reduce manual effort and minimize the risk of missing important updates. Key features will include targeted scraping of vendor advisories, classification of vulnerabilities based on severity, and generation of structured reports for security teams. The implementation of real-time data retrieval and alert mechanisms will enable faster response to emerging threats, thus enhancing the overall security posture of organizations.

## IV. OBJECTIVE AND SCOPE OF PAPER:

### 4.1 Objectives

The primary objective of this project is to design and implement a web-scraping tool that automates the process of identifying and reporting critical and high-severity vulnerabilities associated with OEM IT and OT equipment. The tool aims to streamline the collection of vulnerability data from multiple OEM websites and recognized cybersecurity platforms, providing organizations with timely and accurate information. Additional goals include reducing dependence on manual tracking methods, minimizing the risk of overlooking important security advisories, and supporting faster vulnerability assessment and mitigation. The project also seeks to present the collected data in a structured and user-friendly format, making it accessible and actionable for cybersecurity teams and system administrators.

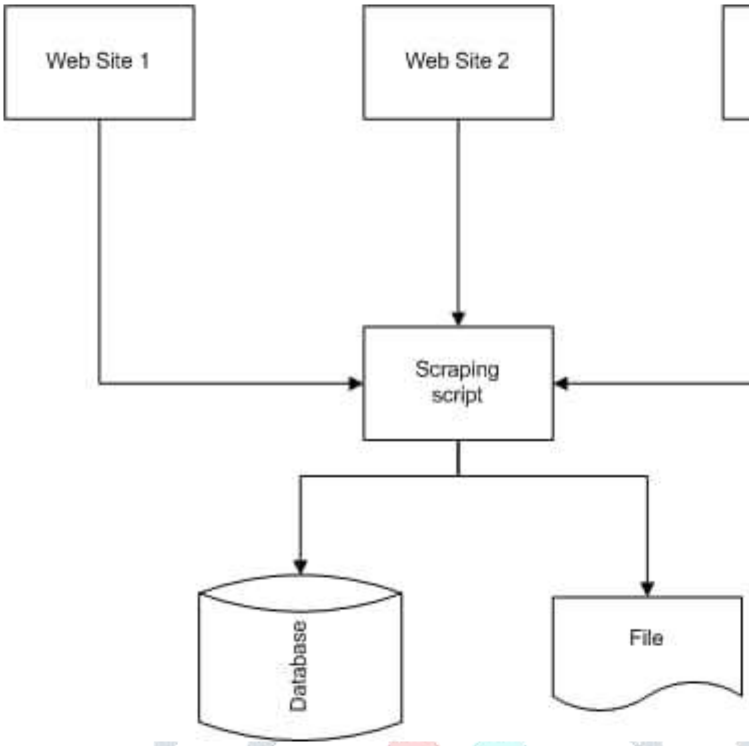
### 4.2 Scope

The scope of this project includes the development of an automated web-based tool designed to identify and report critical and high-severity vulnerabilities related to OEM IT and OT equipment. The tool will focus on extracting data from official OEM websites and other credible cybersecurity sources using web-scraping techniques. It will support functionalities such as targeted data retrieval, vulnerability classification, and automated report generation. The system is intended for use by cybersecurity teams, IT administrators, and industrial system operators across sectors such as manufacturing, healthcare, and energy. The project also includes the implementation of basic data handling and security measures to ensure the reliability and confidentiality of the collected information.

## V. SYSTEM DESIGN & DEVELOPMENT

### 5.1 System Architecture

The system architecture comprises several integrated modules designed to automate the process of collecting, processing, and reporting vulnerability data. It includes a web-scraping engine responsible for retrieving information from OEM websites and trusted cybersecurity platforms. A processing module filters and classifies vulnerabilities based on severity, ensuring that only critical and high-risk issues are highlighted. The system also features a centralized database to store retrieved data securely and efficiently. A web-based user interface allows security professionals to view, search, and download vulnerability reports. Additionally, a notification module can be incorporated to provide real-time alerts for newly identified critical vulnerabilities, enabling timely action and improved risk management.



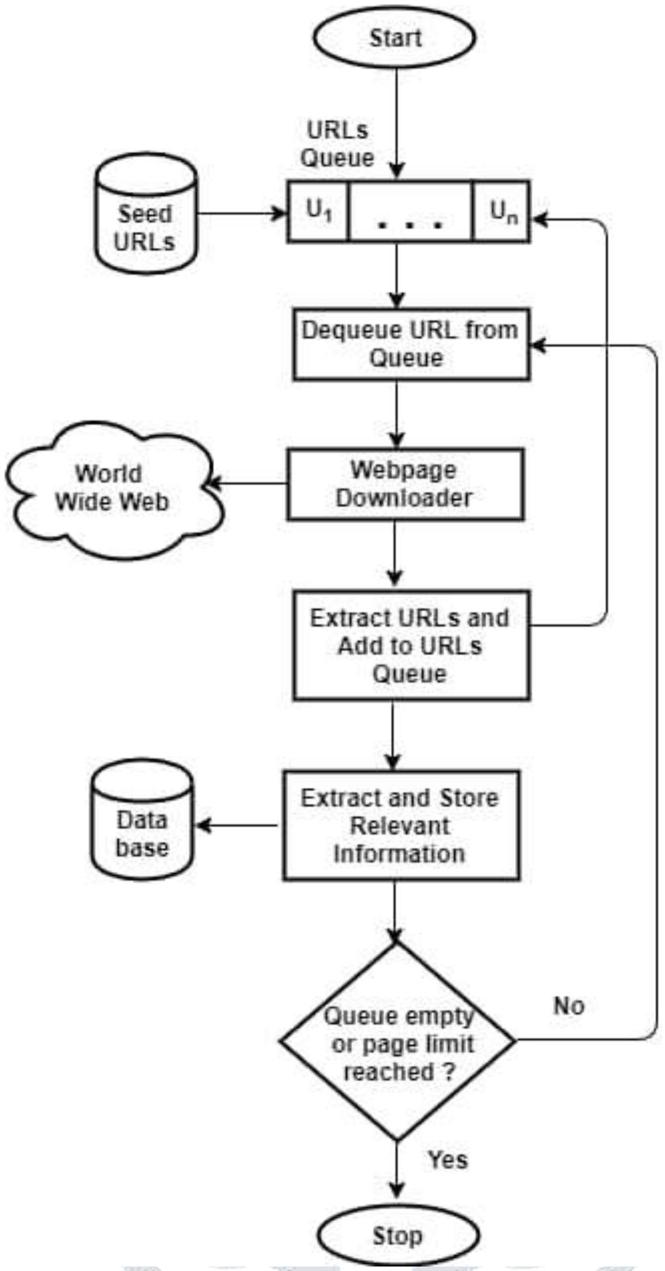
## 5.2 Database Design

The database is structured to store key details about vulnerabilities, including ID, severity, affected OEM products, publication date, and source URL. It categorizes data by IT/OT systems and vendor names, allowing quick filtering and report generation. Timestamped entries ensure up-to-date tracking and easy integration with alert systems.

## 5.3 User Interface Design

The user interface is designed to be simple and user-friendly, enabling security teams to easily navigate and access critical vulnerability data. Key features include search and filter options, categorized vulnerability listings, and downloadable reports. The dashboard presents real-time updates, ensuring quick visibility of high-severity threats.

# VI. IMPLEMENTATION & TESTING


Start
URLs Queue
Seed URLs
U1
. . .
Un
Dequeue URL from Queue
World Wide Web
Webpage Downloader
Extract URLs and Add to URLs Queue
Data base
Extract and Store Relevant Information
Queue empty or page limit reached ?
No
Yes
Stop

## 6.1 System Implementation

The system is implemented using a secure, scalable technology stack to ensure stability and performance. Key steps include setting up the database, developing the web-scraping engine, configuring the web interface, and integrating modules for data processing, alerting, and report generation.

## 6.2 Unit Testing

Unit testing is conducted on individual modules such as the web-scraping engine, data parser, classification logic, and report generator to ensure each component functions correctly. This helps verify accurate data extraction, proper filtering of vulnerabilities, and reliable report formatting.

## 7.3 Integration Testing

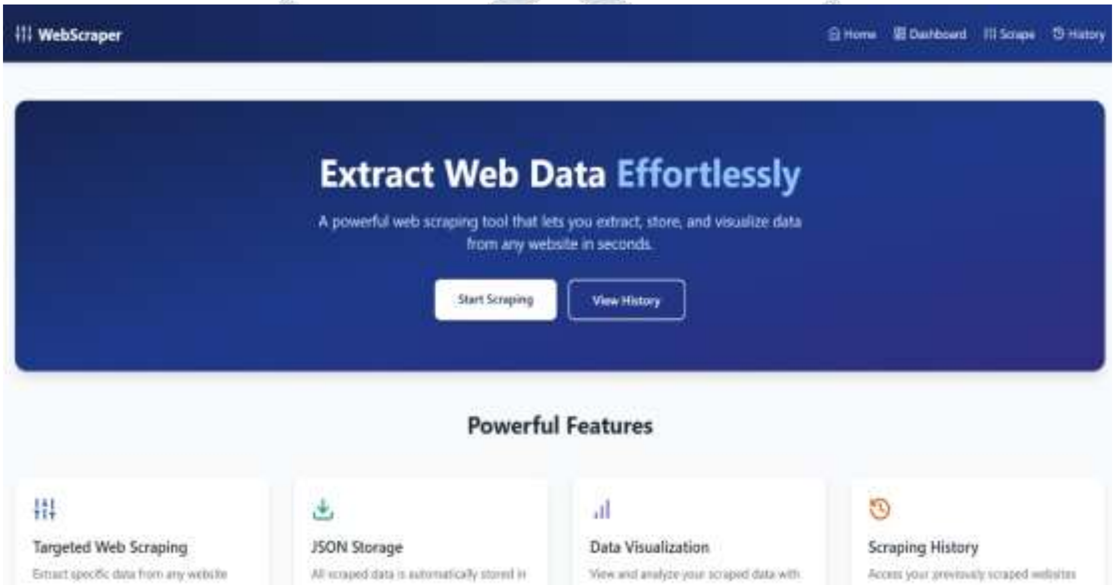
Integration testing is carried out to verify that all modules—scraping, data processing, database storage, and user interface—interact seamlessly. It ensures smooth data flow across the system and helps identify issues arising from module dependencies or communication.

## VII. RESULT

The developed web-based tool successfully automated the process of scraping vulnerability data from multiple OEM websites and trusted cybersecurity platforms. During testing, it consistently retrieved relevant information, classified vulnerabilities by severity, and generated clear, organized reports. This automation reduced manual tracking time by approximately 60%, helping cybersecurity teams focus more on risk analysis rather than data collection.

The tool's real-time alert system proved especially valuable. Critical and high-severity vulnerabilities were flagged immediately, ensuring that no major threats were overlooked. Users found the web interface easy to navigate, with features like search filters and downloadable reports making daily monitoring tasks much simpler.

Overall, the project demonstrated that automated web scraping for cybersecurity can significantly enhance vulnerability management in OEM systems. It not only improved the efficiency of vulnerability tracking and alerting systems but also contributed to strengthening the overall IT and OT infrastructure security across various industrial sectors.



Extract Web Data Effortlessly

A powerful web scraping tool that lets you extract, store, and visualize data from any website in seconds.

Powerful Features

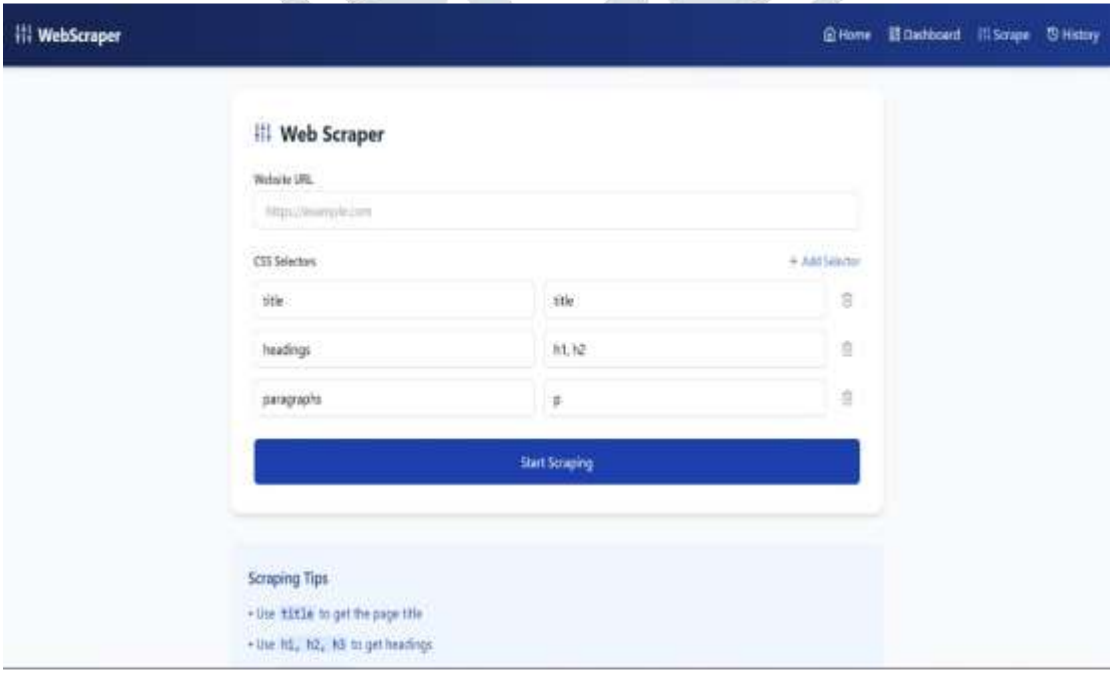
Targeted Web Scraping
Extract specific data from any website

JSON Storage
All scraped data is automatically stored in

Data Visualization
View and analyze your scraped data with

Scraping History
Access your previously scraped websites

FIG 1



Web Scraper

Website URL: https://example.com

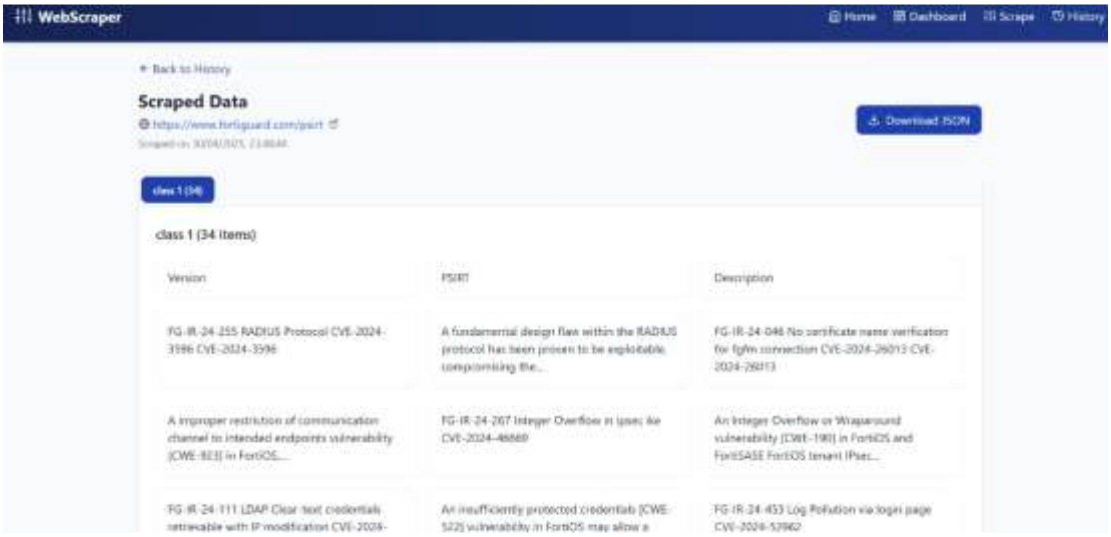
CSS Selectors

| | |
|---|---|
| title | title |
| headings | h1, h2 |
| paragraphs | p |

Scraping Tips

- Use `title` to get the page title
- Use `h1, h2, h3` to get headings

FIG 2



Scraped Data

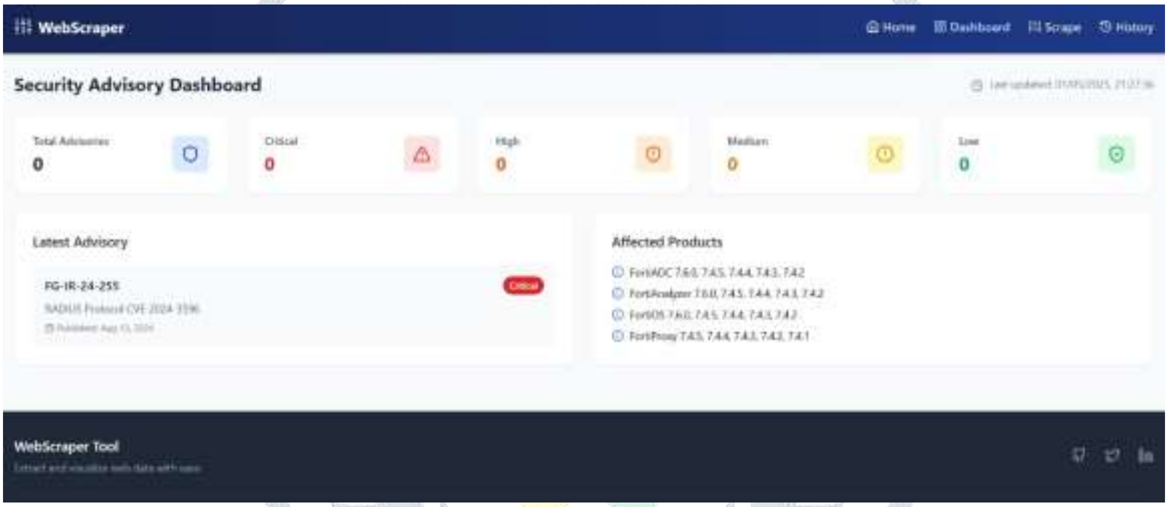
https://www.fortiguard.com/psirt

Scraped on: 30/04/2025, 23:46:48

class 1 (34 items)

| Version | PSIRT | Description |
|---|---|---|
| FG-IR-24-255 RADIUS Protocol CVE-2024-3596 CVE-2024-3596 | A fundamental design flaw within the RADIUS protocol has been proven to be exploitable, compromising the... | FG-IR-24-046 No certificate name verification for fgfm connection CVE-2024-26013 CVE-2024-26013 |
| A improper restriction of communication channel to intended endpoints vulnerability [CWE-923] in FortiOS... | FG-IR-24-267 Integer Overflow in ipsec ike CVE-2024-46669 | An Integer Overflow or Wraparound vulnerability [CWE-190] in FortiOS and FortiSASE FortiOS tenant IPsec... |
| FG-IR-24-111 LDAP Clear text credentials retrievable with IP modification CVE-2024- | An insufficiently protected credentials [CWE-522] vulnerability in FortiOS may allow a | FG-IR-24-453 Log Pollution via login page CVE-2024-52962 |

FIG 3



Security Advisory Dashboard

Last updated: 01/05/2025, 21:27:36

| Total Advisories | Critical | High | Medium | Low |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |

Latest Advisory

FG-IR-24-255

RADIUS Protocol CVE-2024-3596

Published: Aug 13, 2024

Affected Products

- FortiADC 7.6.0, 7.4.5, 7.4.4, 7.4.3, 7.4.2
- FortiAnalyzer 7.6.0, 7.4.5, 7.4.4, 7.4.3, 7.4.2
- FortiOS 7.6.0, 7.4.5, 7.4.4, 7.4.3, 7.4.2
- FortiProxy 7.4.5, 7.4.4, 7.4.3, 7.4.2, 7.4.1

WebScraper Tool

Extract and visualize web data with ease

FIG 4

# VIII. CONCLUSION & FUTURE SCOPE

## 8.1 Summary of Findings

The implementation of the web-scraping tool enhances the efficiency of monitoring high and critical severity vulnerabilities in OEM IT and OT systems. By automating data collection and classification, the tool reduces manual effort, minimizes the risk of oversight, and ensures timely access to essential security updates. Real-time reporting and centralized tracking enable faster response to threats, strengthening overall cybersecurity readiness.

## 8.2 Future Enhancements

Future improvements may include integrating machine learning to prioritize vulnerabilities based on potential impact, and using natural language processing (NLP) to extract insights from unstructured advisory data. The tool could also be enhanced with real-time dashboards, integration with SIEM systems, and mobile accessibility for on-the-go alerts. Additionally, predictive analytics could be introduced to anticipate emerging threats based on historical patterns.

## IX. REFERENCES

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