Introduction to Vulnerability Analysis Project

Overview

As part of my role as an ethical hacker with the EC-Council, I undertook a comprehensive vulnerability analysis project. This project focused on identifying and analyzing potential security weaknesses within a target network. By leveraging information acquired during the footprinting and scanning phases, I was able to conduct a thorough investigation into the network's vulnerabilities.

Objectives

The main objectives of this project were to extract critical information about the target network, including:

- **Network Vulnerabilities:** Identification of network vulnerabilities, listening IPs, TCP/UDP ports, and services.
- **Application and Service Configuration Errors:** Detection of configuration errors and vulnerabilities within applications and services.
- **Operating System and Applications:** Enumeration of the operating systems and applications in use.
- **Weak Passwords and Permissions:** Identification of weak passwords and improper permissions.
- **Default Services and Applications:** Recognition of default services and applications that may need to be removed or secured.

Tasks and Techniques

To achieve these objectives, a variety of tasks were performed using multiple tools and techniques. These tasks provided practical experience in several enumeration techniques essential for ethical hacking and penetration testing. Key tasks included:

Vulnerability Research: Utilizing vulnerability scoring systems and databases to perform thorough research, including Common Weakness Enumeration (CWE) and Common Vulnerabilities and Exposures (CVE).

Vulnerability Assessment: Conducting vulnerability assessments using tools such as OpenVAS and Nessus, which involved:

- Performing scans to identify vulnerabilities.
- Analyzing scan results to determine the severity of discovered vulnerabilities.

Web Server and Application Scanning: Using tools like CGI Scanner Nikto to identify vulnerabilities in web servers and applications.

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Tools Utilized

The project involved the use of several key tools to perform vulnerability assessments and analyses:

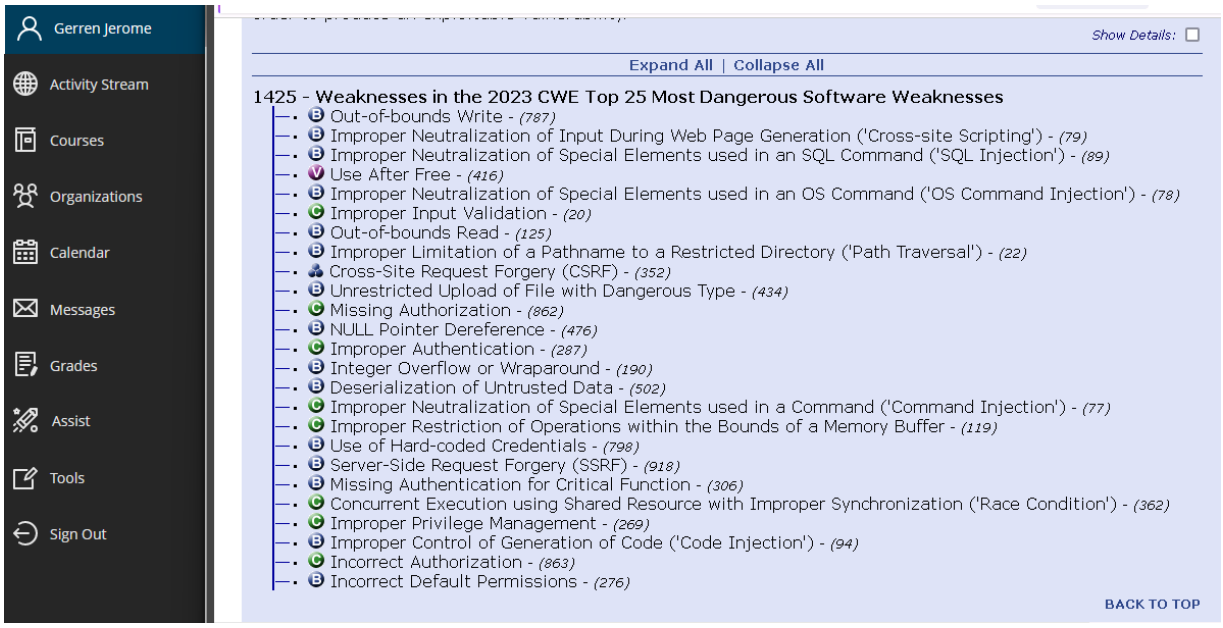
- OpenVAS: For comprehensive vulnerability scanning and analysis.
- Nessus: To conduct detailed vulnerability scans and assess security weaknesses.
- CGI Scanner Nikto: For scanning web servers and applications to detect potential vulnerabilities.

Perform vulnerability research with vulnerability scoring systems and databases.

Perform vulnerability research in Common Weakness Enumeration (CWE)

CWE search results (SMB)

Top 25 Most Dangerous Software Weaknesses (CWE VIEW)



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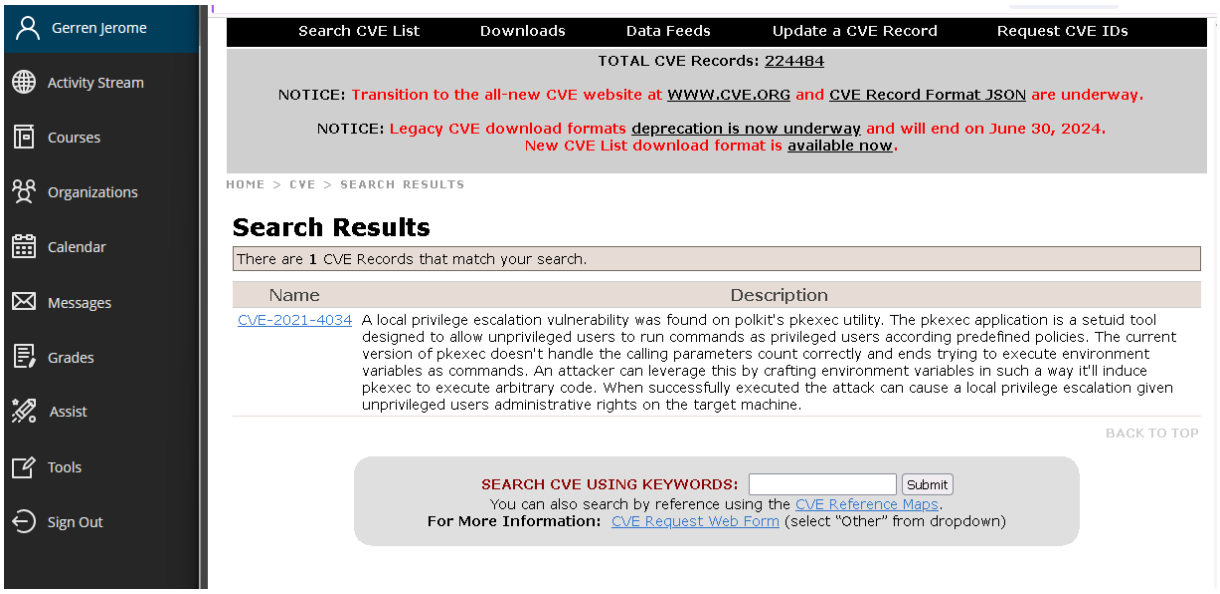
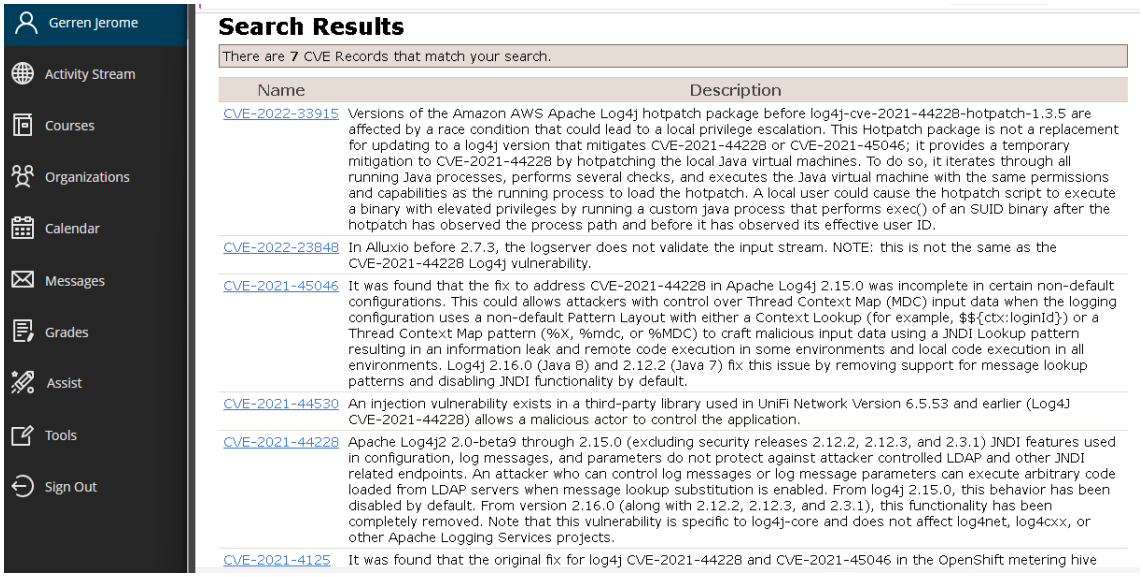
Perform vulnerability research in Common Vulnerabilities and Exposures (CVE)

CVE Search (CVE-2021-4034)



CVE Search (CVE-2021-44228)



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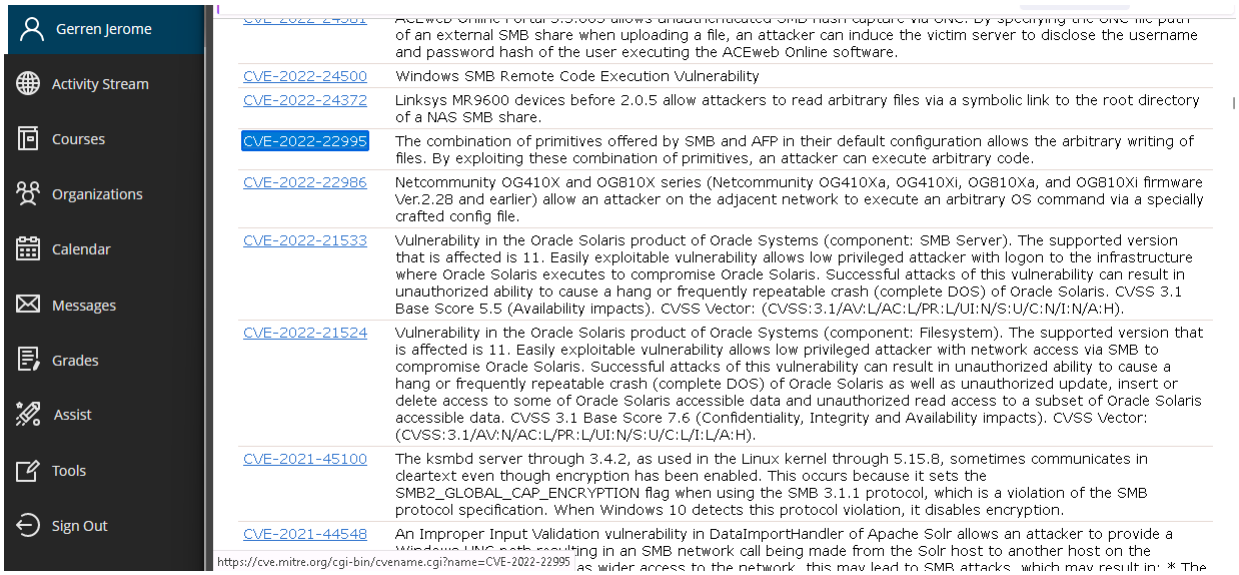
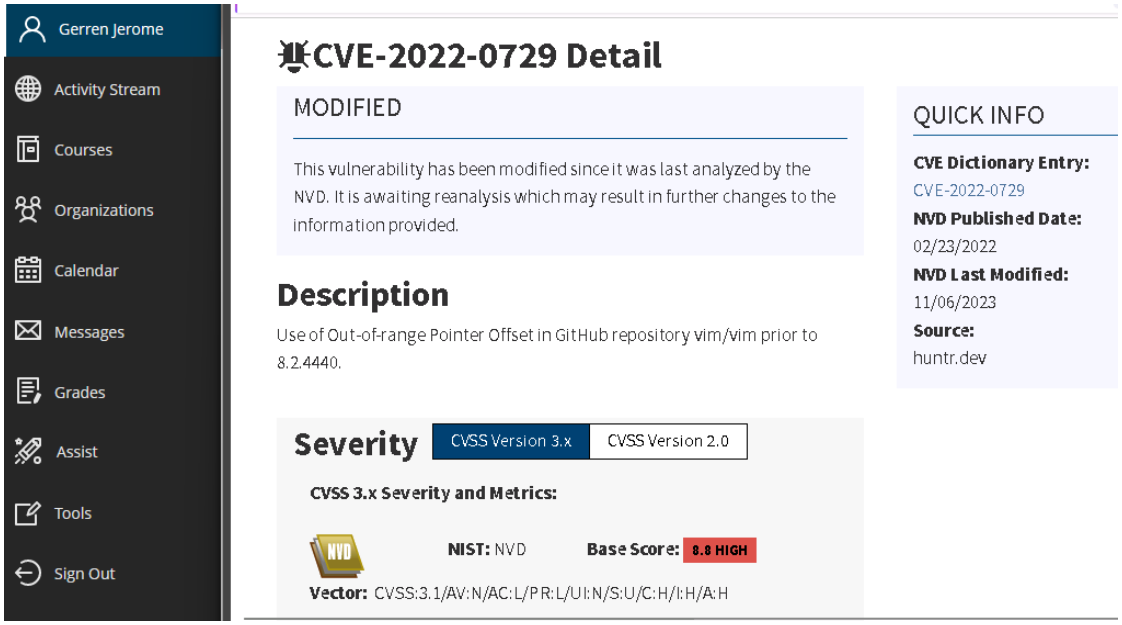
CVE Search (CVE-2022-22995



Perform vulnerability research in National Vulnerability Database (NVD)

NVD Search (CVE-2022-0729)



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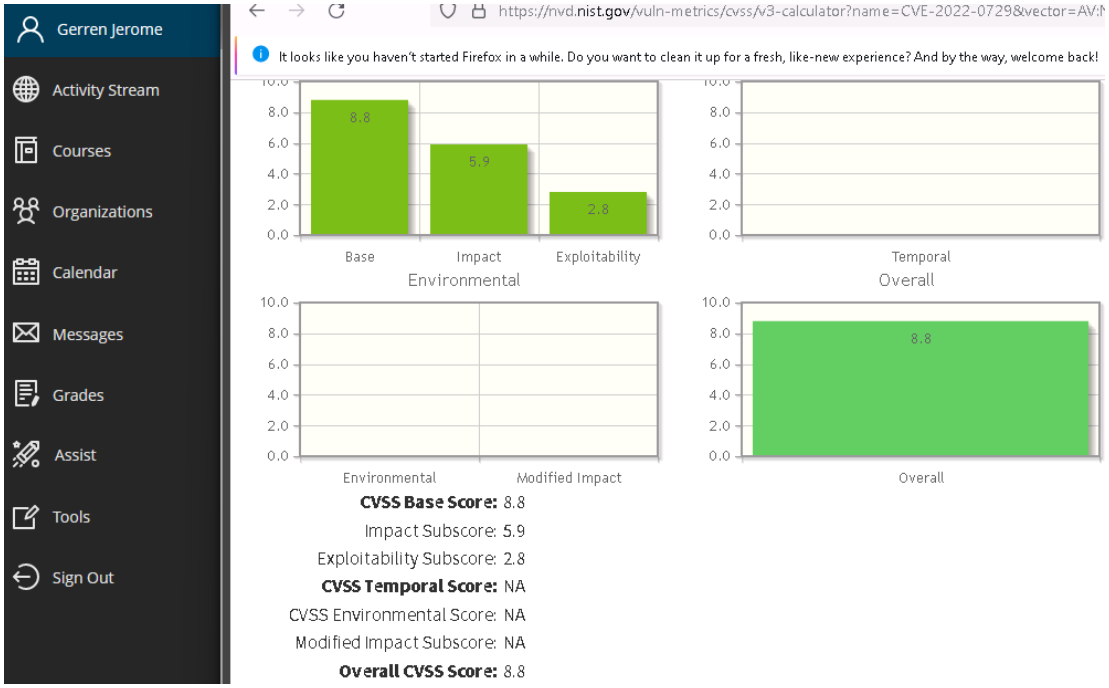
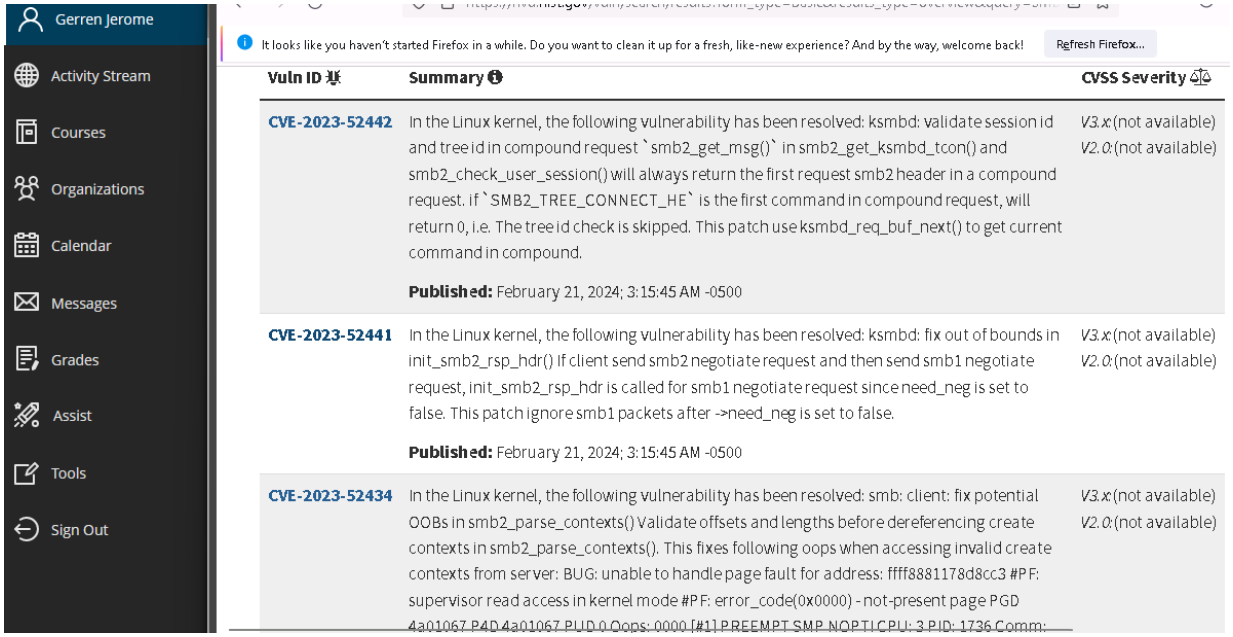
Graphical Score Representation (CVE-2022-0729)



NVD Search (SMB)



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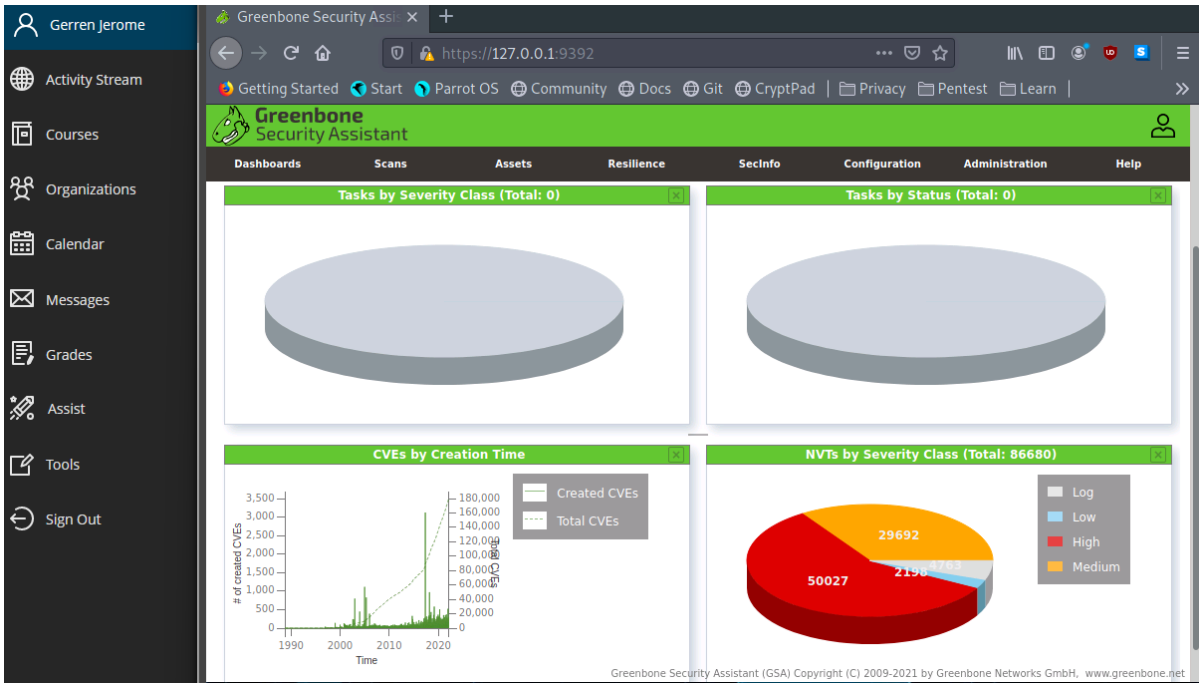
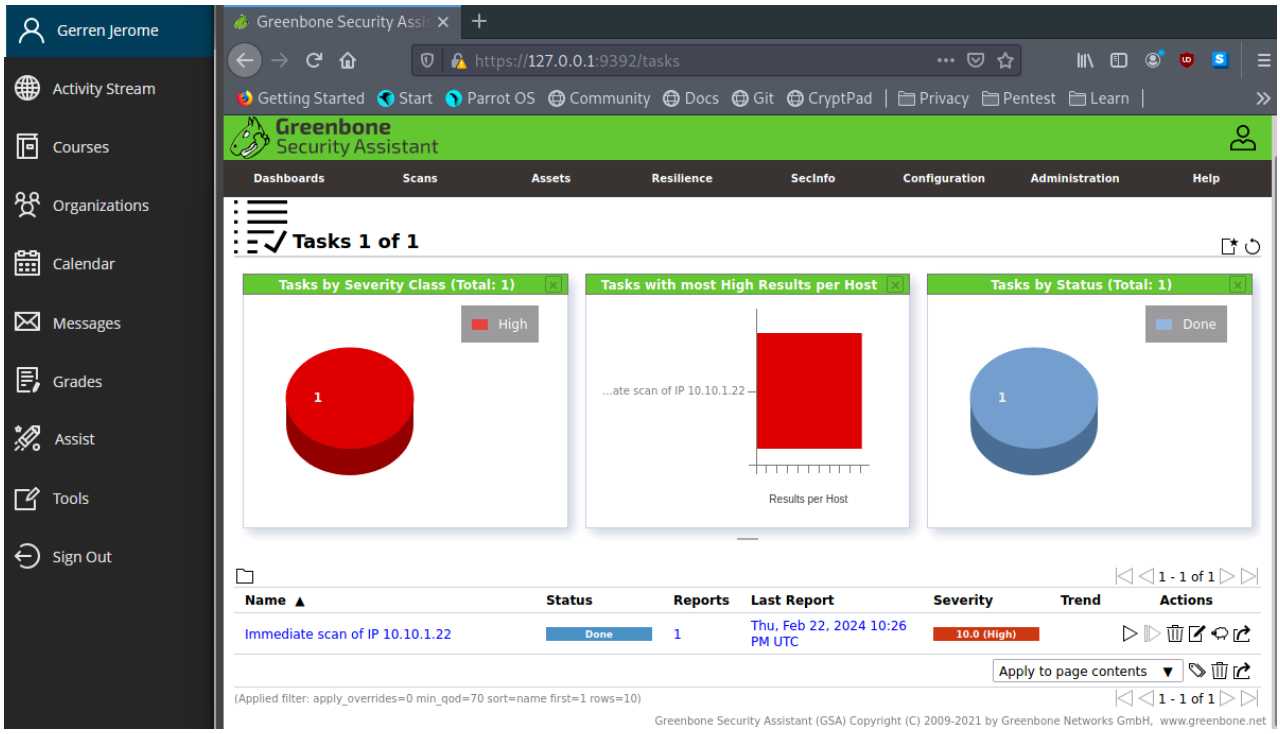
Perform vulnerability assessment using various vulnerability assessment tools.

Perform vulnerability analysis using OpenVAS (5 tasks)

OpenVAS Dashboard post-login



OpenVAS scan completed.



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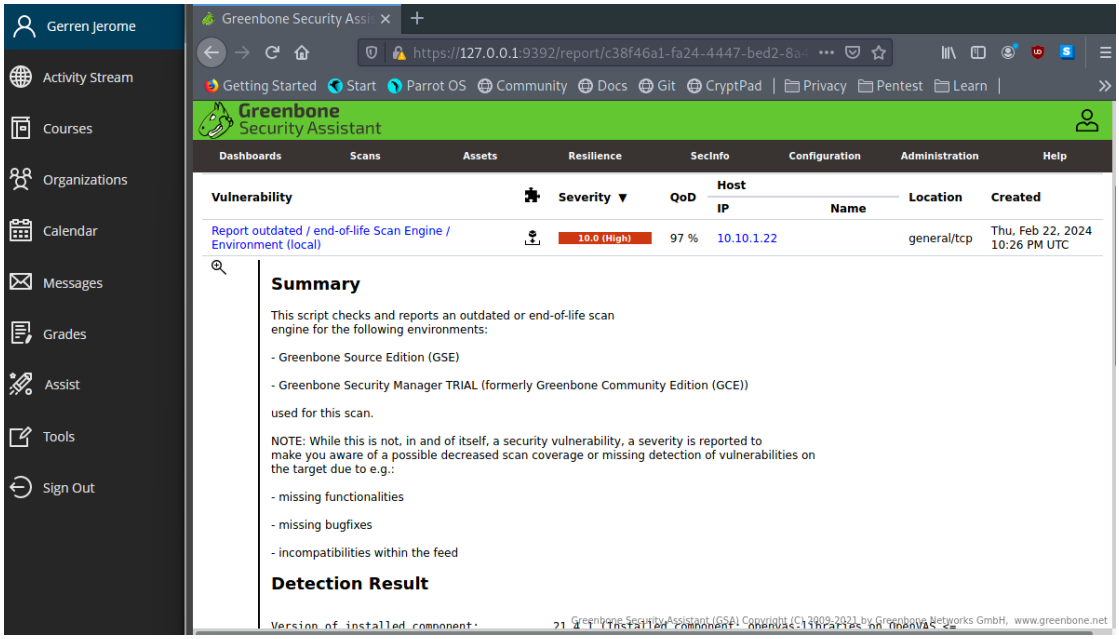
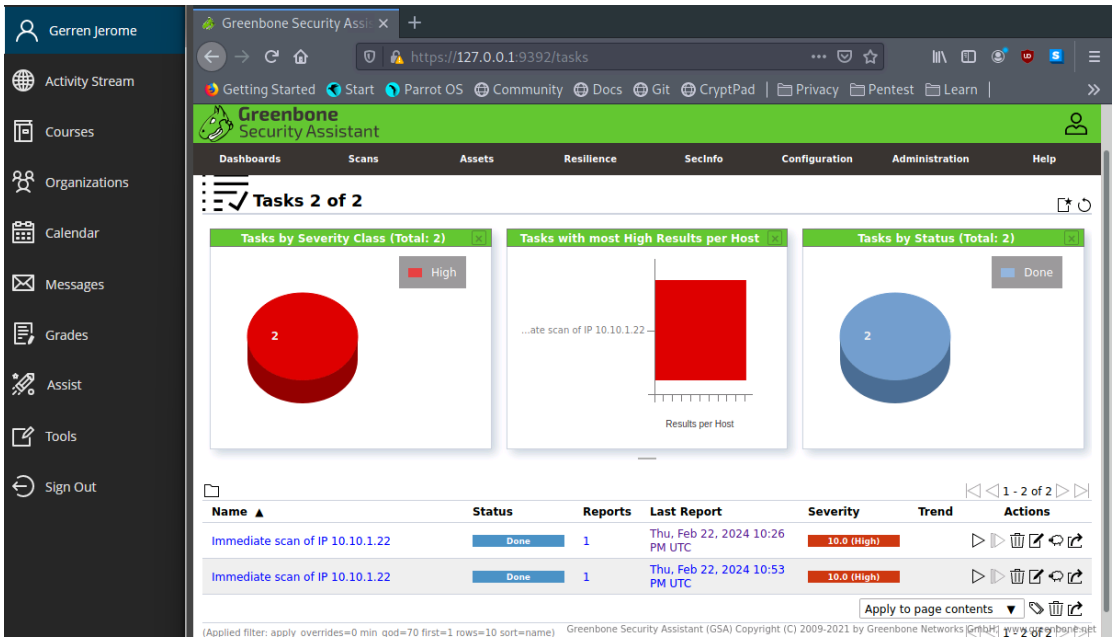
Detailed results re: vulnerability under “Report outdated/end of life/scan engine/Environment (local)”



New task in OpenVAS’ Tasks section



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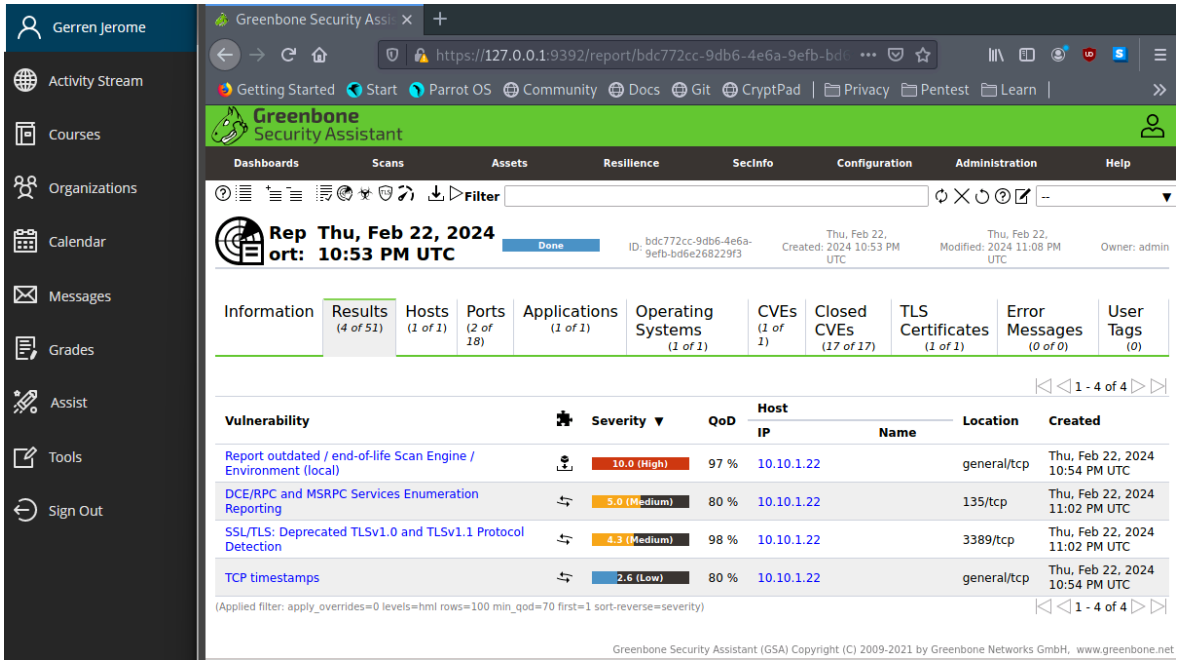
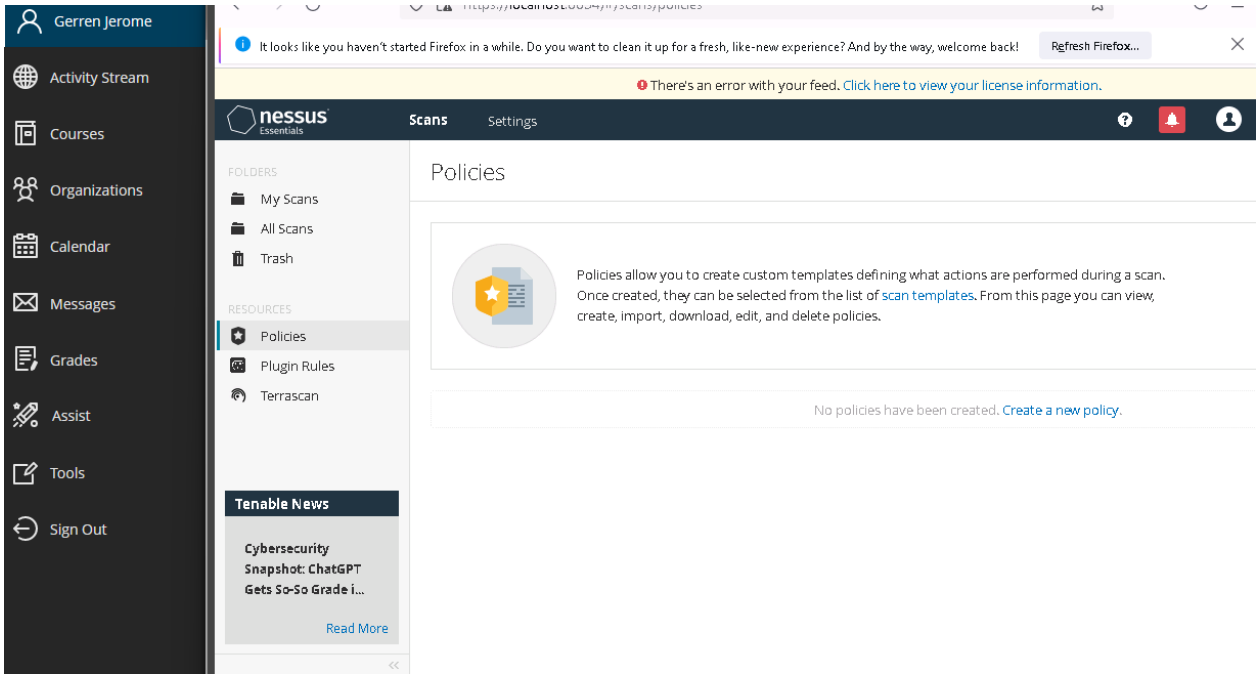
Report results (Severity of vulnerabilities)



Perform vulnerability scanning using Nessus.

Nessus Dashboard post-login



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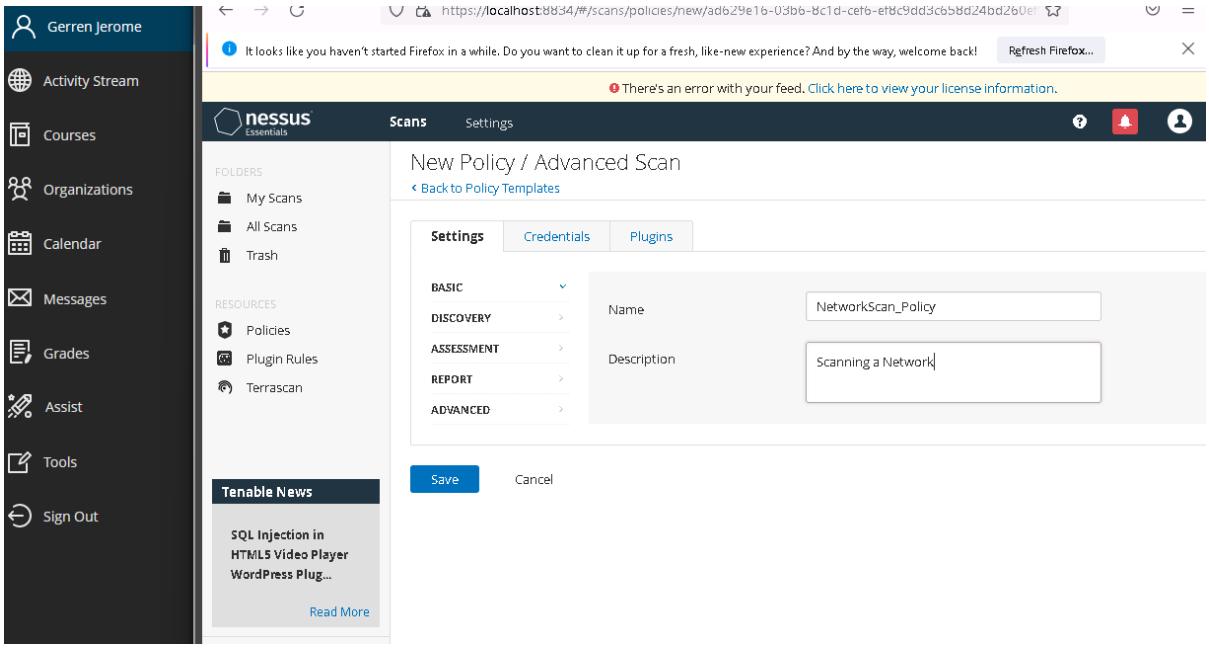
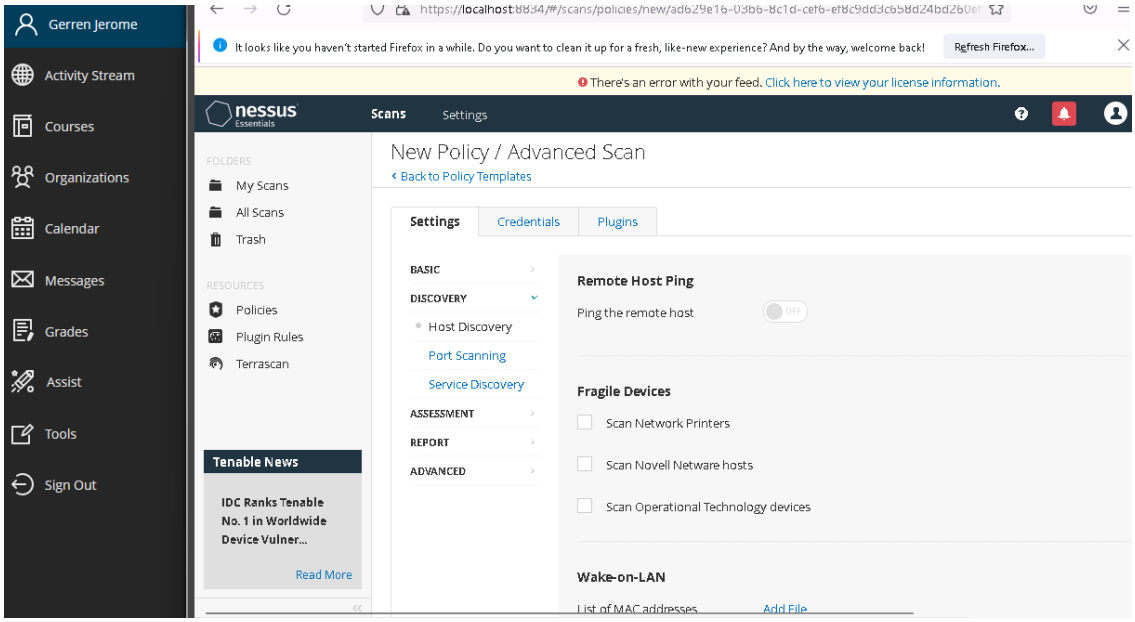
Nessus Advanced Scan settings – BASIC



Nessus Advanced Scan settings – DISCOVERY



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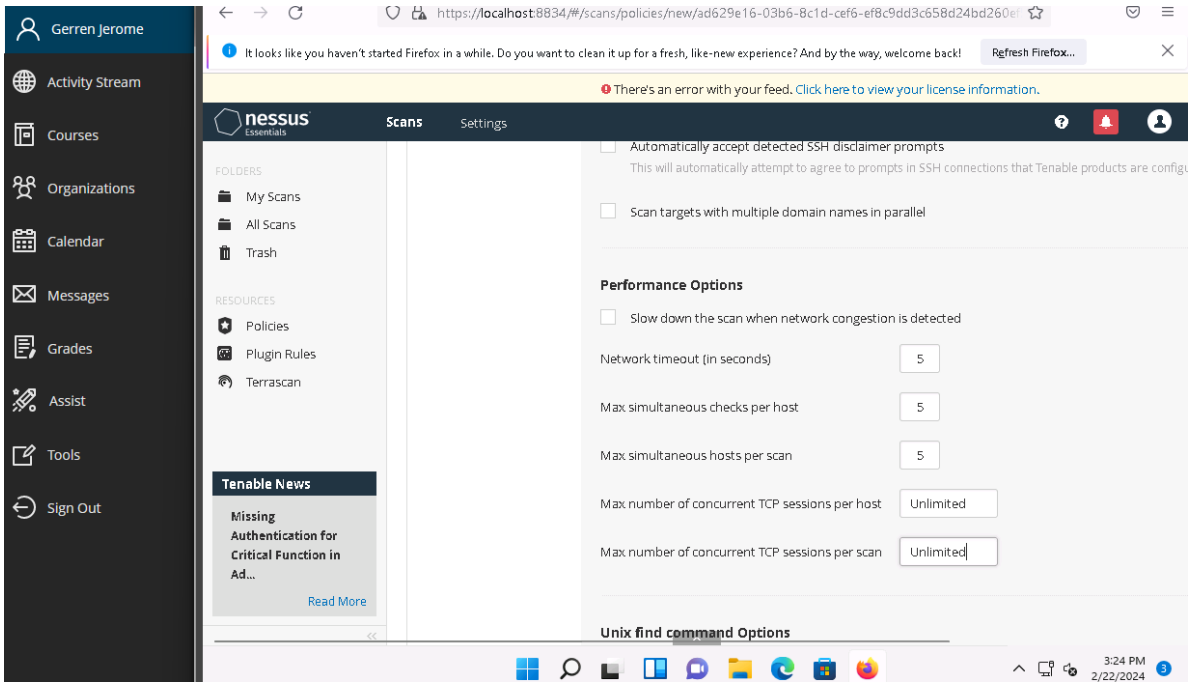
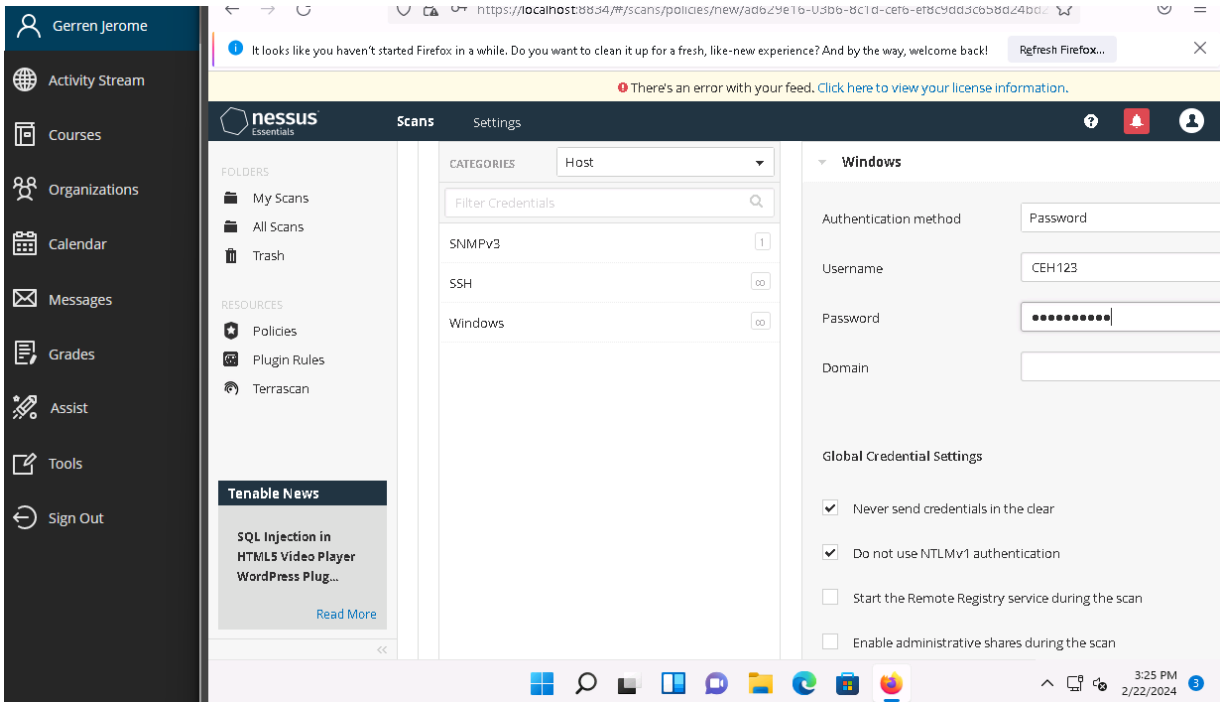
Nessus Advanced Scan settings – ADVANCED



Specify username and password for Windows credentials.



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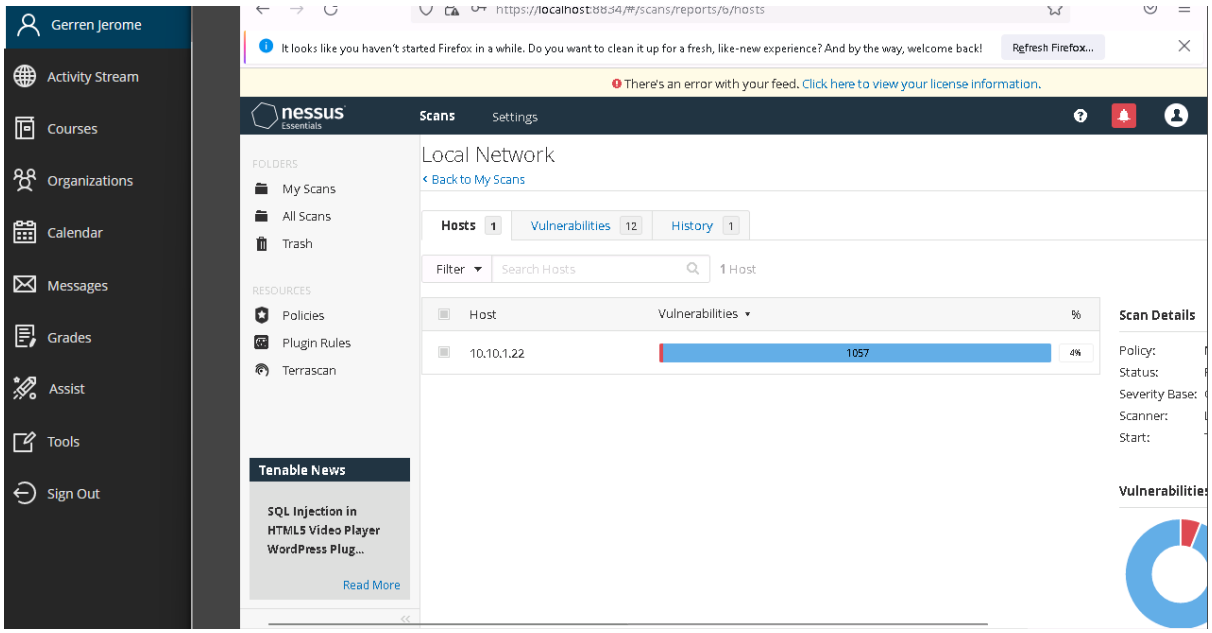
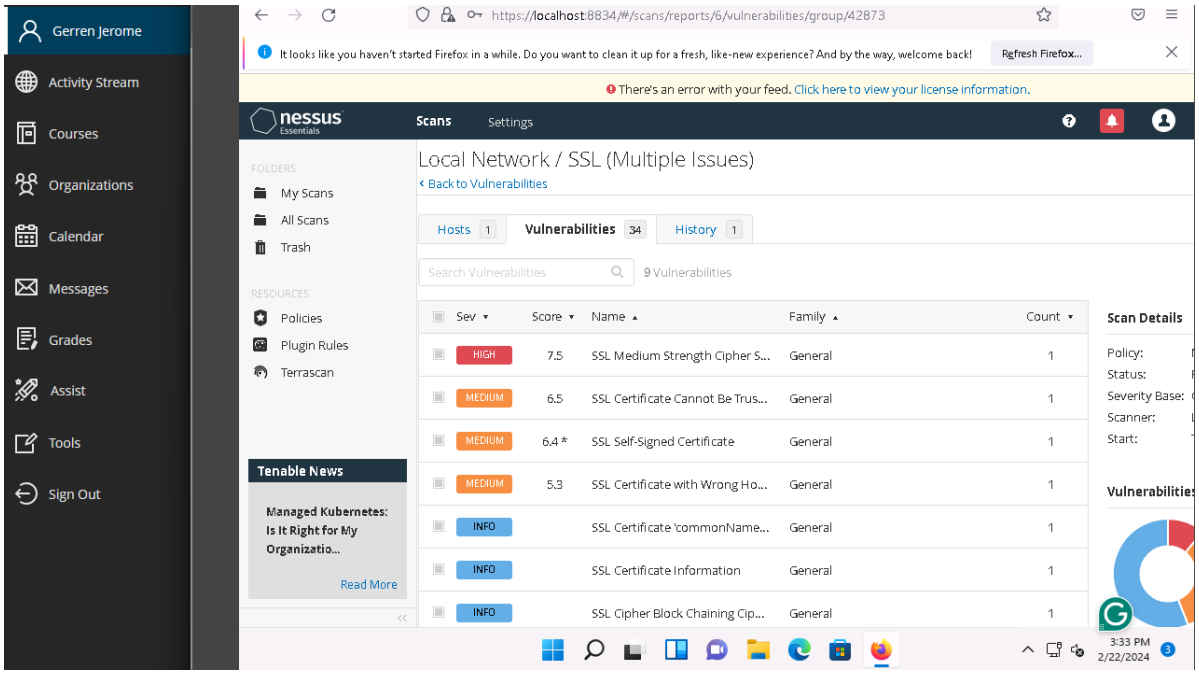
Confirm scan is saved and launched successfully.



Results of Nessus vulnerability scan (SSL)



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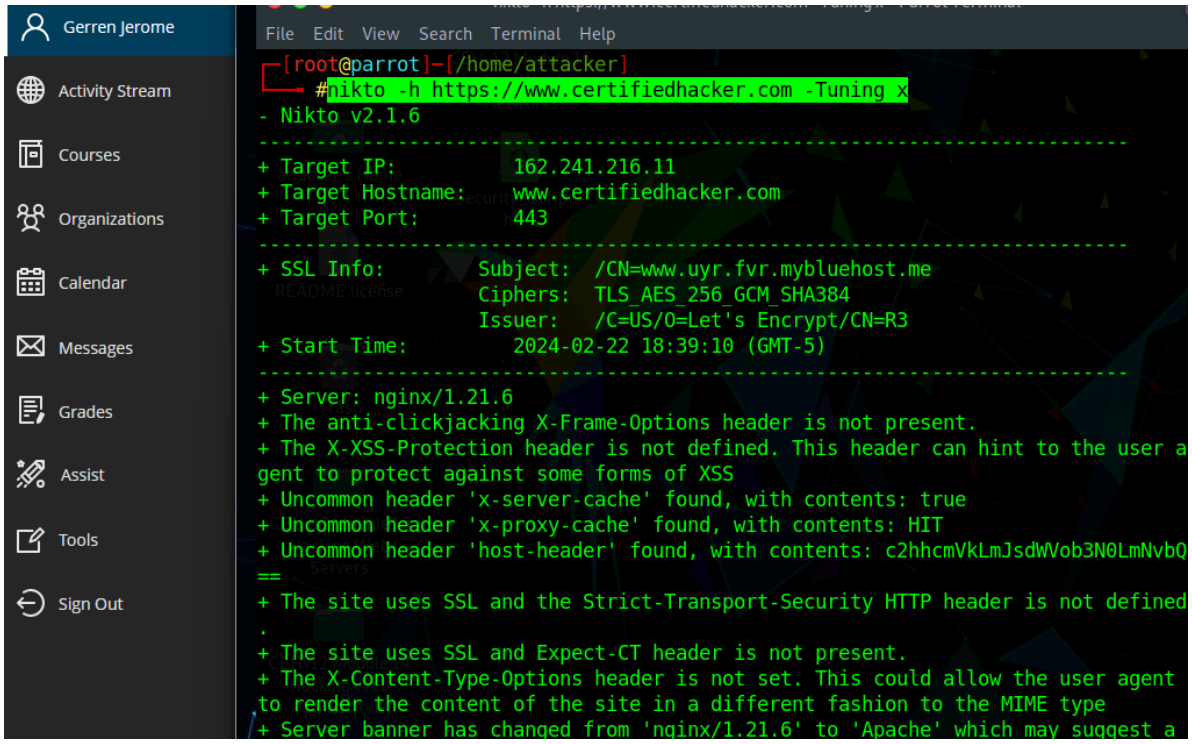
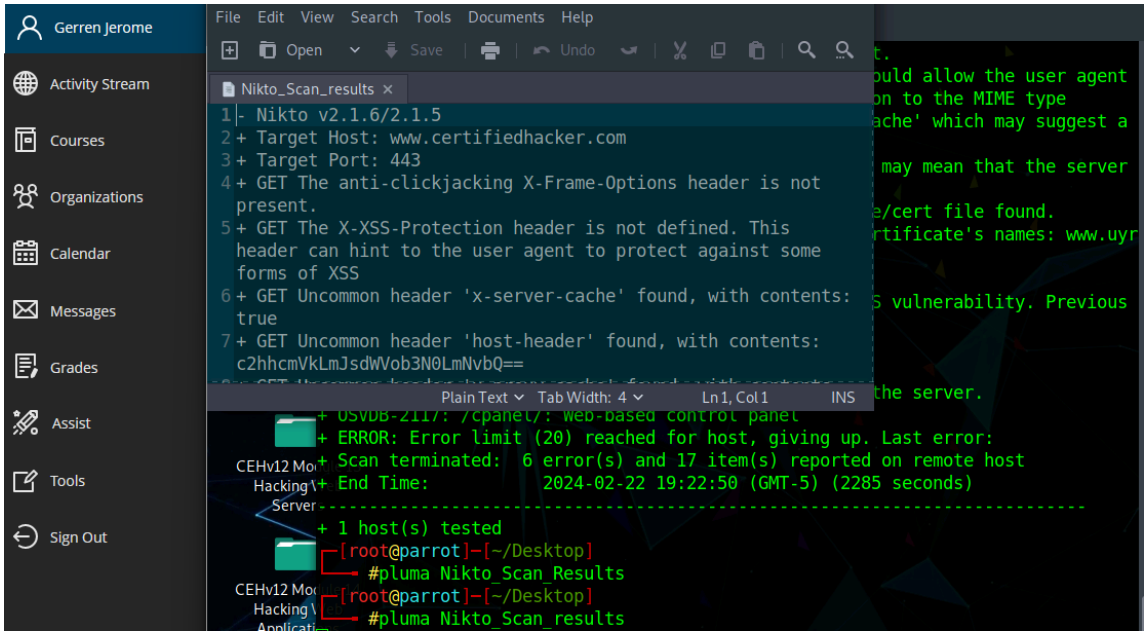
Perform web servers and applications vulnerability scanning using CGI Scanner Nikto

Results (Nikto -h TARGET -Tuning x)



Open Nikto scan results in Pluma to audit scan results.



Reflection

This project provided hands-on experience with various enumeration techniques and tools critical for effective ethical hacking and penetration testing. Through this project, I developed a deeper understanding of how to identify, analyze, and mitigate potential security threats within a network.