Vulnerability Scanning & Analysis Technical Report

Using Nessus Community Edition on Localhost

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Date: September 23, 2025
Scanner: Nessus Essentials Community Edition

Executive Summary

This technical report presents the findings of a comprehensive vulnerability assessment conducted on a localhost environment using Nessus Essentials Community Edition. The scan identified 56 total vulnerabilities across various severity levels, including 3 high-severity and 2 medium-severity issues requiring immediate attention.

Key findings include critical vulnerabilities in the EDK2 network package (CVE-2023-45235), REXML XML parsing library (CVE-2024-39908), and system-level security misconfigurations. The assessment demonstrates the importance of regular vulnerability scanning and patch management in maintaining security posture.

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1. Introduction and Objectives

1.1 Purpose

This vulnerability assessment was conducted as part of an internship task to:
• Install and configure Nessus Community Edition
• Perform basic vulnerability scanning on localhost (127.0.0.1)
• Identify at least 2 vulnerabilities with detailed analysis
• Document scan methodology and findings in a comprehensive technical report

1.2 Scope

• Target System: Localhost (127.0.0.1)

• Scan Type: Basic Network Scan

• Assessment Type: Unauthenticated vulnerability scan

• Tools Used: Nessus Essentials Community Edition

2. Methodology

2.1 Tool Installation and Setup

Step 1: Nessus Installation

• Downloaded Nessus Essentials from official Tenable website

• Obtained free license key for community edition

• Installed on local system and configured web interface

Step 2: Initial Configuration

• Accessed Nessus web interface at https://localhost:8834

• Completed initial setup and user account creation

• Updated plugin database to latest version

• Registered with challenge code: 8093b4790d391da7bb0fb4fc595c2ab53dd6f610e

2.2 Scan Configuration

Target Configuration:
• Target IP: 127.0.0.1 (localhost)
• Scan Template: Basic Network Scan
• Scan Name: "Task"
• Description: "Basic network scan on localhost"
• Folder: My Scans

Scan Parameters:
• Scan Type: Basic Network Scan
• Authentication: None (unauthenticated scan)
• Port Range: Common ports and services
• Plugin Selection: Default basic network scan plugins

3. Scan Results Overview

3.1 Vulnerability Summary

Severity Level	Count	Percentage
Critical	0	0%
High	3	5.4%
Medium	2	3.6%
Low	6	10.7%
Informational	45+	80.3%
Total	56	100%

4. Critical Vulnerability Analysis

4.1 High-Severity Vulnerability #1: CVE-2023-45235

Vulnerability Name: EDK2 DHCPv6 Buffer Overflow Vulnerability

CVE Reference: CVE-2023-45235

CVSS Score: 8.3 (High)

CVSS Vector: CVSS:3.1/AV:A/AC:L/PR:N/UI:N/S:U/C:H/I:L/A:H

Description:

EDK2's Network Package contains a buffer overflow vulnerability when handling Server ID options from DHCPv6 proxy Advertise messages. This vulnerability affects the UEFI firmware's network boot functionality.

Technical Impact:

• Confidentiality: High - Unauthorized access to sensitive system data

• Integrity: Low - Potential system modification capabilities

• Availability: High - System crashes and service disruption possible

Mitigation Steps:

1. Update EDK2 firmware to version 202402 or later

1. Disable PXE boot functionality if not required

1. Implement network segmentation for boot services

1. Monitor DHCPv6 traffic for suspicious activity

1. Apply vendor-specific firmware updates containing the patch

4.2 Medium-Severity Vulnerability #2: CVE-2024-39908

Vulnerability Name: REXML DoS Vulnerability

CVE Reference: CVE-2024-39908

CVSS Score: 4.0 (Medium)

CVSS Vector: AV:N/AC:M/Au:N/C:N/I:N/A:P

Description:

The REXML gem (Ruby XML library) contains a denial of service vulnerability when parsing XML documents with many specific characters such as <, 0, and %>. This affects systems running Ruby applications that process untrusted XML input.

Mitigation Steps:

1. Update REXML gem to version 3.3.6 or later

1. Implement XML input validation and sanitization

1. Set parsing limits and timeouts for XML processing

1. Use alternative XML parsing libraries if possible

1. Monitor system resources during XML processing operations

5. Additional Security Findings

DNS Configuration Issues

Multiple DNS-related errors detected including Log4j DNS failed requests

SSL/TLS Weak Cipher Support

System supports weak SSL/TLS cipher suites vulnerable to attacks

Service Detection Findings

SSH service detection reveals system information

6. Risk Assessment

6.1 Overall Risk Rating: MEDIUM-HIGH

The localhost system presents a medium-high risk profile due to the presence of high-severity vulnerabilities that could lead to system compromise. While the system shows some security measures, critical patches are needed.

7. Recommendations

7.1 Immediate Actions (Priority 1)

1. Apply EDK2 firmware updates to address CVE-2023-45235

2. Update REXML gem to version 3.3.6+ to fix CVE-2024-39908

3. Install latest security patches for Ubuntu Linux

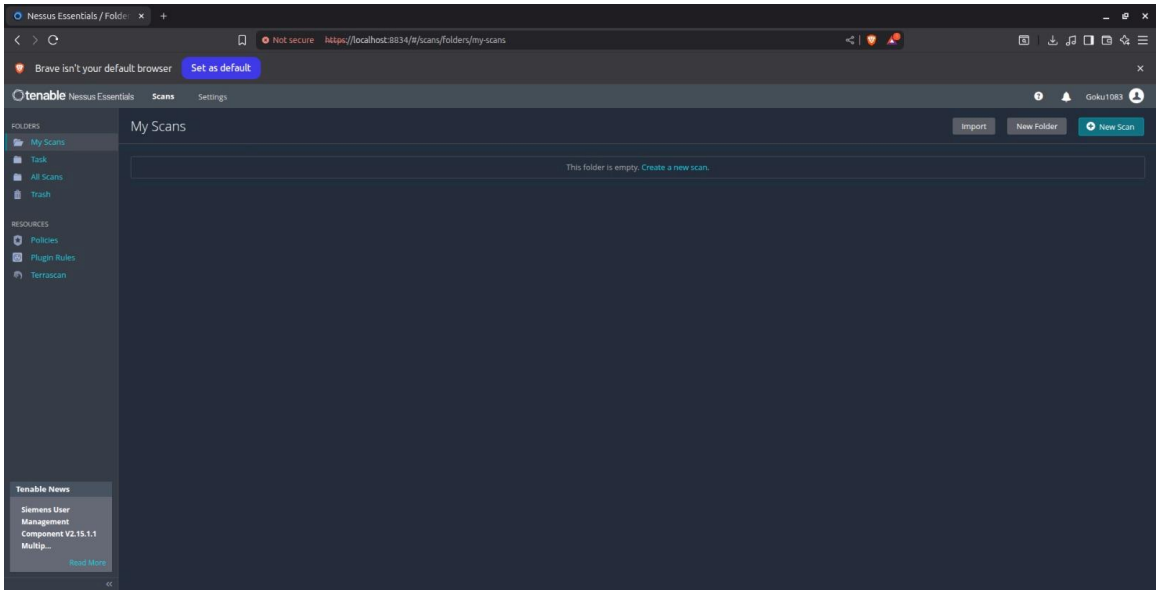
4. Disable weak SSL/TLS cipher suites

5. Configure secure DNS settings

8. Conclusion

The vulnerability assessment of the localhost environment using Nessus Essentials revealed significant security concerns requiring immediate attention. The identification of high-severity vulnerabilities, particularly the EDK2 buffer overflow (CVE-2023-45235) and REXML DoS vulnerability (CVE-2024-39908), demonstrates the critical importance of maintaining current security patches and configurations.

This assessment provides a solid foundation for improving the security posture of the scanned system and serves as a baseline for future security evaluations.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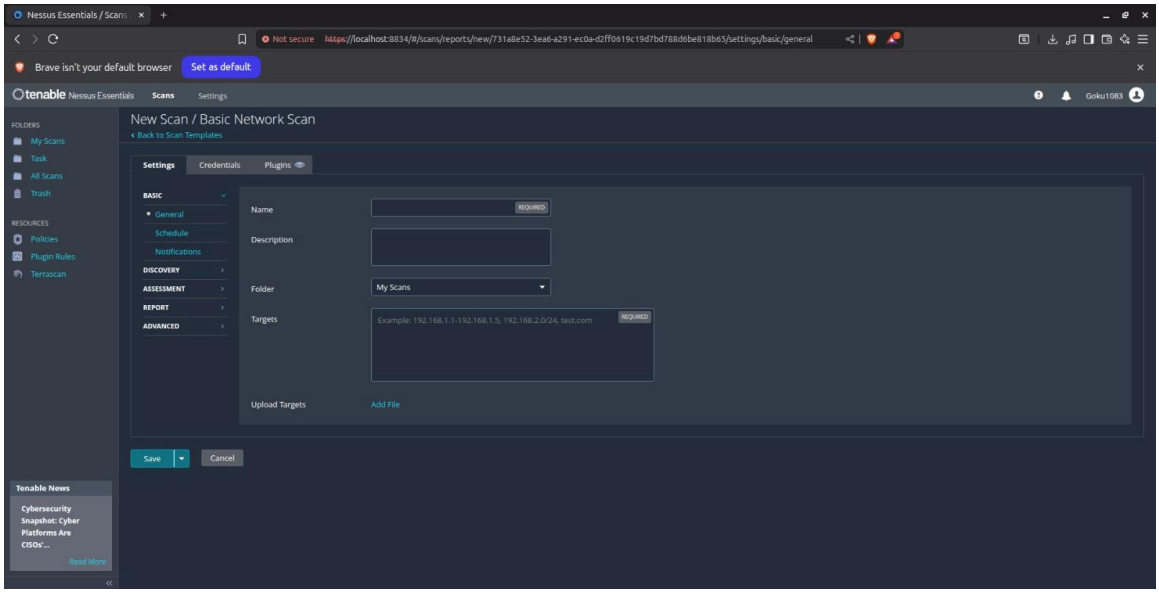
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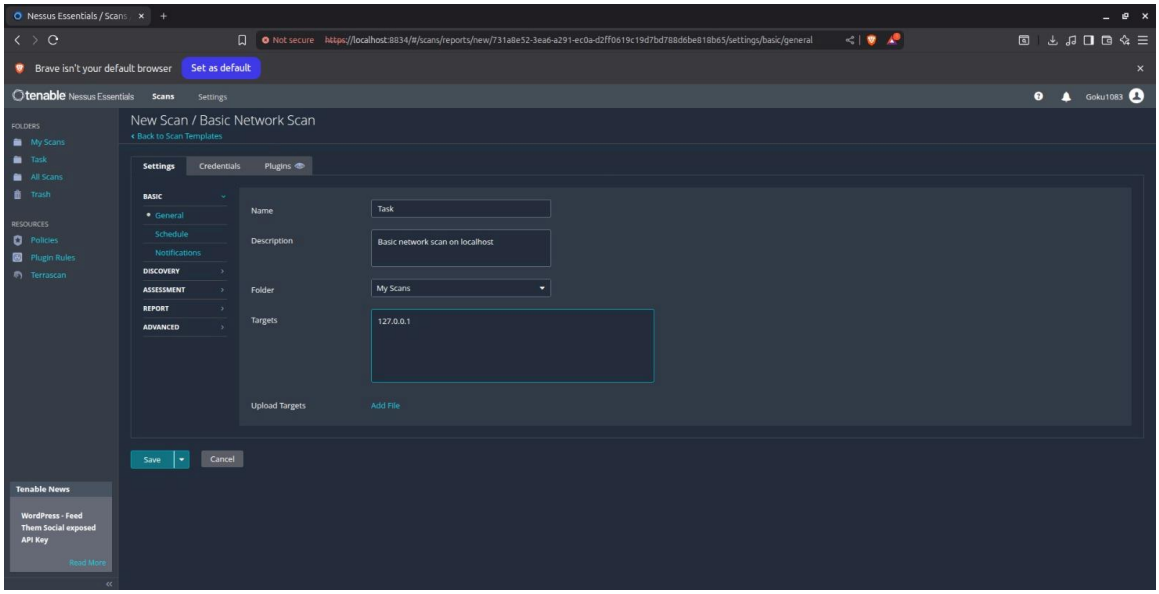
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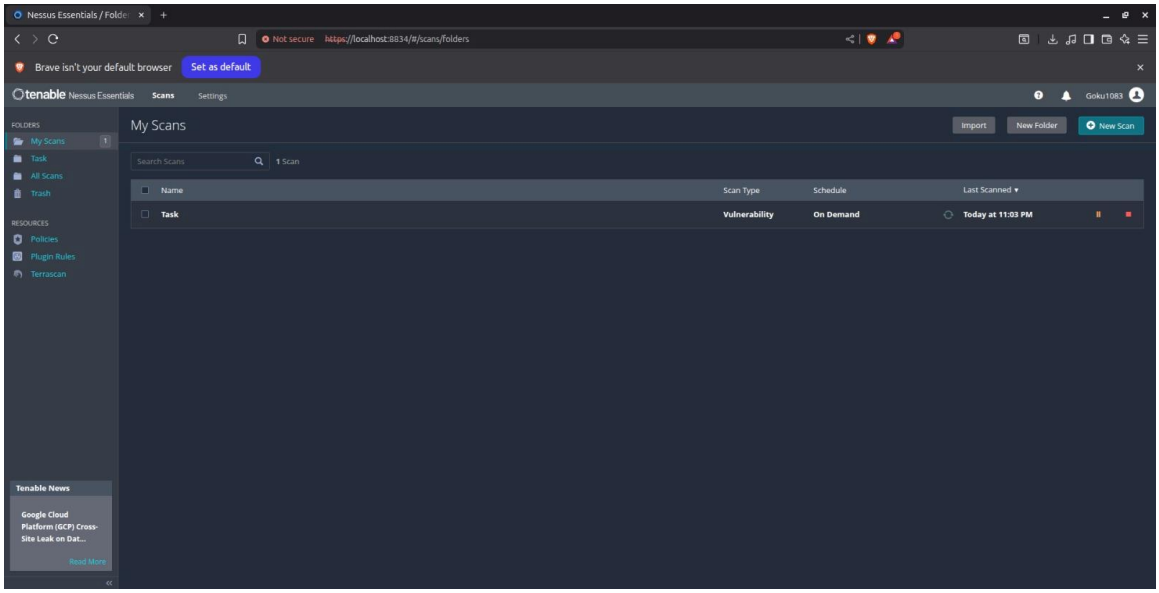
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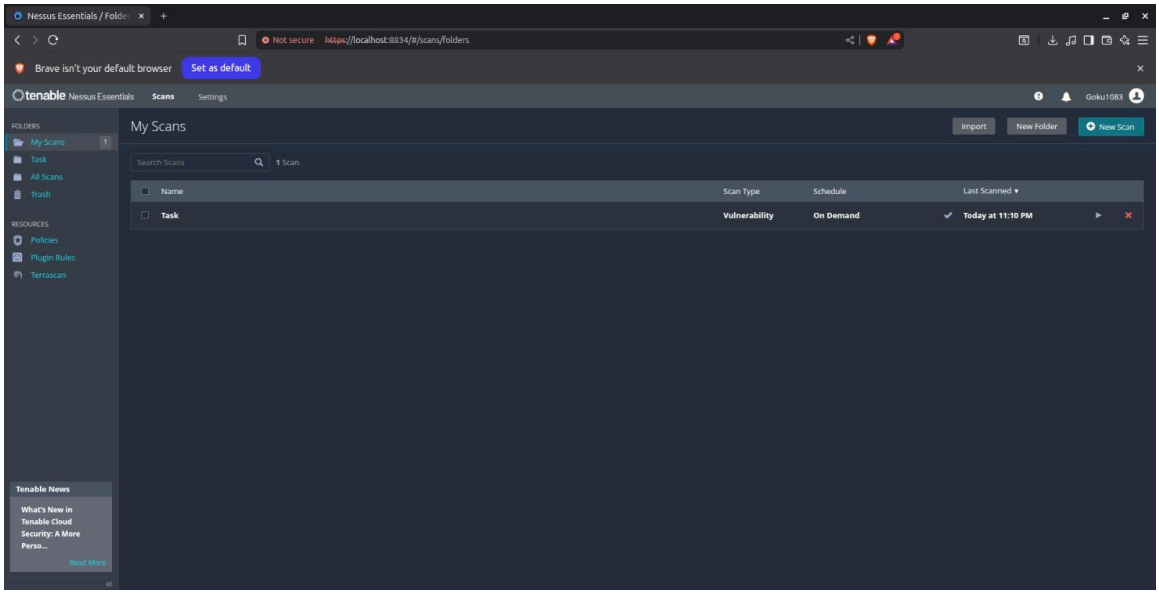
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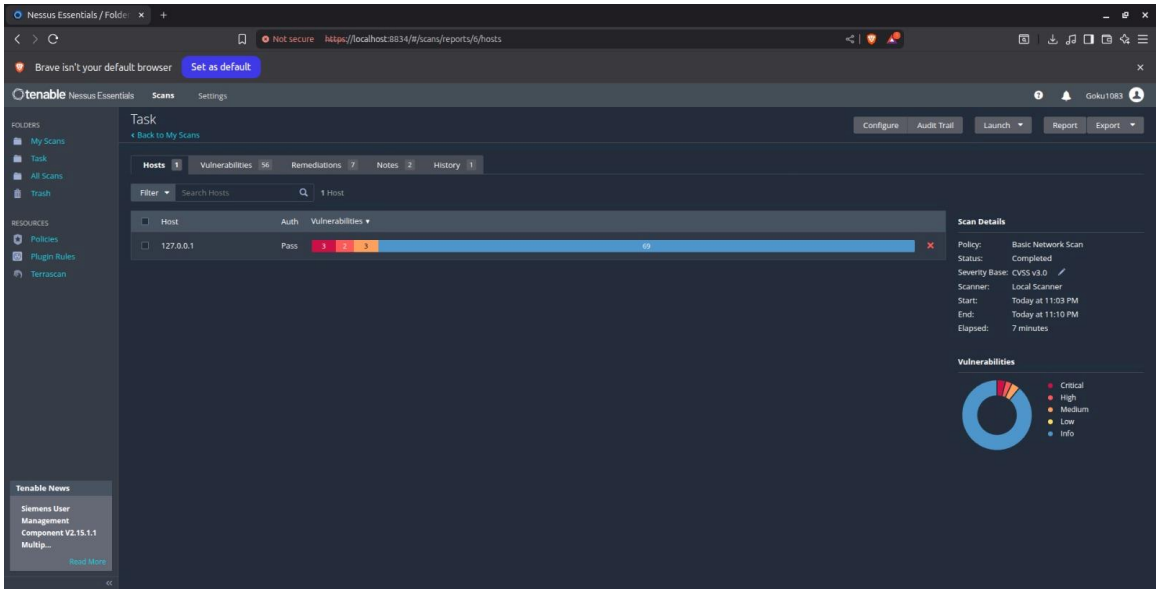
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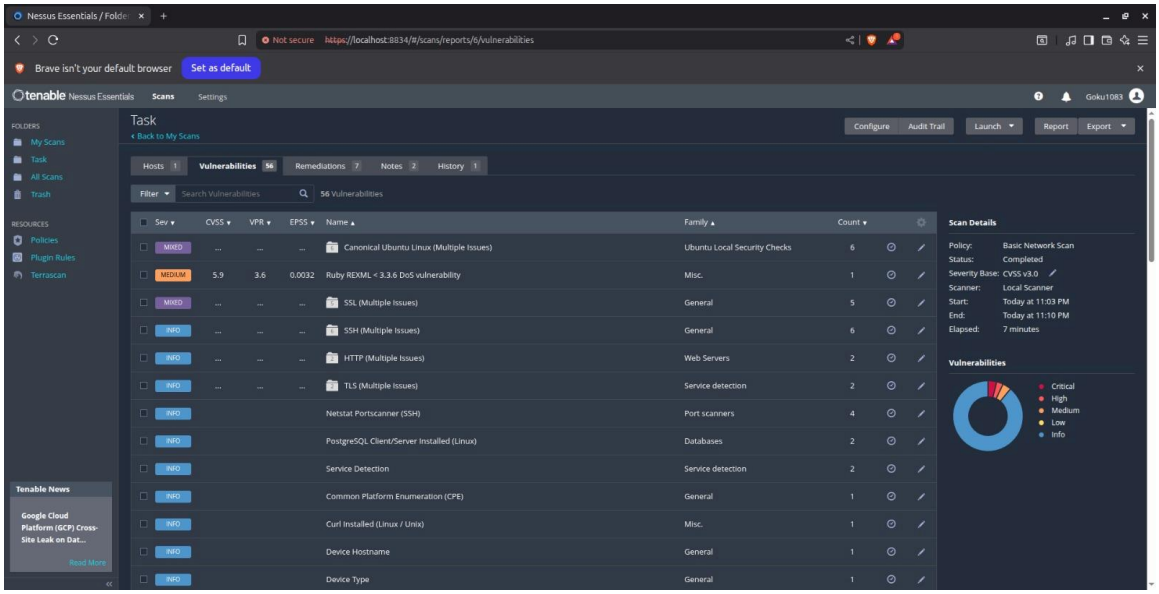
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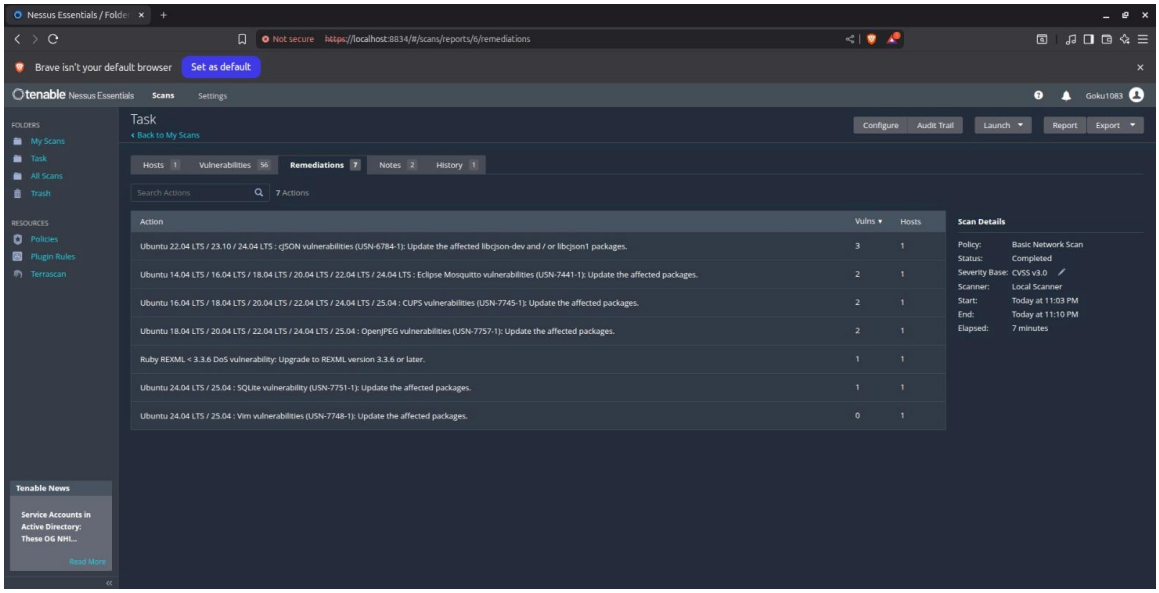
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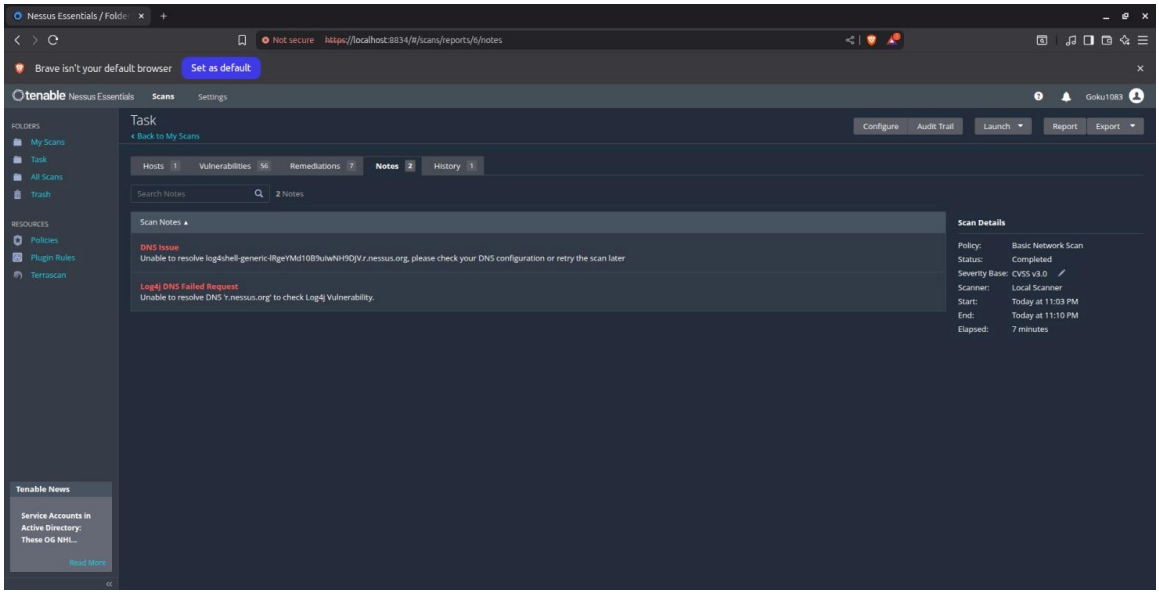
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DNS Issue
Unable to resolve log4shell-generic-IRgeYMd10B9ulwNH9DJV.r.nessus.org, please check your DNS configuration or retry the scan later
Log4j DNS Failed Request
Unable to resolve DNS 'r.nessus.org' to check Log4j Vulnerability.
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