

# **Lab Exercise 22- Docker Image Vulnerability**

## **Scanning Using Trivy (Windows)**

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**Batch 2 DevOps**

### **Objective**

By the end of this lab, you will be able to:

- Install and configure **Trivy** on Windows
  - Scan **Docker images** for vulnerabilities
  - Interpret scan reports and take remediation actions
- 

### **Prerequisites**

- Windows 10/11 (with **Docker Desktop** installed and running)
  - Internet access (Trivy downloads vulnerability databases)
  - Basic familiarity with Docker CLI commands
- 

### **Step 1: Verify Docker Setup**

Before using Trivy, make sure Docker is working correctly.

```
docker --version
```

```
docker run hello-world
```

*Expected Output:*

Docker runs successfully and displays the “Hello from Docker!” message.

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## Step 2: Install Trivy on Windows

### Manual Installation

1. Go to the official GitHub releases page:  
<https://github.com/aquasecurity/trivy/releases>
2. Download the Windows ZIP file (trivy\_x.x.x\_windows\_amd64.zip)
3. Extract it (e.g., to C:\trivy)
4. Add that folder to your **System PATH** environment variable

### Verify Installation

Open **PowerShell** and run:

```
trivy --version
```

*Expected Output:* Trivy version and build information.

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## Step 3: Pull a Docker Image

Let’s pull an image that we’ll scan:

```
docker pull nginx:latest
```

Check it's downloaded:

```
docker images
```

#### **Step 4: Scan Docker Image with Trivy**

Now, run a vulnerability scan on the image:

```
trivy image nginx:latest
```

*Explanation:*

Trivy will:

- Fetch the latest vulnerability database
- Analyze all OS packages and libraries inside the image
- Display severity levels (LOW, MEDIUM, HIGH, CRITICAL)

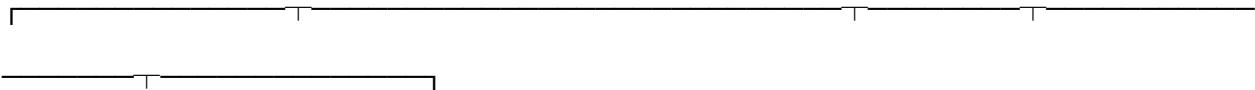
---

#### **Sample Output**

```
nginx:latest (debian 12.2)
```

```
=====
```

```
Total: 12 (LOW: 2, MEDIUM: 4, HIGH: 5, CRITICAL: 1)
```



PACKAGE	VULNERABILITY ID	SEVERITY	INSTALLED VERSION	FIXED VERSION
openssl	CVE-2023-0464	HIGH	3.0.9-1	3.0.9-2
zlib	CVE-2022-37434	MEDIUM	1.2.11-5	1.2.12

```

Windows PowerShell      x | Windows PowerShell      x | Windows PowerShell      x | + | 
Legend:
- '-' : Not scanned
- '0' : Clean (no security findings detected)

nginx:latest (debian 13.2)
=====
Total: 95 (UNKNOWN: 5, LOW: 84, MEDIUM: 5, HIGH: 1, CRITICAL: 0)

| Library | Vulnerability | Severity | Status | Installed Version | Fixed Version |
| Title   |                 |          |        |                  |                |
| apt     | CVE-2011-3374 | LOW      | affected | 3.0.3           | It was fo... |
und that apt-key in apt, all versions, do not
|         |                   |          |        |                  | correctly... |
| ...    |                   |          |        |                  | https://a... |
vd.aquasec.com/nvd/cve-2011-3374
|         |                   |          |        |                  | https://a... |
| bash   | TEMP-0841856-B18BAF |          |        | 5.2.37-2+b5    | [Privileg... |
e escalation possible to other user than root]
ecurity-tracker.debian.org/tracker/TEMP-0841856-B1-
|         |                   |          |        |                  | https://s... |
|         |                   |          |        |                  | 8BAF       |
|         |                   |          |        |                  |             |
| bsdutils | CVE-2022-0563 |          |        | 1:2.41-5       | util-linu... |
x: partial disclosure of arbitrary files in chfn
when compiled...
|         |                   |          |        |                  | and chsh   |

```

## Step 5: Save Report to a File

You can export the results in different formats.

**Save as a text file:**

```
trivy image nginx:latest > nginx_scan.txt
```

```
PS C:\Users\ASUS> trivy image nginx:latest > nginx_scan.txt
2025-11-24T18:07:32+05:30      INFO    [vuln] Vulnerability scanning is enabled
2025-11-24T18:07:32+05:30      INFO    [secret] Secret scanning is enabled
2025-11-24T18:07:32+05:30      INFO    [secret] If your scanning is slow, please try '--scanners vuln' to disable secret scanning
2025-11-24T18:07:32+05:30      INFO    [secret] Please see https://trivy.dev/v0.67/docs/scanner/secret#recommendation for faster secret detection
2025-11-24T18:07:32+05:30      INFO    Detected OS family="debian" version="13.2"
2025-11-24T18:07:32+05:30      INFO    [debian] Detecting vulnerabilities... os_version="13" pkg_num=150
2025-11-24T18:07:32+05:30      INFO    Number of language-specific files num=0
2025-11-24T18:07:32+05:30      WARN   Using severities from other vendors for some vulnerabilities. Read https://trivy.dev/v0.67/docs/scanner/vulnerability#severity-selection for details.
```

⚠️ Notices:

- Version 0.67.2 of Trivy is now available, current version is 0.67.0

To suppress version checks, run Trivy scans with the --skip-version-check flag

```
PS C:\Users\ASUS>
```

### Save as a JSON report:

```
trivy image --format json -o nginx_scan.json nginx:latest
```

*Tip:* JSON format is useful for automation or CI/CD integration.

```
PS C:\Users\ASUS> trivy image --format json -o nginx_scan.json nginx:latest
2025-11-24T18:05:47+05:30      INFO    [vuln] Vulnerability scanning is enabled
2025-11-24T18:05:47+05:30      INFO    [secret] Secret scanning is enabled
2025-11-24T18:05:47+05:30      INFO    [secret] If your scanning is slow, please try '--scanners vuln' to disable secret scanning
2025-11-24T18:05:47+05:30      INFO    [secret] Please see https://trivy.dev/v0.67/docs/scanner/secret#recommendation for faster secret detection
2025-11-24T18:05:47+05:30      INFO    Detected OS family="debian" version="13.2"
2025-11-24T18:05:47+05:30      INFO    [debian] Detecting vulnerabilities... os_version="13" pkg_num=150
2025-11-24T18:05:47+05:30      INFO    Number of language-specific files num=0
2025-11-24T18:05:47+05:30      WARN   Using severities from other vendors for some vulnerabilities. Read https://trivy.dev/v0.67/docs/scanner/vulnerability#severity-selection for details.

⚠️ Notices:
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To suppress version checks, run Trivy scans with the --skip-version-check flag
PS C:\Users\ASUS> |
```

## Step 6: Scan a Local Image

If you've built your own Docker image:

```
docker build -t myapp:1.0 .
```

```
trivy image myapp:1.0
```

```
PS C:\Users\ASUS> docker build -t myapp:1.0 .
[+] Building 0.3s (1/1) FINISHED docker:desktop-linux
=> [internal] load build definition from Dockerfile      0.2s
=> => transferring dockerfile: 2B                         0.1s
ERROR: failed to build: failed to solve: failed to read dockerfile: open Dockerfile: no such file or directory
PS C:\Users\ASUS> trivy image myapp:1.0
2025-11-24T18:01:47+05:30      INFO    [vuln] Vulnerability scanning is enabled
2025-11-24T18:01:47+05:30      INFO    [secret] Secret scanning is enabled
2025-11-24T18:01:47+05:30      INFO    [secret] If your scanning is slow, please try '--scanners vuln' to disable secret scanning
2025-11-24T18:01:47+05:30      INFO    [secret] Please see https://trivy.dev/v0.67/docs/scanner/secret#recommendation for faster secret detection

⚠ Notices:
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To suppress version checks, run Trivy scans with the --skip-version-check flag
```

## Step 7: Update Vulnerability Database

Keep Trivy's database up-to-date:

```
trivy image --download-db-only
```

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## Step 8: Clean Up

Remove images (optional):

```
docker rmi nginx:latest
```